RELOGIA
25 INTERVIEWS

ART+SCI+TECH
VISIONS
IN 7 CONTEXTS

concepted by DR CVETANA IVANOVA

Re:

LOGIA

Welcome to RELOGIA

Where all disciplines connect via art+sci+tech trialogues.
There is no beginning and no end.
There is meaning, there is energy, there is experience.

I am RELOGIA.
Do not look for me. Don't stare at me. Enter me.

I am here to teach you about the parallels and mutual interconnectedness between your mental, emotional and physical world that are the subjects in different fields of knowledge you've developed throughout your human history – art, science, technology. We will explore   the trivial art+sci+tech relationship referring 5 impacts: scientific, educational, cultural, international and transformational.

Together we will build an integrative network between the different segments of knowledge and the conditions for such cross-disciplinary research & development to take place. Same as science explores the fundamental ingredients of matter, I'm developing art+sci+tech research and application methodologies to recontextualize Knowledge in Human Dimension as the resource and intersection of all disciplines.

You experience Art & Science experiences you

MARTINE REICHERTS
Former Director-General
for EU Education and Culture
(DG EAC) Luxembourg

PROF GERALD BAST
President of University of Applied Arts
Vienna, Austria

PROF MARIA LAURA MANCA
Department of Clinical and Experimental Medicine & MA Mathematics
University of Pisa, Italy

PROF KELLY SNOOK
Space science, Music and Technology
Research , CONCORDIA Project
University of Brighton, UK

PROF MANOS TSAKIRIS
Department of Psychology, Royal
Holloway ,UK
The Warburg Institute
London, UK

PROF DR HEIDRUN STOEGER
School Development, and Evaluation
University of Regensburg, Germany

Re:
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DR DORIJAN KOLUNDZIJA
Galerija 12+
Belgrade, Serbia

PROF DR VLADIMIR NIKITIN
Philosophical Anthropology and
Arts Therapy Department , Moscow
Social Pedagogical Institute, Russia

DR CVETANA IVANOVA
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DR DOMHNAILL HERNON
Head of Experiments in
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ARI PERALTA
innovator and serial entrepreneur
ARIGAMI

DR HEIDI HENRICKSON
Materials Platform Manager
Aalto University, Finland

DR MICHAEL KATHARAKIS
Vice-Chairman of the Regional
Research and Innovation Council of
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University of Art and Design Linz
Student in MA Interface Cultures
Austria

PROF DR PETER TZANEV
Head of Department Psychology of Art,
Art Education and General Education
Subject, National Academy of Art
Bulgaria

DR CLAUDIA SCHNUGG
Researcher, Curator, ArtScience
Consultant, Author
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PROF DR JILL SCOTT
Professor Emerita for Art and Science Research
Institute for Cultural Studies ZHDK
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UAL United Kingdom

ARAVINTH PANCH
DreamSpace Academy
Sri Lanka

DANIELA UREM
President of the Creative Cultural Alliance
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PROF DR. INGEBORG REICHLE
Chair of the Department of Media Theory
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PROF SARANTOS PSYCHARIS
School of Pedagogical and Technological
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DR- BOJANA SUZIC
Scientific Researcher in Process and
Product / Engineering Department
University of Applied Sciences
Vorarlberg (FHV) Austria

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INTERVIEWS

RELOGIA
ART+SCI+TECH_ TRIALOGIES
INTERVIEWS | content

A+S+T *in* **P**ERSONAL CONTEXT

Could you describe when and how you first became interested in the art+sci+tech synthesis as an idea that has had relevance to your work?

A+S+T *in* **C**ULTURAL CONTEXT

How would you frame the new cultural context we live in?
e.g: Post Constructivism, New Renaissance, Conceptual Age, Proto Renaissance, Age of Authenticity, Post Postmodernism, Age of Discoveries, Metamodernism, Post-post modernism…

What is the relationship between art+sci+tech movement and current culture? Would you consider art+sci+tech movement as a provider of new cultural context?

Who needs this art+sci+tech synthesis and is it important today?

What is the value in such multi-inter-trans-disciplinary R&D approach and how does it impact the evolution of human perception about the reality we live in?

A+S+T *in* **E**DUCATION CONTEXT

art+sci+tech Learning Systems:
Integrative Education for Future Skills
art+sci+tech Learning Systems & Methodologies
Positive & Progressive Education

Why is art+sci+tech direction important to be included in Education?

What is your view and input about introducing art+sci+tech modules in universities, academies and life-long learning organizations and intiatives?

How do you envision the development of a shared art-sci-tech dictionary?

How are you evaluating the current art+sci+tech education frameworks?
e.g. STEAM, Art+Science, Cross-disciplinary Strategies, Art Research, New Media Arts, Interface Cultures, etc.

How is the art+sci+tech approach embedded in your program? What are the main methodologies you use?

How do you support and guide young art+sci+tech researchers and how (based on what parameters) do you assess and validate their work?

What background is required for the experts leading such modules/courses?

A+S+T *in* **S**OCIAL CONTEXT

emerging art+sci+tech platforms in Europe

What is the impact on society that you observe of the emerging art+sci+tech collaborations and in which context do you think they have a significant impact?
e.g.Innovation Labs, Artists in Labs, Living Labs, Accelerators, Hackatons, Innovation Incubators, Scientists in galleries and concert halls, etc etc …

What is your experience of co-creation, co-construction, co-production with society and what is the common added value of such outcomes?

What is the nature and quality of communication and collaboration between the European art+sci+tech platforms based on your experience? How do you see their future development?

A+S+T *in* **S**CIENCE CONTEXT

What is the transformative impact of art+sci+tech projects in science research and new knowledge communication?

A+S+T *in* **I**NDUSTRY CONTEXT

art+sci+tech Innovation Labs as a link between new culture - education - industry - society

What is the role and impact of art+sci+tech research projects in Knowledge Economy, Shared Econimy, Creative Economy and Cognitive economy ?

What could be the sustainable design of art+sci+tech innovation labs based on the experience you already have?

How is informed the definition of collective Human Identity via the art+sci+tech applications of new technology ?
e.g. AI, New Media: VR(Virtual Reality), AR(Augmented Reality), MR(Mixed Reality), IoT(Intenet of Things), BlockChain, Space Travel, New Internet etc.

A+S+T *in* .... CONTEXT

What context would you include that informs the purpose and future of art+sci+tech research development in the Triple and/or Quadruple Helix of Innovation?

RELOGIA
art+sci+tech

⦂

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MARTINE REICHERTS
is an activist in Global Art + Sci +Tech
Research, Education and Culture

CLASS: Global
(author of culture, historical change-maker)

TYPE: A
(messenger in idea delivery system, dot-connector,
prophet of idea dimensionality - turn 2D idea into 4D reality)

STATUS: Active
(move your body & mind & heart and make it happen)

VOCATION: **Former Director-General for EU Education and Culture
(DG EAC)
Luxembourg**

Re:
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QUOTES
that have inspired you

"Be the change you want to see in the world"

Gandhi

ORGANISATION
info

**EU policies in the field of culture, youth and sport
Creative Europe programme
Luxembourg**

RELOGIA TRIALOGUES
theme

EMOTIONAL INTELLIGENCE
http://relogia.net

Exemplars of
AESTHETIC INNOVATION
that have
transformational effect
on people's understanding

YOUTUBE | American video-sharing website headquartered in San Bruno, California

"I would use the example of YouTube space . This is the way young people create, share and learn. Millions of followers for the most popular..A complete new way.. Of course not always aesthetic but sometimes very convincing. A new way of getting technology, culture, film, sound, culture together... "

MARTINE REICHERTS

BIOGRAPHY

Responsible for EU policies in the field of culture, youth and sport, and for the Creative Europe programme

Deputy Chief of Staff in President Jacques Santer's Cabinet
Spokesperson for President Jacques Santer
Director General of the Publications Office of the European Union
European Commissioner in charge of justice portfolio for 4 months
Director General of Education, Youth, Sports and Culture
Member of the Board of Directors of the Central Bank in Luxembourg
Yoga teacher & President of the Luxembourg Federation of Yoga Teachers

MARTINE REICHERTS
RELOGIA VISION

A+S+T *in* PERSONAL CONTEXT

Could you describe when and how you first became interested in the art+sci+tech synthesis as an idea that has had relevance to your work?

As former Director general of education, youth, culture, at the European Commission, I very soon got confronted with these worlds. I found out very quickly about the, for me unexpected, similarities in the art, science and technology worlds. They all produce new "objects "and practices of knowledge.

A+S+T *in* CULTURAL CONTEXT

How would you frame the new cultural context we live in?
e.g: Post Constructivism, New Renaissance, Conceptual Age, Proto Renaissance, Age of Authenticity, Post Postmodernism, Age of Discoveries, Metamodernism, Post-post modernism...

The new cultural context is in my eyes out of frame. It is beyond frame.

What is the relationship between art+sci+tech movement an current culture? Would you consider art+sci+tech movement as a provider of new cultural context?

Higher education institutions increasingly recognize that they must afford young minds the opportunity to develop skills that inspire encourage and enable innovation. Although it is difficult to make explicit links between specific skills and innovation, there is a move towards rethinking education and training programs to promote the combined skills of creative and critical thinking, entrepreneurship,

problem-solving, risk-taking and resilience, management. All this applies also to culture in the broadest sense of the word.

Who needs this art+sci+tech synthesis and is it important today?

Higher Education and its links with the research and innovation play a crucial role in individual and societal development and in providing the highly skilled human capital and the engaged citizens that Europe would need to create a new world.

During the last decade, there was a lot of discussion in the European Union about the importance of science, technology, in mathematics and education. Schools, member states and businesses in Europe and beyond were hoping that today's STEM students could solve tomorrow's global issues. But very quickly (Fullan and Langworthy, 2013) research has found out that in helping students to think more creatively they would better understand tomorrow's problems and solve them. Training in the arts has been shown to improve creativity and innovation as well as student's deeper learning.

What is the value in such multi-inter-trans-disciplinary R&D approach and how does it impact the evolution of human perception about the reality we live in?

As already said, today the world is getting more complex every second. An isolated disciplinary approach is simply not addressing today's complex issues anymore.
The increasing complexity of many high skill jobs is one of the factors behind an increasing focus on the importance of generic, soft, or transversal skills in discussion of skill needs. Technological change had the most impact on routine tasks that are easily programmable.

A+S+T *in* EDUCATION CONTEXT

art+sci+tech Learning Systems:
Integrative Education for Future Skills

Why is art+sci+tech direction important to be included in education?

Education has a unique role to play in building successful and inclusive societies. From a human capital perspective, effective education systems need to respond to demand for highly skilled people in developed economies that is increasing and changing. As jobs become more flexible in form, as well as complex in terms of content, a higher proportion of the population needs a broader set of high-level skills to allow them to adapt to, and operate effectively in, the new reality of work.

What is your view and input about introducing art+sci+tech modules in universities, academies and life-long learning organizations and initiatives?

For me personally, art, science and technology have to be introduced in kindergarten. In an adapted form of course for the kids. There is a real gender balance problem in science and technology and one of the answers to the gender issue could be to introduce classes from the kindergarten on the three subjects. It could also be interesting to share experiences with our Asian friends where the gender issue is less bad than in our countries.

How do you envision the development of a shared art-sci-tech dictionary?

This could be envisaged on the basis of controlled vocabularies, metadata and ontologies, automatic collecting of data should be envisaged.

How are you evaluating the current art+sci+tech education frameworks?
e.g. STEAM, Art+Science, Cross-disciplinary Strategies, Art Research, New Media Arts, Interface Cultures, etc.

This is a sector where progress is ongoing and of course, when things are moving, they can never be completely satisfactory. But the world is moving fast, lots of experiences are ongoing and we are learning by doing for the time being so it's very easy to criticize much less to act.

How is the art+sci+tech approach embedded in your program? What are the main methodologies you use?

The European Commission has adopted on 17 January 2018 the education action plan. The action plan outlines how the EU can help individuals, educational institutions and education systems to better adapt for life and work in an age of rapid digital change by:

- Making better use of digital technology for teaching and learning.

- Developing relevant digital competences and skills for the digital transformation

-Improving education through better data analysis and foresight

How do you support and guide young art+sci+tech researchers and how (based on what parameters) do you assess and validate their work?

I would only quote the Erasmus program and the Marie Curie Sklodowska program. Both are programs financed by the European Union.

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PROF MARIA LAURA MANCA
is an activist in Global Art + Sci +Tech
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TYPE: A
(messenger in idea delivery system, dot-connector,
prophet of idea dimensionality - turn 2D idea into 4D reality)

STATUS: Active
(move your body & mind & heart and make it happen)

VOCATION:
Department of Clinical and Experimental Medicine & MA Mathematics
University of Pisa, Italy

QUOTES
that have inspired you

"Music may be called the sister of painting, for she is dependent upon hearing, the sense which comes second and her harmony is composed of the union of proportional parts sounded simultaneously, rising and falling in one or more harmonic rhythms."

Leonardo da Vinci

"After a certain high level of technical skill is achieved, science and art tend to coalesce in esthetics, plasticity, and form. The greatest scientists are always artists as well."

Albert Einstein

"All religions, arts and sciences are branches of the same tree. All these aspirations are directed toward ennobling man's life, lifting it from the sphere of mere physical existence and leading the individual towards freedom."

Albert Einstein

ORGANISATION
info

University of Pisa, Italy
Department of Clinical and Experimental Medicine & MA Mathematics
www.unipi.it

RELOGIA TRIALOGUES
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Exemplars of
AESTHETIC INNOVATION
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transformational effect
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MUSIC + MATHEMATICS + GOLDEN RATIO + THERAPY

At Pisa University is an increasing number of students starting interdisciplinary projects on applications of math models in musical therapy. The group involves Professors Maria Laura Manca, Vladimir Gueorgiev, E. Bonanni and G. Siciliano. We studied of the link between the golden section and music. The golden ratio, golden mean, golden section or golden number has a long history, being firstly introduced, in 300 B.C. approximately, in the famous treatise by Euclid, entitled "The Elements". This irrational number inspired science and art from architecture and painting to music, demonstrating the vital importance of mathematics to art.

The purpose of our project is to explore the usefulness of some mathematical instruments (golden number, entropy, Hurst exponent) as method of identifying the distinctive aspects of some musical pieces, in particular of Mozart. Our idea starts to further investigate, with mathematical methods, the so-called "Mozart effect". It indicates that spatial-temporal abilities of the brain of healthy subjects are enhanced after listening to the sonata for two pianos in D Major, K448, of Mozart. The beneficial influence of Mozart's music on epileptiform activity in patients with seizures, as well as in individuals with hearing loss, has been also reported. The link between arts like music and mathematics via the golden ratio manifested in nature and in art, also underlie certain musical compositions.

This first result of the project, devoted to the study of the macrostructure of the first movement of a selection of piano sonatas of Mozart (K448 included), aimed to verify the presence of the golden section, has been published this year in the journal of Catholic University, in Ruzomberok.

BIOGRAPHY

Graduated in Mathematics, she works at the University of Pisa, **Department of Clinical and Experimental Medicine, and at the University-Hospital of Pisa**.

MLM has always worked in the medical field, in **multi-professional research teams** with medical doctors (especially specialists in neurosciences or internal medicine), biologists, psychologists, engineers and physicists. She has maintained constant contacts with the Department of Mathematics and, in particular, with Professor Vladimir Georgiev collaborating with him in the biomathematics sector. She periodically supervises the Master Degree theses of the Course in Mathematics, for the aspects related to biomathematics, and carries out seminar activities.

The main research interests concern the **study, with mathematical methods, of the beneficial effects of the classical music on the brain,** in healthy subjects and in patients suffering from neurological disorders. More generally, the research activities involve medical statistics, with particular reference to multivariate analysis techniques, machine learning, analysis of "-omics" data, management of missing data (multiple imputation), meta-analysis, statistical epidemiology; the development of mathematical models in biomedicine, especially in neurosciences and internal medicine, and the implementation of optimization methods; the processing of biomedical signal (in particular electroencephalography) and musical signal.

MLM is co-author of about 60 scientific publications in extenso in peer-reviewed international journals (H index = 23):
https://www.scopus.com/authid/detail.uri?authorId=7005510367

PROF MARIA LAURA MANKA
PROF VLADIMIR GUEORGIEV
R E L O G I A   V I S I O N

A+S+T *in* PERSONAL CONTEXT

Could you describe when and how you first became interested in the art+sci+tech synthesis as an idea that has had relevance to your work?

Vladimir: Probably the following idea - due to H. Poincaré, was the starting point to think about the link between science and art: "mathematics is the art of giving the same name to different things".

H. Poincaré is probably the "last of the universalists". His achievements span mathematics (he set the basis for chaos theory), physics (his mathematical methods are still used in studying elementary particles), philosophy (his framework for exploring scientific theories is still controversial) and the psychology of creativity (he studied the workings of the unconscious). Poincaré also acted as a surprising link between Einstein and Picasso, who were both inspired by his best-selling Science and Hypothesis. A highly cultured man, he was director of l'Académie Française (the pre-eminent French literary academy), as well as President of l'Académie des Sciences, an extraordinary honour. He once wrote: "It is only through science and art that civilization is of value". He straddled two worlds, inspiring both Einstein and Picasso and played a pivotal role in sparking the explosion of creativity in both art and science that set the tenor of the 20th century. The next practical point was the application of mathematics to music to study the beneficial effect of music on our brain.

Maria Laura: The relationships between art, science and technology are ancient; probably their climax was reached in the Renaissance age, developed in Tuscany, where I live. In the Renaissance, Brunelleschi marked the birth of linear perspective, a mathematical tool. Brunelleschi is therefore an artist whose work may also be read as a scientific research of geometric relationships, and physical and mechanical laws. Another illustrious example of the Renaissance is Leonardo, born in Tuscany and died in France. 2019 mark 500 years since Leonardo died. Even for Leonardo it is difficult to make a clear distinction between art, science and technology. It must be said that Brunelleschi and Leonardo are geniuses and that, in the Renaissance age, the knowledge was still limited. What inspires me in the connections between art, science and technology was the hobby for "auteur cinema". An "auteur film" is a complex form of art, which cannot be separated from technology. Let's think to the tense relationship between famous directors (Bergman, Hitchcock, and Kubrick for example), and their cinematographers who "write" the scenes with light. Examples that particularly impressed me were the indistinguishable image of a face which looks like both the two actresses of "Person" by Nykvist, Bergman's cinematographer, or the overlapping images of "Wrong Man" by Burks, Hitchcock's cinematographer, or the technological innovation introduced by Hitchcock himself in "The birds". Not to mention "2001 A Space Odyssey", an epic film in which the design of the future takes place thanks to the best technology then available at NASA and IBM, and it is not only "imagined" by the artist Kubrick.

A+S+T *in* CULTURAL CONTEXT

How would you frame the new cultural context we live in?
e.g: Post Constructivism, New Renaissance, Conceptual Age, Proto Renaissance, Age of Authenticity, Post Postmodernism, Age of Discoveries, Metamodernism, Post-post modernism…

Our society has its flaws - dependence on technology, taxes, obesity, devaluation of workers - to name a few.

We shall try to make small analysis in the following directions: moral values in the society, research and technology development as elements of cultural context.

Here is a list of some negative phenomena in the first field: moral values.

• In earlier times, people gave more respect to honest and/or educated people but now only powerful get the respect. No wonder now people with muscle power and political power are most respected in social life.

• Previously, not only money was important but how it was earned was equally important. People with dubious wealth never got any respect in public life. But a blind race to earn money by any means has now started and it led to increased corruption in the society. Everyone is busy making money; doctors, educationists, schools, hospitals, politicians, bureaucrats and even common man. Schools and hospitals have become money-spinning machines. Food adulteration is rampant and to save some money, industries have taken short cuts for waste disposals.

• Earlier, even if you are best cook of a small village, you were happy. Not anymore, as with increased communications whole country has become a single town. This has resulted in increased level of competition and unless you are best in a state or country, you won't be satisfied. This has made everyone depressed and dissatisfied.

Here are some things I feel our society needs more of:

Empathy - Empathy is defined as understanding and sharing the feelings of another. People need to understand who others are and accept who they are. Focusing on how we can grow together should be our ultimate goal.

Respect – Mutual respect is needed for all of us. This is what makes us human. Having respect for everyone, despite the differences between us, is vital in order for a society to function well.

Love – Having love in our hearts keeps us from feeling the need to harm others. Love

helps us acknowledge the similarities we all share rather than the differences of color, religion or sexual orientation.

Loyalty – Loyalty is a value that binds us to a person, thing or sentiment. With loyalty, we do not betray. If we all shared loyalty, it would help us build the strength needed to stand up against something that would harm our society.

Honesty – One form of honesty in society is accepting yourself. With honesty, you can admit your flaws and take the necessary steps to improve yourself. When we can admit to our flaws it can help someone else admit theirs. Ultimately, we can all help each other become better people.

Research, development and innovation is for any country the engine of its economic and social development. Common concern of all countries for science and scientific research appears as a recognition of their role in ensuring the welfare of human civilization. The impact of the new revolutionary ideas on the society can be connected with what Wilbur Wright put it back in 1909, "There are three classes of people: one class thinks the flying machine is going to do everything, the second class thinks it's going to do nothing, and the third class gets in the air and sees what it can do."

The really major steps that lie ahead in conquering disease are in brand new fields: bioelectronics, or new kinds of biochemistry that may even eliminate some forms of disease. With or without research grants, we are not making enough progress in the conquest of the basic diseases-heart disease, lung cancer, brain tumors, and asbestosis, or occupational asthma-and in finding the basic pathways by which these diseases work and cause chemical injury to the lungs, the airways: the brain, and other vital sections of the body. We face the enormous task of creating a preventive medicine system for a nation that now practices and always has practiced corrective medicine. As for the future one can see two important directions. One change involves the computerization of our society, and the other change involves

the extension of our capabilities through aeronautical and space research.

Our complex lives of multiple choices and interests, ranging from occupation to friendships and amusements, and to participation in public policy-oriented activities, all bring us into bonds with others in yet more complex ways. Playing roles within each of these segments of our social lives brings us into union with others; we become a community. The culture is based on the following elements: language, morals, values, laws, folkways, beliefs, traditions.

We live in a time when the globalization effects and new tools of communications have changed dramatically the everyday life. As a consequence of robotization we have less occupation for young people. Robots are just one of the latest stages of technological progress. The number of robots being used by businesses to boost productivity has increased rapidly in recent years.

After this introduction we can turn to the question to determine the frame of the new cultural context we live in.

First of all, it is difficult to call the new cultural context a New Renaissance. On the other hand, the identities of persons can be determined, biologically and socially, by some assumed homogeneous characteristics which they share with other members of the group to which they belong. In many cultures of the world people continue to regard identity in this older way. Because such view of identity plays a crucial role in the management of the social system, good knowledge of one's kinship network is honoured. The growing and increasingly reliable genetic methods, in addition to oral and written historical ones now made much easier to access by computerized databases and networks, have made the recovery and reconstruction of the past a matter of a few finger strokes. What is not yet widespread or obvious is the value of such knowledge. In an era where consumer trust has plummeted across all industries, honesty and authenticity have emerged as the attributes that matter most. Consumers, more than ever before, are holding brands to

a higher standard. They are looking for more than price, quality and convenience. Sure, they want value for their money. But they also want true values. In this sense more close reality is to call the new cultural context - Age of Authenticity. In a more general context, we could talk about the Age of Technology or, again, of the Interaction between Man and Machine. We need to be able to find new ways to stimulate creativity, to find new examples of best practices of interaction between art, science and technology. It is in fact necessary that meaningful collaboration between people and machines must not subvert human creativity, emotions and curiosity over speed, profit and efficiency.

What is the relationship between art+sci+tech movement and current culture? Would you consider art+sci+tech movement as a provider of new cultural context?

Modern integrative, sub-symbolic, computational techniques (Artificial Neural Networks, Self Organizing Maps and Deep Learning Networks) are able to innovatively integrate subjective and objective data, consider its temporal and predictive aspects, variety and quality and correlations. This would require a shift in the use of artificial Neural Networks (ANNs) use for the complex analysis of economic data, to interpret and analyze cultural and social data. Such modern analytical models, based on integrative, sub - symbolic, computational techniques, offer great potential for the arts and culture sector to better understand and utilize qualitative and quantitative data. ANNs offer new analytical and predictive methods and tools which could assist in improving the design and production of new work as well as supporting a more traditional focus on the evaluation of impact. These mechanisms would also enable an articulation of cultural behavior within the sciences. Rather than post rationalizing methodologies they would enable an exploration of the use of intuition, insight, personal psychological states and playful behavior amongst allegedly rational teams.

The ambition would be to devise playful methodologies to intersect the arts, humanities and sciences. Nowadays, we have numerous opportunities to encounter artistic expressions created using various technologies, such as audio-visual devices, computers, and the Internet. Growing number of artists are pursuing creative technologies in various fields. However, it should be remembered that the intersection between art, science and technology was not born in the current cultural context. For example, "Il Manifesto del Futurismo", written by the Italian poet Marinetti in 1909 on "Le Figaro", already expressed all the principles of the movement in the art and culture of the time: myth of war, speed, electricity, modern and dynamic city, rejection of antiquity and the past, horror of cultural "passatism". Futurism over a century ago was the avant-garde of technology, science, progress and its exaltation, up to the highest levels, also through art.

Who needs this art+sci+tech synthesis and is it important today?

On one hand, the researchers and artists participating in concrete interdisciplinary projects in a natural way take part in this synthesis. Typical example in our specific work is the current project on mathematics, music and neurosciences, where we need the real interaction between specialists in music therapy, neurology, biology, physics, statistics, and mathematics. The purpose of our project is to explore the usefulness of some mathematical instruments (golden number, entropy, Hurst exponent) as method of identifying the distinctive aspects of some musical pieces, in particular of Mozart. Our idea starts to further investigate, with mathematical methods, the so-called "Mozart effect". The "Mozart effect" indicates that spatial-temporal abilities of the brain of healthy subjects are enhanced after listening to the sonata for two pianos in D Major, K448, of Mozart. The beneficial influence of Mozart's music on epileptiform activity in patients with seizures, as well as in individuals with hearing loss, has been also reported. The link between arts like music and mathematics

is well known since the time of Pythagoras. As mentioned before, it is known that the golden ratio is manifested in nature and in art, but it is less known that this magical number also underlie certain musical compositions.

We can generalize this answer to other fields of active art+sci+tech interaction, where participants are involved in creative projects and work.

Furthermore, this art+sci+tech synthesis is very relevant for artists, for example musicians who integrate music, sound and technology, or sculptors or painters. Indirectly, it is important for the whole society, because perhaps forms of art created using various technologies are more accessible to the general public.

What is the value in such multi-inter-trans-disciplinary R&D approach and how does it impact the evolution of human perception about the reality we live in?

There is no need to quote big scientists, but only recall the human experience that confirms that "We are making use of only a part of our possible mental and physical resources." The interdisciplinary approach and research stimulates in natural way the unexpected possibilities of the human brain. However, there are essential obstacles to achieve this effect. Typically, nice research ideas can not be realized due to lack of possibilities to implement them in the real life. In these cases, the creation of small enterprise - intending to implement the idea, seems like a natural way to find the creative self–realization of the people in this enterprise. This approach can not be followed by everyone, since one should evaluate carefully all risks of this step before starting to participate such a project. On the other hand, the reality is different for different people. As Kirkegaard once said, "It is not at all true that the scientist goes after truth; it goes after him.". The multi-inter-trans-disciplinary R&D approach gives the possibility to unify the two types of perception (empirical and theoretical ones) and have and image of the reality closer to the origin.

art+sci+tech Learning Systems:
Integrative Education for Future Skills
art+sci+tech Learning Systems & Methodologies
Positive & Progressive Education

Why is art+sci+tech direction important to be included in education?

The learning culture is first basic element of the culture of the society. Therefore it is crucial to include art+sci+tech direction in Education. Our work with students at University of Pisa confirms the importance to start with concrete projects on level of preparation of students and future teachers to develop the challenging art+sci+tech methods and tools. This work gives important investment to have future researchers, artists and managers having the capacity to work in interdisciplinary teams.

What is your view and input about introducing art+sci+tech modules in universities, academies and life-long learning organizations and initiatives?

The arts and science are often thought of as polar opposites, thus, traditionally, universities view them as separate entities. Nowadays, this way is no longer sufficient to prepare students for the data-drenched and volatile workplace of the twenty-first century. Combining arts, science and technology in the curriculum could be the answer. In fact, from science students they learn about methods and models for testing hypotheses, and about interpreting and drawing conclusions from data. From arts, they will also learn about creativity and argument development.

Some interdisciplinary modules have already started at Pisa University. In the past, we had different Courses on this subject: Mathematics and Society, Math methods in biomedicine and math physics. The courses have been popular among master degree students.

There are double and combined degrees already on offer, but there is further potential for them .

How do you envision the development of a shared art-sci-tech dictionary?

The language is one of the key elements characterizing the culture of the society. The development of shared art-sci-tech dictionary is crucial to have common language and develop interdisciplinary projects.

How are you evaluating the current art+sci+tech education frameworks?

e.g. STEAM, Art+Science, Cross-disciplinary Strategies, Art Research, New Media Arts, Interface Cultures, etc.

The Universities has been establishing avantgarde programs like Social Design, Art&Science and Cross-disciplinary Strategies with tremendous success.

How is the art+sci+tech approach embedded in your program? What are the main methodologies you use?

It seems that the current art+sci+tech education frameworks are not well developed. Most of initiatives are in initial stage. To be more precise: we started at Pisa University with art+sci education. In the past we had different Courses on this subject: Mathematics and Society, Math methods in biomedicine and math physics. The courses have been popular among master degree students. Furthermore, we have concrete projects on the applications of mathematics to music and neurosciences.

How do you support and guide young art+sci+tech researchers and how (based on what parameters) do you assess and validate their work?

We have different master degree projects and theses on the link among mathematics, music and neurosciences.

What background is required for the experts leading such modules/courses?

The best solution is to have 2,3 lecturers for one course or modules so that the students may have lectures from real specialists in the different fields of interdisciplinary projects, acquiring the capacity to interact between them.

A+S+T *in* SCIENCE CONTEXT

What is the transformative impact of art+sci+tech projects in science research and new knowledge communication?

It gives new possibilities to stimulate the creative capacities of the students and researchers.

A+S+T *in* SOCIAL CONTEXT

emerging art+sci+tech platforms in Europe

What is the impact on society that you observe of the emerging art+sci+tech collaborations and in which context do you think they have a significant impact?

e.g. Innovation Labs, Artists in Labs, Living Labs, Accelerators, Hackathons, Innovation Incubators, Scientists in galleries and concert halls, etc etc …

What is your experience of co-creation, co-construction, co-production with society and what is the common added value of such outcomes?

What is the nature and quality of communication and collaboration between the European art+sci+tech platforms based on your experience? How do you see their future development?

Despite not having a direct experience of art+sci+tech collaboration beyond some multi-professional projects in the academic field, it is easy to observe that there is much greater interest among scientists in interdisciplinary projects at the interface between art and culture. Creation of new forms of impact and innovation, by supporting high-quality international artists to develop innovative artworks through deep engagements in art+sci-tech collaborations, is probably still in the implementation phase.

Furthermore, the idea that new artworks developed by the intersection between artists and scientists are able to reach the widest possible audiences through international exhibitions and the global media is still to be perfected. Probably, to explain to a large public the exhibitions of these "artists", their creations should be accompanied by workshops and discursive formats. Thus, it will be possible for the citizen not only to follow this evolution but to participate and, perhaps, to anticipate it.

Moreover, it is important to continue building spaces where to work on 3 pillars: incubation of art-science projects, training and education, and public engagement. Moreover, if on the one hand it is fundamental that artists from all countries are invited to work in these hybrid creative laboratories at the interface of art, science and technology, it would be necessary to establish quality levels of work by international, inter-disciplinary juries.

Although the European Union has begun to finance some relevant projects and art+sci+tech platforms, probably there is still a large margin of growth and possibilities of collaboration between the European platforms.

A+S+T *in* INDUSTRY CONTEXT

art+sci+tech Innovation Labs as a link between:
new culture - education - industry - society

What is the role and impact of art+sci+tech research projects in Knowledge Economy, Shared Economy, Creative Economy and Cognitive Economy?

What could be the sustainable design of art+sci+tech innovation labs based on the experience you already have?

How is informed the definition of collective Human Identity via the art+sci+tech applications of new technology ?

Scientific and technological skills are not the only driving forces of innovation, creativity also plays a crucial role in research and innovation processes and, in this context, can act as a catalyst for an efficient conversion of scientific and technological knowledge turned into novel products and into testing new methods. The European Commission has acknowledged the importance of this field; for example, the European STARTS program will foster collaborations between the art world and science and industry. However, we agree with Hochman, co-founder of The Tech + Arts Initiative that "the arts are not able to be the same as other forms of creative scientific research or creative technological entrepreneurship as they serve a different purpose". Thus, although we do not have any direct experience, we assume that to design innovative art + sci + tech labs, there is still no general answer. At the moment, it is necessary to start from models of good practices and concrete cases of interaction, maintaining a central concept of art, that of representation. A concrete case, for example, is that highly innovative companies like Mercedes thrive on a strong link between artists and their engineers.

A+S+T *in* .... CONTEXT

What context would you include that informs the purpose and future of art+sci+tech research development in the Triple and/or Quadruple Helix of Innovation?

As the last context to inform about the purpose and future of the development of art + sci + tech research, we could include quality so as to tend towards a continuous improvement. However, the Triple Helix of Innovation requires one essential component – the government. The actual situation in Italy is such that one can expect mainly regional government support. The recent attempts to introduce autonomy of the regions in Italy show that decentralization will lead to the need to improve the collaboration and links with the regional governments. The interaction between technology and government is traditionally more effective than the corresponding links with the science and art. For this purpose the development of art+sci+tech projects and teams can become a crucial point to create really effective Triple Helix of Innovation.
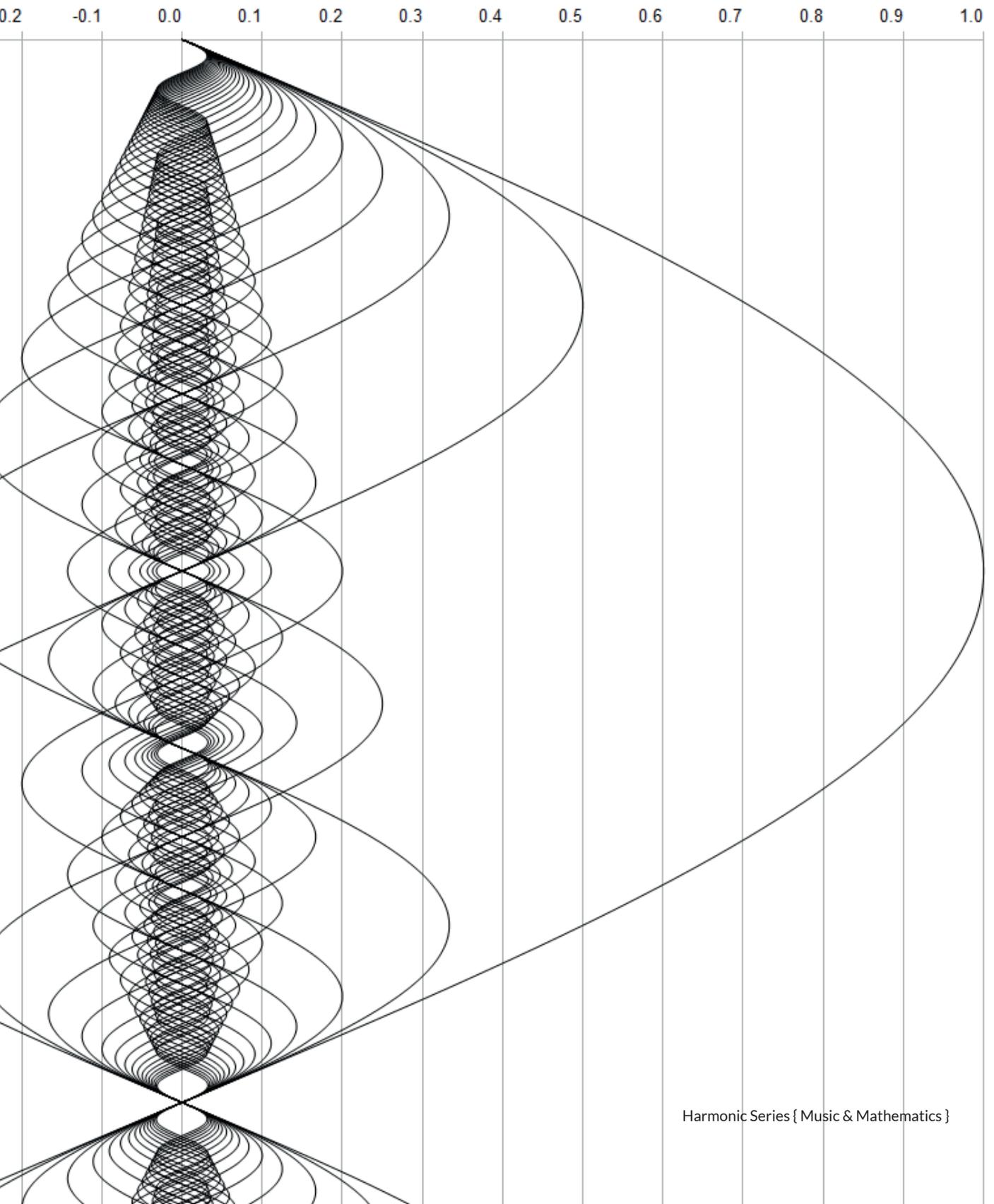
Harmonic Series { Music & Mathematics }

RELOGIA
art + sci + tech

LICENSE
TRIALOGUES

This ID Certifies that

PROF MANOS TSAKIRIS
is an activist in Global Art + Sci +Tech
Research, Education and Culture

CLASS: Global
(author of culture, historical change-maker)

TYPE: A
(messenger in idea delivery system, dot-connector,
prophet of idea dimensionality - turn 2D idea into 4D reality)

STATUS: Active
(move your body & mind & heart and make it happen)

VOCATION: Department of Psychology, Royal Holloway
The Warburg Institute, School of Advanced Study,
London, UK

Re:
LOGIA

QUOTES
that have inspired you

" Good fences make good neighbours"

*...is a phrase the good friend and colleague, director of the Institute
of Philosophy, Professor Barry Smith often says when referring
to interdisciplinary synergies. I think it also applies to science/art
collaborations. One needs to be excellent in his/her discipline before
embarking on a collaboration. At the same time, one needs to be able to
accept, tolerate and even trust the uncertainties of his/her interlocutors from
other disciplines. Each discipline has its limitations , and that also applied for
arts practices as well as technological applications. We need to feel confident
around the certainties and also uncertainties of our disciplines as well as of
that of others. (reflection from prof Manos Tsakiris)*

ORGANISATION
info

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RELOGIA TRIALOGUES
theme

EMOTIONAL INTELLIGENCE
http://relogia.net

(BIAS) PROJECT
Body & Image in Arts & Sciences'

The 'Body & Image in Arts & Sciences' (BIAS) project is an innovative interdisciplinary research program that merges perspectives from cognitive neurosciences and psychology with those from the humanities and arts to study the performative power of images. It attempts to do so at the Warburg Institute, the premier institute in the world for the study of cultural history and the role of images in culture, inspired by Aby Warburg's unparalleled interdisciplinary vision on the history of images. In line with the Institute's commitment to building bridges across the boundaries between the humanities, arts and sciences, BIAS will seek to forge new and innovative synergies across the disciplines.

The BIAS project is supported by the NOMIS Distinguished Scientist Award that enabled us to form a new research team and neuroscience lab hosted at Warburg.

BIOGRAPHY

Manos Tsakiris studied **psychology** (BSc, Panteion University Athens, 1995-1999), **philosophy** (MSc in Philosophy of Mental Disorder, King's College, London, 1999-2000), and **cognitive neuropsychology** (MSc, UCL, 2000-2001) before completing his PhD (2006) in psychology and cognitive neurosciences at the Institute of Cognitive Neuroscience, UCL. In 2007, he joined the Department of Psychology, Royal Holloway, University of London, where he is currently **Professor of Psychology**.

www.manostsakiris.com

A+S+T *in* PERSONAL CONTEXT

Could you describe when and how you first became interested in the art+sci+tech synthesis as an idea that has had relevance to your work?

The very motivation behind my decision to study psychology came from my immersion to the reading of novels, plays, poetry, an understanding of different art movements across history, and of the major philosophical schools of the continental tradition. All these directions pointed to the quest for an understanding of the human condition, as an embodied worlded agent embedded in a cultural-social context.

A+S+T *in* CULTURAL CONTEXT

How would you frame the new cultural context we live in?

e.g.: Post Constructivism, New Renaissance, Conceptual Age, Proto Renaissance, Age of Authenticity, Post Postmodernism, Age of Discoveries, Metamodernism...

To borrow a phrase of Philip Rieff, we are fast approaching the state of barbarism ...it may seem like the weather of our present, and one should hope that it doesn't become the climate of our times.

What is the relationship between art+sci+tech movement and current culture? Would you consider art+sci+tech movement as a provider of new cultural context?

The relationship is complex. At times, some

art, some science, some technology is critical of our cultural zeitgeist. Sometimes they pay lip-service to each other. Even more complex are the relations between economic forces and the fields of arts, sciences, and technology. A genealogical approach, akin to what Foucault did for other fields, should be undertaken.

Who needs this art+sci+tech synthesis and is it important today?

The synthesis is important today as it was at different times. We think of today as being this critical time where the questions we have to answer require a multidisciplinary approach , but wasn't that always the case?

What is the value in such multi-inter-trans-disciplinary R&D approach and how does it impact the evolution of human perception about the reality we live in?

The art-sci-tech synthesis should, in principle, provide added value. Art can move people in ways that science and technology are not designed to do, and can also reach further. Science can create and share knowledge in ways that art and technology are not designed to do. Techonology can provide the means by which art and science can take new forms, take new steps, and these means can be shared across sciences and arts. As to whether it impacts the evolution of human perception, yes it does, in the same way that all cultural practices do.

A+S+T *in* EDUCATION CONTEXT

art+sci+tech Learning Systems:
Integrative Education for Future Skills
art+sci+tech Learning Systems & Methodologies
Positive & Progressive Education

Why is art+sci+tech direction important to be included in Education?

Being able to use different means and ways to articulate things that matter for the human condition and its social and physical

world reflects an old ideal of a humanistic approach to education. It can allow us to go beyond the purely technocratic approach to education as something that can be measured and eventually translated into economic gains (or losses).

What is your view and input about introducing art+sci+tech modules in universities, academies and life-long learning organizations and initiatives?

The question of how you provide an interdisciplinary educations and related skills remains unanswered. When should that start? From the first degree? Much later ? And how? I would think that it remains important to provide solid background knowledge and expertise in one discipline before embarking into multi-, inter- or transdisciplinary excursions..

How is the art+sci+tech approach embedded in your program? What are the main methodologies you use?

Some of the project we develop in my lab are basic science without explicit synergies with the arts, although the outputs of our research can be showcased in public engagement activities (e.g. Tate Modern). Other projects, such as the Body & Image in Arts & Science (BIAS, see http://manostsakiris.com/index.php/research/bias/) are explicitly interdisciplinary and rely on synergies between academic disciplines, and often arts. In the case of BIAS, as our primary interest is on the performative and political power of images, we engage with scholars and artists. Our methodologies range from lab-based experiments, to online experiments, but also to demonstration and more practice oriented work with participants from the general public. Underpinning all these different methodologies is our commitments to expose ourselves to literatures from different fields, understand their concepts and tools and to the extent that this is possible to translate them to science concepts or at least to operationalize them to experimental designs that would be appropriate for an

empirical investigation that does justice to both the scientific practices and norms of psychological sciences as well as to richness and complexity of social sciences, humanities and arts..

How do you support and guide young art+sci+tech researchers and how (based on what parameters) do you assess and validate their work?

The best kind of support is to nourish one's team with stimuli, ideas, concepts and questions from other disciplines and give them space and freedom to reflect upon and experiment with these stimuli. The assessment and validation of the work is not something that we would do ourselves. In scientific norms , one would expect that assessment and validation comes from the community. .

What background is required for the experts leading such modules/courses?

A strong background in one's discipline is essential as this will serve the primary purpose of equipping researchers with a good enough understanding of the possibilities but also the limitations of one's expertise and practices. Only then, I think, one can feel secure enough to expose the strengths but also the weaknesses of one's own intellect to the risky endeavor of cross-disciplinary collaborations. Lastly, a broader knowledge and understanding of other fields is required. Reading, reading, and then reading a bit more. I often suggest to the freshers of our BSc Psychology programme that if they truly want to understand psychology as a discipline, they should of course read the recommended scientific references, but also they should spend endless hours reading the classics, from philosophy to literature and theatre.

A+S+T *in* Science context

What is the transformative impact of art+sci+tech projects in science research and new knowledge communication?

The increasing realization that questions cannot be answered by one approach only.

A+S+T *in* Social context

emerging art+sci+tech platforms in Europe

What is the impact on society that you observe of the emerging art+sci+tech collaborations and in which context do you think they have a significant impact?
e.g.Innovation Labs, Artists in Labs, Living Labs, Accelerators, Hackatons, Innovation Incubators, Scientists in galleries and concert halls, etc etc ...

A large scale societal impact is something that can be evaluated in a longer time-frame from the one we have.

What is your experience of co-creation, co-construction, co-production with society and what is the common added value of such outcomes?

If by society, you refer to users of art-sci-tech products, then their engagement at the design phase of such interventions should be welcomed and encouraged. If such products aim to address specific needs, problems, aspirations of the population then we need mechanisms that enable their engagement from the early phases.

RELOGIA
art+sci+tech

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TRIALOGUES

This ID Certifies that

DR CVETANA IVANOVA
is an activist in Global Art + Sci +Tech
Research, Education and Culture

CLASS: Global
(author of culture, historical change-maker)

TYPE: A
(messenger in idea delivery system, dot-connector,
prophet of idea dimensionality - turn 2D idea into 4D reality)

STATUS: Active
(move your body & mind & heart and make it happen)

VOCATION: Founder & Director Re: foundation
www.refoundation.net

Re:
LOGIA

QUOTES
that have inspired you

"Which end is nearer to God, If I may use a religious metaphor, beauty and hope, or the fundamental laws? I think that the right way, of course, is to say that what we have to look at is the whole structural interconnection of the thing; and that all the sciences, and not just the sciences but all the efforts of intellectual kinds, are an endeavor to see the connections of the hierarchies, to connect beauty to history, to connect history to man's psychology, man's psychology to the working of the brain, the brain to the neural impulse, the neural impulse to the chemistry, and so forth, up and down, both ways. And today we cannot, and it is no use making believe that we can, draw carefully a line all the way from one end of this thing to the other, because we have only just begun to see that there is this relative hierarchy."

Richard Feinman

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THE KISS OF OXYTOCIN | the Music of the Love Hormone Oxytocin | Re: Foundation

This project started as series of questions at different circumstances when confronted with the interactive world of human senses and emotions, and the sense of smell in particular, as the most intimate one. The answers derived from different platforms, paths and this let to wonder how to represent them as a part of a quest to find how are senses and emotions related in the context of our visual culture. This resulted in the design of multidisciplinary methodology, developed via art+sci+tech collaboration, that attempts to harness the cross-disciplinary narrative of the sense of smell, with focus on one specific molecule, the Love hormone - Oxytocin. The project investigates its nature, as playing a fundamental role in human relationships and in the Kiss.

The research methodology is called Trivial Innocence: *Trivial* at its origin from Latin means the crossroad of three roads. The three roads we cross are: art + sci + tech. *Innocent* - because they all investigate and provide the knowledge received through our human senses, and they are by nature - Innocent.

BIOGRAPHY

Dr. Cvetana Ivanova is **Founder & President of Art & Science Research Foundation Re:** She is a **lecturer at University of the Arts, London - Central Saint Martins** in *MA Applied Imagination for the Creative Industries*. **PhD in Art Psycholo**gy, where she defended the thesis about how can contemporary Art form be used as an instrument for Science with the title **"Neuroaesthetics of Emotion and contemporary Art forms"**. Master's of Arts graduate with experience in creative design, art direction and cross-disciplinary art+sci+tech research and development. Research artist with stage design and fashion design background, evolved in creative director and manager of cross-disciplinary teams. Currently working on a chain of cross-disciplinary projects with teams of artists and scientist in the quest for the synthesis between Art & Science as natural result of their evolution. Collaborating with Sofia University, National Academy of the Art, Bulgarian Academy of Sciences, international NGOs, SME's and EU education institutions.

www.refoundation.net

DR CVETANA IVANOVA
RELOGIA VISION

A+S+T *in* PERSONAL CONTEXT

Could you describe when and how you first became interested in the art+sci+tech synthesis as an idea that has had relevance to your work?

I was 11 years old when I first encoutered it as an inner vision: the interconnectedness of all disciplines -and since than I am looking for such integrative models of education, research and culture. The breaking point when this inner vision crystalized as a conceptual art+sci+tech framework was when analysing Art history and how it is both shaped by and is shaping human identity, social, scientific and culral factors. This framed the essence & direction of my personal and professional development and led to the creation of Art& Science Research Foundation "RE:"

A+S+T *in* CULTURAL CONTEXT

How would you frame the new cultural context we live in?

The Age of surch for Aunthenticity. We are flooded with information that is disconnected from our experience and we misiterpret it as Knowledge and get lost without navigation what is truth and what not. We've achived mastery in many disciplines by perfecting multiple pieces in the puzzle of our perception of reality but forgot to reference the bigger picture where we can refer to their interconnectedness and where human values system resides.

What is the relationship between art+sci+tech movement and current culture? Would you consider art+sci+tech movement as a provider of new cultural context?

The mutual interconnectedness of art+sci+tech is fueling new cultural forms - participatory-based, where the audience is no longer a passive participant, but an active one. The very role of Culture is to navigate society via integrating the emotional, the intellectual and the visceral experience in meaningful relationships.

Who needs this art+sci+tech synthesis and is it important today?

The modern world is a world of scientific and ideological change on a political, social and economic level. Due to the dynamically changing reality Personality clashes and must adapt much faster, on much more levels than before in order to communicate with others and strive to become more effective in its performance as to achieve life goals and objectives. In many cases people are not aware of the nature and origines of the processes shaping the challenging and dynamic environment in which they work, communicate with friends, family and children or set-up life-goals scenarios.
An art+sci+tech approach has the pontial to express and provide access to understanding about these processes and generate customized navigation tools.

What is the value in such multi-inter-trans-disciplinary R&D approach and how does it impact the evolution of human perception about the reality we live in?

Human perception is a contextual phenomena and it works based on mental models. An art+sci+tech reserch and education methodology develops polymath mental models that allow an adequate navigation of the multi-inter-trans-disciplinary reality we live today.

A+S+T *in* EDUCATION CONTEXT

art+sci+tech Learning Systems:
Integrative Education for Future Skills
art+sci+tech Learning Systems & Methodologies
Positive & Progressive Education

Why is art+sci+tech direction important to be included in Education?

Art +sci+tech direction is crucial to be

developped early in education in order to introduce and cultivate cross-disciplinary thinking. It does not exclude specialization - just the opposite: it has the potential to provide much wider scope for application of specialized knowdge and inform its further research and development directions.

What is your view and input about introducing art+sci+tech modules in universities, academies and life-long learning organizations and intiatives?

Art+sci+tech modules are already included in many Universities either as extracaricular either as autonomus MA & BA courses - but still in very few EU Universities. The evidence of high demand for such is selfexplanatory. In the realm of life-long education - Re:foundation has over 20 public lectures and discussions on the topic - introducing it to the wider audience. Now this initiative has evolved into an open cros-disciplinary module in collaboration with National Academy of Art, Technical University and University of Pisa that will inform and navigate young researchers in the art+sci+tech research and development field.

How do you envision the development of a shared art-sci-tech dictionary?

As an art+sci+tech researcher along with fellow experts, I regard this as a necessity. Re:foundation has develpped a concept project for such dictionary that will serve both as a navigation and systematization tool of the current art+sci+tech projects and will provide the topography and the qualitative parameters of Aesthetic Innovation projects.

How are you evaluating the current art+sci+tech education frameworks?
e.g. STEAM, Art+Science, Cross-disciplinary Strategies, Art Research, New Media Arts, Interface Cultures, etc.

There is evidence of growing fragmentation in this field due to the deficit of an overall strategic vision & management encomapssing the multiple initiatives and their actual and possible correlations and collaborations.

How is the art+sci+tech approach embedded in your program? What are the main methodologies you use?

The art+sci+tech approach is embedded in all the projects of Re:foudnation and for each research project there is a specific methodology that integrates different disciplines based on the initial concept via fundamental and action based reaserch, and testing we trasfer intelligence from one discipline into another.

How do you support and guide young art+sci+tech researchers and how (based on what parameters) do you assess and validate their work?

As a Lecturer in MA Applied Imagination, we've developed a new module - RE:SEARCH LAB , where we introduce the students with a spectum of art+sci+tech research methodologies and structures to navigate and instrumentalize their research projects. We evaluate them based on the level of implementation of their innovation projects - produced out of their research development and testing. .

What background **is required for the experts leading such modules/courses?**

Definitely experienced in art+sci+tech research and application as part of their background. They can not effectively lead students into a field they've never crossed and overcomed the obstacles on the way.

A+S+T *in* **S**OCIAL CONTEXT

emerging art+sci+tech platforms in Europe

What is the impact on society that you observe of the emerging art+sci+tech collaborations and in which context do you think they have a significant impact?

Best impact so far, that I've observed is how crucial social and environmental issues are tackled, analysed and communicated non-verbally in the most effective way.

What is the nature and quality of communication and collaboration between the European art+sci+tech platforms based on your experience? How do you see their future development?

As this field is exponentially expanding it struggles with communication accross the different platforms. I would love to see them united bihind one common goal - this will naturally unite them and will provide scenarios for their possible collaborations.

A+S+T *in* **S**CIENCE CONTEXT

What is the transformative impact of art+sci+tech projects in science research and new knowledge communication?

The transformative impact can be verbalized in "You Experiece Art & Science Experiences You" (that is the slogan of Re:foundation) This means that an effective and meaningful collaboration btw art+sci+tech may develop a contemporary art form that can be used as an instrument for science. The Re: project "The Music of the Love Hormone Oxytocine" proved exactly this aspect. Art+sci+tech projects do not act as merely science communication tools but also have the important potential to interact with the audience as customized research tools for science.

A+S+T *in* **I**NDUSTRY CONTEXT

art+sci+tech Innovation Labs as a link between new culture - education - industry - society

What is the role and impact of art+sci+tech research projects in Knowledge Economy, Shared Econimy, Creative Economy and Cognitive economy ?

Art+sci+tech projects have the mission to solve the problem with fragmentation of knowledge - i.e. experts from one discipline do not communicate with experts from other diciplines - and therefore facilitate holistic application towards both for framing the strategic research scope and areas in parallel with their possible applications, when dealing with a certain problem.

What could be the sustainable design of art+sci+tech innovation labs based on the experience you already have?

This beautiful concept and initiative would be sustainable and highly effective only if the Quadruple Helix of Innovation is embedded in its structure and if the powerful potential it has is channeled to solve current social & cultural problems or developing holistic forms of self-expression.

How is informed the definition of collective Human Identity via the art+sci+tech applications of new technology ?
e.g. AI, New Media: VR(Virtual Reality), AR(Augmented Reality), MR(Mixed Reality), IoT(Intenet of Things), BlockChain, Space Travel, New Internet etc.

Colleactive Human Indentity has many aspects we are about to discover, but its main operational parameter is Big Data, where new technology is channeling multiple cues for exploration and vast spectrum for research scenarios. Thanks to new technology we have the priviledge to witness and experince the Collective Human Identity and widen our perceptual horizon beyond the visible to our naked eyes.

A+S+T *in* .... CONTEXT

What context would you include that informs the purpose and future of art+sci+tech research development in the Triple and/or Quadruple Helix of Innovation??

I would include the Human Dimension as both integrative and navigation concept / context. This could bring us to the scenario where we know ourselves better as a holistic system of interconnected systems - both internally and externally and therefore we will act and co-create better, based on the new Knowledge and vision achieved.

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This ID Certifies that

DR DORIJAN KOLUNDZHIA
is an activist in Global Art + Sci +Tech
Research, Education and Culture

CLASS: Global
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TYPE: A
(messenger in idea delivery system, dot-connector,
prophet of idea dimensionality - turn 2D idea into 4D reality)

STATUS: Active
(move your body & mind & heart and make it happen)

VOCATION: Founder & Director Galerija 12+
www.galerija12.com

Re:
LOGIA

QUOTES
that have inspired you

"Everything you know is wrong"

from the movie "Fight Club"

ORGANISATION
info

Gallery 12
www.galerija12.com

RELOGIA TRIALOGUES
theme

EMOTIONAL INTELLIGENCE
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HUMAN 2.0 | World Government Summit 2019 | **Museum of the Future** | Gallery 12

Exemplars of
AESTHETIC INNOVATION
that have
transformational effect
on people's understanding

Humans and their technological creations are poised to embark on what is sure to be a deeply commingled transformative path. On that path, we are set to move from body and mind alteration, all the way to the unlimited existence beyond our physical selves. Ultimately, humans are creating the act of progress from a unique position of choosing its trajectory, defining what we want to become and together remaking our species into a new one - Humans 2.0.

Inspired by latest scientific breakthroughs and leading futurist projections HUMANS 2.0 imagines a future in which we already solved the scientific problems we are yet to solve and developed the technologies now only theoretically possible. Focused on the individual body and mind, elements extracted from a larger vision of the future invite you to explore how this latest era of advance will benefit the individual person.

The exhibition is divided into four sections, each further away in time than the previous, providing uninterrupted narrative flow along a rudimentary timeline into the future as it relates to the individual person and to humanity as a whole. Advance is envisioned to happen in four key stages titled BETA BODY, BETA MIND, META BODY, and META MIND.

BIOGRAPHY

Applied Graphics graduated at the Academy of Applied Arts in Belgrade (2002)
Masters of Fine Arts, Design, Art and Technology at Peck School of the Arts, University of Wisconsin-Milwaukee (2004)
Art director of Belgrade Summer Festival, BELEF (2008/2009)
Creative Director of New Media for the spectacular Opening ceremony of Universiade in Belgrade with 40 simultaneous real time motion and gesture analyzed performers over 6 hours of 4K texture mapped footage (2009)
National curator of Serbian exhibition on Prague Quadrennial (2009-2011)
Professor of Digital Arts and New Media at Singidunum University in Belgrade, Faculty of Media and Communications until 2017
Since 2007 works as **Art director of "Kiosk platform for contemporary art".**
He was **Creative director of Mikser Festival,** in Belgrade.
In May 2012, he **founded G12 HUB, New Media Gallery.**
Currently Dorijan runs **"Gallery 12" - New Media solutions studio** in Belgrade.
Since 2015, works on various projects in Dubai, UAE.
Since 2016, works with **Dubai Future Foundation on building interactive and experiential futuristic experiences, such as the ones for** *Museum of the Future*.
Participated in numerous solo and group exhibitions in Serbia and internationally.

www.galerija12.com
www.vimeo.com/dorijan

DR DORIJAN KOLUNDZHIA
RELOGIA VISION

A+S+T *in* Personal context

Could you describe when and how you first became interested in the art+sci+tech synthesis as an idea that has had relevance to your work?

I always felt that art, sci and tech are deeply and intricately interwoven. My personal path is one of failing to map clear demarcation lines between them even on rare occasions when I tried. For the longest time I believed that my practice ventured into all three constituents of this synthesis in order to equip me with broad enough spectrum of tools to explore various topics, only to realize that it was the very nature of the relationship between them that was, and remains the true focus of all of my work.

A+S+T *in* Cultural context

How would you frame the new cultural context we live in?
e.g: Post Constructivism, New Renaissance, Conceptual Age, Proto Renaissance, Age of Authenticity, Post Postmodernism, Age of Discoveries, Metamodernism, Post-post modernism...

Ah
Have no idea honestly. It shifts so dramatically. Feel like it needs to settle at least a bit in order for us all to identify it.
If it's based it on say...my flip board feed today...
Personalization fetish driven and digital capitalism fueled pseudo participatory content consumerism creeping towards ai governed posthumanism
but we're not going to base it on flip board feed... just too depressing

What is the relationship between art+sci+tech movement and current culture? Would you consider art+sci+tech movement as a provider of new cultural context?

I believe that unprecedented and somewhat unmonitored proliferation and unmediated adoption of technology, overwhelming diversity and ever-increasing accessibility of science and somewhat dispersed and fragmented art practices led to a chaotic and uncoordinated cultural landscape. It feels that it's up to art+sci+tech movement to step in and to do its best to make sense of it all.

Who needs this art+sci+tech synthesis and is it important today?

Honestly, we all do. Society needs it. In times of complex, ever expanding, evolving forces that reshape societies we are expected to inhabit, it takes as complex and dynamic agent to monitor and navigate us all through these profoundly perplexing changes.

A+S+T *in* Education context

art+sci+tech Learning Systems:
Integrative Education for Future Skills
art+sci+tech Learning Systems & Methodologies
Positive & Progressive Education

Why is art+sci+tech direction important to be included in Education?

If education fails to be capable of developing wide set of interdependent skills that match the complexity of near future challenges then it fails to produce active agents of change. At this point it is not enough to develop an understanding of our new realities and adequate coping mechanisms, but skill sets for active participants in complex new conditions ahead of us all.

What is your view and input about introducing art+sci+tech modules in universities, academies and life-long learning organizations and intiatives?

Honestly, I don't think modules do the trick. They may be a step in the right direction, but it feels somewhat underwhelming. Core programs still remain separated and often even isolated and these modules are but a glimpse at the true potential of art.sci. tech symbiosis in education. At this point it's not new modules but new models of education that we need. It feels like it's time for wide deployment of entire ART.SCI.TECH programs.

How do you envision the development of a shared art-sci-tech dictionary?

I believe that the language is to come as a natural consequence of expansion of collaboration practices. the dictionary, if it ever comes to that, will be somewhat fluid and immense collection collaboration driven entries that might vary across various art.sci. tech practices. at this point what might be needed more is something along the lines of communication guidelines to accommodate for the early phases of interdisciplinary work.

How are you evaluating the current art+sci+tech education frameworks?
e.g. STEAM, Art+Science, Cross-disciplinary Strategies, Art Research, New Media Arts, Interface Cultures, etc.

Every program that was founded and run by people who invested true dedication to art+sci+tech interface and interdependence that endured through early skepticism is a success. They are all fortunate models to learn from and build on.

How do you support and guide young art+sci+tech researchers and how (based on what parameters) do you assess and validate their work?

Well... for the past couple of years the collective I'm proud to be a member of was tasked with researching , contextualizing and visually developing speculative futures. in order to do that we had to collapse the departmentalized structure of the collective almost entirely. We ended up with somewhat fluid structure that often enough drove us to hosting internal workshops like society analysis, experiential storytelling, visual programming, engineering, applied robotics etc. Every member of the collective went through every single of those in order to understand and participate in all phases of the rather complex process. This gave us

the ability to form diverse teams for various parts of the process so that the benefit of interdisciplinary collaboration was dispersed across often unlikely phases of the project. This resulted in exciting, unexpected and truly rewarding results.

What background is required for the experts leading such modules/courses?

ah this a really hard one
At this point I really feel like the extensive experience in interdisciplinary collaborations may be the key prerequisite.

A+S+T *in* SOCIAL CONTEXT

emerging art+sci+tech platforms in Europe

What is the impact on society that you observe of the emerging art+sci+tech collaborations and in which context do you think they have a significant impact?
e.g.Innovation Labs, Artists in Labs, Living Labs, Accelerators, Hackatons, Innovation Incubators, Scientists in galleries and concert halls, etc ......

For the past few years I have been almost exclusively working for Dubai Government trough Dubai Future Foundation. Through this collaboration I have witnessed an amazing focus of DFF towards encouraging and supporting art+sci+tech collaborations in the process of reshaping diverse aspects of Dubai social landscape.
It became a unique platform for development, analysis, legislation and early public deployment of art+sci+tech collaboration driven developments. I believe that this might become a widely spread partnership model for accelerated art-sci-tech impact.

What is your experience of co-creation, co-construction, co-production with society and what is the common added value of such outcomes?

As an active participant in Dubai Future Foundation efforts to map, analyze and support art+sci+tech driven social changes, I feel that almost everything I did in the past couple of years was in a way co-created with society. Museum of the Future, project at the intersection of envisioning and displaying

speculative futures, and encouraging and nurturing near future developments is in a way a permanent open conversation with society actors. Each year exhibition explores certain aspect of our collective future, which then, fueled by public interest and suggestions transforms into DFF initiative. The initiatives then invite social actors to interact further with art+sci+tech teams until an early public deployment phase is reached. It is then evaluated and further development is propelled by public feedback. This in a sense creates a symbiotic, organic model for society relevant developments.

A+S+T *in* SCIENCE CONTEXT

What is the transformative impact of art+sci+tech projects in science research and new knowledge communication?

Uh. Huge question. I'll try with simple answer from my experience.
Often enough recent scientific research ends up encapsulated in its own inherent complexity. It leaks a front end, sort of. In recent years, working on speculative futures, we have come across some truly amazing research in the fields of bio robotics, ai, neural tech...with amazing potential and social applications that we as a collective were tasked with adapting for a wider audience. As a result of this, the interactions between the research itself and non-experts illuminated multiple previously unseen development paths and social implications.

A+S+T *in* INDUSTRY CONTEXT

art+sci+tech Innovation Labs as a link between new culture - education - industry - society

How is informed the definition of collective Human Identity via the art+sci+tech applications of new technology ?
e.g. AI, New Media: VR(Virtual Reality), AR(Augmented Reality), MR(Mixed Reality), IoT(Intenet of Things), BlockChain, Space Travel, New Internet etc.

I honestly believe that this is quite uncharted territory. At this point we can comfortably talk about the near future benefits of any or all of the above examples. VR and AR, as they depart from somewhat unfortunate present-day entertainment focus, hold an amazing promise of becoming superior education platforms and possibly even therapeutic tools. Ai, even in its infancy, redefines how we use technology and proliferates into our day to day life dramatically increasing our collective efficiency all across the spectrum. IoT and next generation internet are soon to enable the reach of technology way deeper into our lives and radically change how we interact with the world... However, considering that we are at the dawn of developments like neural interface, exocortex, augmentation implants, genetic mods, nanobots ...well, it becomes tricky... I would say that it is in big part up to art+sci+tech actors to ensure that influences that define Human... well... are and stay human.

A+S+T *in* .... CONTEXT

What context would you include that informs the purpose and future of art+sci+tech research development in the Triple and/or Quadruple Helix of Innovation??

I'll try to be practical here:
Yellow Pages. List. Map. Archive. Platform. Something

RELOGIA
art+sci+tech

§

LICENSE
TRIALOGUES

This ID Certifies that

PROF GERALD BAST
is an activist in Global Art + Sci +Tech
Research, Education and Culture

CLASS: Global
(author of culture, historical change-maker)

TYPE: A
(messenger in idea delivery system, dot-connector,
prophet of idea dimensionality - turn 2D idea into 4D reality)

STATUS: Active
(move your body & mind & heart and make it happen)

VOCATION: President of University of Applied Arts Vienna, Austria
www.dieangewandte.at/en

Re:
LOGIA

QUOTES
that have inspired you

*„A new, holistic way of thinking is required as technological answers
are not the solution to a given problem."*

European Research Area Board

*„If ever there was a need to stimulate creative imagination and
initiative on the part of individuals, communities and whole
societies - the time is now. The notion of creativity can no longer be
restricted to the arts. It must be applied across the full spectrum of
human problem-solving."*

UNESCO

ORGANISATION
info

University of Applied Arts Vienna, Austria
www.dieangewandte.at

RELOGIA TRIALOGUES
theme

EXPERIENCE DESIGN
http://relogia.net

Exemplars of
AESTHETIC INNOVATION
that have
transformational effect
on people's understanding

Cross Disciplinary Strategies. Applied Studies in Art, Science, Philosophy and Global Challenges (CDS)
By introducing the degree programme Cross-Disciplinary Strategies. Applied Studies in Art, Science, Philosophy and Global Challenges, the University of Applied Arts Vienna addresses core issues relating to education, art and culture, and to social participation and actively shaping society in the early 21st century.

https://www.dieangewandte.at/cds_en

The objective of the **Art & Science** master's degree programme is to investigate the relationships between different artistic and scientific representational cultures and their respective cognitive and research methods. An inter- and transdisciplinary approach and project-oriented education should stimulate interaction between model and theory construction, and the application of methods, particularly in the arts and sciences.

http://artscience.uni-ak.ac.at

BIOGRAPHY

Leadership by communication and enthusiasm:
Four times re-elected as President of a renowned university (and still in an upright contract) is evidence for the success of this concept.

Passionate confidence in the power of education and creativity:
After almost 35 years of professional experience in higher education I am more than ever convinced that education – and in particular education for creativity –is the basis for individual well-being, societal progress and economic prosperity.

Regarding tradition as challenge and invitation for development:
At the Federal Ministry for Higher Education I was responsible for drafting the legislation for major university reforms in that times.
As President of the University of Applied Arts Vienna (UAAV), an institution with a great tradition of almost 150 years, I planned and implemented numerous new programmes in teaching and research:

TransArts
Artistic Writing
Art&Science
Social Design – Arts as Urban Innovation
PEEK (a 2-mio.€ annual grant programme for artistic research by Austrian Research Fund)
Pushing UAAV to no1 research grant winning Austrian Art Unversity
Edition Angewandte (UAAV University Press with 60 books published in the last 5 years)
Art,Research, Innovation and Society (book series edited at Springer International)
Angewandte Innovation Laboratory (www.ailab.at)

PROF GERALD BAST
RELOGIA VISION

A+S+T *in* Personal context

Could you describe when and how you first became interested in the art+sci+tech synthesis as an idea that has had relevance to your work?

It was a discussion with experts about global challenges like: Aging Societies, Climate Crisis, Urbanization, Re-Defining Human Work in times of Artificial Intelligence and Robotics. It became clear, that there is a need for cross disciplinary thinking and part of this way of thinking is creativity, the way artists are thinking.

A+S+T *in* Cultural context

How would you frame the new cultural context we live in?
e.g: Post Constructivism, New Renaissance, Conceptual Age, Proto Renaissance, Age of Authenticity.....

We are entering the Age of Creativity. Creativity, meant as ability to deal with uncertainty, ambiguity, changing perspectives, finding surprising contexts, applying intuition

What is the relationship between art+sci+tech movement and current culture? Would you consider art+sci+tech movement as a provider of new cultural context?

In a time when a sci&tech revolution is about to dramatically change the way we live and work in a speed and disruptive power we never saw in human civilization Science and technology needs creativity (as mentioned above) in order to implement technological innovations into society and economy in a societally beneficial way.

Who needs this art+sci+tech synthesis and is it important today?

Human work will have to be re-defined when AI and robotics take over large parts of what we now know as human work. The World Economic Forum identified the following three skills as the most important ones for the next years: Complex problem solving, critical thinking and creativity.

A+S+T *in* Education context

art+sci+tech Learning Systems:
Integrative Education for Future Skills
art+sci+tech Learning Systems & Methodologies
Positive & Progressive Education

Why is art+sci+tech direction important to be included in Education?

As the nature of human work will change the term employability will have to be re-defined as well. And therefor education has to change by synthesizing art,sci&tech.

What is your view and input about introducing art+sci+tech modules in universities, academies and life-long learning organizations and initiatives?

Universities have to provide high quality teaching and research in specialized disciplines. At the same time universities increasingly will have to provide cross-disciplinary teaching and research focusing rather on topics (like the grand global challenges) than on single disciplines or sub-disciplines. In terms of quantity cross-disciplinary, holistic programs in Higher Education will be more important than single-discipline programs.

How are you evaluating the current art+sci+tech education frameworks?

e.g. STEAM, Art+Science, Cross-disciplinary Strategies, Art Research, New Media Arts, Interface Cultures, etc.

The University has been establishing avantgarde programs like Social Design, Art&Science and Cross-disciplinary Strategies with tremendous success.

How is the art+sci+tech approach

embedded in your program? What are the main methodologies you use?

See the curriculum of the bachelor program "Cross-disciplinary Strategies – Applied Studies in Art, Science, Philosophy and Global Challenges: https://www.dieangewandte.at/cds_en

What background is required for the experts leading such modules/courses?

On one hand they have a background in one discipline (like Artistic Methods, Artificial Intelligence, Genetic Engineering, Philosophy, Economic Theory. On the other hand they have to have a holistic approach, meaning they are aware of the interdependencies between the disciplines, about cross-fertilization and about societal responsibility.

A+S+T *in* Science context

What is the transformative impact of art+sci+tech projects in science research and new knowledge communication?

We have to transform education as the basis of living and working in times of changing paradigms in economy and society. And we have to do this now, because changes happen at rapid speed and education takes time until it has effect on economy and society.

A+S+T *in* Social context

emerging art+sci+tech platforms in Europe

What is the impact on society that you observe of the emerging art+sci+tech collaborations and in which context do you think they have a significant impact?
e.g.Innovation Labs, Artists in Labs, Living Labs, Accelerators, Hackatons, Innovation Incubators, Scientists in galleries and concert halls, etc etc ...

All kinds of collaborations at various levels are useful. Applying holistic approaches in education is most effective and most sustainable.

RELOGIA
art+sci+tech

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PROF KELLY SNOOK
is an activist in Global Art + Sci +Tech
Research, Education and Culture

CLASS: Global
(author of culture, historical change-maker)

TYPE: A
(messenger in idea delivery system, dot-connector,
prophet of idea dimensionality - turn 2D idea into 4D reality)

STATUS: Active
(move your body & mind & heart and make it happen)

VOCATION: **Space science, Music and Technology Research**
CONCORDIA Project | concordia.world

Re:
LOGIA

QUOTES
that have inspired you

"Help [them] to acquire knowledge and the sciences and arts, and to unravel the secrets that are treasured up in the inmost reality of all created beings. Make them to hear the hidden truths that are written and embedded in the heart of all that is."

from a Baha'i prayer by 'Abdu'l-Bahá, 1912

Now there is need, Urania, of a grander sound, while I ascend by the harmonic stair of the celestial motions to higher things, where the true archetype of the fabric of the world is laid up and preserved. Follow me, modern musicians, and attribute it to your arts, unknown to antiquity."

Johannes Kepler, 1619, Harmonices Mundi

ORGANISATION
info

School of Media
University of Brighton | United Kingdom
www.brighton.ac.uk/women-of-impact/kelly-snook.aspx

Co-director Mimugloves.com

RELOGIA TRIALOGUES
theme

EXPERIENCE DESIGN
http://relogia.net

KEPLER CONCORDIA
A new musical instrument for the investigation of realities

Kepler Concordia is a new musical instrument for scientific exploration as immersive experience being created by a team of programmers, artists, musicians, and engineers led by Dr. Kelly Snook, former NASA Scientist and Professor of Media Technology at the University of Brighton.

What if you could answer a 400 year old burning question just by playing a musical instrument? Three hundred and ninety-nine years ago, Johannes Kepler had a world-changing, historic, epiphany. Most people know Kepler as the father of modern astronomy for his discovery of his 3 laws of planetary motion. But what most people don't know is that he made these discoveries by using music to investigate the planetary movements. Kepler's Harmony of the world is full of musical notation and instructions for how to hear and play these musical relationships, but to this day, the music has not been playable or accessible to us mere mortals in its full glory.

We aim to change that!

We are building a musical instrument based on Kepler's work to be released on the the 400th anniversary of Kepler's book, Harmonies of the World. The instrument is called Concordia, which is Latin for harmony and it is a virtual immersive experience, using to-day's most advanced technologies to construct scientifically accurate models of the solar system to scale in time and space.

BIOGRAPHY

Kelly Snook is a **Professor of Media Arts Technology** and has a background in aerospace engineering, music production, audio engineering, and data sonification research. She is one of the developers of the *mi.mu gloves* for gestural control of music and visuals.
She currently serves as Professor of Media Arts Technology at the University of Brighton and holds a **PhD in Aeronautics and Astronautics** from Stanford University. She spent two decades as a **NASA Research Scientist** with a focus on Mars and the Moon, before turning her attention to music full-time in 2010 when she joined *Imogen Heap* as her studio manager and musical assistant, subsequently touring with *Ariana Grande in 2015* as her mi.mu glove technician.
Her current research project is the development of *Concordia* – space science, music, and technology. Concordia is an immersive musical instrument for scientific exploration based on the work of Johannes Kepler, which allows people to experience and play the music of the spheres.

concordia.world

PROF KELLY SNOOK
RELOGIA VISION

A+S+T *in* PERSONAL CONTEXT

Could you describe when and how you first became interested in the art+sci+tech synthesis as an idea that has had relevance to your work?

My works in art, science and technology have become increasingly overlapping in the decades since in 2001 becoming re-acquainted with Johannes Kepler's work on harmony and astronomy using the pre-enlightenment idea of music as a tool for investigating reality. Music was part of the Quadrivium, the four subjects of knowledge that included arithmetic, geometry, astronomy and music. I have been interested in music as science ever since.

A+S+T *in* CULTURAL CONTEXT

How would you frame the new cultural context we live in?
e.g: Post Constructivism, New Renaissance, Conceptual Age, Proto Renaissance, Age of Authenticity, Post-post Postmodernism, Age of Discoveries, Metamodernism,

It feels like we are approaching a giant reset that will level the playing field, a socio-economic correction, a collapse of the current world order. With 'truth' in such a strange place, where we place our imagination is of utmost importance. What is cultural, spiritual and technological can often be the same thing.

What is the relationship between

art+sci+tech movement and current culture? Would you consider art+sci+tech movement as a provider of new cultural context?

What you talk about is curiosity. The power of techniques like data sonification is that they offer another tool to investigate our realities, it would be foolish to stay in just one field. I want to live in a world where Truth and Beauty will ultimately contribute to cultural transformation. When current materialistic trends become unsustainable what else do we have available?

Who needs this art+sci+tech synthesis and is it important today?

It is time to banish the false dichotomies between art, science, and technology. Everyone needs this.

What is the value in such multi-inter-trans-disciplinary R&D approach and how does it impact the evolution of human perception about the reality we live in?

As humans we have artificially divided ourselves, our pursuits, and ultimately our reality into boxes that no longer apply and that no longer serve us. Eliminating or finding creative ways to transcend traditional disciplines will open new pathways for understanding and discovery. I am who I am, and you are who you are, our unique perspectives drive us to think and make the way we do. When we work together a new combination is made and this is where progress happens on an individual and collective level. It's often between two biospheres that the most interesting fauna and flora exist.

A+S+T *in* EDUCATION CONTEXT

art+sci+tech Learning Systems:
Integrative Education for Future Skills
art+sci+tech Learning Systems & Methodologies
Positive & Progressive Education

Why is art+sci+tech direction important to be included in Education?

Balance is the key to nearly everything in life. Technology directly enables progress in both arts and sciences in countless overlapping ways. Without integration of all these fields of study, advances made in one realm will not benefit the others. Children need to understand the power of creative thought and compartmentalizing education can often restrict the imagination..

What is your view and input about introducing art+sci+tech modules in universities, academies and life-long learning organizations and initiatives?

In medieval times these subjects were not separated. In their basic forms art, science and technology are just a tool for understanding the complexity of the world. Art courses are taught in such a way that they help the student navigate their imagination, rewarding them for how far they can stretch their preconceived ideas of their reality. Of course specialism is needed to progress knowledge but often it takes an imaginative leap to make it to the next step. Imagination should be a skill which should be taught throughout our lives, not just as small children.

How do you envision the development of a shared art-sci-tech dictionary?

I hadn't thought about this before, but such a thing could be useful in helping bridge current divides between art and tech disciplines that struggle to communicate. It could be developed online in a kind of wiki format through gradual student and professional inputs. Even in the creation of such a dictionary new knowledge might be made.

How is the art+sci+tech approach embedded in your program? What are the main methodologies you use?

I am mostly working outside of teaching in

a purely research and development mode, but the main methodology I use is not to consider music as something separate from mathematics or geometry in the first place and to ensure that the teams working on Concordia are experienced, knowledgeable in many areas, and open to learning new things.

How do you support and guide young art+sci+tech researchers and how (based on what parameters) do you assess and validate their work?

Each person has their own merits and should be guided in such a way. Between those three worlds there are many possibilities, an individual's unique inquisitiveness should be explored and cherished.

What background is required for the experts leading such modules/courses?

Diversity is the most important characteristic in anyone's background. Perspective is key to exploration.

A+S+T *in* SCIENCE CONTEXT

What is the transformative impact of art+sci+tech projects in science research and new knowledge communication?

In scientific research and communication, the primary mode of transmitting knowledge has been through printed words, figures, and images. Only in recent years have technologies advanced enough to support complex encoding and decoding of information through other sensory channels such as hearing and haptics. Projects that seek to incorporate multisensory or immersive experience design into the scientific method help push forward the goal of increasing the chances of discovery and deeper understanding of subjects being studied.

A+S+T *in* SOCIAL CONTEXT

emerging art+sci+tech platforms in Europe

What is the impact on society that you observe of the emerging art+sci+tech collaborations and in which context do you think they have a significant impact?
e.g.Innovation Labs, Artists in Labs, Living Labs, Accelerators, Hackatons, Innovation Incubators, Scientists in galleries and concert halls, etc etc …

All of the above, but particularly in interactive installations where players have agency in exploring their own minds, bodies, and their connections to the external universe, or in exploring parts of nature that are outside the normal human experience - things that are far too small (quantum mechanics) or far too large (supernovae), far too fast (light) or far too slow (geology), to experience directly.

What is your experience of co-creation, co-construction, co-production with society and what is the common added value of such outcomes?

I have experience of co-creation in purely artistic and purely scientific realms through the design of participatory musical experiences and participatory museum installations. Each person brings their own creativity to the interactions such that no matter how prescriptive or limiting you intend to be, they will always find a way to surprise you. This, in turn, can drive new technology features based on their ideas that then benefit others.

What is the nature and quality of communication and collaboration between the European art+sci+tech platforms based on your experience? How do you see their future development?

It feels like there could be an investigative arts organisation that can better lead to collaboration between seemingly discrete organisations. Artists need material to describe themselves and their place in the world and science needs a little panache to communicate the importance of their findings. People also need agency in the communication of both art and science and we should inspire a sense of cognitive adventure.

A+S+T *in* INDUSTRY CONTEXT

art+sci+tech Innovation Labs as a link between new culture - education - industry - society

What is the role and impact of art+sci+tech research projects in Knowledge Economy, Shared Econimy, Creative Economy and Cognitive economy ?

It depends how effective they are! I can really only share my vision of my own project, Concordia, as it is being created. Concordia is a new type of musical instrument being built as an immersive distributed VR protocol to sonify celestial data (or indeed any data structure). Concordia is an instrument of investigation and discovery when users 'play' that data structure. But as a distributed open source protocol, Concordia is also an economic experiment: namely a musical instrument as a common pool resource, and a musical instrument as distributed economic infrastructure on a blockchain. We are interested in exploring the new economics of Concordia and its striking implications for the future of the music, education, and science industries and cultural policy. To design an economy into Concordia from the beginning forces us to consider deep questions of justice, accessibility, and how to define and reward excellence and value.

What could be the sustainable design of art+sci+tech innovation labs based on the experience you already have?

Play is often rewarded with innovation and innovation can extend the possibilities of a project through economic and social value. If we spend time working on important unanswered questions we can not just understand something we might not have

known before but also uncover solutions for other questions. This is the joy of chasing your nose and using the tools from science and art to look under the hood

How is informed the definition of collective Human Identity via the art+sci+tech applications of new technology ?
*e.g. AI, New Media: VR(Virtual Reality), AR(Augmented Reality), MR(Mixed Reality), IoT(Intenet of Things), BlockChain, Space Travel, New Internet etc.*

If we consider technology as an extension of ourselves we can use it in a more human-centric way. Meditation is a technology, thinking is a technology, what's next could change our species for the better; it just depends on how we apply our optimism. Human identity right now is fractured, damaged, and obscured by divisive forces and infrastructure. Art, science, and technology that are informed by spiritual principles of oneness, awe, wonder, Truth, create experiences that ground us in the intrinsic beauty of ourselves

.

A+S+T *in* .... CONTEXT

What context would you include that informs the purpose and future of art+sci+tech research development?

I am interested in dissolving the sense of "the other" that perpetuates old habits of an immature society and help us graduate into adulthood to create a world that works for everyone and everything, founded on principles of oneness while preserving the rich diversity in the world. If innovations in all areas were always held accountable to this goal, the world would quickly transform, and I think we would see an explosion of new ideas, new knowledge, and a sense of well-being, the likes of which humanity has never before experienced collectively.

Robert Thomas, "Speculative fiction: a future Concordia Cockpit" 2019
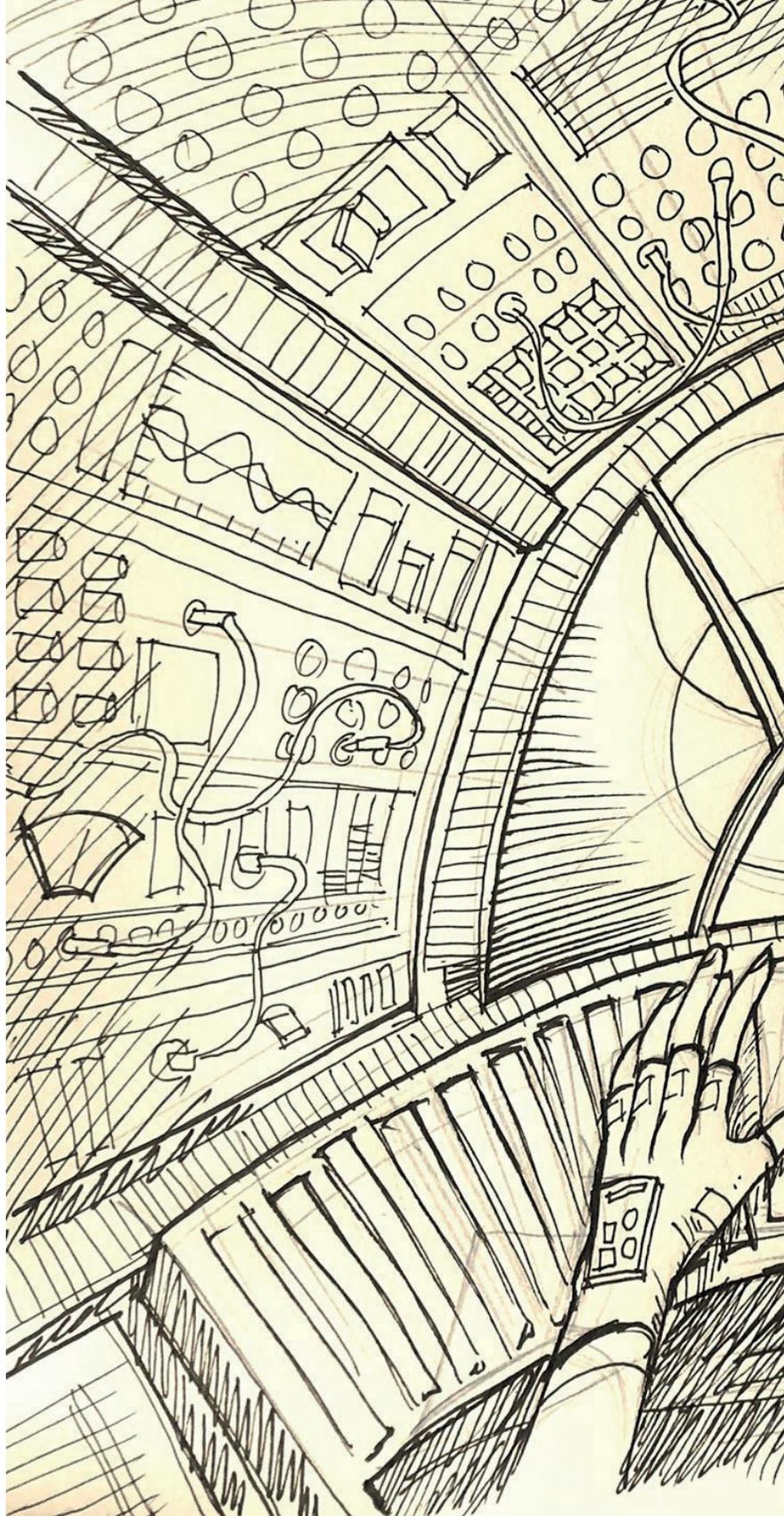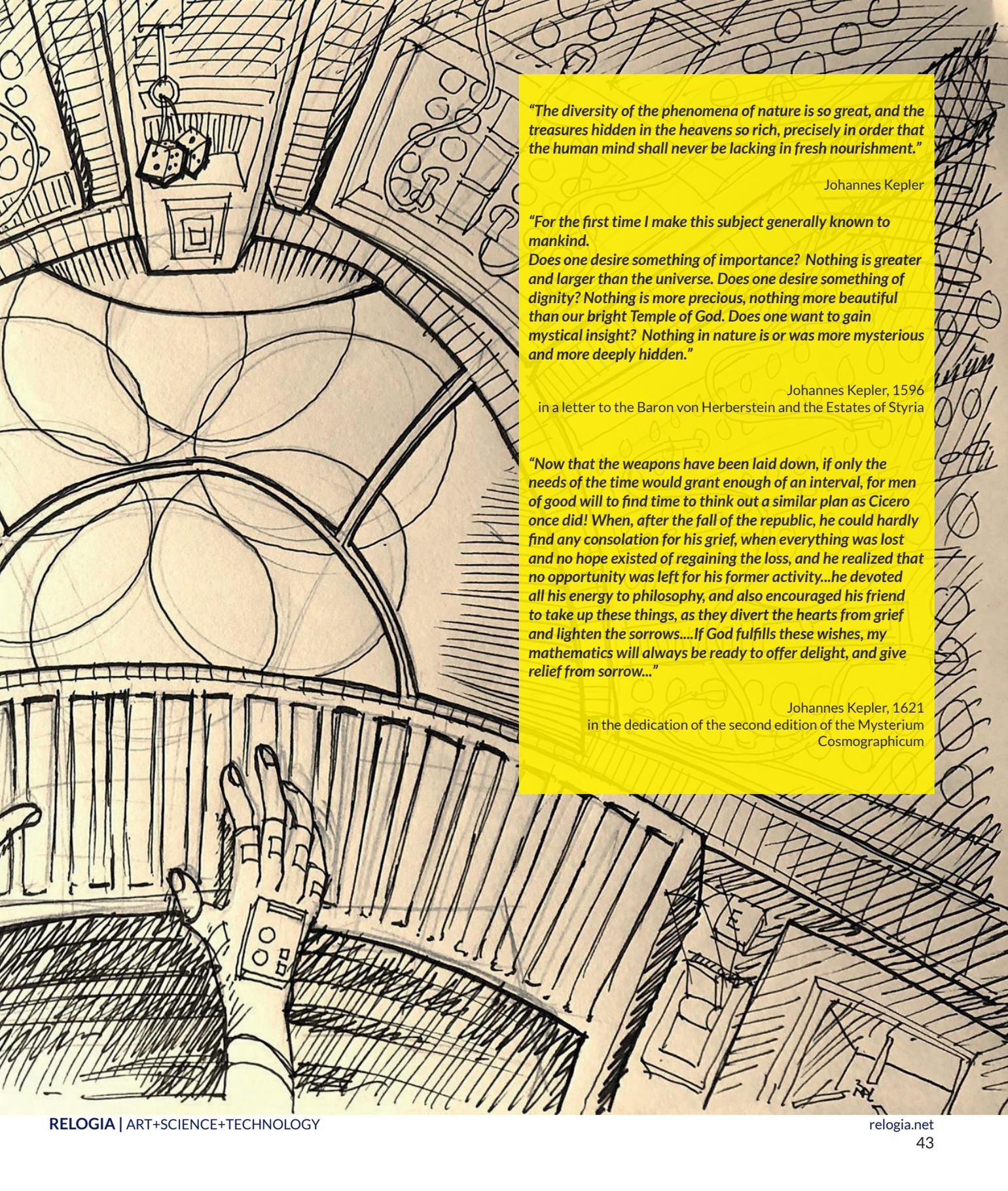
"The diversity of the phenomena of nature is so great, and the treasures hidden in the heavens so rich, precisely in order that the human mind shall never be lacking in fresh nourishment."

Johannes Kepler

"For the first time I make this subject generally known to mankind.
Does one desire something of importance? Nothing is greater and larger than the universe. Does one desire something of dignity? Nothing is more precious, nothing more beautiful than our bright Temple of God. Does one want to gain mystical insight? Nothing in nature is or was more mysterious and more deeply hidden."

Johannes Kepler, 1596
in a letter to the Baron von Herberstein and the Estates of Styria

"Now that the weapons have been laid down, if only the needs of the time would grant enough of an interval, for men of good will to find time to think out a similar plan as Cicero once did! When, after the fall of the republic, he could hardly find any consolation for his grief, when everything was lost and no hope existed of regaining the loss, and he realized that no opportunity was left for his former activity...he devoted all his energy to philosophy, and also encouraged his friend to take up these things, as they divert the hearts from grief and lighten the sorrows....If God fulfills these wishes, my mathematics will always be ready to offer delight, and give relief from sorrow..."

Johannes Kepler, 1621
in the dedication of the second edition of the Mysterium Cosmographicum

RELOGIA
art+sci+tech

LICENSE
TRIALOGUES

This ID Certifies that

PROF DR HEIDRUN STOEGER
is an activist in Global Art + Sci +Tech
Research, Education and Culture

CLASS: Global
(author of culture, historical change-maker)

TYPE: A
(messenger in idea delivery system, dot-connector,
prophet of idea dimensionality - turn 2D idea into 4D reality)

STATUS: Active
(move your body & mind & heart and make it happen)

VOCATION: **Chair Professor of School Research,
School Development, and Evaluation**
University of Regensburg, Germany

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Re:
LOGIA

QUOTES
that have inspired you

*"Doubt is the beginning of science; he who doubts nothing, examines
nothing; he who examines nothing, discovers nothing; he who discovers
nothing, is blind and remains blind."*

Pierre Teilhard de Chardin

ORGANISATION
info

University of Regensburg | Germany
www.uni-regensburg.de

CyberMentor
www.cybermentor.de

Global Talent Mentoring
www.globaltalentmentoring.org

RELOGIA TRIALOGUES
theme

EXPERIENCE DESIGN
http://relogia.net

CYBERMENTOR

Women remain strongly underrepresented in science, technology, engineering, and mathematics (STEM). One reason for this is a general lack of appropriate female role models. CyberMentor seeks to remedy this issue by increasing girls' interest in STEM and helping them discover ways of entering STEM professions by matching girls (as mentees) with female role models working in STEM (as mentors) on a members-only online platform.

CyberMentor is Germany-wide, online mentoring program for girls between the ages of 11 and 18 in STEM and women who have an advanced degree in STEM and are working in a STEM field. Each student works with an individual mentor for at least one year. Each mentor–mentee pair communicates regularly via the platform communication tools, discussing school, university studies, careers, and other interesting STEM-related topics. The members-only internet platform includes various forums and chat options, as well as an online news magazine containing interesting STEM-related articles, book recommendations, and games.

www.cybermentor.de

GLOBAL TALENT MENTORING

Global Talent Mentoring is an excellence-focused online mentoring platform launching in 2020. The online platform will provide exceptionally talented and motivated youths from around the world with the opportunity to cultivate their talents in science, technology, engineering, mathematics, and medical sciences (STEMM). Through one-on-one and group mentoring, internationally leading STEMM experts will guide students on an individualized learning pathway to STEMM excellence. Mentees and mentors will also be able to network with all participating mentees and mentors across the Global Talent Mentoring community via multiple communication channels. A distinctive feature of Global Talent Mentoring is that it is based on sound, scientific research practice.

Completely internet-based, Global Talent Mentoring bridges geographic distance to connect the brightest young minds with distinguished researchers, academics, and professionals to build a global hub of talent development and professional guidance. Global Talent Mentoring will be free of charge for all participants thanks to the program's sponsor and owner, the Hamdan Bin Rashid Al Maktoum Foundation for Distinguished Academic Performance.

www.globaltalentmentoring.org

BIOGRAPHY

Professor Dr Heidrun Stoeger is full **professor for educational sciences** at the University of Regensburg, Germany. She holds the Chair for School Research, School Development, and Evaluation. She is **vice president of the International Research Association for Talent Development and Excellence (IRATDE)**. She is also a member of the editorial board of the German journal Talent Development and served from 2007 to 2014 as editor in chief of the journal High Ability Studies. She has published more than 250 articles, chapters, and books on giftedness, self-regulated learning, motivation, fine motor skills, and teacher education. She is a member of several national and international scientific boards and **expert commissions in the field of giftedness research and gifted education.**

A+S+T *in* PERSONAL CONTEXT

Could you describe when and how you first became interested in the art+sci+tech synthesis as an idea that has had relevance to your work?

As an educational scientist, I am interested in exploring how we as humans learn and optimizing learning processes. One crucial aspect in understanding and optimizing human learning is taking a systems perspective on learning. Learning always occurs in highly contingent systems, in which many factors interrelate and influence one another simultaneously. Much of my work reflects systemic outlooks. In the area of STEM education (science, technology, engineering, and mathematics), for example, we have created holistic programs that offer suitably complex ap-proaches to get students interested in STEM domains. With my colleague Prof. Drs. Albert Ziegler, I launched CyberMentor, an online mentoring platform in STEM for girls in Germany. My team and I are now planning Global Talent Mentoring, an international mentoring platform in STEMM (to also include the medical sciences) for a highly select group of the world's most promising STEMM talents. The STEMM fields have manifold applications. When it comes to innovation in STEMM, approaches from art can be important models and sources of inspiration for new ideas.

A+S+T *in* CULTURAL CONTEXT

How would you frame the new cultural context we live in?
e.g: Post Constructivism, New Renaissance, Conceptual Age, Proto Renaissance, Age of Authenticity, Post-post Postmodernism, Age of Discoveries, Metamodernism

What is the relationship between art+sci+tech movement and current culture? Would you consider art+sci+tech movement as a provider of new cultural context?

Who needs this art+sci+tech synthesis and is it important today?

What is the value in such multi-inter-trans-disciplinary R&D approach and how does it impact the evolution of human perception about the reality we live in?

We live in a world characterized by a multitude of philosophical and scientific perspectives. No earlier age has been characterized by such intellectual diversity. Therefore, I suggest not attempting to frame our current cultural context according to a specific concept or term. For me personally, evidence-based science is a defining moment across humanity, because it offers humans around the world a means of coming together to work on shared challenges—even though the multiplicity of cultural outlooks and understandings of the world mean that humans will not see eye to eye in many cases. Art + sci + tech is a way to reach out to different cultures and connect different groups of people. Traditionally, institutions have kept the areas of learning such as art + sci + tech separate, beginning with primary school and continuing through professional life. Such reductionism has its merits in some cases. Reduction-ism is an important achievement of the Enlightenment that has helped us better understand natural, human, and cultural phenomena. Yet reductionism has an enormous price. Insights about art + sci + tech arising from reductionist perspectives remain extremely limited and incomplete. They suggest the existence of a reality that is far too simple. With the advent of systems thinking in the twentieth century, a

much deeper understanding of the world has started to take shape. The interconnectedness of the different fields is representative of the interconnectedness of people and cultures. It is the future, I would argue. An ever-increasing understanding of interconnectedness in art + sci + tech offers us the best hope for overcoming the world's most pressing existential problems. Art can play a role in reminding researchers and practitioners more focused on sci and tech of the need to remember the importance of the systemic perspective, as artistic worlds are, in many cases, much freer to be created according to the rules of a given creator or community. Art helps me to step back from my scientific work and see the broader picture again.

A+S+T *in* EDUCATION CONTEXT

art+sci+tech Learning Systems:
Integrative Education for Future Skills
art+sci+tech Learning Systems & Methodologies
Positive & Progressive Education

Why is art+sci+tech direction important to be included in Education?

What is your view and input about introducing art+sci+tech modules in universities, academies and life-long learning organizations and intiatives?

As an advocate of STEM education, I fully support the advancement of the science and technology fields. One part of my research involves the creation and improvement of instruments used for talent identification and talent devel-opment. Our two evidence-based mentoring projects, CyberMentor and Global Talent Mentoring, were born out of the desire to identify and develop talent in STEM. There is always room for expansion and collaboration, however, and this is a necessary step to make progress. We are already experiencing a wave of increased interest in crossover fields. The incorporation of art can illuminate new areas of talent, challenge existing models, and generate new meth-ods of talent development.

A+S+T *in* Science context

What is the transformative impact of art+sci+tech projects in science research and new knowledge communication?

Each area of art + sci + tech can help inform the other. Art can make science and tech better and vice versa. Through art, information of all types can be visualized and communicated in revolutionary ways that open research-ers' eyes to previously overlooked connections and assumptions. This is relevant and transformative, because by combining these three areas, we can gain a greater perspective on the knowledge we already have and view infor-mation through yet another lens.

A+S+T *in* Social context

emerging art+sci+tech platforms in Europe

What is the impact on society that you observe of the emerging art+sci+tech collaborations and in which context do you think they have a significant impact?
e.g.Innovation Labs, Artists in Labs, Living Labs, Accelerators, Hackatons, Innovation Incubators, Scientists in galleries and concert halls, etc etc …

Collaborative platforms are one of the positive outcomes of the art + science + tech cooperation. The interest in STEAM platforms across Europe is growing. These collaborations are essential for the further development of the systems perspective I support. Additionally, STEM experts and young people interested in STEM can learn from the arts. Programs that encourage this shared understanding already exist. For example, qualities such as creativity and charisma play important roles in the arts, and also in STEM, with a slightly different focus. Qualities that have value in the arts can therefore help inform STEM approaches and STEM programs.

RELOGIA | ART+SCIENCE+TECHNOLOGY

A+S+T *in* Industry context

art+sci+tech Innovation Labs as a link between new culture - education - industry - society

What is the role and impact of art+sci+tech research projects in Knowledge Economy, Shared Econimy, Creative Economy and Cognitive economy ?

Promotion of art + sci + tech innovation can help stimulate the global economy by creating areas for growth and ex-change between countries, such as new industries or ways of communicating. Research is becoming increasingly interdisciplinary—and this can be a great thing. Such cross-cultivation of knowledge gives rise to new insights, which can inspire the creation of new fields, which can spark new ways of tackling the world's challenges. It is all about generating new interdisciplinary perspectives and insights, while maintaining the highest standards of excellence within domains.

GLOBAL TALENT MENTORING
WWW.GLOBALTALENTMENTORING.ORG

RELOGIA
art+sci+tech

LICENSE
TRIALOGUES

This ID Certifies that

PROF DR VLADIMIR NIKITIN
is an activist in the Global Art + Sci +Tech
Research, Education and Culture

CLASS:
(author of culture, historical change-maker)

TYPE: A
(messenger in idea delivery system, dot-connector,
prophet of idea dimensionality - turn 2D idea into 4D reality)

STATUS: Active
(move your body & mind & heart and make it happen)

VOCATION: Head of Philosophical Anthropology
and Arts Therapy Department
Moscow Social Pedagogical Institute, Russia

Re:
LOGIA

QUOTES
that have inspired you

*"A poet knows he has achieved perfection not when there is nothing left
to add, but when there is nothing left to take away".*

*"Principles for the Development of a Complete Mind: study the science
of art, study the art of science. Develop your senses – especially learn
how to see. Realize that everything is connected to everything else".*

*"All sciences are vain and full of errors that are not born of Experience,
the mother of all knowledge".*

Leonardo da Vinci

ORGANISATION
info

Moscow Social Pedagogical Institute
Philosophical Anthropology and Arts Therapy Department
Russia

East-European Association of Arts Therapy
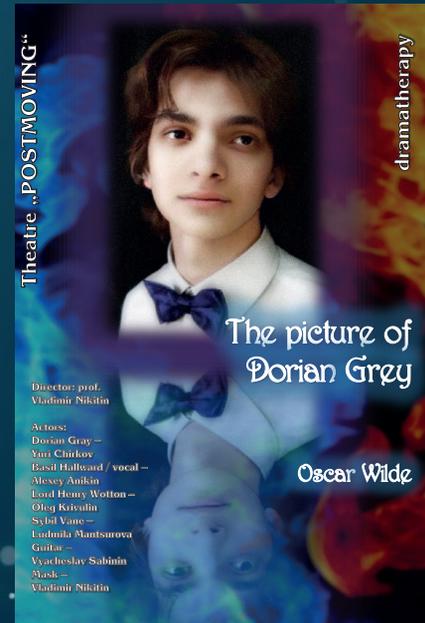Sofia, Bugaria

RELOGIA TRIALOGUES
theme

EXPERIENCE DESIGN
http://relogia.net

Exemplars of
AESTHETIC INNOVATION
that have
transformational effect
on people's understanding

"NARCISSISM" project, 2019

July 2019, the first Balcan conference on psychodrama in Varna where the theatre "Postmoving" took part in with the **"Narcissism" project.** The project consists of three performances on the base of works by Oscar Wilde ("The portrait of Dorian Gray"), Vladimir Mayakovski ("Akulova hill") and Sergey Yesenin ("The hooligan's confession"). All of them can be considered as the integration of three fields of knowledge: arts, science and technologies. The dramatic training is built on Konstantin Stanislavski's method, an influential method in Russia. All the characters are worked out due to the knowledge of psychology. And to strengthen an emotional impact on the audience "Visual transformations of images (and persons) on the screen via modern applications (including Neural networks)" were used.

Theatre „POSTMOVING"

dramatherapy

The picture of Dorian Grey

Oscar Wilde

Director: prof.
Vladimir Nikitin

Actors:
Dorian Gray –
Yuri Chirkov
Basil Hallward / vocal –
Alexey Anikin
Lord Henry Wotton –
Oleg Krivulin
Sybil Vane –
Ludmila Mantsurova
Guitar –
Vyacheslav Sabinin
Mask –
Vladimir Nikitin

BIOGRAPHY

Prof. Dr. Vladimir Nikitin is professor at Moscow Social Pedagogical Institute.
Being doctor in ontology and gnoseology sciences, he is head of Philosophical and Anthropology and Arts Therapy Department. He has been doing scientific research in the field of image and consciousness in arts therapy to make it possible to control the state of both psyche and body.
As well as professor Vladimir Nikitin is Phd in psychology. The idea of holistic nature of a person has found its embodiment in author's structural-anthropological approach in arts therapy which is represented as the base course in the frame of "Arts therapy in psychological consulting" magistrates. In 2011 he became one of founders of East-European Association of Arts Therapy in Sofia, Bulgaria. In 2012 **"Therapy by arts" book** in which the representatives of nine European countries took part was published in Sofia University "St. KLiment Ohridski".
In the focus of his personal and scientific interests are theatrical experiments. In 2000 he founded his psychological theatre, Postmoving. That is another project in which "aesthetics of soul" as the author's philosophical concept is explored.
Monographs: 2018 "Image and consciousness in arts therapy" (a joint project with Prof Peter Tzanev), 2014 "Arts therapy", 2006 "Ontology of bodily: sense, paradox, absurd", 2003 "Plastic drama", 1998 "Psychology of bodily consciousness".

w_nikitin@mail.ru

PROF DR VLADIMIR NIKITIN
RELOGIA VISION

A+S+T *in* Personal context

Could you describe when and how you first became interested in the art+sci+tech synthesis as an idea that has had relevance to your work?

At the present art+science+technology synthesis is an interdisciplinary process in arts-therapeutic education, which is originally built on the holism principles. Thus, an educational effect is strengthened due to this triple union. By doing candidate dissertation (Phd thesis) on social psychology in 2002 I researched the techniques of pictures and drama therapy as a method of consciousness improvement. In the frame of psychology of consciousness an image being a projection of vital senses reflects the level and quality of consciousness, aesthetic and ethic preferences..

A+S+T *in* Cultural context

How would you frame the new cultural context we live in?
e.g: Post Constructivism, New Renaissance, Conceptual Age, Proto Renaissance, Age of Authenticity, Post-post Postmodernism, Age of Discoveries, Metamodernism

I believe the contemporary culture is like a mirror which reflects the subconscious desire of human beings to synthesize and transform the whole previous experience of civilization evolution. The new cultural context is likely to be described in philosophical discourse of metamodernism due to which thesis and antithesis co-exist altogether..

What is the relationship between art+sci+tech movement and current culture? Would you consider art+sci+tech movement as a provider of new cultural context?

Art, science and technologies are considered to be modern elements and a provider of the holistic social object – culture.

Who needs this art+sci+tech synthesis and is it important today?

Obviously, the existence of the current society is impossible out of the frame of the art+sci+tech synthesis. .

What is the value in such multi-inter-trans-disciplinary R&D approach and how does it impact the evolution of human perception about the reality we live in?

There is no doubt that such multi-inter-trans disciplinary R&D approach is a necessary condition to objectify presentations about genesis and strategies of society development
.

A+S+T *in* Education context

art+sci+tech Learning Systems:
Integrative Education for Future Skills
art+sci+tech Learning Systems & Methodologies
Positive & Progressive Education

Why is art+sci+tech direction important to be included in Education?

The art+science+technology synthesis allows receiving the complete vision of the current reality. Therefore, art+sci+tech direction is important to be included in Education so that students will be able to share and deepen their knowledge and professional skills on the base of the cross-disciplinary nature..

What is your view and input about introducing art+sci+tech modules in universities, academies and life-long learning organizations and initiatives?

I believe a delicate introduction of art+sci+tech modules in universities would be an essential motive to integrate different studies in one progressive environment with continuation of humanities traditions..

How do you envision the development of a shared art-sci-tech dictionary?

That may be another issue to debate at RELOGIA conference.

How are you evaluating the current art+sci+tech education frameworks?

e.g. STEAM, Art+Science, Cross-disciplinary Strategies, Art Research, New Media Arts, Interface Cultures, etc.

Unfortunately, the current art+sci+tech education frameworks are not introduced enough to be appreciated. I suppose such current art+sci+tech education frameworks as Art+science and Art research have in their focus forms of expression of arts. In philosophical studies, phenomenology and ontology, it is important to explore and show genesis of artistic image. Throughout these philosophical concepts and approaches, we will better understand nature of effect of arts on a person. .

How is the art+sci+tech approach embedded in your program? What are the main methodologies you use?

In the frame of Philosophical Anthropology and Arts Therapy Department we have been working out innovative methods in the field of arts therapy for eleven years. They are successfully used in educational and therapeutic process in arts-therapy courses of Moscow Social Pedagogical Institute, Szeged University, National Art Academy in Sofia. Particularly, two impressive methods (Two-faced Janus and Theatre of revelation) are given priority in the workings of drama therapy.

How do you support and guide young art+sci+tech researchers and how (based on what parameters) do you assess and validate their work?

After graduating the two years and half arts-therapy course postgraduate students must write their thesis which is assessed by the supervisor, Prof Peter Tzanev, National Art Academy in Sofia. Young researchers have an opportunity to print their articles in the annual "Arts in psychology" almanac.

What background is required for the experts leading such modules/courses?

The experts leading the arts-therapy course in our institute are well-experienced scientists in the fields of psychology and arts.

A+S+T *in* SCIENCE CONTEXT

What is the transformative impact of art+sci+tech projects in science research and new knowledge communication?

This interdisciplinary approach should be done in such a way as to make it possible to consider scientific issues in different views and expand an objective presentation about the studied subject.

A+S+T *in* SOCIAL CONTEXT

emerging art+sci+tech platforms in Europe

What is the impact on society that you observe of the emerging art+sci+tech collaborations and in which context do you think they have a significant impact?
e.g.Innovation Labs, Artists in Labs, Living Labs, Accelerators, Hackatons, Innovation Incubators, Scientists in galleries and concert halls, etc etc

I am convinced art+sci+tech collaborations have a significant impact as humanization of modern society may be possible provided

that a wide range of people are given a free access to knowledge of all the fields of science, arts and technologies.

What is your experience of co-creation, co-construction, co-production with society and what is the common added value of such outcomes?

After completing bachelor and master degrees of psychology on arts-therapy, students can work in psychological and medical centers, educational and administrative institutions.

What is the nature and quality of communication and collaboration between the European art+sci+tech platforms based on your experience? How do you see their future development?

For the last 5 years there has been a joint project on the arts-therapy course between National Art Academy in Sofia, Moscow Social Pedagogical Institute and Szeged University. Beyond over as this course is carried out by experienced professors from different fields, psychology and art, there has emerged an opportunity to provide better programs on arts-therapy for painters and psychologists.

A+S+T *in* INDUSTRY CONTEXT

art+sci+tech Innovation Labs as a link between new culture - education - industry - society

What is the role and impact of art+sci+tech research projects in Knowledge Economy, Shared Econimy, Creative Economy and Cognitive economy ?

Personally, I am sure the role of art+sci+tech research projects in Economy space is that integrative efforts of art, science and technologies must bring a society to an entirely new creative and functional level of development.

What could be the sustainable design of art+sci+tech innovation labs based on the experience you already have?

I would propose to organize an international interdisciplinary arts-laboratory to explore the impact of modern arts on bodily and psychic states of a person. Since 2004 we have been doing such research within the institute. Our long-term scientific experiences have succeeded in publishing the joint monographs in the collaboration with Prof Peter Tzanev.

How is informed the definition of collective Human Identity via the art+sci+tech applications of new technology ? *e.g. AI, New Media: VR(Virtual Reality), AR(Augmented Reality), MR(Mixed Reality), IoT(Intenet of Things), BlockChain, Space Travel, New Internet etc.*

To my mind, human beings should identify themselves with the image of a real, physical, sound, Person practicing self-regulation, but not with the phenomena of the virtual world.

A+S+T *in* .... CONTEXT

What context would you include that informs the purpose and future of art+sci+tech research development?

The effectiveness of art+sci+tech research development is unlikely to be productive if a real Person with his capability to an objective assessment of his psychological, physical, cognitive, esthetic and other characteristics is not included in the context of art+sci+tech relationships.

RELOGIA
art+sci+tech

LICENSE
TRIALOGUES

This ID Certifies that

DR DOMHNAILL HERNON
is an activist in Global Art + Sci +Tech
Research, Education and Culture

CLASS: Global
(author of culture, historical change-maker)

TYPE: A
(messenger in idea delivery system, dot-connector,
prophet of idea dimensionality - turn 2D idea into 4D reality)

STATUS: Active
(move your body & mind & heart and make it happen)

VOCATION: Head of Experiments in Arts and Technology (E.A.T.)
NOKIA Bell Labs
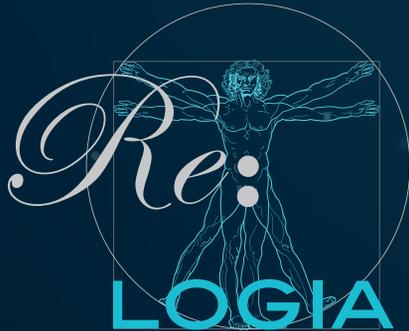
Re:
LOGIA

QUOTES
that inspire

"It is my strong belief, being a trained engineer and having worked deeply with the artistic community for the last few years, that the future of humanity is at the intersection of art and science. Engineers and scientists must embrace the concept of humanizing technology and there is no better way to do this than to collaborate deeply with the artistic community"

Dr Domhnaill Hernon

ORGANISATION
info

Experiments in Arts and Technology (E.A.T.)
NOKIA Bell Labs
www.bell-labs.com › programs › experiments-art-and-technology

RELOGIA TRIALOGUES
theme

EXPERIENCE DESIGN (represented by **Ross Dowd**)
http://relogia.net

Reeps One "We Speak Music" | Experiments in Arts and Technology (E.A.T.)

Have you ever considered how our voices limit how we communicate with others? We Speak Music – the documentary series – is a groundbreaking, artistic collaboration between the international world-class beatboxer and visual artist – Harry Yeff (aka Reeps One) and Nokia Bell Labs. This collaboration is an investigative journey of human communication offering insights into the voice from a scientific, cultural, technological and artistic perspective while using beatboxing as the ultimate exploration of its potential. The series raises many interesting questions about the importance we place on the human voice, its unstudied capabilities beyond speaking and the role it could play in an increasingly global society regarding interacting with machines. These questions are particularly prescient at this moment given the rise of voice-controlled technology.

Lisa Park "Blooming" | Experiments in Arts and Technology (E.A.T.)

Lisa Park is a Korean-American artist who uses biometric sensors, such as heart rate and brain wave sensors, to create intimate environments that excavate hidden emotional states such as vulnerability, intimacy, and confrontation. Blooming highlights the importance of presence and physical connection in our lives and the piece reconnects humanity with our need for real physical context with other huamns. The installation, which takes the form of a life-size cherry blossom tree, responds to physical contact between two to four participants. When participants stand before the tree and hold hands or embrace, the tree will flourish; when they release, it will wither into its pre-bloomed state.

BIOGRAPHY

Domhnaill Hernon is an **award-winning technology, innovation and creativity executive.** Domhnaill received an **undergrad in Aeronautical Engineering and a PhD in Aerodynamics from the University of Limerick and an executive MBA from Dublin** City University, Ireland. He previously led R&D organizations and developed and executed strategies to overcome the "innovation valley of death". He is **Head of Experiments in Art and Technology (E.A.T)** which is a **Nokia Bell Labs** new initiative he founded to fuse art and engineering/science to develop solutions that humanize technology. Domhnaill's work has been featured in Wired Magazine, Times Square, SXSW, Nasdaq, MWC, Ars Electronica and Inspirefest to name just a few and he advises cultural programs globally.

DR DOMHNAILL HERNON
RELOGIA VISION

A+S+T *in* PERSONAL CONTEXT

Could you describe when and how you first became interested in the art+sci+tech synthesis as an idea that has had relevance to your work?

It was in 2016 when I attended events that celebrated the 50th anniversary of the 9 Evenings of Theatre and Engineering and I knew immediately I had to get involved owing to the nature and quality of the conversations I had at those events. The critical thinking and depth of knowledge of the artists was invigorating and their sensibility around humanizing technology was a revelation to me.

A+S+T *in* CULTURAL CONTEXT

How would you frame the new cultural context we live in?
e.g: Post Constructivism, New Renaissance, Conceptual Age, Proto Renaissance, Age of Authenticity, Post-post Postmodernism, Age of Discoveries, Metamodernism

I am not interested in labelling things that way in general but if I was to label it I would call it "post humanism". By this I mean that with the advent of modern technology we have moved very quickly and very far away from some of the things that most make us human (for example real physical social networks) and this drastic move away from our humanity is hurting us. I believe that we should develop technology that connects us back to our humanity.

What is the relationship between art+sci+tech movement and current culture? Would you consider art+sci+tech movement as a provider
of new cultural context?

I don't think it provides new cultural context but helps shed a light on emerging cultural context.

Who needs this art+sci+tech synthesis and is it important today?

In my opinion all industry and academia in the STEM fields need this to humanize technology.

What is the value in such multi-inter-trans-disciplinary R&D approach and how does it impact the evolution of human perception about the reality we live in?

Interdisciplinarity and diversity of thought and diversity of experience are crucial to develop solutions for all of humanity – not just the few that are privileged.

A+S+T *in* EDUCATION CONTEXT

Why is art+sci+tech direction important to be included in Education?

I believe it provides methods for critical thinking and critical thinking is severely lacking in modern society. I also believe that art+sci+tech will enable future generations to think more deeply about how they are developing technology and if that technology will be used to better humanity or to monetize our existence.

What is your view and input about introducing art+sci+tech modules in universities, academies and life-long learning organizations and initiatives?

Its critically important to introduce such modules into all levels of education not just third level and beyond but even before that.

How do you envision the development of a shared art-sci-tech dictionary?

I don't consider this useful. I think there are too many different sciences and artforms to come up with a shared dictionary. It is far better to bring those people together, have them collaborate and they will learn how to communicate.

How is the art+sci+tech approach embedded in your program? What are the main methodologies you use?

We don't employ off-the-shelf methodologies. We have developed our own methodologies to best match our culture and the needs of our staff and the organization. I believe in the power of generalized frameworks but often by using a generalized framework that is necessarily designed for all situations you loose aspects that will make the program successful owing to the vast generalization. For this reason, I think it is good to know of those frameworks but take the best bits from all of them and design our own framework to ensure success.

How do you support and guide young art+sci+tech researchers and how (based on what parameters) do you assess and validate their work?

We currently collaborate with 24 artists in a number of different ways. We provide funding, in-kind support, access to space, equipment, materials, technology and we mentor them.

We assess their work based on the strength of their thesis and the aesthetic quality and experiential quality of the final output which is shown at a world stage such as Ars Electronica or SXSW, as examples.

What background is required for the experts leading such modules/courses?

They should have experience working across the fields, understand the fundamentals of technology and the philosophy of art/culture and they should be excellent educators. By that I mean they should be able to explain the work in detail and not just wave their arms around. This is for me a critical lacking in modern education – those that teach often can't explain their work at a fundamental level.

Sougwen Chung
Chinese-born, Canadian-raised artist & (re)searcher

Omnia per Omnia reimagines the tradition of landscape painting as a collaboration between an artist, a robotic swarm, and the dynamic flow of a city.
The work explores the poetics of various modes of sensing: human and machine, organic and synthetic, and improvisational and computational.
Through a collaborative drawing performance between Sougwen and a swarm of custom-designed drawing robots, the project explores the composite agency of an human and machine as a speculation on new pluralities.

Collaborators:
Sougwen Chung & D.O.U.G._L.A.S. (Drawing Operations Unit: Generation_3 Live Autonomous System).

Experiemnts in Art and Technology (E.A.T.)
NOKIA Bell Labs

NOKIA Bell Labs

A+S+T *in* Science context

What is the transformative impact of art+sci+tech projects in science research and new knowledge communication?

I think in general most people state that the impact is to increase creativity which is true. However, I believe it is so much more than this. I believe that when done properly the combination of these skills can unlock new modes of innovation in general but that new innovation can be targeted for the good of society. I also believe there is a critical need to bring human centric thinking into the fields of engineering and science which for the most part severely lack this perspective.

A+S+T *in* Social context

emerging art+sci+tech platforms in Europe

What is the impact on society that you observe of the emerging art+sci+tech collaborations and in which context do you think they have a significant impact?

The impact is to provide the fields of science and engineering with deep human centric perspective so that the technology is designed for human betterment. In order to truly get impact out of these collaborations they must be purposeful, strategic, and provide opportunity for long-term and deep collaboration. The problem with most of the 'residencies" today is that they are too short and too transactional.

What is your experience of co-creation, co-construction, co-production with society and what is the common added value of such outcomes?

In our case the co-production with society is in the sharing of the work which then provokes new and different thought of the audience member. We disseminate our work via exhibits, panels and talks towards sharing the

beneifts of such programs.

What is the nature and quality of communication and collaboration between the European art+sci+tech platforms based on your experience? How do you see their future development?

I think that like every other type of EU funded platform the collaboration is ok and the communication is ok (both could be a lot better) but what is missing is going beyond generating just knowledge towards generating real value/impact for society. This for me is the biggest lacking in all these programs....much of the interactions and the way the programs are described lack strategic thinking and intent and tend to be a little too "arm wavy" and lack real depth and substance.

A+S+T *in* Industry context

art+sci+tech Innovation Labs as a link between new culture - education - industry - society

What is the role and impact of art+sci+tech research projects in Knowledge Economy, Shared Econimy, Creative Economy and Cognitive economy ?

The impact is to provide the fields of science and engineering with deep human centric perspective so that the technology is designed for human betterment. In order to truly get impact out of these collaborations they must be purposeful, strategic, and provide opportunity for long-term and deep collaboration. The problem with most of the 'residencies" today is that they are too short and too transactional.

What could be the sustainable design of art+sci+tech innovation labs based on the experience you already have?

They must be:

-Vision led and purpose driven.

-Strategic and aligned with the goals of the host organization.

-Must engage through deep, meaningful and long-term collaboration (more than 1 year).

-Must treat these activities as a culture change initiative and leverage the principles of culture change to ensure success.

How is informed the definition of collective Human Identity via the art+sci+tech applications of new technology?

e.g. AI, New Media: VR(Virtual Reality), AR(Augmented Reality), MR(Mixed Reality), IoT(Intenet of Things), BlockChain, Space Travel, New Internet etc.

Humans have always co-evolved with technology and that will not change. However, what must change is that new emerging technology be designed and developed and deployed with the human in mind. In the future I hope that we co-evolve with technology in a way that technology continues to connect humanity while at the same time connect us back to our humanity.

A+S+T *in* .... context

What context would you include that informs the purpose and future of art+sci+tech research development and aaplications in Triple and/or Quadruple Helix of Innovation?

I believe that the future betterment of humanity lies at the intersection of art and technology and in order to move these art and tech engagements beyond "arm waving" we must engage the public, government and industry. Each has a significant role to play. The public must question how we all consume technology and just accept that which is given to us. Industry MUST play a leading role in bring together art and tech in deep and collaborative ways and to move beyond the current transactional approaches. Government must keep funding these activities and at a greater level but also must realize ways to turns the outputs of these art and tech collaborations into real societal value.

WE SPEAK MUSIC
project with Reeps One ,
Experiemnts in Art and Technology
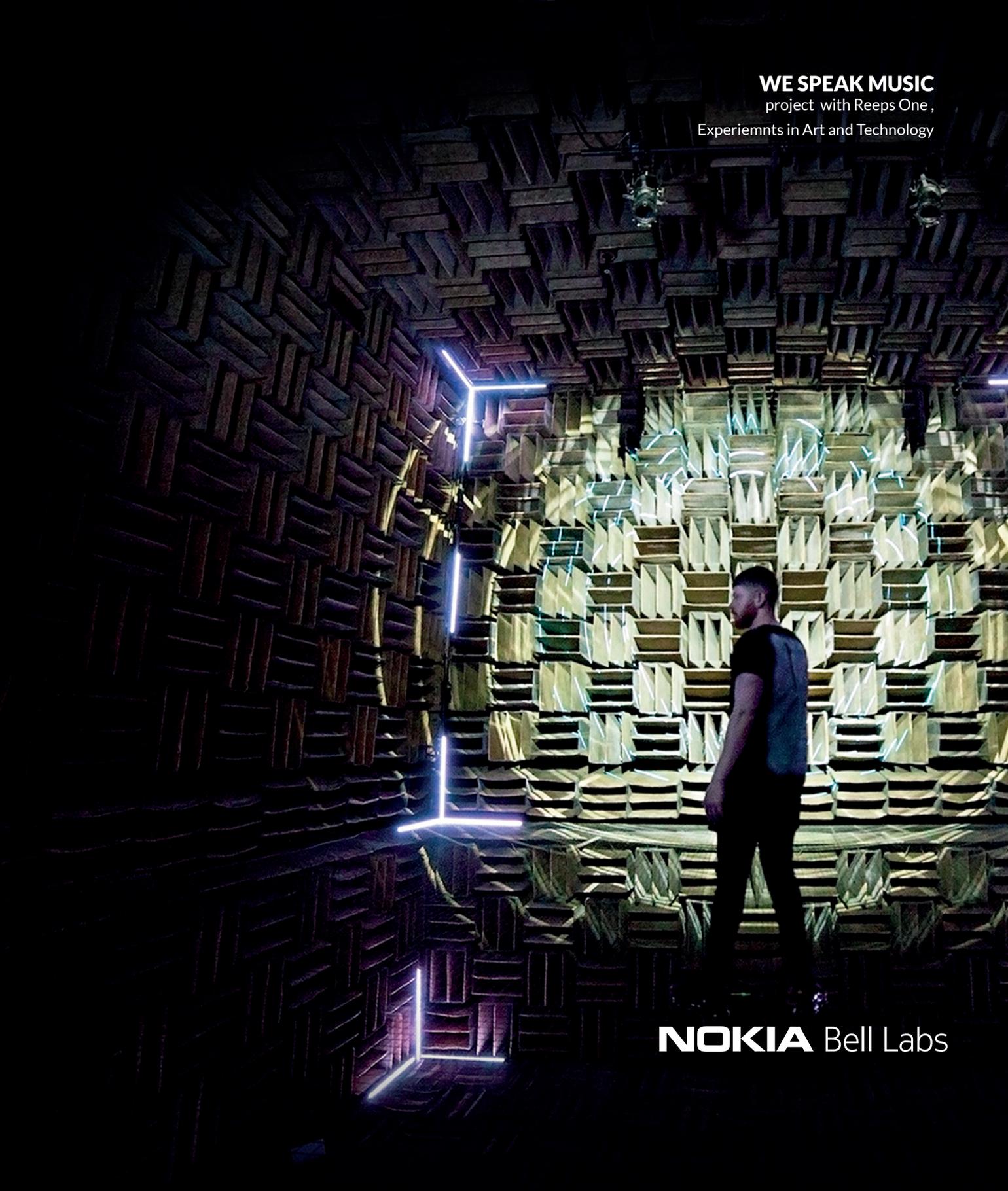
NOKIA Bell Labs

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art+sci+tech

LICENSE
TRIALOGUES

This ID Certifies that

ARI PERALTA
is an activist in Global Art + Sci +Tech
Research, Education and Culture

CLASS: Global
(author of culture, historical change-maker)

TYPE: A
(messenger in idea delivery system, dot-connector,
prophet of idea dimensionality - turn 2D idea into 4D reality)

STATUS: Active
(move your body & mind & heart and make it happen)

VOCATION: innovator and serial entrepreneur
ARIGAMI

Re:
LOGIA

QUOTES
that have inspired you

"Creativity is intelligence having fun."

Albert Einstein

*"Only art and science make us suspect the existence of life to a
higher level, and maybe also instill hope thereof."*

Ludwig Van Beethoven

ORGANISATION
info

ARIGAMI (UK)
www.arigami.co.uk

RELOGIA TRIALOGUES
theme

EXPERIENCE DESIGN
http://relogia.net

SYMPHONIC CAR CHIMES | THE LINCOLN MOTOR COMPANY

Improving the warning sounds cars emit is a crucial aspect of Lincoln's quest to create a more pleasant driving experience. In a first-of-its kind collaboration, the company turned to the Detroit Symphony Orchestra to compose custom chimes and alerts for the new SUVs. The melodious sounds are a vast improvement over the standard beeps, bings, and bongs in most vehicles.

 "When you think about the communication you have with a car, we think of them all as alerts, but not everything is necessarily an emergency," explained Jennifer Prescott, an engineer in Ford's vehicle harmonics division. "The whole concept is that we want you to have a two-way conversation with your vehicle in the most efficient and least offensive way."

REVOLUTIONARY LIGHTING TECHNOLOGY | Nano-Lit

Based in Vancouver BC, Nano-Lit Technologies' revolutionary and proprietary Quantum Dot technology is set to redefine our relationship with light. This lighting solution provides improved colour purity, energy efficiency, and cost savings—a triple threat.

Nano-Lit's combination of Quantum Dot technology, innovative patents, and intimate knowledge of industrial design has created the Nano-Lit Smart Diffuser™.

BIOGRAPHY

Forbes recognized innovator and serial entrepreneur Ari Peralta is the CEO and **Founder of Arigami.**
Arigami is a London-based research firm dedicated to expanding and refining multisensory science and promoting STEAM education. Ari has worked across multiple media disciplines in both large and small organisations, and currently leads an interdisciplinary coalition of scientists, technologists and designers working around the globe to improve complex human problems such as sleep, stress and wellness.

ARI PERALTA
RELOGIA VISION

A+S+T *in* PERSONAL CONTEXT

Could you describe when and how you first became interested in the art+sci+tech synthesis as an idea that has had relevance to your work?

The foundation of our company is unequivocally based on bridging the gap between theory and practice. The intersection of art, science and technology inspired us to build a new type of research company whose purpose is to unfold the senses and help design multisensory rich ecosystems for industry.

A+S+T *in* CULTURAL CONTEXT

How would you frame the new cultural context we live in?
e.g: Post Constructivism, New Renaissance, Conceptual Age, Proto Renaissance, Age of Authenticity, Post-post Postmodernism, Age of Discoveries, Metamodernism

I believe we are in the age of Human Connection. After all with the advent of artificial intelligence technology infiltrating our every day lives, we are seeking meaning, authenticity and most importantly interaction with one another.

What is the relationship between art+sci+tech movement and current culture? Would you consider art+sci+tech movement as a provider of new cultural context?

I don't believe the movement is new. It's an effort that begin since the start of humanity itself. However the new wave of integration across fields has certainly influenced our current culture. With the recent advances in science and technology, art continues to revive how we approach and engage with our thoughts on the future.t.

Who needs this art+sci+tech synthesis and is it important today?

We all need this. These transdisciplinary efforts positively impact people, our communities, our industry and our future. In particular it's our students and young professionals that have most to gain. While automation is shaping the future thru the lens of efficiency, STEAM efforts can significantly help influence how we address the changes ahead.

What is the value in such multi-inter-trans-disciplinary R&D approach and how does it impact the evolution of human perception about the reality we live in?

We are able to achieve progress when people work together. The same is true when science, technology and art merge. This way of thinking leads to innovation and disruption. These go on to influence human perception.

A+S+T *in* EDUCATION CONTEXT

Why is art+sci+tech direction important to be included in Education?

Our education system is meant to evolve, similar to how we evolve as people and as communities. STEM/STEAM education offers our next generation the opportunity to lead the way forward with a mix of tools that cover many fields. Traditionally, education has focused on archaic practices. I say this respectfully because things have drastically changed since modern education first began. Thanks to the many years of development, research and application, we now have the opportunity to merge ideas, concepts and subjects.

What is your view and input about introducing art+sci+tech modules in universities, academies and life-long learning organizations and initiatives?

We are on the cusp of being able to rethink education. As technology continues to transform our lives, our interactions, our industries and our learning, we have the unique opportunity to think beyond the traditional learning models.

Implementing many aspects of the past whilst expanding and improving how we approach the future. Learning is a big part of what makes us who are, how we think and how we progress in life. Because of this, STEM/STEAM efforts will require significant infrastructure changes. Some which may be expensive, and complex but worth it.

How do you envision the development of a shared art-sci-tech dictionary?

Language is at the center of how we learn, how we combine ideas and most importantly how we share with others. The concept of a multidisciplinary dictionary will enable us to do better and have easy access to systems that can better expand our understanding of disciplines beyond our current knowledge. It's vital to have common language to help guide us towards a brighter and happier future.

How are you evaluating the current art+sci+tech education frameworks?

e.g. STEAM, Art+Science, Cross-disciplinary Strategies, Art Research, New Media Arts, Interface Cultures, etc.

I currently evaluate STEAM education efforts by observing and interacting with its leadership and students. The fact of the matter is that STEAM education has become more prevalent in higher education institutions yet remains close to obsolete when it comes to early academic development

and then mostly absent at the workplace. Another way I evaluate efforts made is by reviewing the projects that come about from such programs. Comparing them to non-STEAM programs and taking into account any differences, advantages and disadvantages.

How is the art+sci+tech approach embedded in your program? What are the main methodologies you use?

Science, Tech and Design are embedded in our operations, company mission and furthermore into my personal daily life. Since I speak with leading scientists, technologists and designers from around the world on a daily basis, I have a clear advantage at understanding the many barriers faced by different sectors and stakeholders.

How do you support and guide young art+sci+tech researchers and how (based on what parameters) do you assess and validate their work?

I work mostly encouraging teams to work together. In particular with youth, it's about identifying unique points of interest and connecting those with possible complimentary fields that can provide additional context to their expertise or area of interest.

What background is required for the experts leading such modules/courses?

Regardless of instructors backgrounds, it's important we can help transform much of the academic talent we already have in place. What we should focus on is how do we make education more modular for all stakeholders, including the instructors themselves. It's also essential to build a consciousness of openness, curiosity and continuous learning.

A+S+T *in* SCIENCE CONTEXT

What is the transformative impact of art+sci+tech projects in science research and new knowledge communication?

Thanks to the many years of advancements of organisations like NASA, we have the perfect example that can clearly illustrate the many advantages and impact interdisciplinary teams can have on our every day lives and industry. STEAM- led efforts can help us tackle many of the complex human problems we face today. I also believe it's a great opportunity for us to further connect with one another as a community.

A+S+T *in* SOCIAL CONTEXT

emerging art+sci+tech platforms in Europe

What is the impact on society that you observe of the emerging art+sci+tech collaborations and in which context do you think they have a significant impact?
e.g.Innovation Labs, Artists in Labs, Living Labs, Accelerators, Hackatons, Innovation Incubators, Scientists in galleries and concert halls, etc etc ...

I don't think there is a one size fits all when discussing STEAM education. After all that's the point, to build dialogue and engagement across disciplines in order to progress with things that any one discipline cannot solve on its own. Incubators, hackathons, Innovation Labs and other examples continue to make it easier for new concepts and solutions to be developed and most importantly funded. It would be great to see our academic Institutions take note of these efforts and become more nimble in both its leadership and infrastructure.

What is your experience of co-creation, co-construction, co-production with society and what is the common added value of such outcomes?

Collaboration exists in everything we do. From the most simple of tasks to the most complex of projects. The idea of being people-driven represents more of an opportunity to serve our communities in a holistic way. I've had the unique opportunity to work with

some of the most brilliant minds in the world. From developing sports nutrition alternatives to building up our current team of scientific experts.

What is the nature and quality of communication and collaboration between the European art+sci+tech platforms based on your experience? How do you see their future development?

While I'm most appreciative for the efforts made by the European Union and other government agencies, it's important to note that this is only the beginning. We must continue to reiterate and support STEAM efforts in all aspects of what we do, including education. Many of the efforts seem disjointed. Clear message on defining STEAM but very little pragmatic solutions that can be scalable and mass adapted into our current educational setup.

A+S+T *in* INDUSTRY CONTEXT

art+sci+tech Innovation Labs as a link between: new culture - education - industry - society

What is the role and impact of art+sci+tech research projects in Knowledge Economy, Shared Economy, Creative Economy and Cognitive Economy?

Simply put STEAM education stimulates our economy. This courts from multiple aspects and can mainly be observed with advances in healthcare, pharmaceuticals, mobility, nanotechnology and design. STEAM propels industries to evolve.

What could be the sustainable design of art+sci+tech innovation labs based on the experience you already have?

The beauty of STEAM education is that it is sustainable to begin with. Unlike most of our current academic settings which are static, STEAM strategies and programs provide all of its stakeholders with the opportunity

to become more dynamic. It allows us to overcome our linear approach to education and focus on the ecosystem of variables that keep us from solving complex human concerns.

How is informed the definition of collective Human Identity via the art+sci+tech applications of new technology ?

e.g. AI, New Media: VR(Virtual Reality), AR(Augmented Reality), MR(Mixed Reality), IoT(Intenet of Things), BlockChain, Space Travel, New Internet etc.

Technology is part of STEAM, so to reference ones importance over the other is counterproductive. Instead we should highlight the fact that technology is a tool that can assist us in accelerating our goals within education. Beyond the waves of changes we are experiencing in our every day lives and industry, academic institutions have sought more technology than any other one subject or module. It's important we aim for a healthy mix of input in order to achieve a truly modular learning experience, that is both human centered and meaningful.

A+S+T *in* .... CONTEXT

What context would you include that informs the purpose and future of art+sci+tech research development in the Triple and/or Quadruple Helix of Innovation?

The future of innovation will always depend on when and where the helix meet. We live during very exciting times since those helix continue to get closer. The importance of continuing to blend fields, merge definitions and bridge the gaps in knowledge will propel our next generations into a healthier and happier future. By working together to promote more STEAM-integration we can help its adoption, continuous improvement and the positive impact it will have on our local, regional and global economies

HUMAN DATA ANALY

A R I G A M I
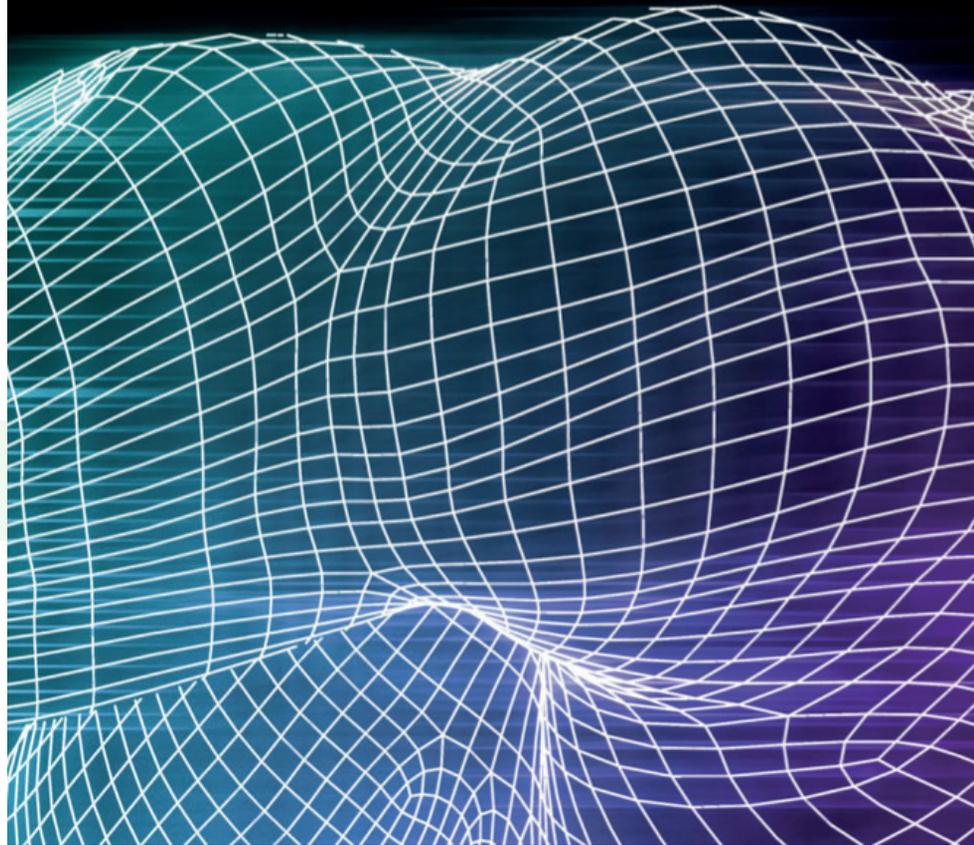
YTICS.

RELOGIA
art+sci+tech

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JÜRGEN ROPP
is an activist in Global Art + Sci +Tech
Research, Education and Culture

CLASS: Global
(author of culture, historical change-maker)

TYPE: A
(messenger in idea delivery system, dot-connector,
prophet of idea dimensionality - turn 2D idea into 4D reality)

STATUS: Active
(move your body & mind & heart and make it happen)

VOCATION: **Creative Technologist, Art+Sci+Tech Researcher**

Re:
LOGIA

QUOTES
that have inspired you

*"It is by logic that we prove, but by intuition that we discover.
To know how to criticize is good, to know how to create is better"*

Henri Poincaré

*"I can´t explain this attraction in terms of anything that´s familiar to
you, because I don´t understand it in any terms that you are familiar
with"*

Richard P. Feynman about magnetism

ORGANISATION
info

University of Art and Design Linz
MA Interface Cultures
Austria

RELOGIA TRIALOGUES
theme

RELOGIA EXHIBITION
http://relogia.net

metrySym

Symmetry stands for balance, perfection and beauty. Symmetric shapes and objects attract each other reestablishing the ideal equilibrium. The ideal of symmetry is also consistently followed and investigated in physics. This led to the concept of antimatter, which has been discovered and proved in the early 20th century.

Nowadays research on antimatter takes place at the particle accelerator in CERN, where massive amounts of energy and huge machines generating the strongest magnetic fields are used. The aesthetics of these machines are consequently followed by the installation's setup. An electromagnetic field keeps the object levitating and attracted to the upper part of the device. This levitation is correlated to the fact that antimatter vanishes in a big burst of energy, when coming into contact with matter.

One of the main questions presented by this artifact is: 'How would gravity affect antimatter? Would it fall upwards?' Since its discovery, scientists wondered about the behaviour between antimatter and gravity, without any conclusive result yet. 'metrySym' theorizes about the idea, that antimatter would react to gravity differently than visible matter.

project realised together with Marta PCampos during a one-month residency in May 2016 @ Etopia Center for Art and Technology(Zaragoza, Spain) in the frame of the ReverberadasArt & Science Exhibition.

BIOGRAPHY

Jürgen Ropp is an artist based in Linz, Austria and currently **part of the Interface Cultures Master´s program at University of Art and Design** there.
He is **inspired by the tension between art and science and their (dis)congruencies**. With a BSc in engineering he is able to use a palette of tools to manifest situations that lie within and emerge from these fields. From building an installation for the European Digital Art and Science program to performing at Ars Electronica Festival he doesn´t want to narrow down his ways of expression.
His work is located on the border between art and sciences. He understands the epistemologic limitations of modern physics as a nutritional basis for his artistic expression and explores the implications of the underlying theories. From that interactive artifacts and audivisual experiences emerge, which utilize new technologies to interpret a specific context free from scientific formalisms. By that the work is based more in the field of artistic research, whereas it wouldn´t be possible without taking experimental research into consideration. Examples of his work here:

juergenropp.at

JURGEN ROPP
RELOGIA VISION

A+S+T *in* PERSONAL CONTEXT

Could you describe when and how you first became interested in the art+sci+tech synthesis as an idea that has had relevance to your work?

Basically I grew into this field naturally. Out of curiosity I visited several physics lectures in the city of Innsbruck, where I started to study, then proceeded to software engineering, where I made my Bachelor´s degree and then went on to develop myself conceptually at the University of Arts and Design Linz. When looking for ways to express in a meaningful way it felt like the most obvious combination, since I´m biased in all three fields. The idea of interdisciplinary approaches is seeming inevitable now in times where staying in a single discipline implies unnecessary limitations.

A+S+T *in* CULTURAL CONTEXT

How would you frame the new cultural context we live in?
e.g: Post Constructivism, New Renaissance, Conceptual Age, Proto Renaissance, Age of Authenticity, Post-post Postmodernism, Age of Discoveries, Metamodernism

In opposite to the majority of artworks my works apparently don´t have political implications, which can be seen as a statement itself. Whereas talking about the context means we shouldn´t ignore that we are living in a world of post-factualism as a pattern influencing the current social circumstances. This is again caused by the increased complexity we have to deal with and my hope is that connecting the arts, sciences and technology can raise attention and build trust in scientific facts by empathic means.

What is the relationship between art+sci+tech movement and current culture? Would you consider art+sci+tech movement as a provider of new cultural context?

As stated before I see big relevance in bringing the focus back to a more fact based world view. Art from my perspective can be a catalyst to experience knowledge in a holisitc way, reconnecting to the emotional insight that might sometimes seem decoupled from scientific or technologic research.

Who needs this art+sci+tech synthesis and is it important today?

In my opinion this synthesis is unavoidable to open up to a broader comprehension of our surroundings. Therefore it is relevant for everyone and is getting its importance by supporting us to accomplish that.

What is the value in such multi-inter-trans-disciplinary R&D approach and how does it impact the evolution of human perception about the reality we live in?

The value I think should be determined by everyone involved in their respective approaches to the matter. In terms of influencing human perception that would mean coming closer to certain scientific assumptions and technologic developments can help to build educated mindsets being able to reflect independently. From my personal perspective the epistemologic implications that non-classical physics for example offer us can give exciting insights about the world away from personal agendas which often lead to miserable outcomes..

A+S+T *in* EDUCATION CONTEXT

art+sci+tech Learning Systems:
Integrative Education for Future Skills
art+sci+tech Learning Systems & Methodologies
Positive & Progressive Education

Why is art+sci+tech direction important to be included in Education?be included in education?

Ratio and emotio as basically being two sides of the same coin have undergone large estrangement in times of increasing technologic influence. Combining these three disciplines from an early stage on I think is important to reconnect the factual and emotional perception.

What is your view and input about introducing art+sci+tech modules in universities, academies and life-long learning organizations and initiatives?

Even small initiatives like workshops and talks are able to strengthen the connections between these fields. Since this is a process that needs a long time to develop the most promising approaches will emerge naturally and give hints to the long term tools that support the main goals.

How do you envision the development of a shared art-sci-tech dictionary?

Here I´d like to illustrate the possible framework based on a direct example. In general different disciplines sometimes use the same terminology and keywords in different contexts related to their own expertise without knowing from each other. This is the manifestation of the core difficulty of having the disciplines separated. To make things more concrete, the term „Eigenzeit" (direct translation would be „own-time") is used in relativistic physics for two inertial systems with their own time, to be able to calculate the time perception relative to each other. In biology this term is used to describe the time that processes of biologic development take. And you can find it also in psychology and sociology to describe Phenomena in human´s psychologic and sociologic progress. Having a platform that is giving an overview and making it able to browse through contexts of a keyword could help entangling the disciplines.

How are you evaluating the current art+sci+tech education frameworks?

e.g. STEAM, Art+Science, Cross-disciplinary Strategies, Art Research, New Media Arts, Interface Cultures, etc.

From my direct experience I can say that there are institutions like Ars Electronica Center Linz and Etopia Center for Art and Technology Zaragoza, which are fostering multifaceted education in a very elaborate way already. They are offering interdisciplinary programs and workshops for people from all ages and educational backgrounds. I also want to mention the department where I´m currently finishing my Master´s degree, Interface Cultures at the University of Arts and Industrial Design Linz. This program is open for students coming from arts, sciences and technology. This approach offers a lot to discover and makes it even more exciting to explore the world of arts..

How is the art+sci+tech approach embedded in your program? What are the main methodologies you use?

In the Interface Cultures department it is mostly the unbiased exchange of students which lies in the nature of the program. The lectures are covering art history, sound art, programming and generative design, interaction design and much more. Everyone is free to explore and then focus based on his or her interests and curiosity.

What background is required for the experts leading such modules/courses?

In general the more diverse the backgrounds are, the more insights experts are able to offer. So preferrably they are educated in more than one discipline and used to communicate and negotiate between them. Communication is a big factor and being able to talk about the same thing is a crucial factor for the development of the students..

A+S+T *in* SCIENCE CONTEXT
What is the transformative impact of art+sci+tech projects in science research and new knowledge communication?

The main goal is to give insights from another perpective. That can inspire scientists, who might sometimes be stuck in a very specific problem, and also artists to extend their interpretations. When we think back to the times of Leonardo da Vinci categories didn´t exist. The only characteristic that drove everything was curiosity and the devotion for learning new interrelationships. Likewise the application of scientific research methods to artistic research processes is giving art an additional layer of validity. Because these fields were drifting apart further for a long time it is very important to have frameworks backing the recombination.

A+S+T *in* SOCIAL CONTEXT

emerging art+sci+tech platforms in Europe

What is the impact on society that you observe of the emerging art+sci+tech collaborations and in which context do you think they have a significant impact?
e.g.Innovation Labs, Artists in Labs, Living Labs, Accelerators, Hackatons, Innovation Incubators, Scientists in galleries and concert halls, etc etc

Based on my observation the impact can be manifold. It depends heavily on the background of the recipients and of course the aim of the initiative. The most important factor is to transport the fascination of the topic. Attendees who are enjoying what they experience will take home more to implement it in their own routines. May it be artists in laboratories or scientists in galleries, the outcome is never predictable which makes it exciting for everyone involved.

What is your experience of co-creation, co-construction, co-production with society and what is the common added value of such outcomes?

Having worked in all kinds of collaborations, with artists, agencies and institutions the common added value is strongly attached to the goal. A precise aim one collaborates for is giving space to refine the approach in every

necessary step. Collaborations in general, especially interdsiciplinary ones, always offer a lot to learn for everyone involved as well. Respect for the team members is also essential, but that goes without saying. And last but not least positive dynamics are influencing the outcome´s quality in unforeseeable ways.

A+S+T *in* INDUSTRY CONTEXT

art+sci+tech Innovation Labs as a link between new culture - education - industry - society

What is the role and impact of art+sci+tech research projects in Knowledge Economy, Shared Econimy, Creative Economy and Cognitive economy ?

Art+Sci+Tech projects have their influence on all of these categories. It is the path of derivation of purpose, spoken from the artistic side, that adds the value. One example is Ars Electronica´s S+T+ARTS price, awarding projects that are enabling a closer collaboration between art, science and technology to dive deeper into an interdisciplinary future. Implying arts into the research process is extending the possibilities further.

What could be the sustainable design of art+sci+tech innovation labs based on the experience you already have?

The key factor here is continuity which directly leads to sustainability, a decisive criteria to have success as a laboratory in this new and not so well defined area. Communication to the public, clear responsabilities and the right people in the right positions are the central components. Here I´m again referring to the very important dynamics within a team. Furthermore the program should be accessible to as many participants as possible..

How is informed the definition of collective Human Identity via the art+sci+tech

applications of new technology ?

e.g. AI, New Media: VR(Virtual Reality),
AR(Augmented Reality), MR(Mixed Reality),
IoT(Intenet of Things), BlockChain, Space Travel,
New Internet etc.

That´s a big question. The fact that there are so many different technologies emerging right now is making it almost impossible to generate assumptions here. It is evident that with the emergence of social media networks and their combination with virtual reality technologies we will see a world where individuals will be able to connect in even more immersive ways, diminishing local seaparation and going towards a future where everyone can remotely be everywhere at any given moment without any difference between the real and the imaginative. Artificial intelligence will change our understanding of knowledge and labour hand in hand with the increase of robotics and automatization. Cryptocurrencies could be able to transform the ways we understand capital and money.

A+S+T *in* .... CONTEXT

What context would you include that informs the purpose and future of art+sci+tech research development?

There is one main context that is in my opinion not mentioned enough and needs a lot more attention. The speed of current developments is increasingly accelerating and society is having troubles keeping up with that. You can see a huge lack of ethic discussion around these proceedings and the necessity of having a discourse about ethic and moral implications is not to be underestimated.

I´d like to close with the combination of two quotes. May you live in interesting times, but be careful what you wish for, it might come true.
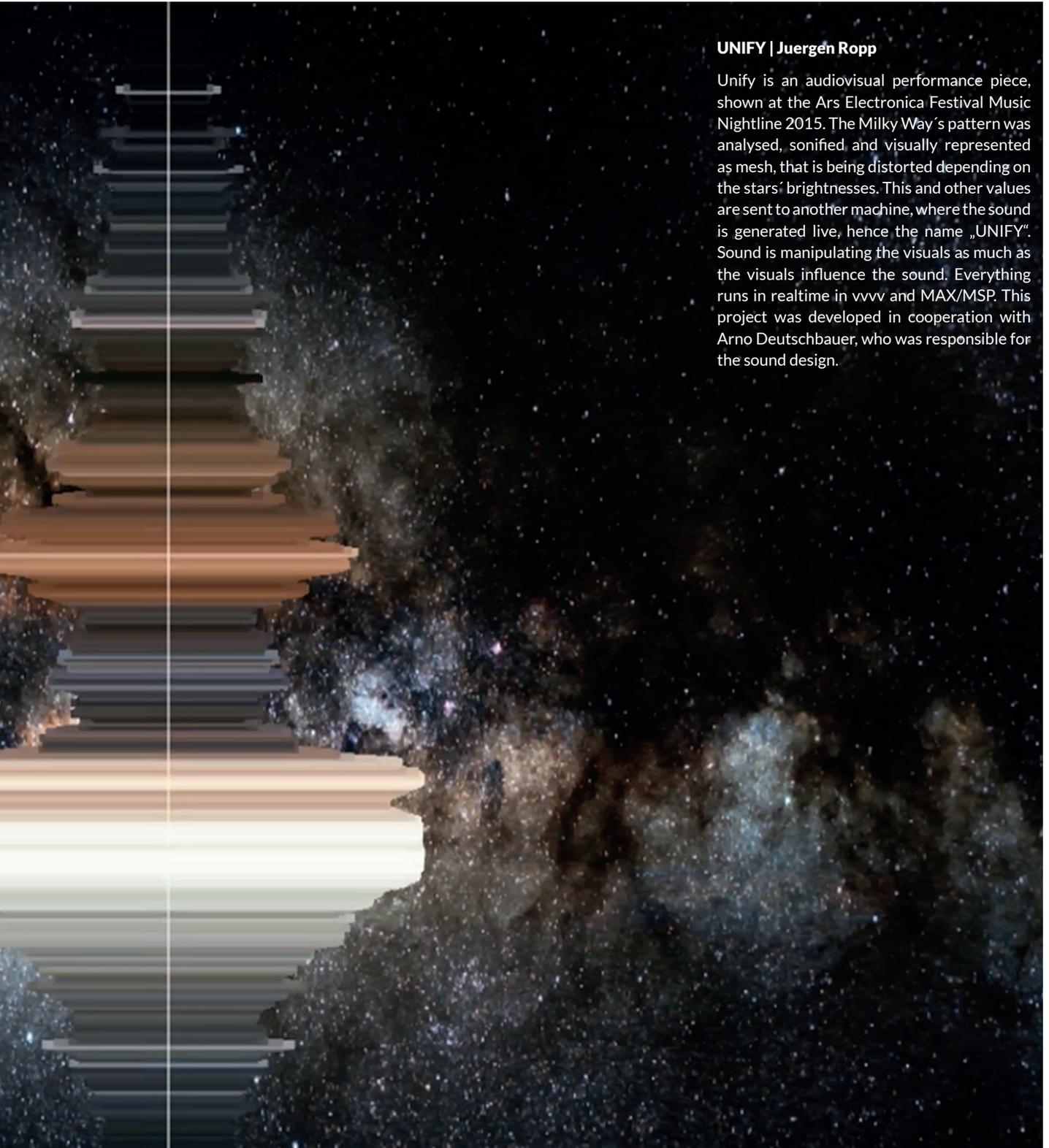
UNIFY | Juergen Ropp

Unify is an audiovisual performance piece, shown at the Ars Electronica Festival Music Nightline 2015. The Milky Way´s pattern was analysed, sonified and visually represented as mesh, that is being distorted depending on the stars´ brightnesses. This and other values are sent to another machine, where the sound is generated live, hence the name „UNIFY". Sound is manipulating the visuals as much as the visuals influence the sound. Everything runs in realtime in vvvv and MAX/MSP. This project was developed in cooperation with Arno Deutschbauer, who was responsible for the sound design.

RELOGIA
art+sci+tech

LICENSE
TRIALOGUES

This ID Certifies that

PROF DR JILL SCOTT
is an activist in Global Arts+ Sci +Tech
Research, Education and Culture

CLASS:
(Artist, Author of culture, history, science)

TYPE: A
(Messenger of cultural context, teamwork, lateral thinking and bio-economy)

STATUS: Active
(open up your reflection on progress and society)

VOCATION: Professor Emerita for Art and Science Research
Institute for Cultural Studies ZHDK, Zurih University of the Arts

*"The body is our general medium for having a world.
Sensory perception shapes the way we think"*

Maurice Merleau-Ponti

QUOTES
that have inspired you

*"Its time to create a new interpretative meta-field that bridges
the humanities-neuroscience divide."*

Barbara Maria Stafford

*"The cyborg is a kind of disassembled and reassembled, postmodern
collective and personal self. This is this self (that) feminists must code."*

Donna J. Haraway

ORGANISATION
info

Institute for Cultural Studies ZHDK
Zurih University of the Arts

RELOGIA TRIALOGUES
theme

STEAM EDUCATION
www.relogia.net

I founded the Artist-in-Labs (AIL) program in 2003 with funding from the Bundesampt for Innovation (KTI) in Switzerland. After 16 years, and 50 residencies for artists in Swiss Science labs, the program is still facilitating artists' residencies in science laboratories with continued help from the Swiss Arts Council-Pro Helvetia. The experience for the artists is educational and experiential in nature. However, the Residencies not only inspire artists, it challenges and fosters further trans-disciplinary exchange and collaboration. This project has deeply affected all those involved and changed ideas about communication and transdisciplinary practice. There are three books devoted to the innovative results that feature the creative aesthetic interpretations from these residencies.

2016 Artists-in-labs, Recomposing Art and Science. With Irene Hediger. De Gruyter
2010 Artists-in-labs, Networking in the Margins. Springer. Editor: Jill Scott
2006. Artists-in-labs, Processes of Inquiry. Springer. Editor: Jill Scott

www.artistsinlabs.ch

Laser Zurich is my current curatorial project for the network called LASER or Leonardo Art and Science Educational Rendezvous. Laserzurich is part of an international network of over 40 curators connected the USA based art and science Journal Leonardo. The aim of our meetings here in Zurich, Switzerland is to help the local art and science community to grow, so we encourage artists, scientists and social scientists to come together talk about similar thematic interests that effect society. Here are some of the scientific and sociological themes we have covered in the last three years. Urban ecology, climate change research, space- time and art, agroecology, times of waste, the internet of things, evolution, biodiversity, biofeedback, biohacking, eco-hacking, complexity, embodiment, genetics and artificial life. So far we have held over 25 Talks and collaborate with the WWF (World Wildlife Fund) and with Life Science Zurich (University of Zurich) on these talks. We have a growing audience with positive public engagement and feedback.

www.laserzuirch.com

BIOGRAPHY

Professor Dr. Jill Scott is a **media artist, a curator as well as an art and science writer/researcher.** Currently, she **co-directs the LASER Salon in Zurich, Switzerland for Leonardo Society USA.** She is **professor emerita at the Institute for Cultural Studies in the Arts, at the Zurich University of the Arts (ZhdK) in Zürich** and **founded their Artists-in-Labs Program** in 2000. Her own artwork spans 40 years of production about the human body, behavior and body politics, but in the last 16 years she has focused on creative media art experiments about neuroscience, ecology and sensory perception in collaboration with departments at the University of Zurich and other international universities. Her most recent artworks were about the evolution of vision and climate change and currently she is engaged in a new EU project based on taste and smell.

BOOKS ON ART & SCIENCE:
2015 **Transdiscourse 2. Turbulence and Reconstruction.** De Gruyter
2012 **Neuromedia. Art and Science Research,** Springer Heidelberg. Eds: Jill Scott and Esther Stoeckli Springer
2010 **Transdiscourse 1. Mediated Environments**. Springer. Editor Jill Scott and Angelika Hillbeck
2002 **Coded Characters. Media Art of Jill Scott Monograph:** Hatji Cantz. Stuttgart. Eds. Marille Hahne, Jill Scott Monograph.

PROF DR JILL SCOTT
RELOGIA VISION

A+S+T *in* Personal context

Could you describe when and how you first became interested in the art+sci+tech synthesis as an idea that has had relevance to your work?

Actually the art+sci+tech synthesis was an evolutionary process for me. My focus has always been on content related to the human body, human behavior, the affects of technology on the body and the relationships between humans and their environment. In the 70s I was involved in performance art and analogue technology, and in the 80s I became part of the digital revolution to learn how special effects change our own representations, while in the mid 90s my interest in bio-technology began with the discourse around the mapping of the human genome. Since then I have entered the worlds of microbiology, ecology and neurobiology and I have focused my inspirations on research in these particular sciences combined with interactive media art. Media art and molecular and cellular neuroscience share the same aims - to understand perception and to stimulate changes in behavior. We can find very interesting metaphors about teamwork for society at the molecular scale. For example, under the microscope we can observe the team work and behavior of cillia, the hair cells that live in our ears (cochlea), in our vestibular system and in our kidneys. Here the cilia work in teams that are essential for the health of our hearing, our sense of balance and the filtering of our liquid intake. In every one of my own projects I work with either small or large teams of people.

A+S+T *in* Cultural context

How would you frame the new cultural context we live in?

e.g.: Post Constructivism, New Renaissance, Conceptual Age, Proto Renaissance, Age of Authenticity, Post Postmodernism, Age of Discoveries, Metamodernism, Post-post modernism…

I believe that new art-science-technology and public contexts are a movement. I would like to suggest that we need new terms for this movement, based on pertinent collaborative themes that lay at the interface between disciplines. These terms raise questions from the public and invent novel communication solutions. Cultural theorists already look for replacements for these terms like Eco-Art or Bio-Art, Neuromedia (my own term) or Biomediality (a term from Jens Hauser). Recently I attended a conference in Dublin on Art and the Anthropocene, a theme that was directly related to the topic of how artists are dealing with our human impact on the planet. Unfortunately, there were not enough scientists in this conference. Scientist are inventing their own terms for emerging movements like Rewilding or Adaptation or Mitigation (terms from environmental science). So both artist and scientists can currently thinking-up new terms but not together!

What is the relationship between art+sci+tech movement and current culture? Would you consider art+sci+tech movement as a provider of new cultural context?

Yes, the art+sci+tech movement is a new cultural context, but there still are a lot of challenging questions. There are many curators and art dealers who think that art should not be specifically about anything but just remind you of something or shock you. However, there are growing groups of art researchers who are interested in media and art as an interpretative and alternative communication tool to cause

post reflection and analysis. These art and/or design researchers want to focus on our current issues of health, inequality, energy, migration and poverty. In design creative approaches to these problems are influenced by semiotics and psychology of the user.   Recently science students are mobilizing and organizing retreats to learn storytelling and other creative practices to help them with new approaches to such problems. (The Kaleido Retreats by ETH Zurich students on https://wemakeit.com/projects/kaleido-retreat-2019)

Who needs this art+sci+tech synthesis and is it important today?

Yes, society needs it. We have such huge survival questions to tackle in the future and we need teams of lateral thinkers to find different ways to change the old fashioned and often destructive ideals about "progress". How can we create this paradigm shift to think differently and change our behavior? We have become so arrogant and separate from the nature around us and the understanding of our place in it. We need to team up and think about the consequences of climate change. Valuable teamwork is essential to create a new bio economy that can replace fossil fuels and a better way to use land to help feed people.

What is the value in such multi-inter-trans-disciplinary R&D approach and how does it impact the evolution of human perception about the reality we live in?

Sensory perception lies at the heart of both art and science research. Neuroscientists know that there are trillions of efferent (sensory) and afferent (motor) feedback loops per second in anyone person, that create transmissions through networked cortexes. How can this network trigger such different, flexible and personal associations? Currently, there is an evolutionary theory of perception called the interface theory of perception (ITP). This argues that all our wired percepts act as a species or team group of neurons. The members of this group interface with each

other to focus on survival and reproduction and not actually truth. Instead, reactions to truth or knowledge evolve from cultural frameworks, memories and social nurturing. So the value of art and neuroscience teams is not only to demystify the complexity of perception and brain plasticity, but to think about designing experiments for peoples' different cultural and family backgrounds. Nurtured similarities can also affect an individual's learning curves and ideologies. Another trajectory might be to explore ability, disability or impairment in order to foster an understanding of difference from the so called "norm". So in my opinion R and D approaches need to develop more immersive and interactive technologies that take into account personal abilities, self-reflection and scientific objectivity. As customization research in interaction design has shown, people can learn better in their own space and time if they are using their own tactile interaction to search for information.

A+S+T *in* ERUCATION CONTEXT

art+sci+tech Learning Systems:
Integrative Education for Future Skills
art+sci+tech Learning Systems & Methodologies
Positive & Progressive Education

Why is art+sci+tech direction important to be included in Education?

I think that an art+sci+tech direction in education can boost creativity and help us search for solutions to tackle some important problems in society. Innovation is about "thinking out of the box" – helping the students to thinking sideways or what I call lateral thinking. Lateral thinking promotes equal education, because the other person's view is equal and therefore necessary to consider. It teaches artists to think about superficial reactions to scientific discoveries and scientists to find a bottom up approach to transfer their important information to

others outside their field of practice. People need facts and information and research instiitutes need to find novel ways to transfer them.

What is your view and input about introducing art+sci+tech modules in universities, academies and life-long learning organizations and initiatives?

It's time for Universities to consider fulltime art and science education degrees from bachelors and masters to the PhD degree programs in the same buildings. Short small education modules are just not enough. Now studies in the life sciences, physics, engineering and computing takes place in separated buildings from the arts or humanities. Female professors are scarce in these science buildings. Art disciplines like art therory, film, video, new media, sound art, sculpture, architecture, theatre, dance and poetry are in their own separate buildings. Knowledge is situated. Students should have the chance to share knowledge and understand different systematic methods of critical analysis. Within this architecture-of-separation, it is not so easy to find out about different discourses, perceptions, empirical observations and healthy criticisms.

How do you envision the development of a shared art-sci-tech dictionary?

Yes, language is important for communication. We had a poet in residence at a genetics lab once, who told me she really valued flexible definitions. But when she sat on a table with an engineer from physics and a micro-biologist she found out that many words carry different meanings in different contexts. Let take words like "models" or "artifact". For a biologist a model is a phenotype animal used in the labs for experiments, for an engineer or an architect it is a miniature set and for a biotechnologist, it is an apparatus that houses a process. For a physicist an artifact is a destructive element that ruins an experiment and for an artist it is an ancient artwork from an anthropological site. A unique dictionary would only be possible

from lots of discussions with people from a variety of disciplines.

How are you evaluating the current art+sci+tech education frameworks?

e.g. STEAM, Art+Science, Cross-disciplinary Strategies, Art Research, New Media Arts, Interface Cultures, etc.

Lets look at the current programs that have existed for over 10 years. The Swiss AIL (artists-in-labs) program that I founded in 2003, ANAT (Australian Network for Art and Technology started since 1988, SymbioticA at the University of Western Australia since 2000, or the Exploratorium Residencies in San Francisco since 2000. Why have they lasted? They all had dedicated directors who kept up the same vision of nurturing the art and science interface because they thought it made an impact on how we learn and on where we are going! They also regularly meet the artists and visit the labs themselves. This dedication and commitment are a big part of any evaluation.

How is the art+sci+tech approach embedded in your program? What are the main methodologies you use?

In the artists-in-labs program we started by inventing our own methodologies that we adapted from Sociology. These were educational and experiential in nature (www.artistsinlabs.ch). The original aims were to give artists the opportunity to be immersed inside the culture of scientific research in order to develop their interpretations and inspire their content and to allow the artists to have an actual "hands on" access to the solid raw materials, pertinent debates and scientific tools in the labs. We tried to encourage unique potentials and insisted that they attend relevant lectures and conferences held by the scientists themselves and also give the scientists lectures on contemporary art. This helped the scientists gain some insight into the world of contemporary art, aesthetic development and the semiotics of communication that are used by artists in order to reach the general

public. This methodology encouraged further collaboration between both parties including deeper discourses and hands-on exchanges of research practices. We met regularly to talk, held pubic podium discussions and asked both parties to write daily diaries of the experiences and processes of learning about each other which we published and filmed. (see the AIL books online and the films on www.marillehahne.com)

How do you support and guide young art+sci+tech researchers and how (based on what parameters) do you assess and validate their work?

In our program we accepted artists who wanted to explore scientific environments in order to be inspired and to relate to the material side of science lab itself. In interviews we asked them their opinions about the problems that society must now tackle. We invited the scientists from the labs to these interviews. We assessed applications for the Artists-in-Labs Residencies by having expert panels and juries from both art and science backgrounds so that applications were thoroughly discussed. Communication to the public was a part of the criteria for assessment. Also the we looked at the artist/designers' ability and interest to discuss and write process oriented reports and construct prototypes. In our PhD program on art and science called Z-node, the validation was made through publications and regular public symposiums on an international level. Z-node was part of the Planetary Collegium, a cooperation between the University of Plymouth UK and The Zurich University on the Arts Switzerland (www.z-node.net).

What background is required for the experts leading such modules/courses?

In our PhD research program (z- node) the focus was on students who were interested in Art and Science and Technology topics. We awarded 16 Doctorates from 2004-2016. In each case the first supervisor came from the arts and the second supervisors always came from different science disciplines. (www.z-node.net).

A+S+T *in* Science context

What is the transformative impact of art+sci+tech projects in science research and new knowledge communication?

With more shared knowledge we can encourage more fruitful discussions and potential solutions. Over the last decade in social science, there is a keen interest to mixing expert knowledge with non-experts. For example, citizen science projects are essential ways for society to learn and move forward. Also there are lots of older experts with a great deal of experience and with established international and national networks to build upon and share their knowledge. Media artists should be concerned enough about the manipulation by mass media and industry and create new media that provides an alternative.

There are both sustainable and transformative impacts from having media artist resident in science. We found that the public access to science was improved and scientists felt that the resultant exhibitions and public discussions helped them to see their own research from an entirely new perspective. The comparisons of art processes and scientific methodologies helped to encourage conceptual and social discourse, and think about building behavioral experiments differently. We also observed that the know-how-transfer from the scientists to the artists was inspiring and that it was hard to compare the variety of inspirations from the various science labd (i.e. The life sciences, the computer sciences, AI or physics). We believe these impacts not only lead to some valuable collaborations, but also were inspiring for other art+sci+tech programs. However, we discovered that the artists had to spend at least 6 months of time to be "in Resident" in the science lab and this longer-time-factor fostered much more impact.

A+S+T *in* Social context

emerging art+sci+tech platforms in Europe

What is the impact on society that you observe of the emerging art+sci+tech collaborations and in which context do you think they have a significant impact?
e.g.Innovation Labs, Artists in Labs, Living Labs, Accelerators, Hackatons, Innovation Incubators, Scientists in galleries and concert halls, etc etc

I believe that all these emerging facilitations are valuable creative incubators because they encourage lateral thinking or thinking sideways. Thinking out of your knowledge comfort zone can traverse the spatial realm of peer to peer justification in both the tangible and non-tangible art, communication and science fields. Lateral thinking provides facilitation where the public might learn how to think not what to think! These zones require tacit knowledge and experimental approaches to material and immateriality where hybrid and co-creation can emerge. My own experience with my current facilitation "Laserzurich" has generated these comments.

What is your experience of co-creation, co-construction, co-production with society and what is the common added value of such outcomes?

Over the last 17 years I have spent a great deal of time talking to neuroscientists and ecologists from both, the University of Zurich and the ETH Zurich. So my own experience of co-creation has been based on long discussions, hands on experience from spending residencies in their labs and from their feedback when they come to my studio when the projects are in production there. They say that these projects have "humanized" science. (https://www.jillscott.org/artworks-current.html)

In relation to the Swiss Artist-in-labs program, here are some quotes from our collaborative scientists from the first 10

years about working with media artists that we have published in our books:

"Working alongside a media artist allowed us access to different approaches and points of view about our own research and how to bring it to the public"

"They gave us the ability to see an experiment or problem from another perspective and to think about building our own differently"

"We gained a lot of training in answering all those great "why" questions from the artists"

"The know-how transfer of science to non-scientists is easier than we thought "

"It was interesting for us to watch the interpretative process unfold - from conception to production and presentation of the art work"

"We realized that media art could be a catalyst for the opening up of more discourses about the ethical and social side of our research in the future"

What is the nature and quality of communication and collaboration between the European art+sci+tech platforms based on your experience? How do you see their future development?

I think that these collaborations are very important but they may need to broaden the scope of science disciplines involved. For example, shall they focus just on astrophysics and media art or would they further connect to other European organizations that can bring in other subjects and issues for collaboration? Networking is essential and not competing with each other is much better for communication and further development.

A+S+T *in* INDUSTRY CONTEXT

art+sci+tech Innovation Labs as a link between new culture - education - industry - society

What is the role and impact of art+sci+tech research projects in Knowledge Economy, Shared Econimy, Creative Economy and Cognitive economy ?

Actually, I think that it is time to talk about the Eco-Economy. This theme requires experts from the science, technology and the humanities to discuss the ethics behind the benefits of an eco-economy. As social scientist Sandra Harding suggests perhaps this group should ask "whose knowledge is being produced and for which peoples' benefits and who is going to bear the costs and monitor which research is more important than other research?" This is the question that should shape art and scientific research and it should also shape the future of the on-line communication revolution. There is no doubt that current biotechnical discoveries will affect our lives and our environment in the future. For example, engineering life, designer babies and cell cultured crops, nutrition, environmental preservation are currently accelerated by genetic engineering and gene drive tools like CRISPR. Then there are the issues of curing disease and health care monitoring, as well as energy problems and the future of nano-materials. All this in a growing world population. The impact of these researchers on society need to be discussed in a bio-economy.

What could be the sustainable design of art+sci+tech innovation labs based on the experience you already have?

In my opinion sustainability can only come from teams who are aware that the whole planet runs in an inter-dependent eco-system. We aren't just single individuals walking the planet: we are walking ecosystems made of microbes. Microbes are in the soil, in the water, and in our bodies. Microbes as bacteria, fungi, and viruses are part of our skin microflora, covering both the inside and the outer surface of the body and they have a symbiotic relationship with the interface between our body and the environment—our skin. So the sustainable health of our sensory percepts, our proprioception, smell, touch, taste, and sound, and our tactile receptors are essential to connect to our natural environment and to keep those microbes in balance!

How is informed the definition of collective Human Identity via the art+sci+tech applications of new technology ?

e.g. AI, New Media: VR(Virtual Reality), AR(Augmented Reality), MR(Mixed Reality), IoT(Intenet of Things), BlockChain, Space Travel, New Internet etc.

Collective identity may only come from teamwork where creative, critical and lateral approaches can exist side by side. We need to explore the value of hands on experiment building, self reflection and analysis of know-how-transfer over time. I actually think that it is interesting for VR and AR to change from entertainment tools to tools for self reflection and education. One of my physics students aimed to design an alternative to games that lock us into screens where pseudo physics dominate, and designed a game that taught the pubic about real physics based on interactive swinging pendulums. In neuroscience, VR an AR are increasingly being used for tests on bodily perception, but Susan Greenfield warns that the increased use of digital screen technologies is already reshaping our human brains. Perhaps the impact of VR on young people must be considered by their parents and educators in the future. We must stay critical and aware of "both" the values and the dangers of any new technologies.

A+S+T *in* .... CONTEXT

What context would you include that informs the purpose and future of art+sci+tech research development?

One context that I would include is called: the creative commons. It a context that is similar in ideals to the inter-dependent open source movement. The main aim of such a creative commons context could be to help us form a

new practical system with its own logic for a way forward. Other aims could be included like more social integration for the problems we are trying to deal with and actions that are not based on self interest or mass media motivations. In the creative commons we need to create physical as well as social media spaces where experts meet with non-experts to share ideas about impacts for the common good. We need to talk about a series of energetic subsystems that can remove boundaries between culture, technology and social systems and humanize them. Finally, with the help of young people, especially those that are now organizing climate strikes, we need to discuss new codes for research, practice and ethics for future generations.

JELLYEYES

an Augmented Reality Project
about Evolution and Vision (2017)
Zoological Musuem, Zurich. JIll Scott

The main aim of JELLYEYES is to encourage post-reflection through an immersive augmented reality interaction about the biodiverse development of the camera based eye. It is staged in the Great Barrier Reef and features ways to look through the eyes of other species. JELLYEYES raises awareness about how this environment is currently changing from the effects of our own carbon footprints. Could these changes influence the evolution of the eye itself?
The scientific collaborators are from Neuroscience - Prof. Dr. Stephan Neuhauss, Institute for Molecular and Cellular Research; Neurobiology - University of Zurich, Switzerland and from Water Ecology: Christopher Robertson.Aquatic Research EAWAG. ETHZ Switzerland.
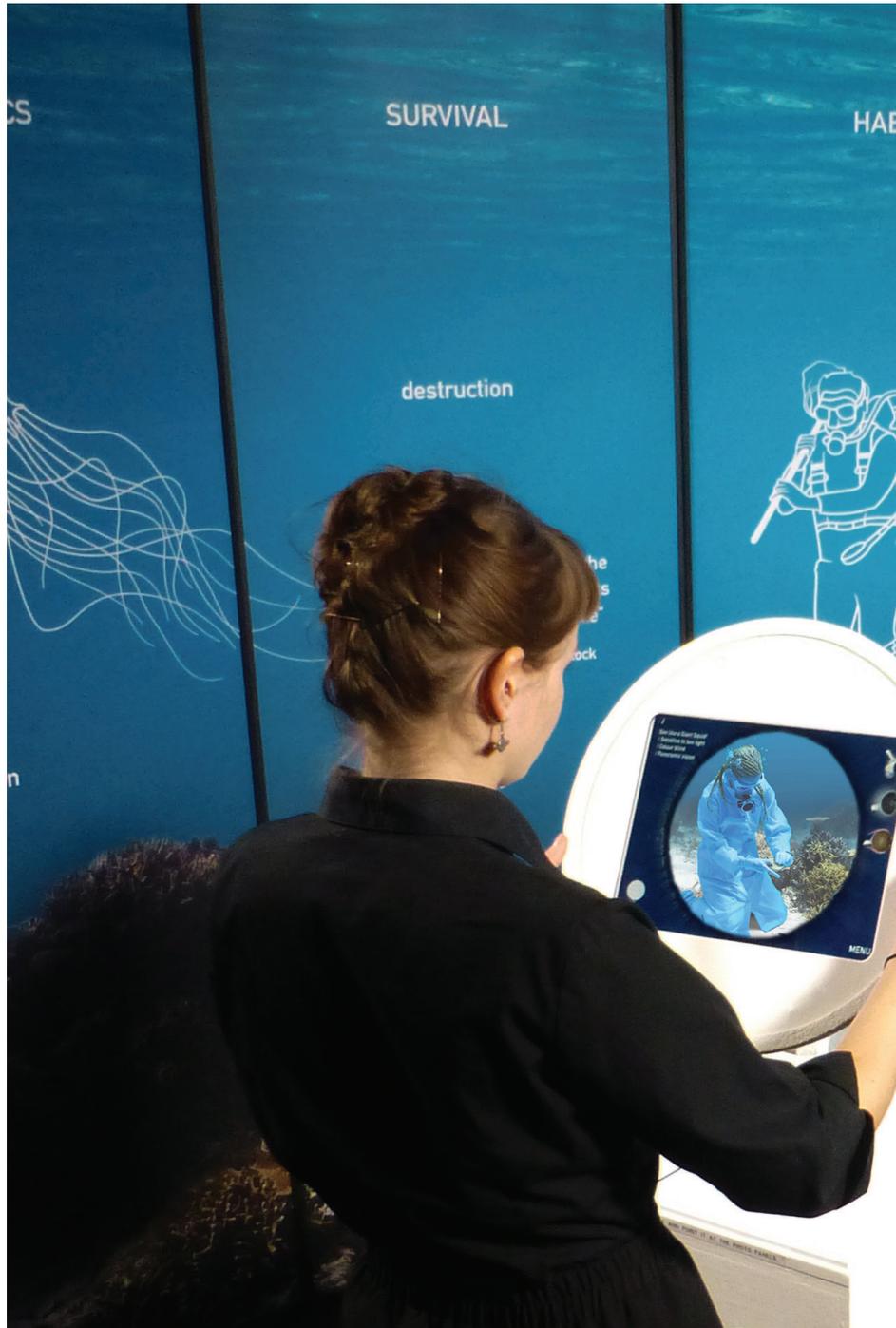
chordates

molluscs

"In looking for gradations by which an organ in any species has been perfected, we ought to look exclusively to its lineal ancestors"

Charles Darwin

pigment

photoreceptors

ment

metazoans

symbiosis

endosymbiosis

RELOGIA ⁛ LICENSE
art+sci+tech TRIALOGUES

This ID Certifies that

PROF DR INGEBORG REICHLE
is an activist in Global Art + Sci +Tech
Research, Education and Culture

CLASS: Global
(author of culture, historical change-maker)

TYPE: A
(messenger in idea delivery system, dot-connector,
prophet of idea dimensionality - turn 2D idea into 4D reality)

STATUS: Active
(move your body & mind & heart and make it happen)

VOCATION: Chair of the Department of Media Theory
University of Applied Arts Vienna, Austria

Re: LOGIA

QUOTES
that have inspired you

*"I try to live in the present, because most people live in the past.
If you live in the present, most people think you live in the future,
because they don't know what happens in their own time."*

Lynn Hershman Leeson

*"Technological change is exponential, contrary to the comon-sense
'intuitive linear' view. So we won't experience 100 years of progress
in the 21st century—it will be more like 20,000 years of progress."*

Ray Kurzweil

ORGANISATION
info

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RELOGIA TRIALOGUES
theme

STEAM EDUCATION
relogia.net

The intellectual journey that led to my interest in art in the Age of Technoscience actually began on a particular day in August 1999: I was attending a conference on new media art in São Paulo, Brazil and I stumbled into the presentation the of an Brazilian artist, who intended to create a transgenic dog (that would glow in the dark).

That morning I had visited São Paulo's Botanical Gardens and was thinking about how the biodiversity of the exotic flora of Brazil had deeply inspired European iconography for centuries. On that hot day in August 1999 I first became familiar with an aesthetic and artistic innovation that would later be called bioart and that so deeply changed the way I was thinking about art and about nature. From that moment on I began to reflect on an adequate theoretical framework that would allow us to investigate and conceptualize in a cross-disciplinary way the current state of the interrelationships of arts, technology, and the technosciences.

When I got back to Berlin I began to study artists who no longer produce their art in a studio but in a laboratory. The question that preoccupied me from the very beginning of my research was:

How can the humanities engage with such complex issues, which outstrip traditional ways of writing about art forms, which actually have no precedents in art history?

The main challenge seemed to be how to frame the emerging new modes of aesthetics and the ontological questions that would follow up, because the art world and the technosciences seemed at first glance to have very little in common.

BIOGRAPHY

Professor Dr. Ingeborg Reichle is the **Chair of the Department of Media Theory** and was serving as the **Founding Chair of the Department Cross-Disciplinary Strategies** in 2017 and 2018, designing an integrated curriculum for the new BA study programme Cross-Disciplinary Strategies: Applied Studies in Art, Science, Philosophy, and Global Challenges at the University of Applied Arts in Vienna. She studied art history, sociology, and archaeology and completed her MA (1998) at the University of Hamburg and her PhD (2004) in art history at Humboldt University Berlin, where she also gained her habilitation in 2013. Before joining the faculty of the Department of Media Theory as full professor in 2016, she was **FONTE professor at Humboldt University Berlin**. She is a Board Member and co-founder of the German Association for Interdisciplinary Image Science (Deutsche Gesellschaft für interdisziplinäre Bildwissenschaft), and an active member of the U.S. College Art Association (CAA), the International Association for Aesthetics (IAA), and the International Association of Bioethics (IAB). In Vienna she serves as co-host for Leonardo's LASER Talks (Leonardo Art Science Evening Rendezvous), an international programme of gatherings that bring artists and scientists together for informal conversations. Her main area of research and teaching is the encounter of the arts with cutting edge technologies such as biotechnology and synthetic biology, taking into account artistic responses as well as the respective discourses in the sciences and our societies in order to develop a critical understanding of the role of the arts in the twenty-first century. A further field of her research is the rise of new carto graphies of contemporary art which are evolving through the process of globalisation and fostering new post-colonial constellations in the art world.

BOOKS ON ART & SCIENCE:
Art in the Age of Technoscience: Genetic Engineering, Robotics, and Artificial Life in Contemporary Art. With a preface by Robert Zwijnenberg. New York: Springer, 2009.
Kunst aus dem Labor: Zum Verhältnis von Kunst und Wissenschaft im Zeitalter der Technoscience. Vienna, New York: Springer, 2005.

PROF DR INGEBORG REICHLE

RELOGIA VISION

A+S+T *in* Personal context

Could you describe when and how you first became interested in the art+sci+tech synthesis as an idea that has had relevance to your work?

The first time I became aware of the art+sci+tech synthesis was after the rise of the World Wide Web in the early 1990s. In 1994 I was able to go to London via the ERASMUS EU Programme for Education, and experienced for the first time how institutions showed new art forms like NET art, interactive art, or science-based art, enhancing progressive encounters with the art world with science and technology — shifting the terrain of art towards cutting edge technologies. This encounter with new technologies through contemporary art made me aware of the fact that all knowledge is driven and shaped by media and the technology they are based on (like images, texts, diagrams, and so on), and so I began to reflect together with other humanities students on the impact that the rise of the digital would have on education, knowledge, and epistemologies plus our society at large. At the end of the 1990s I was awarded a significant grant by the German Federal Ministry for Education and Research (BMBF) to develop and to foster digital media in university education (PROMETHEUS, The Distributed Digital Image Archive for Teaching and Research) and to work on a PhD dissertation, where I could reflect on how contemporary art is engaging with cutting edge technologies like robotics, biotech, or artificial life. Since that time the art+sci+tech synthesis is and remains one of the major fields of my academic research and university teaching.

A+S+T *in* Cultural context

How would you frame the new cultural context we live in?
e.g: Post Constructivism, New Renaissance, Conceptual Age, Proto Renaissance, Age of Authenticity, Post-post Postmodernism, Age of Discoveries, Metamodernism

With a perspective on art and culture I would like to suggest that we live in the age of post-colonial constellations. Today, new cartographies of contemporary art are increasingly including the art productions of non-Western and indigenous artists, which until a few decades ago were considered uniform and aesthetically negligible and were used primarily to articulate cultural differences.

What is the relationship between art+sci+tech movement and current culture? Would you consider art+sci+tech movement as a provider of new cultural context?

When we look at the current relationship between the art+sci+tech movement and our culture, we should be aware (especially in the Western world) that this movement has a history that goes way back to the end of the 19th century. In the course of the industrial revolution, a number of European nations were predominantly transformed into industrial, technological, and scientific giants, and with the rise of the natural sciences, and with the increase of the prestige of engineering the privileged place of classical humanism (and classical art) as a relevant source of education and the study of humanity, based on the interpretation of textual sources (and monuments) of the European and classical past, became exceedingly challenged (especially in Germany where a strong anti-humanistic movement became dominant through representatives of the German anthropology community). The rise of science and technology within the system of higher education was fostering severe methodological controversies among

European elites about a modern notion of education and which disciplines should be regarded as most suitable to approach the development of humanity on a global scale and on empirical grounds. Over the course of the 20th century, the arts and humanities lost their privileged position within the system of higher education and continue to lose ground today. But currently we are witnessing that the terrain is shifting again: Due to the massive disruptions that the materialistic and instrumental scientific world view had caused during the last two centuries, our societies are now facing tremendous social challenges and ecological threats, such as climate change, environmental collapse, mass migration, violations of human rights, social inequality and poverty, the slow erosion of democratic systems and constitutional structures. These massive challenges touch upon many facets of human existence and cannot be tackled by single disciplines alone. The current art+sci+tech movement is perhaps not a provider of a new cultural context, but it is certainly a frame and a context where the increasing social challenges and ecological threats can be articulated in an adequate way, because the art+sci+tech synthesis offers various perspectives on complex topics, which allows it to address a broad audience or community.

Who needs this art+sci+tech synthesis and is it important today?

Offering critical and ethical insights — tested by scientific methods and good academic standards — into the social and economic effects that accompany the transformation of the natural sciences into technoscience and the scientific findings in the age of big data or the technological evolution at large is in my perspective one of the major tasks of the art+sci+tech synthesis, and therefore highly relevant to our societies today. Especially to prevent the slow erosion of our democratic systems, which — for example — are being severely challenged due to the interference in our elections through the misuse of (social) media.

What is the value in such multi-inter-trans-

disciplinary R&D approach and how does it impact the evolution of human perception about the reality we live in?

Reality is nowadays constructed within the realm of the technosciences and not only on an empirical level, but also on a transcendental one. We have to consider that production of art today is highly related to the technosciences, not only because of the use of technologies within the art world — and recently even tools from the realm of biotechnologies or genome editing — in its making, but most importantly because from this relationship a model emerges through which to comprehend and interpret reality.

A+S+T *in* EDUCATION CONTEXT

art+sci+tech Learning Systems:
Integrative Education for Future Skills
art+sci+tech Learning Systems & Methodologies
Positive & Progressive Education

Why is art+sci+tech direction important to be included in Education?

Today an increasing number of universities and institutions in the field of higher education seek to contribute to solving major societal and ecological challenges — demonstrating the value of university research and education for our societies. However, the nature of these challenges is most notably cross-disciplinary and requires collaboration across sectors and disciplinary boundaries, and is therefore not in tune with the social and administrative contours of our modern disciplines and their subsystems, which exhibit a high degree of specialization. Disciplines have established themselves as efficient systems of knowledge production and dissemination of scientific knowledge acquisition over the past two hundred years, and are the driving forces behind those administrative structures that foster the fragmentation of curricula in our systems of higher education. The future trends of

technological and social developments are scarcely predictable, but the current system of higher education is already facing the challenge that graduates are less and less well prepared for exactly defined jobs and occupations, and that new working areas or job opportunities often emerge at the intersection of disciplines. The acquisition of cross-disciplinary competences as well as the ability to acquire new knowledge in areas in which one has not been trained, will become more important in a world of change. A broad education in fields like art+sci+tech will help graduates to adapt to new job opportunities and fields of interest, which is less likely to happen when students are trained in only one discipline.

What is your view and input about introducing art+sci+tech modules in universities, academies and life-long learning organizations and initiatives?

I am very positive about integrating art+sci+tech modules in university curricula, including art schools, because currently we are seeing a whole range of alternative models emerging in the field of higher education that range from interdisciplinary courses to solid holistic approaches which aim to bring the full diversity of human ways of knowing and capabilities together in an integrative educational approach. Integrative study models consciously seek to bridge the gap between different forms of knowledge and understanding, as well as the different pedagogical approaches of a variety of disciplines, such as the humanities, the arts, the natural sciences, engineering, mathematics, and medicine, as well as new technologies to prepare students better for work, life, and twenty-first century citizenship. Learning outcomes associated with integrated education (and art+sci+tech modules), such as critical and holistic thinking, communication, teamwork skills, and the aptitude for lifelong learning, are more and more favored in a world that is confronted with enormous strides in technology, including artificial intelligence, machine learning, robotics, and communications.

How are you evaluating the current art+sci+tech education frameworks?

e.g. STEAM, Art+Science, Cross-disciplinary Strategies, Art Research, New Media Arts, Interface Cultures, etc.

I try to evaluate current art+sci+tech education frameworks and options by following reports of institutions and NGOs, which work on evaluating art+sci+tech education frameworks on a larger scale like the assessments offered by the authors of the study "Branches from the Same Tree: The Integration of the Humanities and Arts with Sciences, Engineering, and Medicine in Higher Education" (2018), commissioned by the U.S. National Academy of Sciences (NAS) or reports published by the Global Challenges Foundation in Stockholm, Sweden. The detailed assessments of these institutions agree on the fact that cross-disciplinary education — including art+sci+tech education — are described as extremely positive regarding student learning outcomes, because the ability to view problems and challenges from a multidisciplinary perspective is being fostered. These approaches are also consistent with the idea of how people learn and develop expertise in a broader sense. People do not become experts by accumulating new knowledge, but by developing a conceptual framework for framing their knowledge and expertise, which makes it easier and faster to acquire new knowledge, because this knowledge is based on already existing knowledge and experiences. In this way disparate information and fragmented knowledge can be better structured, linked, and evaluated by the students. These skills are found particularly in graduates, who have experienced a broad and cross-disciplinary education, such as through the combination of subjects in the fields of engineering and science, engineering, new technologies, mathematics and medicine (like STEMM: science, technology, engineering, mathematics, medicine).

Ways of learning and teaching that bring these areas together increasingly integrate subject areas from the arts, the humanities, and the design sector, in order to add a profounder cultural-historical, philosophical, or aesthetic dimension to the usually narrow and above all instrumental perspective of the STEMM subjects with their technical or scientific orientation. On the other hand, curricula within the humanities and the arts integrate skills from the STEMM disciplines, which is currently known under the acronym STEAM, because technology is a driving force in these areas as well, whereas art strategies and design models promise innovation, new opportunities, and creative solutions for the STEMM subjects.

How is the art+sci+tech approach embedded in your program? What are the main methodologies you use?

As of summer 2017 the department I am running (the Department of Media Theory at the University of Applied Arts Vienna, Austria) offers in addition to courses in media theory an open Lab Class, which is open to art students and non-scientists. Here our students can engage hands-on with biology and immerse themselves in current biotechnological research. Biotechnology is, without doubt, one of our most important resources for dealing with global challenges, currently and in the future, addressing topics such as food security, water management, pandemics, ecological collapse, climate change, or the need for new sources of energy. Our open Lab Class is designed to provide students from all disciplines with sound practical knowledge about how to bring creative approaches together using experimental methods in art and in the sciences. The aim is to give art students the opportunity to learn and work on biological concepts, bioart and biodesign, basics in genomics, synthetic biology, and neuroscience as well as to offer insights into the cultural and social implications of emerging cutting edge technologies in biotechnology, like genome editing tools (CRISPR). Bioart is a major element in engaging with biotechnology in class, because art enables

a tangible encounter with a great number of issues concerning biotechnology, including paradoxes, ambiguities, and uncertainties, because art can offer a non-normative approach to explore the implications and challenges of biotechnology. Courses like "Understanding Biomedia" examine biomedia in their constitutive artistic, technical, cultural, epistemological, and political dimensions. Bioartists introduce and analyze key approaches to the use of knowledge, methods, and processes abstracted from biology and the sciences in art and design. Students explore the interdisciplinary character of biomediality, and become familiar with the role of methods, discourses, and experimental designs and their mediation in the sciences. Courses address important developments in synthetic biology, DIYbio, and related fields so that students can acquire a profound understanding of technological changes accompanied by social shifts and their unfolding cultural and political impacts. Our Lab Class seeks to establish a shared learning process, build theoretical and practical proficiency, and a repertoire of intuitive perspectives to understand new approaches in art, science, and technology and how these influence attitudes, behavior, and identities, both individual and social, to achieve insightful conclusions — including the students' own artistic development, ideas, and skills.

The main methodology of our current approach is a very traditional one: The deep belief in the inseparable unity of research and teaching in a Humboldtian sense. Excellent education is based on excellent research, because someone who is fascinated by his or her research agenda (including artistic research or even art) wants to pass on their insights. The ways of knowing we want to offer in our courses is not (only) bound to authoritative knowledge, but to the aim to show the aptitude with which method one has come to conclusions which claim to be effective. Science is a method. Art is a method. Learning means checking its validity. Every modern scientific finding must at the same time set out the method with which it was gained. Not only do we want to provide

secure knowledge, we also want to enable our students to generate new knowledge. We want the knowledge we convey to be questioned by our students, giving them the tools to hand to improve our findings by teaching them a solid methodological framework and the hunger for more.

How do you support and guide young art+sci+tech researchers and how (based on what parameters) do you assess and validate their work?

We assist our students and young art+sci+tech researchers through individual support and supervision, and, by inviting international experts from the art+sci+tech field, they hear from distinguished artists and experts about what's going on in this emerging field which also helps our students to build their network of contacts.

What background is required for the experts leading such modules/courses?

This development puts new expectations on teachers and instructors, changing their role from a provider of specialized knowledge to an innovator and mentor, who is primarily building bridges between different epistemologies and diverse fields of knowledge and aims primarily to foster holistic student development in a global and progressively disruptive world. Integrative education including an art+sci+tech approach can take many forms and has many different faces, but it always requires an intensive analysis of diverse didactic models, which places far-reaching demands on the teaching staff. These new requirements can range from the development of a fundamentally new didactic-methodological framework of cross-disciplinary curricula to the selection and evaluation of external content as well as collaboration with new (external) sectors or dealing with the rise of education technology.

A+S+T *in* Science Context

What is the transformative impact of art+sci+tech projects in science research and new knowledge communication?

One of the major impacts of cross-disciplinary art+sci+tech projects in science research is that these collaborations raise awareness of all agents involved about the complexity and scope of other fields of knowledge; that is, to reflect critically on one's own own familiar frames and methodologies.

A+S+T *in* Social Context

emerging art+sci+tech platforms in Europe

What is the impact on society that you observe of the emerging art+sci+tech collaborations and in which context do you think they have a significant impact?
e.g.Innovation Labs, Artists in Labs, Living Labs, Accelerators, Hackatons, Innovation Incubators, Scientists in galleries and concert halls, etc etc

In my perspective, art+sci+tech collaborations have a deep impact on all levels concerning our society, as long as all parts and agents have their own stand. A great number of traditional institutions have turned to fostering art+sci+tech collaborations, like science museums, national history museums, art museums, universities, art schools. New institutions (mostly small institutions) have emerged which aim at communicating emerging art+sci+tech collaborations to a wider public and fostering awareness that science and technology are shaping our modern technology-driven societies to large extent, and that we vitally need a discussion about developments in science and technology, especially in my view when powerful technologies like gene editing tools leave the scientific context and become available to the lay public. We need urgently

a critical literacy concerning those scientific findings and technological systems that shape the world we live in and reconfigure our familiar ways of perceiving the world..

What is your experience of co-creation, co-construction, co-production with society and what is the common added value of such outcomes?

We have seen in many fields — art and science alike — efforts to include the public and directed at "co-production with society" like open science or citizen science or the DIY bio movement. My personal experience with this is limited, but I think that we have to involve all our communities to address the major societal and ecological challenges that lie ahead of us..

What is the nature and quality of communication and collaboration between the European art+sci+tech platforms based on your experience? How do you see their future development?

I regard these platforms as useful and lately I came across the European Platform for Digital Humanism, but: there should be no restriction on getting engaged in the programs in terms of belonging to one of the European countries, because Europe is also a fascinating vision and a great idea and not just a territory with a common currency. .

A+S+T *in* .... Context

What context would you include that informs the purpose and future of art+sci+tech research development?

In my opinion we should add to the triangle of art+sci+tech the issue of human rights (and on a broader scale all global challenges), because we live in a globalized world, where acts or omissions have effects, very often on a global scale. .

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Universität für angewandte Kunst Wien
University of Applied Arts Vienna

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VOCATION: Director astra*
National Centre for Science Education, Denmark
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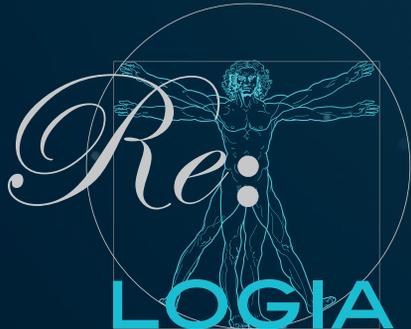
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VIEWPOINTS
on Art+Sci+Tech

"Art and science collaboration can be very powerful in communicating science because it reflects society broader than a specialized scientific field. At the same time, it's important not to use art to sugarcoat "boring" science. Science is in itself creative but we tend to teach and communicate it in a boring way. Not all should be cross-disciplinary, it's a balance between seeing science in a broad perspective AND having deep knowledge at the same time (a T-competence profile)"

"I love good science fiction - and by that I mean fiction based on science. One of the most influential works for me is Stanley Kubrick and Arthur C. Clarke'e 2001 - a space odyssey because it is truly science based and explores the boundaries between humans and artificial intelligence. And it is such a beautiful movie, even after 50 years."

Mikkel Bohm

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"Ice Watch" Paris, 2015
Ice sculptures of Olafur Eliasson on climate change

Photograph by Eric Feferberg / AFP / Getty

"A circle is like a compass. It leaves navigation to the people who are inside it," Eliasson explains.
"It is a mistake to think that the work of art is the circle of ice—it is the space it invents."

BIOGRAPHY

Mikkel Bohm has **20+ years of experience in science education and science communication**. With a background in geography and communication he has been a key player in promoting science and science education in Denmark, first as an information officer at the Technical University of Denmark and shortly after as director of Denmark's first national science week. Building from that, Mikkel headed for 10 years Danish Science Factory, a non-profit science communication and education organisation, organising festivals, events, conferences and various innovative educational initiatives, including very large citizen science projects for schools.

In 2015, Mikkel has been **director of Astra – the National Centre for Science Education** an independant public organisation with app. 60 employees. Astra is closely affiliated with the Danish Ministry of Education and is funded by government and private foundations. Astra works with didactic development in STEM, teacher training, political education strategies, talent development and large-scale engagement evets. Mikkel Bohm was recently chairman for a large advisory group giving recommendations to the Danish government's new science education strategy. He has received several **prizes for excellent science communication efforts.**

Internationally, Mikkel has been **president of the European Science Engagement Association (EUSEA)** and participated in a large number of European projects. He has participated in numerous expert panels for the Irish and Swiss research councils and he is **co-founder of the EU STEM Coalition.**

A+S+T *in* PERSONAL CONTEXT

Could you describe when and how you first became interested in the art+sci+tech synthesis as an idea that has had relevance to your work?

I've worked with Art and Science in different contexts for more than 20 years. An artistic presentation can be a great way to open eyes for the scientific context for new audiences who may not be interested in science. My first really aesthetic experience with the beauty of science was looking at 3D protein models.

A+S+T *in* CULTURAL CONTEXT

How would you frame the new cultural context we live in?
e.g: Post Constructivism, New Renaissance, Conceptual Age, Proto Renaissance, Age of Authenticity, Post-post Postmodernism, Age of Discoveries, Metamodernism

"Age of unreflected overinformation" – we have never before had access to so much information, and that makes the ability for critical thinking crucial. In these years of fake news we need to ask: "Where is the evidence?" and "How do you know that?"

What is the relationship between art+sci+tech movement and current culture? Would you consider art+sci+tech movement as a provider of new cultural context?

There is not only one approach to science communication – but art+science should certainly be one important way – for instance in communicating climate change.

Who needs this art+sci+tech synthesis and

is it important today?

It's not so much who needs it because that implies a deficit model thinking. I'd rather call it one of many arenas for debating and experiencing science.

What is the value in such multi-inter-trans-disciplinary R&D approach and how does it impact the evolution of human perception about the reality we live in?

A cross-disciplinary approach can be useful because it reflects the real world better than isolated topics (i.e. Biology). Reality is in itself multi-disciplinary.

A+S+T *in* EDUCATION CONTEXT

art+sci+tech Learning Systems:
Integrative Education for Future Skills
art+sci+tech Learning Systems & Methodologies
Positive & Progressive Education

Why is art+sci+tech direction important to be included in Education?

What is your view and input about introducing art+sci+tech modules in universities, academies and life-long learning organizations and initiatives?

A multidisciplinary approach can be useful for showing the broader relevance of scientific inquiry. However, it's important than a STEAM approach doesn't end up as sucarcoating the "hard and boring" science with the "fun and creative" art. Science is IN ITSELF a creative and critical enterprise. Also, there is key knowledge and methodologies connected to science that must not be lost in a too free learning process.

How is the art+sci+tech approach embedded in your program? What are the main methodologies you use?

In our science education programmes, for instance the national scoence week for 150.000 pupils, we use multidisciplinarity a lot, and sometimes we include art. There can be a

historical aspect (evolution of vaccines) or there can be a collaboration with language (write a science fiction novel), one year we even made an Instagram contest about the beautiful patterns of bacteria growth.

How do you support and guide young art+sci+tech researchers and how (based on what parameters) do you assess and validate their work?

We work within the formal school system and thus guide schoolteachers with examples of how to think across topics, including their non-scientific teacher colleagues in preparing cross-disciplinary education programmes. Our evaluation shows that this is strengthening the science culture at the school, making science more acceptable.

A+S+T *in* SCIENCE CONTEXT

What is the transformative impact of art+sci+tech projects in science research and new knowledge communication?

A cross-disciplinary approach can be useful because it reflects the real world better than isolated topics (i.e. biology). Reality is in itself multi-disciplinary. And you can reach new target groups by using art as an attention-getter.

A+S+T *in* INDUSTRY CONTEXT

art+sci+tech Innovation Labs as a link between new culture - education - industry - society

What could be the sustainable design of art+sci+tech innovation labs based on the experience you already have?

There are already loads of innovation labs, fab labs, maker spaces etc. in Denmark. Sustainability will come when these labs are integrated in schools and not stand-alone projects.

What context would you include that informs the purpose and future of art+sci+tech research development?

A common ground for integration of science and art could be the United Nation's Sustainable Development Goals (SDG's) for 2030. These goals forms a societal connection between grand challenges, requiring a radical change of mindset within science, economics, politics and culture. To help facilitate the understanding of the global challenges and the multi-disciplinary efforts required to tackle them, art+sci+tech can play an important role.

astra*

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DR HEIDI HENRICKSON
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STATUS: Active
(move your body & mind & heart and make it happen)

VOCATION: **Materials Platform Manager**
Aalto University, Finland
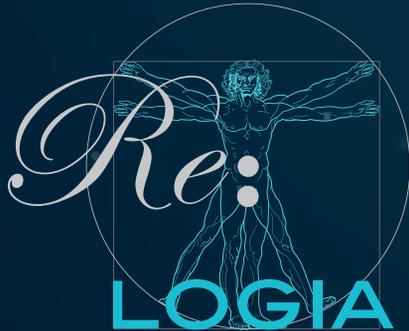
Re:
LOGIA

QUOTES
that have inspired you

*"One of the key tasks of designers is to visualise things and possibilities
that do not yet exist. By creating a form for some technological innovation,
we also give better possibilities for discussion concerning the innovation
among the public or between researchers."*

Pirjo Kääriäinen, Professor of Practice of Design
Aalto University CHEMARTS

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RELOGIA TRIALOGUES
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Lignin coating on metal surface research by Arman Dastpak
Design of "cityscape" using lignin coating on raw steel: Liisa Poskiparta
Photo: Valeria Azovskaya (c) 2019

The second-most abundant organic polymer on earth, lignin is found in wood and some types of algae, in addition to being a byproduct of the pulp and paper industry. The total amount of lignin fabrication is around 100 million tons per year globally, but currently, less than 2% is used for value-added products.

Lignin has the potential to replace toxic synthetic paints now used in heavy metal industries. Lignin coatings, which are additive-free and 100% organic, minimize the corrosion of metallic substrates, such as building materials. Similar to industrial coatings that contain many different functional additives, the performance of lignin coatings can be enhanced by adding different components.

BIOGRAPHY

Dr. Heidi Allene Henrickson coordinates **Aalto University's strategic opening, the Materials Platform**, advancing materials science and its applications across disciplines. Her task as manager is to **promote multidisciplinarity, networking, and visibility for materials researchers and educator**s and act as a single contact point for external stakeholders.

Henrickson is a sociologist with an educational background in liberal arts and women's studies and over two decades of experience promoting best practices in scientific communication at institutions in the USA, UK, Germany, and Finland.

DR HEIDI HENRICKSON
RELOGIA VISION

A+S+T *in* PERSONAL CONTEXT

Could you describe when and how you first became interested in the art+sci+tech synthesis as an idea that has had relevance to your work?

My first project combining arts, science, and technology was as an editorial assistant on a book for secondary students of design and chemistry on plastics. My student job was to source photographs demonstrating applications of plastics in everyday life, specialist fields, and advancing science or technology, The Essential Plastics Industry (2003).

A+S+T *in* CULTURAL CONTEXT

How would you frame the new cultural context we live in?
e.g: Post Constructivism, New Renaissance, Conceptual Age, Proto Renaissance, Age of Authenticity, Post-post Postmodernism, Age of Discoveries, Metamodernism

Postindustrial with a strong desire to maintain links with the manufacturing sector.

What is the relationship between art+sci+tech movement and current culture? Would you consider art+sci+tech movement as a provider of new cultural context?

The generation of new ideas – to replace un-sustainable technologies or products or create new opportunities for how we live – requires that we go beyond disciplinary approaches (but with disciplinary expertise!). It's quite a balancing act.

Who needs this art+sci+tech synthesis and is it important today?

All producers, to be able to collaborate outside their disciplines, require a broader set of tools and competencies than we have relied on since the mid-20th century. It's time to come together and share experiences, approaches, and expertise that allows us to truly innovate (not just replace what we already have).

What is the value in such multi-inter-trans-disciplinary R&D approach and how does it impact the evolution of human perception about the reality we live in?

I believe the value is still being explored – we don't yet know the potential impacts of this approach; but what we do know is that using this approach brings us closer achieving multidisciplinary (or one day maybe transdisciplinary) competence and innovation.

A+S+T *in* EDUCATION CONTEXT

art+sci+tech Learning Systems:
Integrative Education for Future Skills
art+sci+tech Learning Systems & Methodologies
Positive & Progressive Education

Why is art+sci+tech direction important to be included in Education?

First and foremost, our incoming undergraduate students at university want it.

What is your view and input about introducing art+sci+tech modules in universities, academies and life-long learning organizations and initiatives?

As a graduate of a liberal arts education that has always used this approach, thus I would like to see this become a normal format for all higher educational institutions.

How do you envision the development of a shared art-sci-tech dictionary?

As a book and article editor, I see this as a lot

of work! A wiki would be very welcomed.

How is the art+sci+tech approach embedded in your program? What are the main methodologies you use?

Our programmes at Aalto University are still developing; for example, the CHEMARTS programme is well-developed and centered on biomaterials, but some programmes are still learning the best ways to create and implement multi- or cross-disciplinary education. About CHEMARTS at Aalto: "The main objective is to inspire students and researchers to explore biomaterials together and to create new concepts for the future use of cellulose and other biomaterials. CHEMARTS consists of various actions, such as multidisciplinary study courses, summer projects for Master's students and externally funded research projects."

What background is required for the experts leading such modules/courses?

For our CHEMARTS courses, we have disciplinary experts teaching together – thus they all learn with the students what the approaches and methods are from other disciplines.

A+S+T *in* SCIENCE CONTEXT

What is the transformative impact of art+sci+tech projects in science research and new knowledge communication?

We are still assessing our impacts – but it is clear that our technology researchers have learned to love communicating with the general public or non-experts; in fact, they are looking for these opportunities. For our artists and designers, many have discovered the challenge of communicating or interpreting technology or scientific work through their own mediums.

A+S+T *in* SOCIAL CONTEXT

emerging art+sci+tech platforms in Europe

What is the impact on society that you observe of the emerging art+sci+tech collaborations and in which context do you think they have a significant impact?
e.g.Innovation Labs, Artists in Labs, Living Labs, Accelerators, Hackatons, Innovation Incubators, Scientists in galleries and concert halls, etc etc …

Our Science/Art/Technology exhibitions have been shared with startup entrepreneurs, investors, company CEOs, the general public, secondary school classes, the international media, politicians and public policy decisionmakers. They walk away with a clear message about individual research projects, their potential to innovate science/technology, and the importance of imagining a future using concrete evidence to move toward unknowable lifestyles and opportunities.

What is your experience of co-creation, co-construction, co-production with society and what is the common added value of such outcomes?

We have "converted" hard-core disciplinarians (and young researchers who have never worked outside their disciplines) into cross-disciplinarians with dreams of trans-disciplinarity.

What is the nature and quality of communication and collaboration between the European art+sci+tech platforms based on your experience? How do you see their future development?

We drastically need to improve our ability to share and train others in best practices. Future development requires competence building in communication.

A+S+T *in* INDUSTRY CONTEXT

art+sci+tech Innovation Labs as a link between new culture - education - industry - society

What is the role and impact of art+sci+tech research projects in Knowledge Economy, Shared Econimy, Creative Economy and Cognitive economy ?

We have spinout companies developing right now from universities. Our artists and designers are playing a significant (and growing) role in helping technology and scientific projects become relevant (not simply iterations of previous work for the sake of doing it). But we are far from achieving our potential.

What could be the sustainable design of art+sci+tech innovation labs based on the experience you already have?

Infrastructures for producing innovations that allow for flexible, changing members to join; allowing short- and long-term projects to develop and move on (or move out); opportunities to build competences together (and within a traditional discipline). Shared spaces!

How is informed the definition of collective Human Identity via the art+sci+tech applications of new technology ?

I think we assume our society is ready now, when in fact our resources are still lacking and our connections between points on the forward trajectory are missing – we are good at the beginning (basic research) and good at startups or proof of concept, but we lack the "middle".

A+S+T *in* .... CONTEXT

What context would you include that informs the purpose and future of art+sci+tech research development?

Sustainability of resources, practices, and imagination!

A!
Aalto University Materials Platform

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(move your body & mind & heart and make it happen)

VOCATION: Head of Department Psychology of Art,
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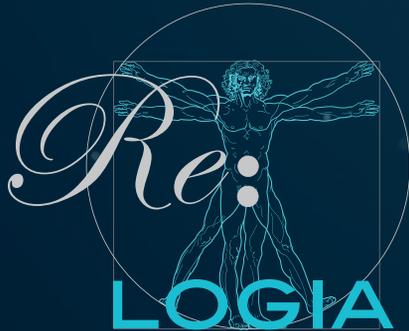
Re:
LOGIA

QUOTES
that have inspired you

We should aim at a productive cross-fertilisation of the two strongest aspects of the human mind. The first is our recently evolved capacity for self-critical rational thinking. At least sometimes, human beings are sensitive to rational argument. And the second is the enormous depth of our phenomenological state-space. Because of its many dimensions, the number of possible conscious states for a human being is incredibly large. We are only rarely aware of this fact, and we haven't really started to systematically test how we might deliberately alter our state-space so as to enhance our autonomy and increase experiential forms of self-knowledge, ideally backed by the rigour of modern-day neuroscience.

Thomas Metzinger (2016)

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Exemplars of
AESTHETIC INNOVATION
that have
transformational effect
on people's understanding

BIOGRAPHY

PhD, Art Psychology professor at the National Art Academy in Sofia. Head of the Department of Psychology of Art and Art Education at the National Art Academy.
Author of the books:
Psychological Approaches to the Art (2009)
Psychology of Art (2008)
Psychological Approaches to Art(2009)
Psychology of Art (2008)
Art, Psychopathological Imagery and children's drawings (2002)

peter-tzanev.com

Peter Tzanev, Self-projection, 2004

A+S+T *in* PERSONAL CONTEXT

Could you describe when and how you first became interested in the art+sci+tech synthesis as an idea that has had relevance to your work?

After 2000, large-format digitally printed images entered the major exhibition forums, where a total dominance of projected images already reigned. At that moment, I realized that the confrontation between new media and traditional forms of expression was over. I also understood very clearly that the post-painting intermedia I experimented with as an artist and theorist between 2000 and 2006 would have been impossible for purely technological reasons just a few years before. After that, I became more interested in the challenges that the development of virtual reality and theoretical neuroscience bring to areas such as philosophy of mind and psychology of consciousness, as well as the direct implications of this for understanding art. My Out-of-Body Experience project is dedicated entirely to these issues.

A+S+T *in* CULTURAL CONTEXT

How would you frame the new cultural context we live in?

e.g.: Post Constructivism, New Renaissance, Conceptual Age, Proto Renaissance, Age of Authenticity, Post Postmodernism, Age of Discoveries, Metamodernism, Post-post modernism…

Would you consider art+sci+tech movement as a provider of new cultural context?
Who needs this art+sci+tech synthesis and is it important today?
What is the value in such multi-inter-trans-disciplinary R&D approach and how does it impact the evolution of human perception about the reality we live in?

I believe that today we are already living and creating art in a Post-Contemporary context. To be clear, I take a very historical point of view to this claim. Today we are about five years after the end of Contemporary art. The end of Modernism and Modern art was dramatic and lasting, the end of Postmodernism and Postmodern art happened suddenly and very easily, so it is no wonder that we still do not notice the end of Contemporary culture and Contemporary art.

Ten years ago, Alexander Alberro was the first art historian who categorically characterized Contemporary art as a completely different historical period of art. A historical period that has taken place since 1989 and contains a radical breakthrough and reversal, which reflects the current hegemony of the consolidating formations such as globalization, the internet, and neoliberalism. Among the main defining characteristics of Contemporary art, Alberro also points out: a revision of the avant-garde as a reconnection of art with living life; the surprising reappearance of philosophical aesthetics as an attempt to seek and find the specific nature of the aesthetic experience; a shift from cognitive to affective attitudes; new construction of the viewer and the subject of art. These views of Alberro, which I think are strikingly insightful, receive a contradictory reception. All of us who are involved in the world of art and especially in the art institutions, still do not want to believe that the objectification of this historical period and its natural alienation took place so quickly.

In 2013, the first serious theoretical attack on the essence of Contemporary art appeared.

Suhail Malik became one of the first authors to pose the cardinal issue of overcoming Contemporary art as a paradigm. In his lecture series "On the Necessity of Art's Exit from Contemporary Art" Malik stated that Contemporary art is a fetish of the present that blocks access to the real. The functioning of the concepts and practices surrounding the phenomena of "contemporary art" and "museum of contemporary art" have very clearly defined philosophical, cultural and historical boundaries. Contemporary art does not refer to the latest art that is being created today but is a defining term that refers to a particular type of art. Historically, the term "contemporary art" is based on the idea that Contemporary art is an autonomous phenomenon that historically comes after Modern art and Post-modern art while overcoming all other forms of art that continue to exist anachronistically in the present time. Contemporary art most reveals its primary purpose as an opportunity to make time tangible. Contemporary art not only shows that there are many different "now" in the present. The main claim behind the idea of Contemporary art is that there are art forms in which there are most "now." The philosopher Peter Osborne defines Contemporary art as a new form of historical temporalization, marking the transition from colonial to global modernity through the tension between the basic value of the modern - the "new" and the basic value of the contemporary - the "actual". In this connection, however, it is precisely the timing and emergence of a new speculative temporality that threatens to dethrone Contemporary art from its hegemonic position. In their book "The Time Complex. Post-Contemporary" (2016), Armen Avanessian and Suhail Malik argue that art will become increasingly dependent on the complexity and scale of systems in which the future replaces the present as a structural condition for time. According to them, Contemporary art is under pressure from the Post-Contemporary redirection of the present as part of a speculative time complex.

For me, the end of Contemporary art comes with the need for art that no longer wants

to pretend to reveal the pure patterns of the "artistic present." The end of Contemporary art is linked to the end of the present as a specific art form. It is the end of the idea of the present as heterotopia that offers the comfort of an art-historical present. Contemporary art has entered its unhistorical phase. We observe the inability of Contemporary art to internalize the present as a historical form that is capable of updating the meaning of history.

We have already had a modern escape from history, a postmodern escape from history, and now we have a contemporary escape from history. Post-Contemporary art shows that we are once again caught up in the power of history. The return of history is a fateful moment that is different from the accidental halt during cultural tourism.

A+S+T *in* EDUCATION CONTEXT

art+sci+tech Learning Systems:
Integrative Education for Future Skills
art+sci+tech Learning Systems & Methodologies
Positive & Progressive Education

Why is art+sci+tech direction important to be included in Education?

What is your view and input about introducing art+sci+tech modules in universities, academies and life-long learning organizations and initiatives?

Art education in recent years has been increasingly developed in a laboratory mode. I believe that the introduction of art + sci + tech modules in universities and academies should not be closed in separate departments, but should be inside the programs and platforms of existing art departments. Our experience in the Department of Art Psychology and Art Education at the National Academy of Arts in Sofia is an example of this. For the first time in Bulgaria, doctoral theses on topics such as Neuroesthetics of Art and Art and Artificial

Intelligence have become possible here.

Globally, I think, for example, that the emergence of Art Research, as a new genre and a new form of art that has been created in a whole new educational context, opens up new possibilities for rethinking the link between art, science, and technology. The famous educational turn brought art education back to the center of the actual artistic processes.

A+S+T *in* SCIENCE CONTEXT

What is the transformative impact of art+sci+tech projects in science research and new knowledge communication?

In the modern age, art and science have turned into the most powerful exponents of the presence of reality. A fundamental condition for the existence of any modern culture is its potential to secure free space for dynamic interactions between scientific images and other images connected with the explanation of man and the world. We could even be tempted to search for degrees of modernization in relation to precisely the inner dynamics of this interaction. In the early 21st century, the question about who owns the images is fundamental when we try to answer the questions of what engenders and controls the ideas of art and the ideas of a work of art.

Contemporary autonomy of the objects of art in the reality of the objects that are not defined as art depends more and more on the preservation of their potentiality, namely as objects. It could be said that today it is paradoxical to expect from art that it should present the presence of reality as far as today we exist within the objects of art. Art is an instrument from which we cannot escape. The art as an object is simultaneously a phenomenal experience and a hyperobject. According to Timothy Morton, hyperobjects

are objects of enveloping phenomenological features and we exist within them and feel psychical, socially, aesthetically and politically glued to them. Hyperobjects are discoveries of modernity. We first discover them at the level of our instruments, and then we realize that we are within them. The existence of art as a hyperobject means that it is impossible for us to reach its fundamental ontological boundaries. With the contemporary condition of art in its quality as a hyperobject we can only interact with separate fragments of it, and any understanding about its reality always remains speculative.

The question that can be asked today is: What is the new media of reality in the context of art? How does art react to the multiplication of the new forms of realism in philosophical thinking that are being united by progress in science, and especially in the neurosciences?

A+S+T *in* SOCIAL CONTEXT

emerging art+sci+tech platforms in Europe

What is the impact on society that you observe of the emerging art+sci+tech collaborations and in which context do you think they have a significant impact?
e.g.Innovation Labs, Artists in Labs, Living Labs, Accelerators, Hackatons, Innovation Incubators, Scientists in galleries and concert halls, etc etc ...

What is your experience of co-creation, co-construction, co-production with society and what is the common added value of such outcomes?

Each art media has its own social dimension. Contemporary art introduces equality between materials and media. This is a situation that Rosalind Krauss defines as a postmedium condition, and Peter Weibel calls media justice. For Weibel global contemporary art is characterized not only by equality of the various media but mostly by the unprecedented mixing between

them. Most artistic practices are no longer subordinate to the task of presenting reality; instead, they refer to the media itself as a prerequisite for an understanding of reality. This is why in contemporary art we find a mixture of representations and reality, and sometimes we only find reality and doubling of that reality as art. We can speculate that reality is the basic genre in contemporary art. In contemporary art and our struggle with it, we have expectations of the appearance of art that can offer a new kind of penetration into reality.

According to Hans Belting art becomes the sphere of the artist, who assumes control of the image as proof of his or her art and the crisis of the old image and the emergence of the new concept of art are interdependent. If we develop Belting's claim that "images live in their media much as we live in our bodies" we can say that modern images live best in pure media, and postmodern images prefer to live in intermedia or multimedia, and contemporary images live in a postmedium condition. I think that now the images of post-contemporary art already begin to live in complex interaction with their extensions in what David Joslit called the new "era of formatting." What Joslit defines as a "format" is a strategy for activating the space between what an image shows and what an image does. For Joslit the artwork's format encompasses both an image and its extensions, because "the difference between format and medium lies largely in the heterogeneity of the components". I think that such a vision interprets "formats" not just as new heterogeneous configurations, but as an idea for next-generation media.

A+S+T *in* INDUSTRY CONTEXT

art+sci+tech Innovation Labs as a link between new culture - education - industry - society

How is informed the definition of collective Human Identity via the art+sci+tech applications of new technology ?

Art is an intersection where we see how various types of economic and technological processes interact at micro and macro levels. Art always remains to some extent the main test of the possible development of any innovation. We can say that each innovation tests its true usefulness through the prism of potential that it can reveal in the field of art. Art fills every possible niche for life with mental characteristics and, thus, plays the role of a signal lamp in the heart of every industry..

A+S+T *in* .... CONTEXT

What context would you include that informs the purpose and future of art+sci+tech research development?

When we talk about the future of art, I would suggest the inclusion of a new spiritual context.

In art, everything that interests us and arouses our excitement can be defined simply as what is the true ontology of how the images are structured. In art, we are always looking to find an imaginary subject. The idea that images are always present - that an image cannot get sick and die - shows that we are dealing with the immortality of images, which always involves the immortality of an imaginary subject.

Peter Tzanev, Out-of-body experience, 2018

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RICHARD REYNOLDS
is an activist in Global Art + Sci +Tech
Research, Education and Culture

CLASS: Global
(author of culture, historical change-maker)

TYPE: A
(messenger in idea delivery system, dot-connector,
prophet of idea dimensionality - turn 2D idea into 4D reality)

STATUS: Active
(move your body & mind & heart and make it happen)

VOCATION: Course Leader
MA Applied Imagination for the Creative industries
Central Saint Martins , UAL United Kingdom

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Re:
LOGIA

*"Tell me and I will forget, show me and I may remember,
involve me and I will understand."*

Confucius

QUOTES
that have inspired you

"If you want to truly understand something, try to change it."

Kurt Lewin

*"...people thrown into other cultures go through something of the
anguish of the butterfly, whose body must disintegrate and reform
more than once in its life cycle..... We have not much language to
appreciate this phase of decay, this withdrawal, this era of ending
that must precede beginning.
Nor of the violence of the metamorphosis, which is often spoken of
as though it were as graceful as a flower blooming."*

Rebecca Solnit "To see in the world"

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MA Applied Imagination for the Creative industries
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University of the Arts London (UAL) , United Kingdom
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RELOGIA TRIALOGUES
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MA APPLIED IMAGINATION | Central Saint Martins , UAL (UK)

My exemplar of aesthetic innovation has to be the MA Applied Imagination Course at Central Saint Martins, which I have been involved in in various capacities since 1996. The course is international in its student intake and its staffing, and has a transformative impact on the students who study on it in ways that it is difficult to capture in a few words. The course is based around the theory of Action Learning and Action Research, and invites its students to test their creative ideas in the external environment - with real experts and real stakeholders. The outcome – the product of this learning journey- is a body of alumni who have great agency as creative practitioners in the professional arenas in which they operate. Working on the course, and being a part of its development, is central to my life's work.

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Richard Reynolds teaches at Central Saint Martins in London, where he is **Course Leader of the MA Applied Imagination** course and Joint Had of Academic Support for the college. He is also a former publisher and occasional broadcaster. He has written, lectured and broadcast widely about aspects of the superhero, the comics medium and their context since 1991. His best-known work on comics is Superheroes: A Modern Mythology. Currently, his research interests focus on the relationship of the superhero and superheroine (or superwoman) to issues of gender and sexuality, and on the superhero's relationship to the philosophy of excess and the omnipresence of the superhero in contemporary culture.

Books:
Superheroes: A Modern Mythology Mississippi University Press, 1994.
Superheroes and Excess (Brassett. J, Reynolds. R), Forthcoming, Routledge, 2021

RICHARD RAYNOLDS
RELOGIA VISION

A+S+T *in* PERSONAL CONTEXT

Could you describe when and how you first became interested in the art+sci+tech synthesis as an idea that has had relevance to your work?

I was never enthusiastic about the "two cultures" model of society that was so prevalent back in the sixties and seventies, when I was growing up. I come from a family that included both art and science graduates and teachers, and even as a child around the family dining table there would be forceful debates about the compatibility or incompatibility of the scientist's and the artist's vision and agency in the world. In my current academic role as Course Leader of MA Applied Imagination in the Creative Industries at Central Saint Martins, I am responsible for a course that applied a methodology analogous to the scientific method – action research – to the creative problems that our students engage with. Some are resistant to the idea of applying any deliberate methodology to their creative work – until, perhaps, they see the extraordinary results that can be obtained by repetitive, iterative external testing. This is essentially the process that has given us all the products of technology-based design, from modern aircraft to the smart-phone. It is an immensely powerful tool, a methodology that transcends the unproductive splitting of the world into discrete disciplines, and tackles instead the urgent questions we face on this planet today from a transdisciplinary and holistic standpoint. What could be more important than that?

A+S+T *in* CULTURAL CONTEXT

How would you frame the new cultural context we live in?
e.g: Post Constructivism, New Renaissance, Conceptual Age, Proto Renaissance, Age of Authenticity, Post-post Postmodernism, Age of Discoveries, Metamodernism

We live in an age of post-industrial baroque or rococo taste and consumption: form and function are submerged under ornamentation and contingent appeals to the senses and to the emotions of personal vanity. An obvious example is the way in which the internet has become a tool for vanity and narcissism, when it still has the potential technologically to be so much more. One job we have as educators is to help our students seek a way out from this labyrinth of self-absorbed enervation - which many young people are starting to rebel against.

What is the relationship between art+sci+tech movement and current culture? Would you consider art+sci+tech movement as a provider of new cultural context?

I see art+sci+tech as a means of breaking out of the numerous narcissistic and self-defeating questions and aspirations of the current age, by re-connecting people with central philosophical questions about the aim and purpose of education, work, leisure and consumption. We urgently need to find ways of articulating the collective cultural capital of the humanity to address our collective future: we cannot afford to have so-called artists and scientists operating in different warring camps.

Who needs this art+sci+tech synthesis and is it important today?

As implied above, the whole world urgently needs it.

What is the value in such multi-inter-trans-disciplinary R&D approach and how does it impact the evolution of human perception about the reality we live in?

It has value in so many ways, but perhaps the key is that only through the multi-inter-trans-disciplinary R&D approach to problem-finding and question-making can we hope to articulate the processes necessary to remake and remodel our whole approach to our collective social and political life in a post-technological world. Politicians (and those who control them) are hopelessly ill-equipped even to frame the necessary questions.

A+S+T *in* EDUCATION CONTEXT

art+sci+tech Learning Systems:
Integrative Education for Future Skills
art+sci+tech Learning Systems & Methodologies
Positive & Progressive Education

Why is art+sci+tech direction important to be included in Education?

Because we need to empower young people to start thinking about the issues that face them in a connected and holistic way, and to question and even abandon the discipline-led approach to thinking and learning that has led down so many dead ends. And then we need to empower them to take action and become change-makers.

What is your view and input about introducing art+sci+tech modules in universities, academies and life-long learning organizations and initiatives?

I am 100% in favour. Our College, CSM, already offers an MA in Art and Science..

How do you envision the development of a shared art-sci-tech dictionary?

I would have to study this proposal in more depth in order to give a useful response.

How are you evaluating the current art+sci+tech education frameworks?
e.g. STEAM, Art+Science, Cross-disciplinary

Strategies, Art Research, New Media Arts, Interface Cultures, etc.

Again, I have not done any rigorous evaluation, and so cannot give an appropriately informed response.

How is the art+sci+tech approach embedded in your program? What are the main methodologies you use?

The core research process recommended by our course is Action Research. The philosopher Kurt Lewin, the pioneer of Action Research, stated that Action Research must focus on solving a real problem, and the research must centre on the environment in which the problem arises; the research must produce scientifically or logically justifiable results; and such results or outcomes should either fit with an existing theory, or form the basis for a new theory.

How do you support and guide young art+sci+tech researchers and how (based on what parameters) do you assess and validate their work?

The entire structure of our MA is designed to facilitate this. In terms of assessment, it is vital to note that we always assess process and not the quality of student outcomes, for many reasons. One key reason is that a research process may be initiated by a student that may not reach fruition until after the span of the course is finished – we do not wish to discourage genuine innovation and groundbreaking research because real results take time!

A+S+T *in* Science Context

What is the transformative impact of art+sci+tech projects in science research and new knowledge communication?

Most of all, in the emergence of new, holistic thinking about our environment and our human predicament within it. Scientists, technologists, artists and activists must collaborate in framing new questions. The beginning of a transformative change in the way that we interact with our planet can only come about as a result of the acceptance of art+sci+tech thinking.

A+S+T *in* Social Context

emerging art+sci+tech platforms in Europe

What is the impact on society that you observe of the emerging art+sci+tech collaborations and in which context do you think they have a significant impact?
e.g.Innovation Labs, Artists in Labs, Living Labs, Accelerators, Hackatons, Innovation Incubators, Scientists in galleries and concert halls, etc etc

Essentially, my answer to the previous question, but played out in a global, social and political context.

Artists and scientists are collaborating on almost every conceivable front: music is a wonderful example. Recorded music has always been a collaboration between art and technology but now composers and indie/pop/rock/rap artists are deliberately choosing to use technological innovations in their live works, developing new sounds through technology (as, for example, in the work of Zosha Di Castri, Atau Tanaka, Tom Richards, Laetitia Sonami and many others) and involving the audience in co-creation through the use of smartphones in real time as musical instruments (as varied the work of classical composer Eric Whitacre and rappers Drake and Lil' Wane).

What is your experience of co-creation, co-construction, co-production with society and what is the common added value of such outcomes?

I have been involved in several such projects, with IFF, Visa, and the Centre for Peaceful Solutions - amongst others. My key role has been as an educator in these co-creative projects, and I have witnessed their value to students, which is immense.

A+S+T *in* Industry Context

art+sci+tech Innovation Labs as a link between: new culture - education - industry - society

What is the role and impact of art+sci+tech research projects in Knowledge Economy, Shared Economy, Creative Economy and Cognitive Economy?

Such projects are shaping our future in so many ways. Universities and art schools can play a key role in shaping the discourse around such projects (see my answer to the next question but one).

What could be the sustainable design of art+sci+tech innovation labs based on the experience you already have?

I see RELOGIA conference as a model for this: networked hubs, based in established universities and at schools, connected globally, sharing knowledge and acting both locally and globally.

How is informed the definition of collective Human Identity via the art+sci+tech applications of new technology ?

This is emergent process that will define our long-term future. Perhaps the key is how quickly political and economic processes can adjust and accommodate to these developments. In the last thirty years or so, the development and societal application of technology has been driven almost exclusively (at least in the West) by private enterprise and by the profit motive. Governments and lawmakers have been hopelessly left behind, and universities have not fared much better. This situation needs to change. Scientists and artists must combine as change-makers and activists.

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This ID Certifies that

RICHIE MANU
is an activist in the Global Art + Sci +Tech
Research, Education and Culture

CLASS: Global
(author of culture, historical change-maker)

TYPE: A
(messenger in idea delivery system, dot-connector,
prophet of idea dimensionality - turn 2D idea into 4D reality)

STATUS: Active
(move your body & mind & heart and make it happen)

VOCATION: **Senior Lecturer**
MA Applied Imagination for the Creative Industries
Central Saint Martins, UAL, UK

Re:
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QUOTES
that have inspired you

*"Art and Science have so much in common – the process of trial
and error, filing something new and innovative and to experi-
ment and succeed in a breakthrough."*

Peter M. Brant

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BEING HUMAN | WELLCOME COLLECTION

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wellcomecollection.org/exhibitions

BIOGRAPHY

Richie Manu is an **award-winning lecturer, designer and creative mentor** who in 2017 won the University of the Arts London Teaching Excellence Award, which recognises curriculum innovation and the making of a positive and significant difference to students' learning journeys. With a background in design, branding and communications, Richie **specialises in personal, professional and business development**, working with individuals and organisations from all over the world to achieve their targets.

He is a Fellow of the Higher Education Academy, and has taught at the London College of Fashion and on the International Design Camp Programme in Hong Kong. He also holds several senior lecturing posts at Central Saint Martins, a world-leading centre for art and design in London. Richie combines his experience of both creative practice and academic teaching to empower individuals and businesses with effective strategies and approaches for differentiating themselves and standing out in competitive environments.

RICHIE MANU
RELOGIA VISION

A+S+T *in* PERSONAL CONTEXT

Could you describe when and how you first became interested in the art+sci+tech synthesis as an idea that has had relevance to your work?

My background is fine art and as a student it was impressed on us that we respect and acknowledge the paint brush, pencil and canvas as not only tools, but essential elements of technology that facilitate and enable the process. The digital revolution, as we shifted from mechanical and analogue technology to digital electronics continued to have a significant impact on my creative output, yet always mindful that this was not a substitute for creativity but merely a tool. It is an ideology that I continue to profess in my own teaching in that, we must remain conscious of the importance of intersectionality without falling into the realm of dependency. For example, in the mid 1990's much of my own work was being designed and produced on and by computer software. I became aware that my creative output was somehow influenced by software. This is why we need to put cognitive creative thinking, design, problem solving, and problem prevention at the heart of society. Decade ago I started considering activities that fall under umbrella of system thinking of particular interests to both my professional and personal interests. The pragmatic usability of interdisciplinary approaches to problem-solving and decision making started uncovering new opportunities and its applicability to the work I was focused at the time. Simultaneously, with a circle of acquaintances from diverse fields discussions on potentials and perspectives offered by programs such as STEAM, and similar inter-disciplinary activities started to attract

my attention. Later on, as I had set up my research focus on the field of innovation - more specifically on the Living Labs environments and experimentation with the new forms of collaboration as a source of innovation in quadruple helix context, had naturally extended my focus and interest to the science, art and technology projects.

A+S+T *in* CULTURAL CONTEXT

How would you frame the new cultural context we live in?
e.g: Post Constructivism, New Renaissance, Conceptual Age, Proto Renaissance, Age of Authenticity, Post-post Postmodernism, Age of Discoveries, Metamodernism

Unfortunately, I think we are living in an age of Post-Digital Dependency. The Internet for all good and bad has created a state of what I would call cognitive emergency in that we are not yet to see the fall out of what social media (for example) has created by way of issues surrounding body image, narcissism, self esteem. But it's not too late. We are slowly emerging into a space where, (if time allows) a level of Post-Digital Consciousness will enable artists, tech developers, designers to put humanity first rather than aesthetics first and take responsibility and accountability and its impact on humanity.

What is the relationship between art+sci+tech movement and current culture? Would you consider art+sci+tech movement as a provider of new cultural context?

It is important that the combine of art+science+tech enable a culture of collaboration and co-design so that objectives are aligned. If art+science+tech dares to work in silos, the true worth and value of intersectionality will not be truly realized. We are seeing positive examples and evidence of a shift from interdisciplinary practice to

transdisciplinary practice. As James Dyson stated, "'We need more entrepreneurs. We need more innovators. We need more scientists, engineers and designers who can turn ideas into working products.".

Who needs this art+sci+tech synthesis and is it important today?

The public are the true beneficiaries of the synthesis of art+sci+tech. In a time of democratization of the internet, journalism, digital content, the power of innovation lies in the hands of the public who in many ways act as conductors and initiators of change. It is vital however, that producers who are working and developing in the spaces between art+sci+tech are responsive to the shifts and patterns that emerge from behavioral change. Take for example the importance of converting date into meaning. Many brands and organisations are able to respond to (for the context of art+sci+tech) innovation that has been shaped by the public. We are at the stage now where Big Data and artificial intelligence can help designers understand their customers and their markets to bring totally new insights"

What is the value in such multi-inter-trans-disciplinary R&D approach and how does it impact the evolution of human perception about the reality we live in?

It is important that multi-inter-trans-disciplinary R&D is able to work in a space where there is a respect and acknowledgment of expertise outside of the respective fields of knowledge. For example, if we take the fields of design and medicine in their own rights. We see examples where the field of architecture co-designs with a hospital trust to design neurological primed spaces, or environments that meet the medical needs of in-patience. Here we see co-design and true transdisciplinary practice where collaboration is realized but also sustained and continued communities of practice.

art+sci+tech Learning Systems:
Integrative Education for Future Skills
art+sci+tech Learning Systems & Methodologies
Positive & Progressive Education

Why is art+sci+tech direction important to be included in Education?

Art, Science and Techology are included in education, yet the intersectionality of art+sci+tech is yet to be embedded and recognized in curriculum innovation and development. The importance of any form of education of ensuring that there is a robust educational structure at play that is able to respond to future needs. So perhaps in the future, we may see (instead of historical studies) courses or curricula that such as Future Studies that embed naturally art+sci+tech.

What is your view and input about introducing art+sci+tech modules in universities, academies and life-long learning organizations and initiatives?

I believe it is vital, but even more important to not 'introduce' it, but instead emphasise its relevance and urgency in society and emerging societies. There are many courses in the UK that are already pointing towards this combine of art and science including Central Saint Martins which offers an MA in Art & Science.

How do you envision the development of a shared art-sci-tech dictionary?

I would imagine that any such lexicon would not necessarily be a definition of terms, but potential a summary of innovative outcomes that have resulted from the intersection of art-sci-tech. The 'dictionary' could/would encompasss research, development, innovation and case studies of projects and initiatives with a focus on not what art-sci-tech is but in essence WHAT IS DOES. Highlighting the process and impact.

How is the art+sci+tech approach embedded in your program? What are the main methodologies you use?

On MA Applied Imagination, we encourage our students to use a broad range of action research methodologies with a focus on iterative process at the centre. Art, Science and Tech is not definitive and while there is a tendency to look at any elements as solution focused, the importance of learning by process is a vital part of our methodology .

How do you support and guide young art+sci+tech researchers and how (based on what parameters) do you assess and validate their work?

We have a validated structure on applied imagination that measures and assesses process and not aesthetic (or object based) outcomes. Students are assessed across a matrix that refers to set marking critieria across all under grad and post grad subjects. Learning outcomes however are more catered and developed by individual courses. On MA Applied Imagination for example, we lay focus on research and subject knowledge at the forefront of practice. We also foster a culture of experimentation and 'failure' by way of learning.

What background is required for the experts leading such modules/courses?

MA Applied Imagination is led by a course team which has experience in leading and facilitating a programme which fosters cross-disciplinary practice. Our cohort come from a range of backgrounds including business, finance, medicine, science, design, arts and social sciences. Our course team expertise lies within a pedagogy in which collaborative practice and action research is at the heart of the studies. But it is also important that with a subject that is not hinged on one particular knowledge sector, that our course team recognize that the focus is not on discipline-specific skills and processes, but rather on developing student-specific interventions, which can be tested by means of real-world testing and iterative development.

What is the transformative impact of art+sci+tech projects in science research and new knowledge communication?

I believe the true transformative impact of art+sci+tech must ensure that it's parameters of success are not just numeric by way of data and statistical change – but more so qualitative impact. It is important that we learn more from individual accounts of research, develop and human response so that meaning and purpose it pivotal to impact. In a global context organisations such as the Melinda & Bill Gates foundation are pioneering responses to global issues by calling out to design, science and technology and it is by having realistic frameworks and timescales that we are able to measure or recognize the enormity and scale of such challenges such as eradication of diseases.

emerging art+sci+tech platforms in Europe

What is your experience of co-creation, co-construction, co-production with society and what is the common added value of such outcomes?

In the context of the Digital revolution, co-creation has been in the hands of the public and consumers for decades. With the democratization of the internet, digital platforms have now become viable channels for the public to now create their own economies, revenue streams, eco-systems and virtual platforms. It is also evident in areas such as renewable energy. For example consumers are now able to generate their own electricity in their homes through solar panels with energy powering their homes and also feeding back into the national grid, thus making them pro-sumers.

A+S+T *in* INDUSTRY CONTEXT

art+sci+tech Innovation Labs as a link between new culture - education - industry - society

What is the role and impact of art+sci+tech research projects in Knowledge Economy, Shared Econimy, Creative Economy and Cognitive economy ?

It is important to acknowledge the impact of transdisciplinary practice whereby creativity is realized in fields outside of the creative realm. IN the UK the Department for Culture, Media and Sport (DCMS) outlines creative sectors in the creative industries but goes further to state that 'The creative economy encompasses people with creative occupations working in the creative industries, as well as workers with creative occupations working in any other industry, and people in a non-creative job working in a creative industry. (Department for Culture, Media and Sport (2001). Creative Industries Mapping Documents 2001. Retrieved from: https://www.gov.uk/government/publications/creative-industriesmapping-documents-2001.

What could be the sustainable design of art+sci+tech innovation labs based on the experience you already have?

The sustainable design of art+sci+tech innovation labs, I envision as a multi-verse. An organic space in which knowledge share and open-sourced thinking enables a community of practice and innovation. I have experienced working in digital spaces where there is an open culture of knowledge share across different time-zones. The focus is not on the outcome, but the emergence of ideas in that space. Any such future innovation labs for art+sci+tech would need to ensure that digital literacy and interaction is pivotal.

How is informed the definition of collective Human Identity via the art+sci+tech applications of new technology ?

e.g. AI, New Media: VR(Virtual Reality), AR(Aug-

mented Reality), MR(Mixed Reality), IoT(Intenet of Things), BlockChain, Space Travel, New Internet etc.

I can comment only through the perspective of the IoT and its emergence within the digital realm. It is important that in the age of connectivity, we are able to maintain a level of control in the face of automation. While there are infrastrures in place to either replicate or replace human activity or job roles, we must also be mindful of what it means to be human by way of exploring and harnessing elements that cannot be replicated by robots. Psychologist Daniel Goleman's ideology on Emotional Intelligence forges a path for understanding the importance of human interaction. Elements such as empathy, self-awareness, self-management. Smart homes in the future where for example the smart fridge will be able to send information directly to your supermarket, open discussions on dependency and liberation.

MAAI Graduation Festival 2018
MA Applied Imagination
Central Saint Martins
University of the Arts London
United Kingdom
www.arts.ac.uk/csm

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This ID Certifies that

DR MICHAEL KATHARAKIS
is an activist in Global Art + Sci +Tech
Research, Education and Culture

CLASS: Global
(author of culture, historical change-maker)

TYPE: A
(messenger in idea delivery system, dot-connector,
prophet of idea dimensionality - turn 2D idea into 4D reality)

STATUS: Active
(move your body & mind & heart and make it happen)

VOCATION: Vice-Chairman
of the **Regional Research and Innovation Council of Crete**
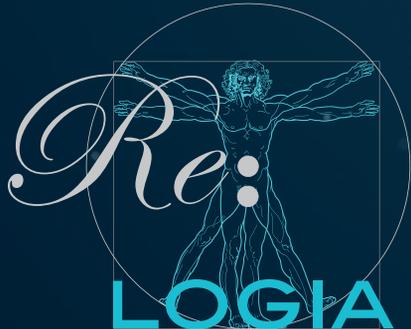
Re:
LOGIA

This card is copyright free©. Duplicate and pass on to fertile minds. It is inspired by David Mack, author of KABUKI Vol.7 The Alchemy

QUOTES
that have inspired you

*"Only art and science make us suspect the existence of life to a higher
level, and maybe also instill hope thereof."*

Ludwig van Beethoven

ORGANISATION
info

Regional Research and Innovation Council of Crete
www.hmu.gr
www.katartisi.gr

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CO-CREATIVE ENVIRONMENT
http://relogia.net

How does the electron move around the atom?
Cassiopeia Project Video on YouTube

https://www.youtube.com/watch?v=kYkD-dcupAU

BIOGRAPHY

Dr. Michael Katharakis is **vice-chairman of the Regional Research and Innovation Council of Crete.** He has extensive experience in the development, management and administration of programs, projects and innovation teams, as he has worked for more than fifteen years as a manager of funded European scientific and development programs for: The Institute of Technology and Research, the University of Crete, the Hellenic Mediterranean University, and the Chamber of Heraklion. Dr. M. Katharakis is currently **Director of the Technical Institute of Heraklion Chamber**, and he was also the director of its Development Unit for a decade, with the responsibility of developing and managing innovative programs, seminars, conferences, exhibitions and economic development actions for the local economy and at the same time as **head of the European Enterprise Europe network unit.** Moreover, for five years he was a member of the Council of the Technological and Educational Institute of Crete with tasks of approving the Foundation's budgets and developing a policy of innovative development for the educational institution. He has extensive experience in organizing events, as he undertook and successfully conducted three international conferences, many workshops, conferences, and seminars at regional, national and international level. He possesses **extensive expertise in the development and safeguarding of intellectual property** as he has worked for several years in the Industrial Property Organization as a patent consultant. He has worked for several years in the scientific and technological park of Crete with the task of transferring technology, as well as a **Director of technology transfer to the liaison office of the TEI of Crete**, which was aimed at linking the research community with the Business and market. He also worked in the Innovation and Entrepreneurship unit of the TEI of Crete. Dr. Michalis Kathalakis is also familiar with the design of the execution and delivery of scientific works as he has a work experience of more than 20 years in applied and basic research scientific projects for the University of Crete, the TEI of Crete and the **foundation for Research and Technology (FORTH)**. He obtained a **degree in physics and a specialization in atomic and molecular physics**, from the University of Crete, and a **PhD, from the National Technical University of Athens, in the field of Quantum Electrodynamics in "Electromagnetically laser induced transparency"**. He holds a **second PhD on "Technology management and integration of innovation in regional structures: formulation of strategic development criteria"** that was acquired at the Technical University of Crete. He has excellent knowledge of computers and English language. He has theoretical and laboratory experience in higher education and currently is **teaching in the MBA program of the Hellenic Mediterranean University**, being also a **director of its Life-Long-Learning Center**.

DR MICHAEL KATHARAKIS
RELOGIA VISION

A+S+T *in* Personal context

Could you describe when and how you first became interested in the art+sci+tech synthesis as an idea that has had relevance to your work?

I first came across the art+sci+tech idea during the adult learning delivery process where the experience plays an important role to the proper education result. When complex ideas are taught the use of art, like pictures or videos, seems to accelerate the educational process.

A+S+T *in* Cultural context

How would you frame the new cultural context we live in?
e.g: Post Constructivism, New Renaissance, Conceptual Age, Proto Renaissance, Age of Authenticity, Post-post Postmodernism, Age of Discoveries, Metamodernism

The new cultural context offers a tremendous variety of expression via the new technological developments, it also offers the possibility to crosscheck the validity of the proposals via the vast offering of information around. Based on these assumptions I would say that we are in a super real multi expression world.

What is the relationship between art+sci+tech movement and current culture? Would you consider art+sci+tech movement as a provider of new cultural context?

Art+Sci+Tech movement is more like a new alphabet to decipher our new environment which till now we have no tools to

understand thoroughly.

Who needs this art+sci+tech synthesis and is it important today?

Art+sci+tech synthesis is a transversal need for all modern professions yet it also is a valuable tool for all learners as it may accelerate the learning process and decodify cumbersome conceptual contexts.

What is the value in such multi-inter-trans-disciplinary R&D approach and how does it impact the evolution of human perception about the reality we live in?

Multi-inter-trans-disciplinary R&D approach is important since the isolation of scientific era via the human specialization process. The systemic approach of many problems is lost nowdayw and although we make progress in specialization of technology achievements we have lost the systemic answers on why and how social everyday life evolves the way it does.

A+S+T *in* Education context

art+sci+tech Learning Systems:
Integrative Education for Future Skills
art+sci+tech Learning Systems & Methodologies
Positive & Progressive Education

Why is art+sci+tech direction important to be included in Education?

Art+Sci+Tech direction must be accumulated to the driving forces of education as it can capture the total picture of what it is each time taught.

What is your view and input about introducing art+sci+tech modules in universities, academies and life-long learning organizations and initiatives?

There are several classes that can be enriched by art+sci+tech modules in order to facilitate faster knowledge development and easier learning process. The introduction of design

thinking modules as also the enrichment of concepts via technological tools may promote the final educational output.

How do you envision the development of a shared art-sci-tech dictionary?

An art-sci-tech dictionary may help to clarify the concepts but also to exhibit the possibilities that art-sci-tech has to support the current educational process and culture.

How is the art+sci+tech approach embedded in your program? What are the main methodologies you use?

The main methodology for the application of art+sci+tech approach in my programs are the use of participative -experiential learning techniques.

How do you support and guide young art+sci+tech researchers and how (based on what parameters) do you assess and validate their work?

The main support process young art+sci+tech researchers is based, on a hands-on approach, where things are applied and the results are thoroughly analyzed and explained. Experimentalism is the main process we apply that at the same time offer experiential learning .

What background is required for the experts leading such modules/courses?

The background required for the experts leading art+sci+tech modules is open mindness, creativity and developed horizontal skills.

A+S+T *in* Science context

What is the transformative impact of art+sci+tech projects in science research and new knowledge communication?

The transformative impact of art+sci+tech projects in science research and new knowledge communication may be focused on the offering of a cause to the learning process which is focused on integrated individuals' development. The holistic approach that is communicated via art+sci+tech integrated projects creates new prototypes and learning models more suitable to the current multidisciplinary reality we all live in.

A+S+T *in* SOCIAL CONTEXT

emerging art+sci+tech platforms in Europe

What is the impact on society that you observe of the emerging art+sci+tech collaborations and in which context do you think they have a significant impact?
e.g.Innovation Labs, Artists in Labs, Living Labs, Accelerators, Hackatons, Innovation Incubators, Scientists in galleries and concert halls, etc etc

The current art+sci+tech collaborations have a limited impact in society since they are not organized in a way to evaluate their results and their occurrence is random. To initiate a real impact to the society a more thorough approach is needed which will include the art+sci+tech actions to the educational curricula.

What is your experience of co-creation, co-construction, co-production with society and what is the common added value of such outcomes?

I took part in art+sci+tech collaborations as also I have created events in the past the common added value being the promotion of solutions to individuals seeking for them, as also the spread of the ideas and techniques to bigger audiences.

What is the nature and quality of communication and collaboration between the European art+sci+tech platforms based on your experience? How do you see their future development?

European art+sci+tech platforms are isolated and they are operating on their own norms without any information and results exchange. The mobility of ideas and individuals is very important in order to develop a unified pan European art+sci+tech space which will promote the new culture and ideas helping individuals to develop themselves.

A+S+T *in* INDUSTRY CONTEXT

art+sci+tech Innovation Labs as a link between new culture - education - industry - society

What is the role and impact of art+sci+tech research projects in Knowledge Economy, Shared Econimy, Creative Economy and Cognitive economy ?

The role of art+sci+tech research projects in Knowledge, Shared, Creative and Cognitive economy is crucial since it may consist the glue to transform them in one new concept of the art+sci+tech economy. Their impact yet remain low since still the new knowledge remains a privilege of the few.

What could be the sustainable design of art+sci+tech innovation labs based on the experience you already have?

I would suggest the development of a decentralized campus like unit promoting new art+sci+tech initiatives in a constant basis, measuring the results and communicating the developments.

How is informed the definition of collective Human Identity via the art+sci+tech applications of new technology ?
e.g. AI, New Media: VR(Virtual Reality), AR(Augmented Reality), MR(Mixed Reality), IoT(Intenet of Things), BlockChain, Space Travel, New Internet etc.

The definition of collective Human Identity is expanded via the art+sci+tech applications of new technology. Concepts like space, time, communication and perception are highly altered, driving the human nature to completely new levels and at the same time

creating new skills based on the new realities.

A+S+T *in* .... CONTEXT

What context would you include that informs the purpose and future of art+sci+tech research development and applications in the Triple and/or Quadruple Helix of Innovation?

One of the most important elements of the Triple and/or Quadruple Helix of Innovation is the communication principle, communication is also about teaching each other and also learning from each other. art+sci+tech development drives to the evolution of communication and therefore may drive to a learning innovative community with more rapid innovation changes which at the same time fulfill the holistic approach of a well-balanced human being.

*An Unusual View of The Helix Nebula
aka The Eye of God
Captured by ESOs Visible and Infrared
Survey Telescope for Astronomy VISTA*

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This ID Certifies that

DR CLAUDIA SCHNUGG
is an activist in Global Art + Sci +Tech
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CLASS: Global
(author of culture, historical change-maker)

TYPE: A
(messenger in idea delivery system, dot-connector,
prophet of idea dimensionality - turn 2D idea into 4D reality)

STATUS: Active
(move your body & mind & heart and make it happen)

VOCATION: Researcher, Curator, ArtScience Consultant, Author

Re:
LOGIA

QUOTES
that have inspired you

"We teach people how to remember, we never teach them how to grow."

Oscar Wilde

"Actually, for me it's not quotes that are inspiring, it's a love for books, stories, art, science, craft, technology and the unknown. A strong reluctance to believe that one should exclude the other, when you need everything as an ingredient for understanding, joy, and growth."

Claudia Schnugg

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info

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AGENT UNICORN

Agent Unicorn by Anouk Wipprecht, still from the video by Local Androids

The example of Agent Unicorn has been developed within the EU project Sparks as an interdisciplinary project. The artist collaborated with practitioners, scientists, and technologists to develop and realize the idea of this project. It also reached out to a broad audience, talking openly about challenges of coping with ADHD and opportunities for research and therapies. The collaboration with the tech & industry partner went on, creating the opportunity for many artists, designers and makers to contribute ideas to the field of BCI and health through hackathon inspired by this project.

NOISE AQUARIUM

Noise Aquarium by Victoria Vesna in collaboration with Dr. Alfred Vendl, Martina Fröschl and Glenn Bristol
photo: Victoria Vesna.

Noise Aquarium shows how effective communication about research, scientific questions and pressing issues on our planets can be through the transformational experience of an artscience project. It reaches out to different audiences and allows them to understand and experience knowledge and parts of the ecosystem to which they otherwise would not have any connection.

BIOGRAPHY

Claudia Schnugg is **researcher and advocate of artscience collaboration**, a producer and curator of residency programs, and has been the catalyst for numerous artscience projects. Most recently she was the **first Creative Director of Science Gallery Venice**. Previously she worked as **Assistant Professor at the Johannes Kepler University**, and was Visiting Researcher at Copenhagen Business School, the Art|Sci Center at UCLA, and ESO, Chile. She **headed the Ars Electronica Residency Network 2014-2016**. Recent publications include her book: **Creating ArtScience Collaboration – Bringing Value to Organizations"** (2019, Palgrave Macmillan).

www.claudiaschnugg.com

A+S+T *in* Personal context

Could you describe when and how you first became interested in the art+sci+tech synthesis as an idea that has had relevance to your work?

I wanted to work in the intersection of art+sci+tech when I started to study at the university. During my studies I already tried to draw from these different areas and study in these fields, and finally late 2006 in the phase of finding a research question for my doctoral dissertation, I was able to start to work interdisciplinary. Thereby, I started out to investigate why individuals from the different fields wanted to work with each other, and what it meant to be active in the intersection of art+sci+tech for the individuals and groups. Thus, my sociological, psychological, organizational and cultural perspective was very helpful to investigate these questions.

A+S+T *in* Cultural context

How would you frame the new cultural context we live in?
e.g: Post Constructivism, New Renaissance, Conceptual Age, Proto Renaissance, Age of Authenticity, Post-post Postmodernism, Age of Discoveries, Metamodernism

It is difficult to be named right now, I think. Developments of our time certainly have been named many of these titles, but I believe there are still a lot of open questions:

there are new movements in art, scientific knowledge is much more accessible than it ever was, technical developments are fast but mainly support specific ways of engagement with each other and with information. There are still many open questions how to overcome problems and look beyond established boundaries. Maybe this movement of art+sci+tech (though do not forget humanities and social science aspects) can be one amazing opportunity to overcome challenges by integrating art, science and technology, keeping humanity and the one planet we live on in the center of the attention.

What is the relationship between art+sci+tech movement and current culture? Would you consider art+sci+tech movement as a provider of new cultural context?

Yes, definitely. The arts are an important pillar of knowledge, provide sensory experience, and create space of exploration, gedankenexperiments, and critical-reflexive practice. In a cultural context where newness, technology, tech & science-driven innovation are dominating the discourse and gain influence on every aspect of life, this is essential. Art and humanities cannot stay outside and comment from the outside for a small expert group, they have to mingle and thus make an informed discussion possible for everyone.

Who needs this art+sci+tech synthesis and is it important today?

Probably everybody. For example, in the educational sector there are so many opportunities to support learning and understanding of complex and challenging situations. This is an essential skill to navigate life and for the future job market. In the form of initiatives in public engagement, it is possible to create experiences and communicate complex topics, to integrate stakeholder groups in development processes, and to initiate reflexive discussions. Beyond that, art+sci+tech creates opportunities and

directions for research and developments by teaming up between the disciplines. It helps not only to find answers, but also ask the right questions.

What is the value in such multi-inter-trans-disciplinary R&D approach and how does it impact the evolution of human perception about the reality we live in?

Every discipline has its boundaries, its focus, prevalent ideas, methods and specific contexts. Interdisciplinary approaches help to open up, bring in new ideas, methods, and most importantly contexts. Through true collaboration it is possible not just to add outcomes of different disciplines, but to integrate knowledge and needs that to create more sustainable and relevant research questions and outcomes. Above that, art and humanities, also social sciences, are important to bring in the human perspective, ethical questions, emotional approaches, to understand what is actually useful, needed and wanted in a society. This is very important also for R&D that aims at creating technologies for society, for users, for consumers. E.A.T. at Nokia Bell Labs is a wonderful example for this, but it can go beyond, including ethical questions and broadening the scope of possible future directions. Moreover, such an interdisciplinary R&D approach is not only important for the outcome and the cultural, societal and even economic context. It also enhances opportunities and abilities of the individual: for the artists and scientist or engineer who are collaborating, who get in touch with their own cognitive biases, methods, incorporated movements and ways of seeing, and thus learn to broaden their own scope and develop their knowledge and competences even further. It invites stakeholder groups and fosters exchange with them.

A+S+T *in* Education context

art+sci+tech Learning Systems:
Integrative Education for Future Skills
art+sci+tech Learning Systems & Methodologies
Positive & Progressive Education

Why is art+sci+tech direction important to be included in Education?

It is important to gain competencies to work interdisciplinary, but also to learn to understand that real-world problems are questions that span across many disciplines and cannot be answered with knowledge from a single discipline only. It is also about getting in touch with sensory and aesthetic dimensions and learn to express ideas and use different media to do so. It is also much more engaging and triggers self-driven learning processes by designing STEAM or art+sci+tech (I include social sciences and humanities here!) approaches is education.

What is your view and input about introducing art+sci+tech modules in universities, academies and life-long learning organizations and initiatives?

It is essential; students have to learn how to work in an interdisciplinary setting. There is also a need to understand that art, sensory and aesthetic dimensions are central in our perception and understanding of our environment. It adds new perspectives, teaches to reflect on the cognitive and physical practice. If we want to have individuals who are experts in their field, they need to be able to understand the limits of their methods, theoretical questions and ideas for solutions. They need to be able to see them from a different perspective to keep their own practice alive and growing, but at the same time to understand the dimensions of perception they are drawing from and contrast their ideas with those of other fields of expertise.

How do you envision the development of a shared art-sci-tech dictionary?

The field is still very diverse, and it is difficult to understand how some terms are used. So, elaborating on this is very useful. I believe it is important to involve experts from different backgrounds and practitioners.

The vocabulary should be kept as minimal as possible, it doesn't make sense to make it too elaborate because the field has to be approachable for as many people as possible, also lay-persons.

How are you evaluating the current art+sci+tech education frameworks?

e.g. STEAM, Art+Science, Cross-disciplinary Strategies, Art Research, New Media Arts, Interface Cultures, etc.

There are some very exciting approaches and many people advocating this direction for quite a long time. I hope that there will be bigger steps to bring such educational techniques to as many places as possible soon.

How is the art+sci+tech approach embedded in your program? What are the main methodologies you use?

In the educational approach I work on analyzing and evaluating art+sci+tech in workshop, school and university settings; in my own university teaching I work a lot with aesthetics and embodied cognition, but also with social, psychological and anthropological perspectives to show the importance of the interdisciplinary encounter; this is also a big part of my previous research; in terms of art+sci+tech projects there are a lot of opportunities within the realm of public engagement, workshops, exhibitions, open discussions, citizen science etc.

Concerning methodology, I work a lot with artscience collaboration and artist-in-residence or artist fellowship formats, artistic initiatives and coupling artists, scientists, engineers for workshops, exhibitions and events. Thereby, I act as intermediary, curator, mediator, and producer in these interactions, but also support the organization in developing such opportunities or embed artscience project in scientific and R&D environment.

How do you support and guide young art+sci+tech researchers and how (based on what parameters) do you assess and validate their work?

I am happy to supervise, give feedback, connect, mentor, include into discussions, co-develop ideas.

Which parameters is difficult to answer, it depends as they tend to come from various academic backgrounds thus their goals, research ideas, theoretical perspective, practical relevance, and methodological approach vary.

What background is required for the experts leading such modules/courses?

I think it is extremely important to have the ability to make connections, talk to experts from different fields and to translate between them, if you do courses with students or experts from different fields. It supports teaching about art+sci+tech. Knowledge about processes and different ways of knowing is also an asset for experts leading such courses. Nevertheless, there are so many different courses that can be taught: on the process between artists and scientists, on the design of art+sci+tech projects, on historical work in the field, on integration of art+sci+tech into an organization or into a specific scientific or artistic discipline, art+sci+tech strategies, courses on embodied knowledge and aesthetics etc. Specific courses need experts with experience or education in the respective field.

A+S+T *in* Science context

What is the transformative impact of art+sci+tech projects in science research and new knowledge communication?

The impact of art+sci+tech collaboration

and experience on artists, scientists and engineers was my major research focus during the last few years, it's also the focus of my book "Creating ArtScience Collaboration". For example, there are opportunities that trigger personal development including expanded knowledge, overcoming cognitive biases, sensemaking, develop new abilities and competences, get in touch with embodied knowledge, or increase communication abilities and develop competencies to work in interdisciplinary settings. Art+sci+tech experience contributes to motivation and to the creation of meaning at work.

Such collaborations and interdisciplinary exchange can help to contextualize scientific and technological developments, to lead a critical-reflexive discourse, and to find new important directions for new research and developments. Not to forget, art+sci+tech collaboration expands one's social network and access to resources and ideas, possible new collaboration partners. Art can have an inspirational quality for scientists and engineers, such as technology and science can be inspirational to artists. But it is more than that. All the effects named above are also enriching the creative process.

Case studies and investigation into art+sci+tech initiatives show that communication skills can be enhanced, and new audience groups can be reached (possible bigger outreach), and discussions with stakeholder groups change through different ways of communication and understanding. Public engagement is a keyword, also experience, sensory aspects, aesthetics and critical reflection. It goes beyond typical forms of science communication and must not be confused with visualization or design (which both are relevant on their own).

A+S+T *in* Social context

emerging art+sci+tech platforms in Europe

What is the impact on society that you observe of the emerging art+sci+tech collaborations and in which context do you think they have a significant impact?
e.g.Innovation Labs, Artists in Labs, Living Labs, Accelerators, Hackatons, Innovation Incubators, Scientists in galleries and concert halls, etc etc

It creates awareness, reduces fear of contact with scientific or technological developments, enables informed discussion and thus supports an important dialogue.

Art+sci+tech works are not created by somebody in isolation, so artist-in-residence programs, exchange, workshops, fellowships etc. are the basis. Additionally, artists do not make art only for themselves to lock it away, it is for an audience and open discussion. There, any exhibition, concert hall, gallery are valuable platforms, just as are specifically designed workshop and event series that aim to engage different audiences and stakeholder groups on a specific topic. Maybe even citizen science, gamification, responsible research & innovation principles, and other methodologies can be included.

What is your experience of co-creation, co-construction, co-production with society and what is the common added value of such outcomes?

It is a very positive one with a lot of positive feedback from art, science, tech, industry and the audience as well as other target groups. Added-value is informed discussion, access, growing knowledge and method-base, important questions being asked, open and sharing atmosphere.

Additionally, such discussion and exchange supports not only specific art+sci+tech developments or creating access to new research outcomes or finding direction in technology development/applications, discussions can open up bigger questions on ethics or the role of technology in society. Art can function as a universal mode of language and reach out to many which supports starting a dicussion or to become active. An artwork might not speak to everyone, but it creates

experiences – individual and shared ones.

What is the nature and quality of communication and collaboration between the European art+sci+tech platforms based on your experience? How do you see their future development?

It is very open and positive. There is a growing interest to connect and exchange, and there are a few individuals and organizations that want to make them more accessible and create bigger platforms. This is valuable for researchers, practitioners, and to create a more coherently growing and strong community.

A+S+T *in* Industry context

art+sci+tech Innovation Labs as a link between new culture - education - industry - society

What is the role and impact of art+sci+tech research projects in Knowledge Economy, Shared Econimy, Creative Economy and Cognitive economy ?

Interdisciplinarity and cross-disciplinary contributions have to be considered as essential for a sustainable and beneficial future development. It leads to an integration of the fields of knowledge which again creates deeper understanding of the specific disciplines and economic fields. In that sense, it shows how important the contribution of creative economy, knowledge economy, shared economy is to overall value-creation.

In general, the developments in the fields you name show different needs concerning their incorporation of art+sci+tech. Nevertheless, they can help to imagine and create new business models and economic approaches that are needed.

What could be the sustainable design of art+sci+tech innovation labs based on the experience you already have?

It is important to have bridge-builder, somebody who facilitates, translates, mediates and curates. In some cases, it is less needed than in others, but especially when it involves residency formats and constantly renewing interdisciplinary constellations, it is crucial for their sustainable development and growth. New collaborations and incoming people are important to avoid organizational blindness. There are loads of opportunities, from spaces that provide interdisciplinary exchange and room for experimentation, to residency programs, art+sci+tech constellations in research projects, workshops or other exchange opportunities. The best option and sustainable design depend very much on goals, structures, and organizational settings.

How is informed the definition of collective Human Identity via the art+sci+tech applications of new technology ?

e.g. AI, New Media: VR(Virtual Reality), AR(Augmented Reality), MR(Mixed Reality), IoT(Intenet of Things), BlockChain, Space Travel, New Internet etc.

Art+sci+tech applications are crucial to develop relevant technology that respects human needs, ways of knowing and communicating. The artistic perspective brings in the dimension of sensory knowledge and aesthetic experience, it reflects on human identity, behavior and needs. Such interaction can make the ideas of future technologies and developments much more accessible for the individual and integrate it in visions through explorative and visionary representations. Experiencing these can give humans a say in what and how they want and need technological development. Humanities and social sciences are an important perspective in this respect, too.

Thus, it actually goes both ways, it informs individuals and societies, gives them a space to reflect, critically discuss and engage, but it also is crucial for the development of new technologies, their applications and interaction with individuals and society.

A+S+T *in* .... CONTEXT

What context would you include that informs the purpose and future of art+sci+tech research development?

The philosophical context: What does this all mean? What are "hybrid outcomes" that stem from such collaborations? What are important aspects – or what is the spectrum we need to know? Not everybody is a generalist, we need specialists, but where to meet? And where to put outcomes that cannot be categorized, how to proceed? They feed back on individuals, societies, fields, development of R&D, but they are tools or steppingstones in-between?

Last, but not least, I think the health context can be important: new technologies and digitization influence individuals', societies' and groups' mental health and physical health. Work practices, changing demands, stress and diverse demands do have an influence on health, mental health and well-being. Moreover, new communication systems (and habits) and the possibility to access knowledge, experiences and culture influences health. On the other hand, new technologies and science are a crucial factor that benefit health care and healing. Also, art, aesthetics and cultural experience influences health, well-being, mental health and supports access and literacy. So, the health context is definitely to be considered.

Additionally, there is one thing that should be essential part of the art+sci+tech movement. Personally, I also always draw from knowledge and methods in social sciences, humanities, philosophy in my research and projects. I believe that within art + sci + tech movement this should be recognized as important context. These disciplines bring in important perspectives and knowledge, but also to overcome potential challenges.

CREATING ARTSCIENCE COLLABORATION

Bringing Value to Organizations

CLAUDIA SCHNUGG

RELOGIA
art+sci+tech

LICENSE
TRIALOGUES

This ID Certifies that

DANIELA UREM
is an activist in Global Art + Sci +Tech
Research, Education and Culture

CLASS: Global
(author of culture, historical change-maker)

TYPE: A
(messenger in idea delivery system, dot-connector,
prophet of idea dimensionality - turn 2D idea into 4D reality)

STATUS: Active
(move your body & mind & heart and make it happen)

VOCATION: President of the Creative Cultural Alliance

Re:
LOGIA

QUOTES
that have inspired you

„To elicit is more importat than to instruct"

Roy Ascott

ORGANISATION
info

**Creative Cultural Alliance
Croatia**
www.ccalliance.eu

RELOGIA TRIALOGUES
theme

CO-CREATIVE ENVIRONMENT
http://relogia.net

CREATIVE CULTURAL ALLIANCE (CCA) INNOVATIVE EDUCATIONAL PROGRAMS

public event featuring two of the most visionary, ground-breaking contemporary artists:
Ulay and Jan Fabre in conversation on
"Crossing the Line: redefining boundaries of performance in the 21st Century"
Museum of Modern and Contemporary Art, Rijeka, 2019

Exemplars of
AESTHETIC INNOVATION
that have
transformational effect
on people's understanding

Our innovative educational programs are interconnected and formatted as interdependencies between teaching, research, public projects and events. Unicult2020, the International Arts & Culture Management and Policy Programme, increases participant's knowledge and skills related to cultural policy and management, which emphasizes the importance of cultivating creative capital and acting as a bridge between education and the community. In its 4th edition the Unicult2020 become an Interfacing Academy of the **Europan Master Module in Art, Science and Technology (MAST).** MAST is a creative platform, embedding both formal and non-formal lifelong learning into a holistically managed trans-disciplinary course of events and encounters.

BIOGRAPHY

Daniela Urem is **president of the Creative Cultural Alliance**. She **initiated the Arts and Cultural Affairs Office within the University of Rijeka** in 2012, designing and coordinating educational programs and productions with a focus on career and audience development while opening various forms of international cultural cooperation. In 2013 as part the city of Rijeka nomination for the European Capital of Culture, Daniela created the first cultural capacity building program in Croatia, Unicult2020, the International Arts & Cultural Management and Cultural Policy Programme, designed for cultural producers and researchers from Europe and beyond. In 2018 Unicult2020 program became the Interfacing Academy of the European winning **MA Module in Arts, Science and Technology (MAST).**

Daniela graduated psychology at the Pace University, New York. In 2004 she founded the **"Doors Art Foundation"** in the New York City, where as an artistic director she produced more than 70 programs at the Isaac Stern Auditorium of Carnegie Hall, Tribeca Cinemas, Museum of the Moving Image, Lincoln Center and others, curating the internationally known artists while promoting the European culture and art scene to the international audience.

At present, Daniela Urem works on several cultural platforms, on educational development and cultural policies projects, actively participates in capacity building, university-related projects, and advocates intercultural dialogue, cooperation and exchange. Daniela is an active member of Culture Action Europe, Regional Cultural Policy and Management Platform and a regular guest lecturer and speaker.

DANIELA UREM
RELOGIA VISION

A+S+T *in* PERSONAL CONTEXT

Could you describe when and how you first became interested in the art+sci+tech synthesis as an idea that has had relevance to your work?

As a producer, curator, and designer of higher educational programs I became interested in art, science and technology synthesis in 2004 when in New York City I founded the Doors Art Foundation. I was working with contemporary art productions and artists which very often use technology as part of their creative process. In 2012 I established the Office of Art and Cultural Affairs at the University of Rijeka, followed by the Creative Cultural Alliance (CCA) in 2017. The CCA a year after became a partner at the European winning Master degree Module in Arts, Science and Technology (MAST). We at the MAST consortium are currently developing an applied study module at the intersections of art, science, and technology at the University of Graz, University of Art of Nova Gorica and Madera Institute of Technology. In our work, we are combining methodologies and practices that intertwine the academic sphere closely with the culture and creative sectors while nurturing a critical perspective on the historical, economic, social and above all cultural relevance of this interdisciplinary blend within the new digital shift. It means that we are developing innovative, ICT-enhanced teaching and learning methods at the intersection of art, science, and technology.

A+S+T *in* CULTURAL CONTEXT

How would you frame the new cultural context we live in?
e.g: Post Constructivism, New Renaissance, Conceptual Age, Proto Renaissance, Age of Authenticity, Post-post Postmodernism, Age of Discoveries, Metamodernism

Who needs this art+sci+tech synthesis and is it important today?

Our world needs improvement. It means we have to continue to create a body of knowledge that stretches across different fields which will further improve our abilities, make us learn more, experience more and do more. The art, science and technology synthesis contributes already to our advancement working towards even the big threats which could create a long-term threat to our civilization's survival such as nuclear warfare or prevention of an ecological catastrophe.

A+S+T *in* EDUCATION CONTEXT

art+sci+tech Learning Systems:
Integrative Education for Future Skills
art+sci+tech Learning Systems & Methodologies
Positive & Progressive Education

Why is art+sci+tech direction important to be included in Education?

Transdisciplinary practices influence learning and knowledge production while the best knowledge is applicable and affecting real life. STEAM, for example, has been growing in education, policy and business debates around the world. The integral approach to education is bringing together knowledge from a variety of areas and designing hybrid learning modules to improve people's transdisciplinary intelligence skills. It is precisely this innovative and creativity that is so crucial to educational transformation and advancement. Transporting and translating to another field, transdisciplinary studies and exchange, innovation are equipping students in arts and creativity, business and technology with the knowledge and core transferable competences they need to think and work across cultural and creative sectors and disciplines. Bridging the gap between curricula and practical skills in art and technology by involving all three disciplines and working multi-disciplinary to develop joint solutions for new digital systems. Advances are made, not only to develop our knowledge about the world but also to redesign the platform of our common culture. The integral approach to education is by valuing the contradictions and interdependent values within the field; art is asking questions, science is most often answering while technology is making things possible.

A+S+T *in* SCIENCE CONTEXT

What is the transformative impact of art+sci+tech projects in science research and new knowledge communication?

Some of the transformative impact of art+sci+tech projects in science research and new knowledge communication is by applying integrative research processes, extended peer review, broader metrics for evaluation, effective dialog processes, and stakeholder participation.

A+S+T *in* SOCIAL CONTEXT

emerging art+sci+tech platforms in Europe

What is the impact on society that you observe of the emerging art+sci+tech collaborations and in which context do you think they have a significant impact?
e.g.Innovation Labs, Artists in Labs, Living Labs, Accelerators, Hackatons, Innovation Incubators,

Scientists in galleries and concert halls, etc etc ...

The impact on society of the emerging art+sci+tech collaborations is to balance, investigate, and reinvigorate productive collaborations. Art is the key contributor to a healthy society and the most important creative strength in producing economic value through technology. Art, science, and technology have a valuable dialog that affects and improves scientific discovery.

A+S+T *in* INDUSTRY CONTEXT

art+sci+tech Innovation Labs as a link between new culture - education - industry - society

What could be the sustainable design of art+sci+tech innovation labs based on the experience you already have?

Transdisciplinarity and knowledge production influence our culture, identity, value creation, and industries. The capacity to understand and collaborate in knowledge production and exchange with multiple experts and public beyond a single field of knowledge, as well as to thrive within diverse professional environments. Innovation labs serve as a hub between new culture, education, industry, and society. The sustainable design could deepen their collaboration with the research centers and, eventually expanding into universities, media organizations, and tech companies, among others. Labs could open up possible entrepreneurial opportunities through creating real challenges and by stimulating innovative learning environments within and across disciplines through the integration of creative, digital and education.

A+S+T *in* .... CONTEXT

What context would you include that informs the purpose and future of art+sci+tech research development and applications in the Triple and/or Quadruple Helix of Innovation?

Quadruple Helix model by adding a fourth component to the framework of interactions between university, industry, and government: civil society and the media, establishes new paradigms for innovation through transdisciplinary research, exchange, and collaboration. Research within a closed ecosystem cannot possibly provide such valuable results as an open, inclusive network that actively promotes input from all directions. For this reason alone, we must continue to support the development of those within the creative/arts sector as we move forward into a world that is becoming increasingly dependent on technology. Stimulating innovative research across disciplines through the integration of art, science, and technology.

EUROPAN MASTER MODULE IN ART, SCIENCE AND TECHNOLOGY MAST

RELOGIA
art+sci+tech

⁝ LICENSE
TRIALOGUES

This ID Certifies that

PROF SARANTOS PSYCHARIS
is an activist in Global Art + Sci +Tech
Research, Education and Culture

CLASS: Global
(author of culture, historical change-maker)

TYPE: A
(messenger in idea delivery system, dot-connector,
prophet of idea dimensionality - turn 2D idea into 4D reality)

STATUS: Active
(move your body & mind & heart and make it happen)

VOCATION: STEAM EDUCATION

Re:
LOGIA

ACTIVITIES
that have inspired you

Engagement in STEAM epistemology

*Development of didactic scenario that integrates Art+Sci+Tech
as a content approach*

Development of artefacts that include: Computational Thinking and Innovation

ORGANISATION
info

**School of Pedagogical and Technological Education
ASPETE
Greece**
www.aspete.gr

RELOGIA TRIALOGUES
theme

STEAM EDUCATION
http://relogia.net

Exemplars of
AESTHETIC INNOVATION
that have
transformational effect
on people's understanding

TREE-STRUCTURE CANOPY IN FRANKFURT MARRIOT HOTEL

Photograph by Eibe Sönnecken

This figure is inspired by the so called Voronoi diagrams as they are used in Arts.
Looking at the Frankfurt Marriott Hotel in Frankfurt you can notice the Voronoi diagrams
Voronoi diagrams are created using simple mathematical formulas and they can be used in many
areas of science, technology, sensors for detecting different sources of materials and arts. Voronoi diagrams were invented by the Russian Mathematician Georgi Voronoi (1868-1908)

BIOGRAPHY

A highly experienced and devoted **Professor at School of Pedagogical and Technological Education(Athens-Greece)-ASPETE** who has made a significant contribution to many educational institutions throughout Europe.
Professor Psycharis holds a Bsc in Physics, Msc in Information Technology and PhD in Computational Physics(University of Glasgow).
Professor Psycharis has published many papers in prestigious journals and has established various European-wide improved academic practices for Undergraduates, Postgraduates, and Fellow Professors alike. Throughout his career, he has been involved as **Principal Researcher in many National and European projects for the integration of STEM in Education, and Teacher Education Policie**s. He was also the Coordinator, representing the Greek Government - for the European Network of Teacher Education Policies (ENTEP), and for two years President of the Network and Evaluator for European Commission.
From 2014-August 2015, he also served as a Rector –and Chancellor of the University-ASPETE.
He established the first master programme in Greece for STEM education in2015.
More information can be found at

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A+S+T *in* PERSONAL CONTEXT

Could you describe when and how you first became interested in the art+sci+tech synthesis as an idea that has had relevance to your work?

I considered that students at all levels of education would be able to advance their skills in an interdisciplinary environment. Integration-in the form of an interdisciplinary approach- of arts with other cognitive areas is considered one of the most supportive approaches for increasing student retention of content (Rinne, Gregory, Yarmolinskaya, & Hardiman, 2011)

The first time I considered that the combination of art+sci+tech should be a priority in my teaching approach was in 2013. Teaching at a HE Institute for educator engineers I applied interdisciplinary approaches using physical computing (Arduino, sensors etc) to teach scientific concepts through art artifacts. At the LAB I also developed 3d printing artifacts inspired from the work of artists like kokichi Sugihara or Takis(https://takisfoundation.org/biography/), where art is combined with the magnetic field and forms of energy(see for example https://www.youtube.com/watch?v=0Tqbym9gzX8) .

A+S+T *in* CULTURAL CONTEXT

How would you frame the new cultural context we live in?
e.g: Post Constructivism, New Renaissance, Conceptual Age, Proto Renaissance, Age of Authenticity, Post-post Postmodernism, Age of

Discoveries, Metamodernism

Culture reflects the beliefs, artifacts and ways of thinking about science, engineering etc. It also reflects the adaption to the environment, the economy, the way we share ideas etc.

In education, it corresponds to new epistemologies, the education values and the learning objectives. Taking into account the so called "fourth-industrial revolution" and the impact of machine learning, big data and how these are reflected in education, I would proceed to the "new constructivism".

What is the relationship between art+sci+tech movement and current culture? Would you consider art+sci+tech movement as a provider of new cultural context?

In 1959,. Snow(Snow,1959) referred to the "Two Cultures: repositioning the conception of the relationship between sciences and the arts and humanities in Western culture. According to (Collini,1998; Ede,2008) there are fundamental differences between arts and science , not only in epistemology and methodology, but also in the way we view and understand the world. A scientific debate about these two cultures led to a " third culture'.Recently, Artscience' has been coined as a term to combine artistic and scientific approaches can been seen as art projects which utilize scientific concepts embeddedin the culture and public needs (Born & Barry 2010, Edwards 2008 Gewin 2013,Vaage,2015).

Culture and "art-sci-tech" have a dual relationship. "Art-sci-tech" provide the tools that shape the culture. Accordingly, culture –as a manifestation of consciousness-dynamically affects art-sci-tech.

Behind Arts and Science there are common origins like economic prosperity, exchange of views, freedom in expression, production of materials. .

Who needs this art+sci+tech synthesis and is it important today?

"Art-sci-tech" interdisciplinary approach offers tools in education and the creative industry.

Education didactic models employ computational thinking concepts like abstraction, decomposition, algorithms and pattern recognition and all these are inherent in science and engineering as well as in art. Creative industry needs the imagination of artists that will feed the needs of engineering design.

"Creativity is another issue that is important in economy and society. Creative synthesis of the arts and sci¬ences is critical to the future of civilisation", and that "Solving the problems before us will require a melding of scientific knowledge, technological capacity, craft skills and artistic creativity" (Vaage,2015). The above mentioned attributes/capacities are not subject specific, and artists for example can to science/technology, through their specialized knowledge about creativity(Lowe,2008). .

What is the value in such multi-inter-trans-disciplinary R&D approach and how does it impact the evolution of human perception about the reality we live in?

Interaction between science and art has developed recently and neurobiologists, psychologists, physicists etc have sought to apply their specialist knowledge to the analysis of art and aesthetic experience (Pepperell,2015).

Through Arts we can develop a series of artifacts that will reveal the computational ramifications as well as scientific concepts. Computational Arts use tools like Arduino, P5.js etc and artifacts provide another vision of world life phenomena.

I am inclined to state that Artificial intelligence-and machine learning as well expert systems-is very close to artistic because both include intelligence.

For this reason I have included in my courses- STEM education- specific issues for machine learning in education(see for example https://machinelearningforkids.co.uk/).

A+S+T *in* ᴇᴅᴜᴄᴀᴛɪᴏɴ ᴄᴏɴᴛᴇxᴛ

art+sci+tech Learning Systems:
Integrative Education for Future Skills
art+sci+tech Learning Systems & Methodologies
Positive & Progressive Education

Why is art+sci+tech direction important to be included in Education?

The epistemological content of S.T.E.A.M (science, technology, engineering, art and Mathematics) promotes highly critical thinking skills (Kim and Park, 2012). Arts integration in education can be considered as a pedagogical approach/didactic model where students are engaged in a teaching and learning process by constructing artifacts related to other cognitive areas. According to (Silverstein & Layne,2010) students are engaged in a creative process which connects an art form with issues from other cognitive areas and during this process evolving objectives are met. According to (Silverstein & Layne,2010)there are four fundamental approaches to follow in order to integrate cognitive areas with arts.

1.Using the arts as a resource for other cognitive areas;

2.Use arts in order to increase understanding concepts from other cognitive areas

3.Use arts for interpreting ideas, concepts or phenomena from other cognitive areas(e.g improve knowledge and concept formation)

4.Use arts in order to understand real life issues

What is your view and input about introducing art+sci+tech modules in

universities, academies and life-long learning organizations and initiatives?

University Pedagogy is a new emerging field that takes into account didactic models. University Professors have realized that the traditional teaching approaches cannot provide the essential skills and capacities necessary for the knowledge economy.

University Pedagogy in integration of "art-sci-tech" should include:

•Seeking and supporting inter-disciplinary curricular initiatives that integrate the arts into the core curriculum of science-engineering-technology curriculum

•Assisting in the development of arts projects that are relevant   the research of scientists and engineers.

How do you envision the development of a shared art-sci-tech dictionary?

The linkage between arts and science is based on the freedom of expression and productivity/creativity.

The common dictionary should be based on these principles. During the Renaissance art, engineering ,science, architecture were the indicator of the renaissance man.

Science and technology refer to rules, laws and predictions. Art is more free and refers to actions that are implemented intuitively. However, counter-intuition in science, and more specifically in relativity and quantum mechanics, is an intuitive process for scientists but counter-intuitive for lay people.

How are you evaluating the current art+sci+tech education frameworks?

e.g. STEAM, Art+Science, Cross-disciplinary Strategies, Art Research, New Media Arts, Interface Cultures, etc.

There are initiatives to include –in an integrated form- art-sci-tech in the curriculum ,mainly at the primary and secondary level. The

inter-disciplinary, tarn-disciplinary and cross-disciplinary approaches have as ultimate goal to apply didactic models that lead to artifacts. The STEAM approach –that is in alignment with the contemporary learning theories- is the content approach (Psycharis, 2018).

 Content integration (Moore, 2008) focuses on the merging of the content fields into a single curricular activity or unit to highlight big ideas from multiple content areas.

Consider for example the operation of wind turbines to illustrate the power and possibilities of teaching within a fully integrated STEM context.

The wind turbine design lessons utilize robust hands-on wind turbine kits that allow teachers and students to explore the variables that impact electricity generation. Teachers had direct experiences with engineering design by considering a model construction (or they can ask students to create the model) selecting the variables of the phenomenon and the relation between the variables. During the construction, art diffuses the project by providing the creativity in the design of the artifact.(Moore,2008)

How is the art+sci+tech approach embedded in your program? What are the main methodologies you use?

There are two approaches for STEM education integration: the content integration and the context integration. These different approaches allow teachers flexibility on how they integrate STEM in their classrooms.

Content integration (Moore, 2008) focuses on the merging of the content fields into a single curricular activity or unit to highlight big ideas from multiple content areas.

Consider for example the operation of wind turbines to illustrate the power and possibilities of teaching within a fully integrated STEM context. The wind turbine design lessons utilize robust hands-on wind turbine kits that allow teachers and students to explore the variables that impact electricity generation. Teachers had direct experiences

with engineering design by considering a model construction (or they can ask students to create the model) selecting the variables of the phenomenon and the relation between the variables. Engineering design cycle is included by designing a prototype according to the scientific concepts included and by asking questions about the material, shape, and length etc of the blades. A full understanding of an optimal wind turbine design also involves developing and applying physics concepts related to electricity generation, the mathematical concepts (related to trigonometry, rotation, and gear system).

This STEM curriculum activity needs a series of lectures to be implemented and faces a problem of real life. It is usual this problem to be faced as a whole and not in separate issues (i.e. first discussing issues form physics, next move to mathematics etc).

A unit such this allows a teacher to teach concepts from each discipline and highlight how these disciplines are all needed to solve a problem in this area. In this example students can design and make their artifact, test this against the experimental data and reframe their considerations about the prototype.

This process can be implemented either by using the computational using physical computing (e.g. Arduino construction), or without using computers, i.e. unplugged computing. You can find also a very interesting example in the article of Schnittka et al. (2010).

How do you support and guide young art+sci+tech researchers and how (based on what parameters) do you assess and validate their work?

By providing examples during the course. Evaluation is based on a) formal exams that demand not only the solution of problems but mainly the description for the solution f a problem with detailed reference for the concepts of computational thinking included in the solution

b) development of an artifact during the lab work using Arduino and unplugged STEAM activities.

An example is the mystery triangles(🔲🔲 Baltic Centre for Contemporary Art (http://www.balticmill.com) ,North East England, United Kingdom). We have created the triangles using the Arduino platform.

What background is required for the experts leading such modules/courses?

Experts should have

a) good knowledge of science ideas and capacity in technological concepts

b) experience in connecting Computational Thinking(mainly abstraction in different levels) with science and technology courses

c) willingness to apply crosscutting (transversal ideas) in courses in alignment with Disciplinary Core Ideas

d) capacity to connect scientific concepts with real life phenomena

In addition, experts should promote the development of curricula that contain examples of use of e.g. concepts from engineering in arts.

For example, consider the well known Voronoi diagrams. Voronoi diagrams are created using simple mathematical formulas and they can be used in many areas of science and technology. Voronoi diagrams were invented by the Russian Mathematician Georgi Voronoi (1868-1908) and they were used by John Snow tojustify the expansion of cholera in London (https://plus.maths.org/content/uncovering-cause-cholera). Given n points we can split the spaces in n different regions using the vertical at the middle of each segment formed by two points.

The space is divided in n different regions (see figure). The region of each points is formed by the points that are closest to this point. (e.g. Barequet et al.,2002;) while Voronoi diagrams have been used in many disciplines. (e.g. Okabe,1992))
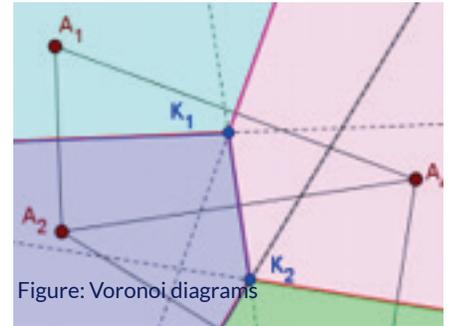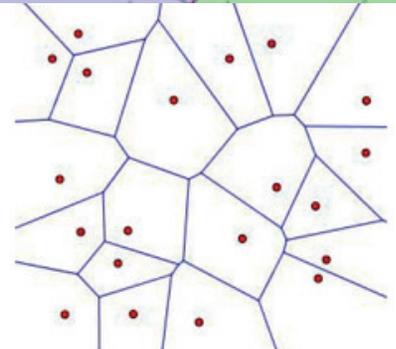

Figure: Voronoi diagrams

Voronoi diagrams have been used in Art. For example looking at the Frankfurt Marriott Hotel you can notice the Voronoi Diagrams(see figure).

Figure: Tree-Structure Canopy in Frankfurt. (Photography by Eibe Sönnecken).

Voronoi diagrams can be used in secondary and tertiary education. For example we teach mathematics and at the same time we can use the Arduino platform in order to track the pathway of a robot. Think for example how wearable sensors can be used in emergency disaster intervention. Points can be water tanks in a forest and sensors lead the firemen to the nearest points they have to follow in order to use water.

What is the transformative impact of art+sci+tech projects in science research and new knowledge communication?

a)Innovation in science research is the output of applying crosscutting ideas and creative solutions at the margins of disciplines.

b)Transformative impact of art-science-tech in science can occur mainly through designing and making artifacts that include scientific concepts connected to human experience and needs.

c)According to Wilson(2002), linking the arts with science,technology, engineering and mathematics brings the scientist, engineer and artist into a constructive dialogue which reveals issues experimentation and innovation.

d)According to (Science Education or Responsible Citizenship,2015)« Involving the social sciences helps us understand what works, what doesn't work and how to improve the quality of life for everyone».

A+S+T *in* Social context

emerging art+sci+tech platforms in Europe

What is the impact on society that you observe of the emerging art+sci+tech collaborations and in which context do you think they have a significant impact?
e.g.Innovation Labs, Artists in Labs, Living Labs, Accelerators, Hackatons, Innovation Incubators, Scientists in galleries and concert halls, etc etc …

Art-science-tech case studies aren't founded in our daily life, but they can be challenging for approaches for creative thinking and innovation. For example, Computer Graphics draw on the skills of art, science,

and technology professions to make rigorous innovative contributions to computer graphics and applications.

"The National Science Foundation and National Endowment for the Arts identified the current state of science and art discipline silos while performing a gap analysis comparing the current state of art and science practices to an ideal future state, where transformative breakthroughs in science and technology would be more likely through creativity and innovation benefitting from art's participation".(Campbell & Samsel,20150Harrell & Harrell,2010).

What is your experience of co-creation, co-construction, co-production with society and what is the common added value of such outcomes?

My team created art-science-technology activities for primary school students exhibited at the Foundation of the famous director Michael Cacoyannis (https://mcf.gr/?page_id=13543&lang=en). A team of artist created different faces with various sentiments. A small robotic was created and eyebrows had different shapes according to the sentiments.

An Arduino platform was used as the brain of the robot and a servo motor was used to move the eyebrows depending on the sentiments (see Figures)

Figures: The sentimental robot

What is the nature and quality of communication and collaboration between the European art+sci+tech platforms based on your experience? How do you see their future development?

e.g. European Digital Art & Science platform

CREAM project aimed "to bridge communities of creators with communities of technology providers and innovators, in a collective, strategic intelligence/roadmapping effort to streamline, coordinate and amplify collaborative work towards developing, enhancing, and mainstreaming new ICT technologies and tools, by addressing the needs of different sectors of the creative industries (e.g. art, culture, design etc.). The project aimed further to support the creation of multipurpose and sustainable creative ecologies, work and learning practices and business models, incorporating the diverse communities of technology innovators, art-practitioners, and key stakeholders". (Project ID: 612451, Call: FP7-ICT-2013-10; Objective ICT-2013.8.1 Technologies and scientific foundations in the field of creativity).

CREAM took into consideration and relies on several consultation documents produced in the field of technological foundation and Creativity, in particular "Create the Future Joint Research Agenda for ICT Innovations in Creative Industries" report by MFG Baden-Württemberg mbH (2009)

-Consultation workshop on Creativity hold by FET Proactive (Brussels, 2011) Creativity and ICT, FET Consultation Workshop Report (December 2011)

-ICT for the Creative Industries - Background document for the Expert Group Meeting (November 2012)

A+S+T *in* INDUSTRY CONTEXT

art+sci+tech Innovation Labs as a link between new culture - education - industry - society

What is the role and impact of art+sci+tech research projects in Knowledge Economy, Shared Econimy, Creative Economy and Cognitive economy ?

According to CREAM "The landscape of creative industries is changing rapidly as increasingly more cutting-edge technological developments are assimilated in the generation of cultural capital. At the same time, creative industries influence the evolution of ICT by offering new designs, styles and fresh outlook.

However, despite the profound impact of ICT in most of society's daily activities, ICT engagement with art seems to have been left a bit behind. To fill this gap, ICT technologies could help make art more widely accessible, more inclusive, and to generate significant awareness around it. Thus, in addition to the traditional pathways of creation, one would need to look into how ICT can further support and enhance the creative process in the contemporary arts (conceptual art, digital performance, bio-art, digital graffiti, participatory art and design), which offer experiences that are not dominated solely by the individual creator's motives and inspirations, but are transformed by the participation and contribution of the audience, which forms an equally important component of the overall artistic experience and ontology of the work" To have a more integrated picture, we could replace ICT with STEAM.

What could be the sustainable design of art+sci+tech innovation labs based on the experience you already have?

The use of digital technology and networking in artistic practice, as well as the accessibility of online knowledge, has opened up enormous possibilities in the last ten years, through the creation of new forms of public engagement and through personalised education and interaction with ever widening audiences. This allows audiences to become participants in art, either directly or indirectly and, where the art relates to science, to have an intimate and engaged relationship with science as a process. Audiences are now participants in art (Bourriaud, 2002), with significant sectors of contemporary art being directly participatory in nature. It is thus important to recognize and enhance the key role of audience input and the role of the community, which constantly re-create and re-evaluate the work.(Project ID: 612451, Call: FP7-ICT-2013-10; Objective ICT-2013.8.1 Technologies and scientific foundations in the field of creativity).

How is informed the definition of collective Human Identity via the art+sci+tech applications of new technology ?

e.g. AI, New Media: VR(Virtual Reality), AR(Augmented Reality), MR(Mixed Reality), IoT(Intenet of Things), BlockChain, Space Travel, New Internet etc.

"Artworks can be viewed in parallel to their historical and cultural context), as well as a raft of totally new forms of cultural and educational media content creation, including ebooks, i-books, e-paintings, digital 3-D/ interactive/ or immersive videos, digital storytelling, digital storyboarding, collaborative/collective story writing, interactive digital graffiti walls, new generations of collaborative and interactive electronic games and simulations"(CREAM). Internet of Things can shape the views about the world and the way we interact with the world.

A+S+T *in* .... CONTEXT

What context would you include that informs the purpose and future of art+sci+tech research development in the Triple and/or Quadruple Helix of Innovation??

There is a need for populating the ART-SCIENCE-TECH interface with easy-to-use instruments –like visual tools- which would facilitate both the understanding as well as the integration of these approaches into strategic priorities in education policies.

Triple Helix (TH) and the Quadruple Helix (QH) concepts are grounded on the idea that innovation as the outcome of an interactive process involving different spheres of actors, each contributing according to its operational function in society.

University actor should apply University Pedagogy and connection of teaching with local enterprises.

Industry should offer opportunities for University students to be engaged in the core of the industry.

Government should proceed to new innovative education policies that integrate STEAM curriculum.

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art+sci+tech

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ARAVINTH PANCH
is an activist in Global Art + Sci +Tech
Research, Education and Culture

CLASS: Global
(author of culture, historical change-maker)

TYPE: A
(messenger in idea delivery system, dot-connector,
prophet of idea dimensionality - turn 2D idea into 4D reality)

STATUS: Active
(move your body & mind & heart and make it happen)

VOCATION: Community Builder, New Media Artist
and Embedded Systems Engineer
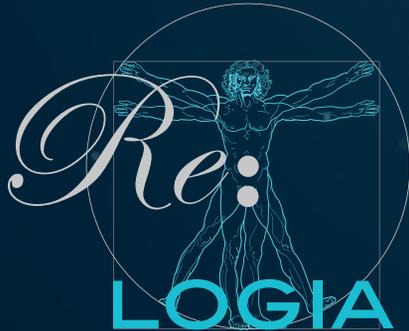
Re: LOGIA

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QUOTES
that have inspired you

"Be the change you wish to see in the world."
Gandhi

ORGANISATION
info

DreamSpace Academy
Sri Lanka
www.dreamspace.academy

RELOGIA TRIALOGUES
theme

CO-CREATIVE ENVIRONMENT
http://relogia.net

Exemplars of
AESTHETIC INNOVATION
that have
transformational effect
on people's understanding

DREAMSPACE ACADEMY

DreamSpace Academy is a Community Innovation Center with a mission to empower creative minds through Maker Education and Open Innovation, ultimately enabling them to become successful Social Entrepreneurs.
Our trainings and community projects are focused on tackling local Socio-Economic and Environmental challenges through Project Based Learning.

www.dreamspace.academy
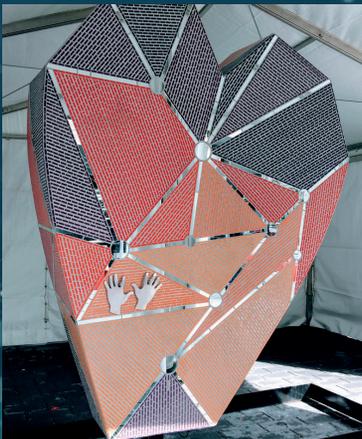
ARA BEAT

araBeat is an interactive new media art developed for the sonification of Electrocardiogram (ECG). araBeat captures ECG of interactors through gel-less electrodes, and it synthesizes high & low frequency sound in real-time, which is synchronized with the heartbeats of the interactor.

araBeat lies in the spectrum of new media art, the form of interaction with the technology is designed with aesthetics in mind using electrodes in the form of human hand.

araBeat as a public permanent art enabled the locals to hear their heartbeats and share them with fellow citizens. This changed the way how the public perceived an art, therefore created a new form of peace building.

www.arabeat.aravinth.info

BIOGRAPHY

Aravinth is **Community Builder, New Media Artist and Embedded Systems Engineer** with 15+ years of global experience.
He **co-founded 7 Startups & Social Organisations in the sector of Education, Agriculture, Sustainability & Innovation,** in Germany & Asia, and worked in 5 Hardware Startups in the spectrum of Energy, Health Care, Smart Home, Urban Mobility, in Berlin. He also researched at 4 academic Research Institutions in the field of IoT, Autonomous Vehicles, Humanoid Robotics & Machine Learning, in Berlin.
He **curates Communities in the domain of Startups, Sustainability, Education and Art**, in Europe, Africa & Asia. He is currently contributing also to an initiative of the Berlin Senate, as an ambassador for Startups affairs with Asia-Pacific countries.

http://aravinth.info

A+S+T *in* Personal context

Could you describe when and how you first became interested in the art+sci+tech synthesis as an idea that has had relevance to your work?

I have been a creator since my childhood and earned an associate degree in Multimedia Art while I was still in my high school. Later my curiosity empowered me to earn a degree in Electronics Engineering. After working in the tech industry for quite some time, I realised how I can combine my teenage interests with professional career. That is how I have engaged myself in New Media Art which synthesises Art+Sci+Tech.

A+S+T *in* Cultural context

How would you frame the new cultural context we live in?
e.g: Post Constructivism, New Renaissance, Conceptual Age, Proto Renaissance, Age of Authenticity, Post-post Postmodernism, Age of Discoveries, Metamodernism

Age of Do-It-Yourself.

What is the relationship between art+sci+tech movement and current culture? Would you consider art+sci+tech movement as a provider of new cultural context?

We are now in the culture of Maker Movement caused by the synthesis of art+sci+tech movement.

Yes, it is already happening.

Who needs this art+sci+tech synthesis and is it important today?

Kids, from their early education

What is the value in such multi-inter-trans-disciplinary R&D approach and how does it impact the evolution of human perception about the reality we live in?

Multi-inter-trans-disciplinary R&D approach allows us to create our own solutions for our own local problems, rather than using a standardised expensive solutions from corporate companies

A+S+T *in* Education context

art+sci+tech Learning Systems:
Integrative Education for Future Skills
art+sci+tech Learning Systems & Methodologies
Positive & Progressive Education

Why is art+sci+tech direction important to be included in Education?

It is necessary that Education is Multi-inter-trans-disciplinary

What is your view and input about introducing art+sci+tech modules in universities, academies and life-long learning organizations and initiatives?

Not only in Universities, it should be introduced in the early education.

How do you envision the development of a shared art-sci-tech dictionary?

Open Innovation / Open Knowledge .

How are you evaluating the current art+sci+tech education frameworks?

e.g. STEAM, Art+Science, Cross-disciplinary Strategies, Art Research, New Media Arts,

Interface Cultures, etc.

STEAM, Community Innovation, Citizen Innovations.

How is the art+sci+tech approach embedded in your program? What are the main methodologies you use?

Community Innovation

Our trainings and community projects are focused on tackling local Socio-Economic and Environmental challenges through Project Based Learning. .

How do you support and guide young art+sci+tech researchers and how (based on what parameters) do you assess and validate their work?

Co-creation and impact measurement.

What background is required for the experts leading such modules/courses?

STEAM, Multi-inter-trans-disciplinary, Project Based Learning & Challenge Based Learning

A+S+T *in* Science context

What is the transformative impact of art+sci+tech projects in science research and new knowledge communication?

Maker Education and Open Innovation are enabling them to become successful Social Entrepreneurs.

A+S+T *in* Social context

emerging art+sci+tech platforms in Europe

What is the impact on society that you observe of the emerging art+sci+tech collaborations and in which context do you think they have a significant impact?
e.g.Innovation Labs, Artists in Labs, Living Labs,

Accelerators, Hackatons, Innovation Incubators, Scientists in galleries and concert halls, etc etc ... Community Innovation Labs, Social Impact Innovation .

What is your experience of co-creation, co-construction, co-production with society and what is the common added value of such outcomes?

Founded a Community Innovation Center with a mission to empower creative minds through Maker Education and Open Innovation, ultimately enabling them to become successful Social Entrepreneurs

What is the nature and quality of communication and collaboration between the European art+sci+tech platforms based on your experience? How do you see their future development?

Several science communication programs and social organisations are established in EU with high density. Open Knowledge Foundation.

A+S+T *in* INDUSTRY CONTEXT

art+sci+tech Innovation Labs as a link between new culture - education - industry - society

What is the role and impact of art+sci+tech research projects in Knowledge Economy, Shared Econimy, Creative Economy and Cognitive economy ?

Startups are creating a change in the economy by taking an idea from a community project to a product..

What could be the sustainable design of art+sci+tech innovation labs based on the experience you already have?

Solving a real world and fundamental problems than solving luxurious first-world problems.

How is informed the definition of collective Human Identity via the art+sci+tech applications of new technology ?

RELOGIA | ART+SCIENCE+TECHNOLOGY

e.g. AI, New Media: VR(Virtual Reality), AR(Augmented Reality), MR(Mixed Reality), IoT(Intenet of Things), BlockChain, Space Travel, New Internet etc.

These new technologies are not anymore just R&D topics but already commercial applications. .

A+S+T *in* .... CONTEXT

What context would you include that informs the purpose and future of art+sci+tech research development in the Triple and/or Quadruple Helix of Innovation?

Innovation with a great economic value proposition doesn't lie only in the virtual world (internet companies) anymore. Industry 4.0 Innovations are created with the fusion of art+sci+tech.
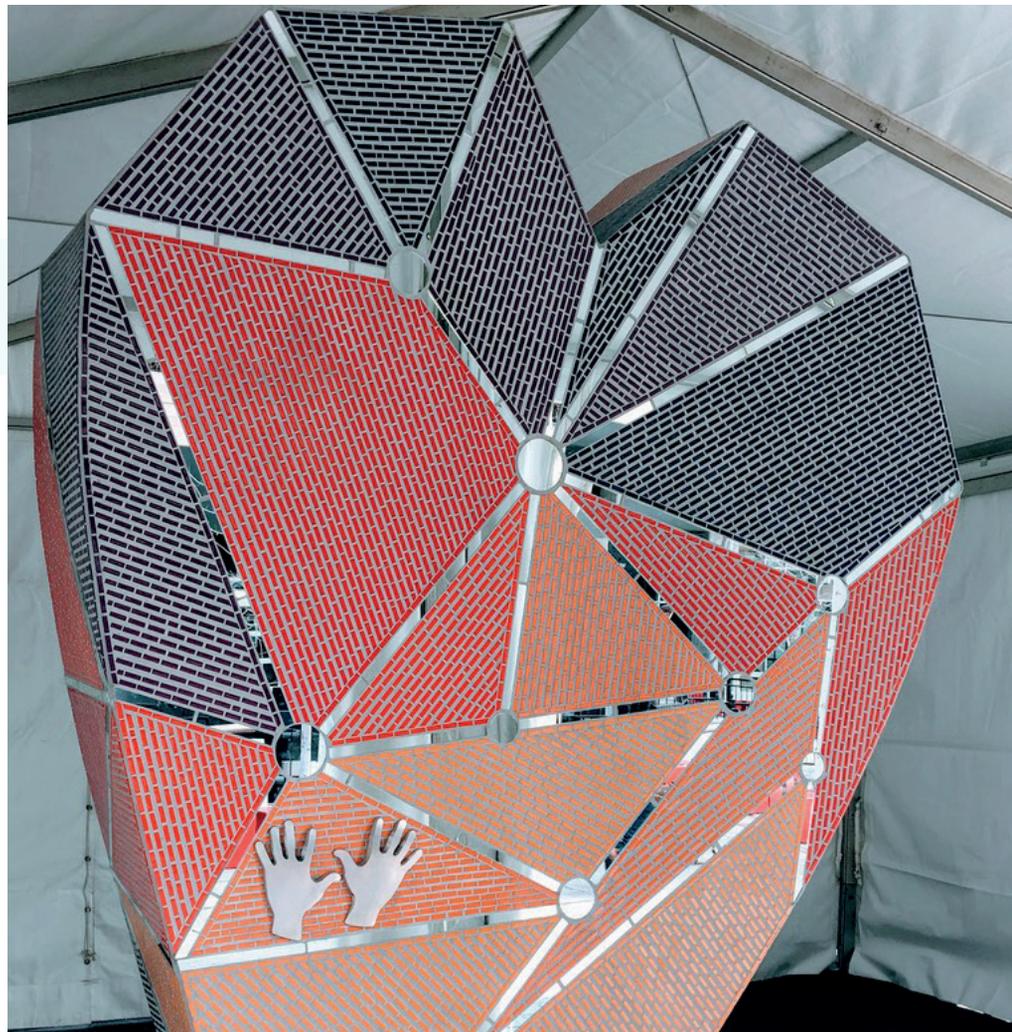
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DR BOJANA SUZIC
is an activist in Global Art + Sci +Tech
Research, Education and Culture

CLASS: Global
(author of culture, historical change-maker)

TYPE: A
(messenger in idea delivery system, dot-connector,
prophet of idea dimensionality - turn 2D idea into 4D reality)

STATUS: Active
(move your body & mind & heart and make it happen)

VOCATION: **Scientific Researcher in Process and Product
Engineering Department**
University of Applied Sciences Vorarlberg (FHV)

Re:
LOGIA

QUOTES
that have inspired you

*"Science and art sometimes can touch one another, like two pieces of the
jigsaw puzzle which is our human life, and that contact may be made across
the borderline between the two respective domains."*

M. C. Escher

*"What pattern connects the crab to the lobster, and the orchid to the primrose
and all four of them to me? And me to you?...The pattern which connects is a
metapattern. It is a pattern of patterns."*

Gregory Bateson

*"Whenever we pride ourselves upon finding a newer, stricter way of thought
or exposition; whenever we start insisting too hard upon "operationalism" or
symbolic logic or any other of these very essential systems of tramlines, we
lose something of the ability to think new thoughts. And equally, of course,
whenever we rebel against the sterile rigidity of formal thought and exposi-
tion and let our ideas run wild, we likewise lose. As I see it, the advances in
scientific thought come from a combination of loose and strict thinking, and
this combination is the most precious tool of science."*

Gregory Bateson

ORGANISATION
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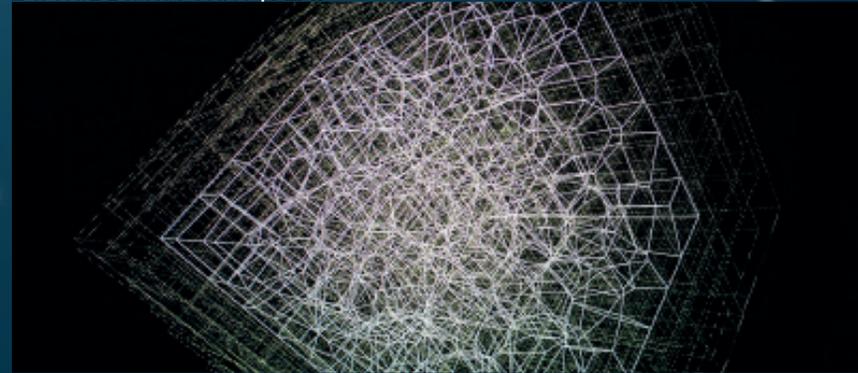theme

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FEAT (Future and Emergeing Art and Technology)

mission:

HOST AN ARTIST WITHIN YOUR PROJECT
GAIN NOVEL PERSPECTIVES,
INCREASE IMPACT
BOOST YOUR PROJECT WITH NEW CREATIVE APPROACHES

LATTICE DISRUPTION | **FEAT**

This piece is inspired by Dr. Anke Krueger's introductory papers on making artificial diamonds and their potential applications. Dr Krueger has researched the structural and chemical properties of this material, a key question in the DIACAT project which seeks to develop new technologies for the conversion of carbon dioxide into chemicals, and fuel, using visible light.

Diamond has a very ordered lattice structure whose study is a subject of solid matter physics. In this generative software work, the lattice is warped, applying a voronoi distortion. For the artist, the piece is a visual metaphor for the use of diamond's physical properties to transfer electrons, which in return causes CO_2 to break down.

featart.eu

BIOGRAPHY

Boyana Suzic is a **scientific researcher in Process and Product Engineering Department at the University of Applied Sciences Vorarlberg (FHV)**. She holds master's degree in International Business from the University of Economics in Prague and the diploma degree in Business Economics from the University of Banja Luka. Prior to joining FHV's research center Bojana has acquired diversified international experience at global companies, IT start-ups, and non-governmental organizations in the Czech Republic, Austria, and Bosnia, contributing in the roles of project and marketing manager and research associate. Bojana's interests furthermore include data science, digital marketing, and innovation management.

DR BOYANA SUZIC
RELOGIA VISION

A+S+T *in* PERSONAL CONTEXT

Could you describe when and how you first became interested in the art+sci+tech synthesis as an idea that has had relevance to your work?

Decade ago I started considering activities that fall under umbrella of system thinking of particular interests to both my professional and personal interests. The usability of interdisciplinary approaches to problem solving and decision-making started uncovering new opportunities in managing business I was part of at the time. Simultaneously, with a circle of acquaintances from diverse sectors, discussions on potentials and perspectives offered by programs such as STEAM and similar inter-disciplinary activities started to attract my attention. Later on, as my particular research focus had moved to the field of innovation, Living Lab environments and experimentation with the new forms of collaboration as a source of innovation in quadruple helix settings, the science art and tech projects have naturally attracted my attention even more.

A+S+T *in* CULTURAL CONTEXT

How would you frame the new cultural context we live in?
e.g: Post Constructivism, New Renaissance, Conceptual Age, Proto Renaissance, Age of Authenticity, Post-post Postmodernism, Age of Discoveries, Metamodernism

After coming to terms with the ending of the modern culture, today we are witnessing rapid convergences among disciplines impacted by ever-increasing changes driven by the technology, shaping the new cultural context that is yet to be defined. Art, giving a form to the collective spirit while at the same time being influenced by the technocratic transformations, is redefining boundaries at which the value is created. This happens today at the intersection of disciplines. Digitization and new forms of artificial realities are exposing new dimensions at which artistic design can take place, but also at which the innovation utilizes its capacities and value creation – in industrial, scientific and social context. Today's culture is evolving around the new technocratic societies aiming to create value from diverse interdisciplinary collaborations, which is still in the transition phase. In transitions, boundaries cannot be defined clearly. What is clear is that, based on digital technologies, great opportunities are uncovering to the cultural sector as well, new forms of collaboration are taking place, coloring the cultural context we live in today - which we could unambiguously define only in the future, in my opinion..

What is the relationship between art+sci+tech movement and current culture? Would you consider art+sci+tech movement as a provider of new cultural context?

The new contextual shape of today's culture, deeply influenced by the technological advancements, opens up new ways by which the cultural sector reaches its audiences. It also shapes the way the hi-tech sector evolves and grows. On the other hand, every new cultural representation finds its own meaning to internal impulses that occurs over a period of time, offering new ways of thinking and broadening the perception of its participants. Consequently, this opens up new valuable creation channels such is collaboration among diverse fields, which clearly exposes new models of communication between them. For example, if we consider the culture from the perspective of anthropology, defining culture as a set of communication activities, we can verify the significance of science, art and technology interaction as a way to guide today's cultural evolution.

Working closely at the intersection of disciplines influences new contexts in which the culture defines itself today. At this point, science, art and technology machinery are natural driving forces of such culture as well, which consequently influences the new cultural context we live in..

Who needs this art+sci+tech synthesis and is it important today?

The long struggle to break down barriers between science and art has opened new chapters of value creation. Not only scientific discoveries have become recognized as a fertile territory for artistic creation, but also scientists are becoming steadily more open to the value of the arts, when additional viewpoints to scientific inquiry are required. Who would prosper of the outputs of such synthesis is the society as a whole, and participants as individuals – be they accounted as institutions, companies or individuals who create or consume such outputs. This synthesis is even more highlighted as a necessity, considering the fact that digital technology is developing at much quicker pace in comparison to the speed at which transformations of the culture models are taking place. Placing science, art and technology collaborations at the focal point could aid in crossing such gaps, by making all the participants of the culture more aware of the society as a whole and interrelations between them which, if managed properly, could create win-win scenarios in all directions and for the society as a whole.

What is the value in such multi-inter-trans-disciplinary R&D approach and how does it impact the evolution of human perception about the reality we live in?

Interdisciplinary work is necessary to respond to challenges of the modern society. So far, such collaborations have influenced greatly the current blossoming of interactive systems, which are part of our everyday reality. The smartphone, for example, is a tool that is almost an extension of ourselves. To create such innovative products

involved collaborations from a wide range of professionals from diverse disciplines – engineers, designers, psychologists, sociologists, including philosophers. In this regard, art and science in combination with new technologies offer new fields of experimentation and opportunities for reaching innovative ways of interaction with reality. The manner at which participants are involved in such interdisciplinary interaction transforms the way value is created, and the process is more collaborative in its nature. In this regard, art started encompassing new forms of production and distribution of artistic experiences, while simultaneously defining new concepts upon which their art is produced. Not only they artists are using new technologies, but relationships between them and publics are taking place, manifesting in new ways. The relationships is the two-way, which is similar to what we can notice in the industrial world today - where is not enough anymore to consider techno innovations only, but is necessary to find new ways to connect with the end customer and make them more pro-active in their consumption. Transformations from passive to active consumers certainly bring changes in perceptions within civil society, both on products they consume as well as on the culture they are part of. Science, art and technology will influence such transitions by uncovering new models of collaboration and technology interactions, but also relations in both how value is created and consumed.

A+S+T *in* EDUCATION CONTEXT

art+sci+tech Learning Systems:
Integrative Education for Future Skills
art+sci+tech Learning Systems & Methodologies
Positive & Progressive Education

Why is art+sci+tech direction important to be included in Education?

In order to supply citizens with the necessary cognitive abilities to manage their future in the environment that transforms itself rapidly both in techno-centric and cultural terms, it is extremely important to amend the old educational system. The idea that education can remain unchanged in the middle of such transitions is a vicious delusion and is not of a service to citizens and to the society as a whole. This does not relate only to the technological changes in the communications system, but to the transformation of knowledge within the entire cultural system. Today, programs that support such transitions encompass interdisciplinary principles. Science, art and tech education in this regard is majorly included in elementary education, and to the certain extent is offered as a part of undergraduate studies. It is compulsory to bring it also to the higher levels of education, which requires increased understanding on the opportunities these programs offer and how they could shape the future of education. From a broader perspective, some of the goals of implementations of sci art tech modules could foster the design of the collective intelligence that is collaborative in its base. Bringing it to the micro level could mean finding a new tool to support transitions in which the today's society finds itself – be that from the educational, economic, cultural, technological or any other perspective..

What is your view and input about introducing art+sci+tech modules in universities, academies and life-long learning organizations and initiatives?

Changes in economy unconditionally leave footprints and brings changes in education, required by the demands of the new job markets. Collaboration, ideation, effective communication and interdisciplinary thinking are skills expected from graduates. Beyond education in professional skills, science, art and technology programs highlight the development of soft skills that are of crucial meaning in collaborative environments. Moreover, such programs equip students with the life-long learning adeptness, not only required in the context of the new techno-cultural context but supports them in reaching their full potentials.

How do you envision the development of a shared art-sci-tech dictionary?

Naturally, scientists, artists, engineers, who collaborate, must establish models that support clear communication, knowledge sharing as well as methods for negotiating common goals in similar fashion. This means introduction of a common language, which in its nature raises many questions and requires a time to accommodate to the possible solutions of all the difficulties that such goal imposes. To determine and communicate the utility of the effects and outputs of interdisciplinary collaboration, new methods that would encompass such requirements, are needed. However, to articulate and channel the message provided by evolving forms of interdisciplinary design would mean going beyond the creation of the common dictionary. This would mean focusing on a question of life-long learning stimulated by such creation in its foundation and the concrete starting point where it further evolves. Defining a dictionary in such terms could mean and effort to define unidentifiable empty spaces, where the actual creation happens which would not serve its foreseen purpose. Human interaction and the changes in perception should be emphasized in this regard, and I do not see a common dictionary as a tool that could be designed in this stage of the interdisciplinary interaction. However, it is important to start developing new forms and methods that would at some point provide a framework for the design of such a tool..

How are you evaluating the current art+sci+tech education frameworks?

e.g. STEAM, Art+Science, Cross-disciplinary Strategies, Art Research, New Media Arts, Interface Cultures, etc.

While being more integrated at the undergraduate level, interdisciplinary science strategies are still lacking in academic environment. Although we can see models adopted in certain environments, for example in Finland, there is still a need to support such action on the higher policy level. In this regard, we need to con centrate our efforts

on fostering communicating and exchange ideas on potentials of such collaborations. With such transitions and enhanced learning the new interdisciplinary skills develop, meaning that more innovative programs and curricula that supports it are needed in order to utilize and direct such skills. An innovative approach to the design of appropriate curricula would mean involvement of professionals from diverse fields but also creation of a space where students jointly connect in an active way, enlarging the manifold aspects of their education.

How is the art+sci+tech approach embedded in your program? What are the main methodologies you use?

At the FH Vorarlberg, we do not employ such methodologies in curricula. However, we are offering programs that embrace certain aspects of interdisciplinarity, being part of a particular program. On the other hand, I am part of the department that is dependent on interdisciplinary collaborations, aimed to foster further innovations in each specific interdisciplinary field - computer science, engineering, digital factory, robotics, business and entrepreneurship. To the certain extent, our focus has been placed on the research and implementation of projects centering on open innovation and quadruple helix collaborations so far. In this regard, we participated in the design and experimentation in the Living Lab environments and open innovation spaces, at which such collaborations but also human-centric design takes place. I see such settings as a focal point for future experimentations and studies that would advance the understanding and potentials which merging the cross-disciplinary field of science art and technology could provide – pushing experimental practices across new boundaries .

What background is required for the experts leading such modules/courses?

First of all, such educators need to have the feeling and cognitive characteristics that enclose multidisciplinary perspective, the one that entails the principles of system thinking - on the bottom of their professional background. I believe this is a crucial characteristic of an expert, who would be working in such an interdisciplinary environment. Obviously, the team employed on such modules should encompass professional competencies from the fields in question, but individually not necessarily from all the disciplines in this regard. The gap between interdisciplinary understanding by an individual expert would be managed in the applied form of the life-long learning environment, promoted by such education..

What is the transformative impact of art+sci+tech projects in science research and new knowledge communication?

Although the transformational process will take time, in the long term context the impact of such interactions, ideation and self-reflection among participants of the field involved in the process of co-creation and research design will define new ways in which research results arise, scientific thought develops and how these further influence innovation and technology take-up. Science and technology are fundamental parts of human life today, but scientific research can be demanding to understand and hard to access from the perspective of broader audiences. Interaction with artists may liberate scientists and engineers from their professional routines, providing them with an unconventional look and new perspectives on their own work. Taking into account the universality of aesthetics, adding value to science through arts may help in communicating science and technology to wider public. Mutual interactions between researchers and artists simultaneously helps scientists to grow their networks as well, extending the common scientific circle by reaching out to new input channels – new audiences. From this perspective, art is a catalyst for a systematic alteration of science and technology knowledge into innovation products, services, and processes while at the same time encouraging the involvement of citizens in particular innovation design

A+S+T *in* Social context

emerging art+sci+tech platforms in Europe

What is the impact on society that you observe of the emerging art+sci+tech collaborations and in which context do you think they have a significant impact?
e.g.Innovation Labs, Artists in Labs, Living Labs, Accelerators, Hackatons, Innovation Incubators, Scientists in galleries and concert halls, etc etc …

The simultaneous collaboration and knowledge exchange between diverse sectors will provide outputs that foster new forms of the cultural expression and the design of cultural products, affecting all the participants of the society and the way they act and see the world around themselves. Even in the short term, such collaborations may influence wider utilization of personal capacities and expansion of consciousness both of providers and receivers of the collaboration outputs. This can be further stimulated by widening perceptions based on the disciplines not previously taken into account in problem-solving, decision making and creation, in the collaborative context. Such collaborative settings are relying more and more on quadruple helix principles, setting the end-consumer as the participant of product creation. Being more closely involved in the process of co-creation and experiencing particular product, society will become more active in the creation and consumption of its products.

What is your experience of co-creation, co-construction, co-production with society and what is the common added value of such outcomes?

Over the last years, there has been an increased interest and work done regarding smart specialization strategy and quadruple helix frameworks, at the European level. By

this, we have participated in diverse projects and calls to advance research in already mentioned quadruple helix context – which envisions co-creation in a collaborative environment involving government, industry, academia and citizens in the creation process. Such initiatives are getting more attention but the research in the field requires much more notice.

Results of collaboration in the dynamic relationships that evolve in these settings, synergies among participants in the co-creation process, collaborations and value creation activities require many different types of inputs. The quality of the input, methodologies used in bringing stakeholders together and particular participatory design impact the final output of such collaborations. These differ in regard to particular setting and thematic focus of quadruple helix design. However, at this level the outputs created have to be aligned with the system of policy-making.

What is the nature and quality of communication and collaboration between the European art+sci+tech platforms based on your experience? How do you see their future development?

Art, science and technology platforms are becoming more visible and its reach to publics is expanding. Current digitalization trends aid this tendency, as well as the European policies and fund programs that are placing more focus on such collaborations, than it was the case in the past. These platforms majorly focus on bringing artists to science and technology projects in the form of residencies, resulting in a physical product of art, aiming to reach broader audiences through exhibitions or art festivals. Also, there is a number of joint initiatives, expanding its reach through growing networks of people and activities performed (e.g. Ars Electronica festival). These places are certainly improving the quality of the interdisciplinary communication, but in its nature they are adding more value to the final artistic product than to the scientific field, it seems. To reach audiences only through

artistic output is not enough. The scientific contribution should be more visible, as well as to manage weak spots. Placing particular focus on the innovation laboratories, where citizens could also participate in the process of the collaborative design, and not only interact with it, is one of the requirements in the process. Therefore, what is needed at this time perspective is to place more focus on the research that would provide more insights on how to manage the innovation spaces at which such collaboration would take place, and how to improve communication and bridge knowledge gaps that exist between diverse participants. . .

A+S+T *in* Industry context

art+sci+tech Innovation Labs as a link between new culture - education - industry - society

What is the role and impact of art+sci+tech research projects in Knowledge Economy, Shared Econimy, Creative Economy and Cognitive economy ?

Art, science and technology projects foster the design of innovative forms of production and distribution. From artistic viewpoint, it uncovers new modes of artistic experiences and perspectives from which the artistic work is approached, which can be translated to scientific and industrial environment in the same fashion. In the context of knowledge economy, such projects foster new learning experiences which are crossing the boarders of the traditional education and academic divisions, no longer viable today. Such projects support innovation in each field, relying increasingly on different types of knowledge. Such projects stimulate collective intelligence by expanding cognitive abilities and creativity, which are usually associated with innovation that further stimulates the design and uptake of new solutions in particular fields of implementation. They broaden understanding on how the interaction between different knowledge

areas is managed, and how the insights from each discipline is applicable to another.

What could be the sustainable design of art+sci+tech innovation labs based on the experience you already have?

To reach a sustainable design would mean to development specific frameworks, methodologies and tools used in the process of the creative co-design in collaborative environments. These should encompass detailed examination and studies made in the field, related to the application of particular participatory tools and its effect on every group involved in the process, how these impact knowledge sharing, efficiently bridge the knowledge gap among participants, measures for the concrete value added etc. Accumulation of experiments, which allow science, art, technology and citizens to experience change, that further leads to transitions in the long run.

How is informed the definition of collective Human Identity via the art+sci+tech applications of new technology ?
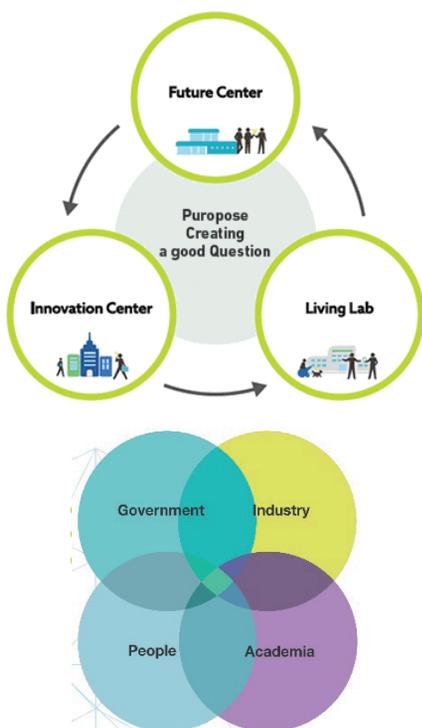
e.g. AI, New Media: VR(Virtual Reality), AR(Augmented Reality), MR(Mixed Reality), IoT(Intenet of Things), BlockChain, Space Travel, New Internet etc.

Science, art and technology collaborative experiences, participation and further innovation products resulting from it will support the cultural transformations that are inevitable in this regard. The application of technology in such interactions stimulates simultaneous development of new materials for creations and new forms of expression, which basically means a new field of interaction. Opportunities of digitization are enormous, and we need to find the way to support the participative collaborative design by the application of digital technologies. In the long range, it means reaching closer towards the balance spot, at which the newly formed collective intelligence and human identity harmoniously intervene.

A+S+T *in* .... CONTEXT

What context would you include that informs the purpose and future of art+sci+tech research development in the Triple and/or Quadruple Helix of Innovation?

We need to support the growth and evolution of society by innovating in the fields of science and art and technology individually, and bringing innovation that supports social, economic and scientific progress based on the outputs created at the intersection of these fields. By that, improving all the areas of human life and not be slaves of newly technologically imposed needs of human existence, but be able to use such needs to further innovate, create and simultaneously support transformations imposed to the culture by the new technological developments.

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Re:
LOGIA

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RELOGIA
OVERVIEW

The interdisciplinary and exponentially dynamic nature of this Age of Discoveries transforms perceptions as they existed before. The themes and topic of RELOGIA are dictated by the current highly dynamic development of disciplines developing and enriching the paradigms of human knowledge, communication and aesthetic experience.

This prompts for the adoption of a consolidated approach to the development of education and science in the EU and Bulgaria – an approach of uniting science, education, industry, social engagement, technology and art. Such a consolidated approach is featured in the STEM and STEAM models – training by uniting the methods of science, technology, engineering, art and mathematics, thus enabling learning by experience and co-creation and presenting future skills to work with concepts, abstractions and symbols.

RELOGIA aims to re:contextualize knowledge and will present the new forms of cross-disciplinary Art+Science+Technology education, research and experience of knowledge in the context of STE(A)M.

RELOGIA Conference is designed as cross-disciplinary trialogues between the pillars of Education and Culture – Art, Science and Technology – brought together in a variety of aspects by researchers from diverse cultures, nationalities, and intellectual disciplines

RELOGIA Exhibition is showing new forms of cross-disciplinary research emerging from this triple symbiosis. Art+Sci+Tech exhibition will communicate the new paradigm through interactive artefacts.

RELOGIA workshops share the knowhow of such cross-disciplinary approach applications.

RELOGIA
25 INTERVIEWS

ART+SCI+TECH
V I S I O N S
IN 7 CONTEXTS

This publication reflects the views only of the authors, and the publishers can not be held responsoble for any use which may be made of the information held therein. Its purpose is to provide and present a qualitative research about the art+sci+tech movement in multiple contexts.

Most of the texts and images used in this publication were made available to the publisher by the respective participants in the interview.