



Innovative Ways to Improve
the Culture of Living

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OUT OF THE BOX CONFERENCE 2012
Innovative Ways to Improve the Culture of Living

Programme book

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FOREWORD

In the beginning of Western philosophy in ancient Greece, the cradle of Western civilization, the philosophers were asking the first fundamental questions about the world, the nature, the universe, and among them the first, a very influential one, was Pythagoras. He has developed the extremely important philosophical thought that “all things are numbers”, meaning that the bits of the world can be decomposed into some kind of atomic elementary physical and logical units, and that their structure and evolution can be described by mathematics. His contributions in science, especially in mathematics, about which he learned a lot in Egypt, are also important. From his philosophical opinions and systems further progress emerged on the philosophical and scientific side, mainly by Socrates, Plato and Aristotle, although this evolution came to a stop until the end of the middle age, the renaissance and enlightenment.

It was Galileo, who introduced mathematical physics in the sense of mathematical description of natural physical phenomena. This has been further developed in a revolutionary way by Newton. The Newtonian physics was supplemented in the 20th Century by the emergence of quantum physics and theory of relativity, confirming that also in the microscopical, molecular, atomic, nuclear and the elementary particles level, the mathematics can be used. This series of revolutionary developments in the natural sciences lead the world towards revolutionary inventions and developments in technology, and thus affected the historical development of the human society embracing the entire mankind. Yet, the world and the human society is even more complex than what is described by the natural sciences: we have psychology, sociology, economics, and the general culture, the political organization of the society etc. We are at the edge of a new revolution aiming to understand these complex phenomena.

Let us quote the words of Professor Tassos Bountis from the University of Patras, Greece, saying: “In the last 3 decades, we have witnessed an explosive scientific activity worldwide aiming to understand, predict and hopefully control complex systems of great physical, biological, technological and social importance. These systems typically consist of a multitude of interacting components, yet exhibit a wealth of collective phenomena of self organization, pattern formation and phase transitions that cannot be explained simply by analyzing their individual constituents... [we are just about to introduce] the fundamental concepts of what has come to be known as Complexity Science, emphasizing the importance of mathematical models and what they can teach us about some basic principles of complex systems in the physical and biological sciences,” [and also sociology, economics and even politics].

Thus, in analogy with the introduction of mathematics in natural sciences in the time of Greek philosophy and later in the renaissance and enlightenment, we are about to discover the way how to describe the complex systems not only in natural sciences, but also in sociology, economics and even politics, in an almost revolutionary way, with the final goal to understand these structures and processes, and to make them stable for the better of the entire society, even in the worldwide context. The utility of computers and information systems to collect and process all the necessary data is of primeval importance in this undertaking.

Society has become extremely complex and fragile, and even apparently limited and local activities can have unintended far-reaching and global consequences. The result is that the world finds itself facing challenges on a global scale which are beyond the capacity of leaders from any given background to solve. It is not possible to find solutions to today's problems either in geographical

isolation, or by restricting oneself to individuals sharing the same mind-set and tradition. Rather it is necessary to adopt approaches which are interdisciplinary rather than dependent on a narrow skill-set, multi-scale rather than local, and cooperative rather than competitive.

The general mission of the Out of the Box Conference is to organise an interdisciplinary meeting in which experts from a variety of backgrounds can discuss human problems of common interest. We hope that these meetings will enable people of different backgrounds to find a common language which will enable ideas for sustainable global solutions to emerge. Thus the Out of the Box Conference shall also (re)activate one of the most significant potential of universities - their multidisciplinary.

The 2012 Out of the Box Conference runs under the title Innovative Ways to Improve the Culture of Living and has the following goals:

To address the key problems and obstacles which hold back our civilization and the whole planet on a way to a higher quality of life.

To find innovative ways which might enable our civilization to overcome the complex problems that are holding back the evolution of our civilisation.

To develop a systematic means of communication between scientists, artists and professionals from different areas.

The conference is organized by the University of Maribor, the second biggest university in Slovenia and an important regional player of social, economic and technical development. University of Maribor is a broad-based institution committed to excellence in education, the extension of knowledge through basic, advanced, and applied world-quality research, and creative and artistic expression. With its complement of arts and sciences, law, business, engineering, medicine, and pedagogy, the University promotes cooperation, competition, and multidisciplinary.

We, the organizers, have invited a number of outstanding thinkers, experts, scientists and spiritual leaders from all over the world, to present their topics within the scope described above. Among them we have three Nobel Prize Laureates, namely His Holiness The Dalai Lama (Peace), Muhammad Yunus (Peace) and Jean-Marie Lehn (Chemistry). Nine keynote speakers and twenty one other invited speakers will cover topics from natural sciences and mathematics, to psychology, sociology and philosophy, to engineering and technology, medicine, physiology, architecture and arts, among them high ranking politicians and - last but not least - also humanitarian workers.

This programme book contains a collection of the abstracts of all invited lectures, which offers the readers a good overview about the detailed conference topics.

We are happy to welcome all invited guests and other participants at the University of Maribor on this occasion, and wish all of them a pleasant and intellectually fruitful stay during the conference.

Sincerely Yours,



Professor Dr. Marko Robnik
Coordinator of the OBC



Professor Dr. Danijel Rebolj
Rector of the University of Maribor



PROGRAMME SCHEDULE

Please find the detailed programme schedule for each day on the following pages.

Hour	TUESDAY, 15 MAY	WEDNESDAY, 16 MAY	THURSDAY, 17 MAY	
9	REGISTRATION	REGISTRATION (SNG)	KEYNOTES	
10	OPENING KEYNOTES	SPECIAL SESSION WITH WORLD THINKERS (SNG)		
11	 INVITED SPEAKERS		INVITED SPEAKERS	
12				
13		AFTERNOON KEYNOTES		
14	AFTERNOON KEYNOTES		AFTERNOON KEYNOTE SHORT REPORT INVITED SPEAKER	
15		INVITED SPEAKERS	CONCLUDING REMARKS	
16	INVITED SPEAKERS & SHORT REPORT		SPECIAL SESSION WITH MUHAMMAD YUNUS	
17		INVITED SPEAKERS		
18				
19				+ FRIDAY, 18 MAY AT 11:00
20			CONCERT	OBC FOLLOW UP EVENT SPECIAL SESSION WITH JEAN-MARIE LEHN

day 1 Tuesday, 15 May 2012

Great Hall / Velika Dvorana
University Main Building, Slomškov trg 15

08:30 - 09:30	<i>Registration</i>	chair: Dejan Dinevski
09:30 - 10:10	Rector of the University of Maribor, Danijel Rebolj Minister Žiga Turk President of the European Academy of Sciences and Arts, Felix Unger Feguš String Quartet	14:00 - 14:45	The creative use of visual and spoken narrative to help people and policy-makers understand our connected world Steven Bishop, University College London, UK
.....	chair: Marko Robnik	14:45 - 15:30	Does beauty make us kinder? Piero Ferrucci, Firenze, Italy
10:15 - 11:00	The music of life Denis Noble, University of Oxford, UK	15:30 - 16:00	<i>Coffee & Tea</i>
11:00 - 11:30	<i>Coffee & Tea</i>	chair: Dušan Repovš
.....	chair: Danijel Rebolj	16:00 - 16:30	Complexity science and the role of mathematical modeling Tassos Bountis, University of Patras, Greece
11:30 - 12:00	The obstacles only exist inside people's heads! Ivo Boscarol and Gregor Veble, Pipistrel, Ajdovščina, Slovenia	16:30 - 17:00	Observing the brain to know ourselves Sara A. Solla, Northwestern University, Chicago, USA
12:00 - 12:30	How to make the world and humanity aware of the worst sufferings of people: The case of Sudan Tomo Križnar, Naklo, Slovenia	17:00 - 17:30	What can we learn from microbes? Maja Rupnik, University of Maribor, Slovenia
12:30 - 13:00	New development in the therapy of basal cell carcinoma Thomas Ruzicka, LM University of Munich, Germany	17:30 - 18:00	From flirt to innovation: How to establish network ties between science and industry Andreas Kornherr, Mondi, Ulmerfeld-Hausmening, Austria
13:00 - 14:00	<i>Lunch</i>	18:00 - 18:15	Insights on self management from life of Mahatma Gandhi Ipshita Bansal and Ms. Niharika Bajpai, Banastahli University, Rajasthan, India
		19:00 -	<i>Wine tasting and light dinner</i>

day 2 Wednesday, 16 May 2012

Slovenian National Theatre (SNG)
Maribor, Slomškov trg, Large Hall

09:00 - 10:00 *Registration*

10:00 - 12:00

Special session with World Thinkers

Moderated by Danijel Rebolj, Rector of UM

H.H. Dalai Lama, Nobel Peace Prize Laureate

Life as process: a systems biology reply to the question "what is life?"
Denis Noble, University of Oxford, UK

New ways to promote sustainability, resilience and well-being in our complex world: The FuturICT approach
Dirk Helbing, ETH, Zürich, Switzerland

The n-fold road - Towards better way(s) of life
Siegfried Grossmann, University of Marburg, Germany

12:00 - 13:00 *Lunch*

Great Hall/Velika Dvorana
University Main Building, Slomškov trg 15

..... chair: Sara A. Solla

13:00 - 13:10 **About the Cultural Center of the European Space Technology-KSEVT**
Dušan Petrač, NASA, Jet Propulsion Laboratory, Caltech, Pasadena, USA

13:10 - 13:55 **After media industry: Media culture - the future dispositive of society's development**
Thomas Bauer, University of Vienna, Austria

13:55 - 14:40 **Towards a biophilic future: Culture and human nature**
Juhani Pallasmaa, Helsinki, Finland

14:40 - 15:10 *Coffee & Tea*

..... chair: Marjan Slak Rupnik

15:10 - 15:55 **String theory and quests for unification of fundamental forces of nature**
Mirjam Cvetič, University of Pennsylvania, Philadelphia, USA

15:55 - 16:25 **How to improve fundamental research in developing countries:
UNESCO diploma program in mathematics and physics at ICTP**
Dušan Repovš, University of Ljubljana, Slovenia

16:25 - 16:45 *Coffee & Tea*

..... chair: Denis Noble

16:45 - 17:15 **Quantum physics out of equilibrium: A new paradigm of computation and information**
Tomaž Prosen, University of Ljubljana, Slovenia

17:15 - 17:45 **Synthetic biology announcing the coming technological revolution**
Roman Jerala, National Institute of Chemistry, Ljubljana, Slovenia

17:45 - 18:15 **The lure of the media: Discourse as social cognition**
László I. Komlósi, University of Pecs, Hungary

19:00 - 21:30 *Conference Dinner*

day 3 Thursday, 17 May 2012

Great Hall/Velika Dvorana
University Main Building, Slomškov trg 15

- chair: Steven Bishop
- 09:00 - 09:45 **FuturICT – Global participatory computing for our complex world**
Dirk Helbing, ETH, Zürich, Switzerland
- 09:45 - 10:30 **Sustainability of automobile fuels**
Amarjit Singh, University of Hawaii at Manoa, USA
- 10:30 - 11:00 *Coffee & Tea*
- chair: Mirjam Cvetič
- 11:00 - 11:30 **Innovative ways to improve the culture of living towards health and wellness**
EU Commissioner John Dalli, Brussels, Belgium
- 11:30 - 12:00 **Beta testing**
Marjan Slak Rupnik, University of Maribor and CIPKEBIP, Slovenia
- 12:00 - 12:30 **Omnipresent sensor systems - the pros and cons of monitoring almost every aspect of our world – environment, processes, humans** Volker Ribitsch, University of Graz, Austria
- 12:30 - 13:00 **UNESCO's contribution to global challenges**
Rosanna Santesso, UNESCO, Venice, Italy
- 13:00 - 14:00 *Lunch*

- chair: Tassos Bountis
- 14:00 - 14:45 **Challenge higher education** Siegfried Grossmann, University of Marburg, Germany
- 14:45 - 15:00 **Conventional religiosity and new age beliefs as predictors of subjective well-being in Europe** Andrej Kirbiš and Sergej Flere, University of Maribor, Slovenia
- 15:00 - 15:30 **Buddhist philosophy and modern society**
Geshe Ngawang Samten, Central Univ. of Tibetan Studies, India
- 15:30 - 15:45 **Concluding remarks** Rector of UM Danijel Rebolj
- 16:00 - **Social Business: A way to solve society's most pressing problems**
Lecture of Muhammad Yunus, Nobel Peace Prize Laureate
- 18:00 - 18:45 *Dinner*
- 20:00 - *Concert in the Cathedral, Slomškov trg* Graz University Orchestra, Austria

day 3+ Friday, 18 May 2012

Great Hall/Velika Dvorana
University Main Building, Slomškov trg 15

- chair: Danijel Rebolj
- 11:00 **Jean-Marie Lehn, Nobel Prize Laureate (for Chemistry)**
From matter to life: Chemistry? Chemistry!

COMMITTEES

Out of the Box Conference 2012 is under the auspices of

Danilo Türk, the President of the Republic of Slovenia

Honorary Committee

Žiga Turk, Minister of education, science, culture and sports of the Republic of Slovenia

Stane Pejovnik, rector of the University of Ljubljana

Danijel Rebolj, rector of the University of Maribor

Suzana Žilič-Fišer, director general of European Capital of Culture Maribor2012

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Danijel Rebolj, concept

Marko Samec, visual design

Alenka Jarc, conference secretary

Mladen Kraljić, organization and communication

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Dean Korošak, link with RAZ:UM

Marko Ivanišin, communication

Damir Mlakar, protocol

Jože Furman, general assistance

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World, University of Sorbonne Paris IV

Dimitris Charalambis, political theorist, University of Athens

Mirjam Cvetič, Department of Physics, University of Pennsylvania

Péter Érdi, Center for Complex Systems Studies, Kalamazoo College

Piero Ferrucci, psychotherapist and philosopher

Christos Giannoulis, management consultant, Cyprus

Dirk Helbing, Chair of Sociology, ETH Zürich

Joan Hemmels, Emeritus at Amsterdam School
of Communication Research

Roman Jerala, National Institute of Chemistry Slovenia

Magdalena A. Kalaidjieva, Bulgarian Society for Systems Research

Barbara Köpplova, Department for Media Studies,
Charles University in Prague

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University of Maribor

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University of Munich

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Hokkaido University

Tatjana Welzer-Družovec, Faculty of Electrical Engineering
and Computer Science, University of Maribor

ABSTRACTS OF INVITED LECTURES

The following section includes the Opening remarks by Felix Unger followed by abstracts in alphabetical order of all speakers.

Nobel laureates

H.H. Dalai Lama, Nobel Peace Prize

Muhammad Yunus, Nobel Peace Prize

Jean-Marie Lehn, Nobel Prize in Chemistry

Keynote speakers

Thomas Bauer, University of Vienna, Austria

Steven Bishop, University College London, UK

Mirjam Cvetič, University of Pennsylvania, Philadelphia, USA

Piero Ferrucci, Firenze, Italy

Siegfried Grossmann, University of Marburg, Germany

Dirk Helbing, ETH Zürich, Switzerland

Denis Noble, University of Oxford, UK

Juhani Pallasmaa, Helsinki, Finland

Amarjit Singh, University of Hawaii at Manoa, USA

Invited speakers

Ivo Boscarol, Pipistrel, Ajdovščina, Slovenia

Tassos Bountis, University of Patras, Greece

John Dalli, EU Commission, Brussels, Belgium

Roman Jerala, Institute of Chemistry, Slovenia

László Imre Komlósi, University of Pecs, Hungary

Andreas Kornherr, Mondi, Ulmerfeld-Hausmening, Austria

Tomo Križnar, Naklo, Slovenia

Geshe Ngawang Samten, Sarnath, Varanasi, India

Dušan Petrač, Jet Propulsion Laboratory, NASA,
Caltech, Pasadena, USA

Tomaz Prosen, University of Ljubljana, Slovenia

Dušan Repovš, University of Ljubljana, Slovenia

Volker Ribitsch, University of Graz, Austria

Maja Rupnik, Public Health Center Maribor,
and University of Maribor, Slovenia

Thomas Ruzicka, LM University of Munich, Germany

Rosanna Santesso, UNESCO, Venice, Italy

Marjan Slak Rupnik, University of Maribor and CIPKEBIP, Slovenia

Sara A. Solla, Northwestern University, Chicago, USA

Felix Unger, European Academy of Sciences and Arts,
Salzburg, Austria

Opening remarks by Felix Unger

President of the European Academy of Sciences and Arts

St.-Peter-Bezirk 10, 5020 Salzburg, Austria

“Out of the Box” is a very challenging title, especially when the subtitle „Innovative Ways to Improve the Culture of Living “ is considered.

This gives new incentives and stimuli to our whole society. The time is appropriate. We are all frightened by the financial crisis which endures in Europe and gives mixed feelings looking towards the future.

There is something wrong in our society and culture, a statement which has been done by Hamlet. We lost the values or define them too superficially and secondarily. A principal way to improve the culture of life is starting to consider the real values, which is the easiest but also most difficult part in our life. Definitely life per se has the highest value, it is too less in our conscious. Man as centre seems to be displaced in our society. From this top of the highest value - the life - we can derive all our doing and as ethical issues to transform our knowledge to other people.

The prerequisite to improve the culture of our living are we self. We self are the example to our children, to the next, to our next generation how we should act to be prepared to the future.

The financial crisis is a typical indicator for the present time: We lost the human dimension and value in our thinking. The whole financial crisis reflects the severe change from a real-economy to finance-economy. In the real economy the human has to play certainly a role, all doing is centred to man. In the finance-economy all serves the money. This results in an edge for jobless people falling into poverty.

In the way of “living together” we have a virtue: the tolerance. Tolerance can be educated. You as well educated man is giving a good example directly. It is necessary to

recognize and to respect the meaning of the others and to discuss opposite positions. Mostly in discussing opposite positions you learn a practicable new position as a new way to improve the “Culture of Living”. I see that all our doing - sciences as well - have to serve man in his existence. All other things lead to the dance around the “Golden Calve” in a finance-economy quickly resulting in an exploitation of all, the human resources and the nature as well.

Being life orientated needs a new form of education. I have to stress again that an important way of living together can start only with the recognition of all our values where we keep life as highest value, in respect to the other one, in treating the other respectfully and in avoiding any exploitation of the others. We have simple to motivate us to the life and act toward a contribution to life. In motivating we bring all to a new human dimension future directed. This I understand as an innovation way improving the present “Culture of Living”.

Those meetings are indispensable to rethink the human position.

After Media Industry: Media Culture - The Future Dispositive of Society's Development

Thomas A. Bauer

University of Vienna, Austria

The term of „Media Society“ marks an epochal social and cultural change saying that the societies globally increasingly turn to be or to assert what their media status is like. Societies more and more get constituted in the mode of media, its aesthetical and social design. Even if the term of a media society is a myth, it is the myth and the facts of media change that pushes societies into a new and so far unknown formation.

Society is what its communication is like. Both, society and communicates as culture as well, are constructs done and used in the interest of social and cultural sustainability. Any communication is defined by its mediality as this is the structural environment of social communication. But media has the tendency to shape or even to dominate the message since media is the frame of reference for comparability of status, prestige, identity, and need of social observation.

For long time most of the organized societies get used with their internal and external communication structure in relation to politics, economy, everyday life culture etc. to a media order in the manner of the distributive mass media (massmedia communication). Facing now the new media development (social media) the traditional structures of communication, mostly following the industrial models of Taylorism and Fordism - partialisation of media competence in roles of production and consumption, and doing that with increasing automatization – makes us aware that organized societies have “democratized” economical structures, but not communication culture. There is an aporia of how to develop social changes sustainable.

The future of media communication will be: more communication, less organization, less logics of sorrow, more logics of experiment, which is indeed a post-modern phenomenon.

The future of media communication will count more with competences of authenticity, situativeness, networkability and less with organizational (domination) interests.

The lesson to be learned: ecological culture of social attention: diversity, inter-culturality, value of difference and public value of media competence.

The creative use of visual and spoken narrative to help people and policy-makers understand our connected world

Steven Bishop

Department of Mathematics, UCL, Gower Street, London WC1E 6BT, UK

Introduction

Many policy decisions end up in a story telling. Get the narrative right and everything falls into place; the reasons for the action are understood by all, models to support the decision are correctly formulated, the factors considered are comprehensive and the public acceptance of solution is high. Information and communication technologies (ICT) are critical in each of these areas. But how do we arrive at a narrative, especially for new problems without history to help us? That is, how can we turn new science into a narrative? How can we translate mathematical and computational models – which can help understand events – into mental models that can easily be turned into narrative? What language do we use to do this? How does a visual, or graphical, narrative usefully complement other techniques? How can we assess the take-up of any narratives and how do we quantify public opinion? What is the role of media in shaping this narrative? To answer these questions and better engineer the use of science in policy-making, we need to creatively stimulate interaction between science, technology, language and art.

This presentation will explore how art and language may be used improve our understanding of decision-making. At the same time, stimulating new interactions between science, technology and art may lead to wider engagement and a better understanding of social wellbeing that goes beyond measures of GDP.

The Role of Modelling

In some sense, a process of simplification has already begun. In the mathematical world the study of linked

systems for policy models has various labels. When the network produces 'surprising' outcomes, such as patterns or other emergent properties, the systems are called complex systems. However, to avoid any negative aspects and a feeling that the systems are too complicated, a number of researchers are now referring to such systems as 'global systems' [1]. But the main problem is that these global systems include people. As opposed to the study of many physical systems where the study does not affect the system, for socio-economic systems the modelling of the system and the system itself are tightly coupled. In his work with Jenkins-Smith, Paul Sabatier [2] effectively stated that policy models should include the policy-maker within the model rather than as an observer. The use of Facebook and twitter to both disseminate and glean information is an extreme version of this idea, where we need to include the collective and yet almost individual effects of a certain policy if we wish to guarantee its successful uptake. A requirement therefore is to develop models that incorporate the actions of the key agents that can influence the system, given the outcomes of the modelling, whilst avoiding tautological arguments.

In some cases, the use of complex systems models are widely accepted, when the key entities in the systems are defined, or where the social interactions are highly predictable (for example in military planning or in project management). However where the behaviour of the entities in the systems are much less certain (for example, people acting independently), the assumptions and predictions of models are also uncertain, and may be controversial. Although certain models provide insights into these systems, such as economies close to

equilibrium or concepts of happiness in psychology, they are not generally trusted as a basis for policy-making. But the language and concepts of complex systems, especially with ICT advances contributing new sources of data, massive simulations and innovative visualisation, provides a way of comparing models, concepts and policies of decision-makers that could lead to clearer public discussion and narrative, and ultimately to better policies. The role of modelling is to produce constructed similes that can be questioned, criticised and refuted. Global systems themselves form of metaphor or narrative to explain emerging behaviour in connected systems.

ICT and Art

Information and communication technologies are changing the way we live and work, they are changing our social habits, the perception of ourselves and how we link to the world around us. But so does art! ICT can create accurate representations of the world as well as fictitious ones through games and avatars living in a cyber world. Likewise an artwork can both represent reality or an imaginary or fictional world and thus, both ICT and art, can provide a narrative in response to the current societal challenges. We know that works of art can reach audiences on intrinsic emotional levels and influence their emotional state producing long-lasting effects. We also know that artists excel at lateral thinking. Therefore, by exploring the link between art and ICT we can encourage people to explore the box they live in as well as thinking outside it, with the aim of stimulating societal change.

References

[1] <http://www.gsdp.eu>.

[2] Sabatier, P.A., and Jenkins-Smith, H.C., eds. *Policy Change and Learning: An Advocacy Coalition Approach*. Boulder: Westview Press, 1993.

The obstacles only exist inside people's heads!

Ivo Boscarol & Gregor Veble

Pipistrel d.o.o. Ajdovščina, Goriška cesta 50A, 5270 Ajdovščina, Slovenia

Pipistrel is the world's leading designer and manufacturer of advanced light aircraft and self-launching gliders. With its products, Pipistrel sets global aviation standards. From the very beginning, the aircraft have been built according to the "glider philosophy"; meaning they have a very low drag and high lift. The consequence of this is that the Pipistrel aircraft are much quieter and faster than the competition and also have a much lower fuel consumption. It is no wonder then, that they keep winning major awards and titles: the World Championship title, a record-breaking flight around the world, three victories in the NASA Challenges. In 2007 Pipistrel introduced world's first two-seat electric aircraft, followed by the world's first fully electric 4-seater in 2011. All these successes and achievements lead to one of the most prestigious business awards, the 2010 Europea Business Award for Innovation, when Pipistrel was chosen for the most innovative company in the European Union from among 15,000 competitors. The Taurus Electro won the 2011 Lindbergh award for the best electric aircraft. Finally, the president of the republic of Slovenia, Dr. Danilo Türk, decorated Pipistrel with the highest civil decoration in the Republic of Slovenia, the Golden Order for Services to the Country.

So what is it that sets Pipistrel apart from all the competitors? The CEO Ivo Boscarol will introduce his business philosophy and his secret of success.

Complexity Science and the Role of Mathematical Modeling

Tassos Bountis

CRANS - Center for Research and Applications of Nonlinear Systems, University of Patras, 26500 Patras, Greece

In the last 3 decades, we have witnessed an explosive scientific activity worldwide aiming to understand, predict and hopefully control complex systems of great physical, biological, technological and social importance. These systems typically consist of a multitude of interacting components, yet exhibit a wealth of collective phenomena of self – organization, pattern formation and phase transitions that cannot be explained simply by analyzing their individual parts. These phenomena may sometimes be beneficial and helpful to our progress, but – as we now know all too well – can also threaten and deeply shake the fabric of our society. In this lecture, we will discuss the fundamental concepts of what has come to be known as Complexity Science, emphasizing the importance of mathematical models and what they have taught us about some basic principles of complex systems in the physical and biological sciences. In particular, I will report on certain very interesting quasi – stationary states with complex statistical properties in weakly chaotic regions of conservative dynamical systems.

Chaotic Orbits in Conservative Maps in the Context of the Central Limit Theorem, Intern. J. Bifurc. Chaos, February 2012.

[5] T. Bountis and H. Skokos, Complex Hamiltonian Dynamics, Springer Synergetics series, (March 2012).

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String Theory and Quests for Unification of Fundamental Forces of Nature

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In past decades, string theory has emerged as the prime candidate for a quantum unification of electromagnetic, nuclear and gravitational forces. Geometrical aspects of string theory, and in particular the existence of extra dimensions, shed light on many important fundamental questions, including the microscopic structure of black holes and the geometric origin of particle physics. We review certain aspects of these developments and their impact on quests to gain insights into fundamental workings of nature.

Innovative ways to improve the culture of living towards Health and wellness

EU Commissioner John Dalli

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Does beauty make us kinder?

Piero Ferrucci

Firenze, Italy

In this presentation we will deal with two vital resources, kindness and beauty. We will also study some aspects of the relationship between the two.

Kindness is a readily available resource. By kindness I do not mean only social courtesy, but a composite of several factors – in my book *The Power of Kindness* I have indicated eighteen: sincerity, forgiveness, warmth, sense of belonging, contact, trust, empathy, attention, humility, patience, generosity, respect, flexibility, loyalty, memory, gratefulness, service, joy.

Kindness in its many aspects has been shown to affect us deeply, both when we are recipient of it and when we feel it and express it to other human beings. Studies show that some aspects of kindness, such as empathy, are deeply ingrained in the functioning of the human brain, and that the homo homini lupus philosophy – the traditional view that human beings are at war with each other and act only out of selfish motives, is false or at least largely imprecise and incomplete. We also know that altruistic and caring behaviors are widely present in many animal species, especially in such forms as a sense of fairness, empathy, mutual help, and warmth.

Kind people live longer and are in better health; they are more successful in their business, need less psychotherapy, often are fitter and smoke less. Above all, kindness is an end in itself: it is experienced as valuable independently of any ulterior benefits it may offer. In recent years more and more studies have shown that feelings and behaviors which have to do with kindness and care are not just socially learned coping patterns or even defense mechanisms to protect ourselves from feelings and

impulses which are incompatible with our self-image, but authentic, spontaneous needs and emotions springing from the depth of our being. They can also be seen as adaptive attitudes which have helped us human beings survive in the course of our evolution. The idea that kindness is a fundamental inborn human trait is crucial to a fair and thorough understanding of human nature.

Beauty is often linked with competition, richness, exclusiveness, and envy. It is also associated with jealousy, compulsive cosmetics, fear of aging. But the experience of beauty itself is freeing, nourishing, uplifting, and transforming. By “beauty” I mean the experience of beauty such as we may have in a variety of contexts: for instance, listening to a piece of music, contemplating the starry sky, looking at a face, reading a poem, watching a movie. It also comprises everyday situations; people may have an experience of beauty as they look at the reflections of the sun on a piece of metal, or the shape of a fallen leaf, or as they listen to the pitter patter of the rain. Most important, there is such a thing as inner beauty: for example, the beauty of intelligence, of caring and generosity, of vivaciousness and humour.

Beauty has rarely been researched as such, because the word is too general and vague, and also perhaps because to many it sounds old fashioned. However, an ample volume of research shows that more specific activities manifestly connected with the aesthetic dimension of life, such as learning a musical instrument, spending time in nature, going to an exhibition, reading a book, producing a painting, singing, doing drama, are highly beneficial to physical and mental health. Also, studies show that art school benefits academic performance in all fields,

that it improves physical and mental health, stimulates intelligence and liveliness, increases self esteem, evokes prosocial attitudes and behavior.

In the past few years I have investigated the effects beauty can have on the human psyche both through my own work as a psychotherapist, as well as by interviewing a variety of individuals. The results are extremely encouraging, and show that beauty in all its aspects is a readily available resource to all. There may exist something we could call “aesthetic intelligence”, the capacity to appreciate beauty, which can be cultivated and developed. Unfortunately, for a variety of cultural and historical reasons, it is underrated; beauty is not appreciated in its full potential, and is often presented in schools in ways that are boring and too rigid and abstract. Many people think that in order to appreciate beauty you should be highly cultured, or need money to afford great works of art in your home or travels in expensive places and exclusive resorts; or, deep down, they feel threatened by the extremely powerful effects the experience of beauty may have on their personality, or they may feel they do not deserve it.

One important benefit of the aesthetic experience is that it can move us powerfully, so helping us to shed our masks and roles, and get in touch with more authentic elements of our being. Once we have at least partly outgrown limited models of beauty – consumerism, possessive outlook, competition, preoccupation with one’s own physical appearance, materialism, stereotyping, cultural clichés, preconceived preferences, aesthetic habits – we can learn to develop our aesthetic intelligence, both in its range as well as in its intensity. The experience of beauty can make our prosocial attitudes stronger for at least two reasons.

One is that the instinctive need most of us feel in front of beauty is to share it. Beauty that is shared with other people is felt as stronger and more enjoyable. Secondly, the experience of beauty makes us open, spontaneous, empathic. Research shows that in that state we are more drawn to altruistic attitudes and behavior.

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Challenge higher education

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The importance of the well-being and prospering of higher education for “Improving the Culture of Living” will be addressed in several subtopics. a) Physics educates – Science educates, why and how it contributes to the culture of living. b) The unity of research and teaching has to be fostered and cultivated. i. Research is free and independent. It presently suffers from tendencies of either permanently being measured or becoming increasingly commercialized. But technical development and innovation need input by free flow of original ideas. These rarely come upon request, but need free and independent thinking, and free time for it. Thus project-oriented support alone will neither be effective nor sustainable. ii. University teaching is a source of research and research keeps teaching at the frontier of scientific progress, if connected in the sense of Humboldt’s great idea!

c) The Universities are highly responsible also for modern teaching at High Schools as well as Elementary Schools via teachers’ education. They thus have to consider modern teachers’ education as a prominent task sui generis. d) Society has the right to free access to its own research results. In the age of internet the means of publishing have changed and will go on changing. The distribution of research results can no longer be punished by the loss of the researchers’ copyright. This must indispensably stay with the authors, independent of commercializing it. e) Higher education has to take care of our cultural memory. The threatening loss of modern cultural documents is alarming: How can we archive data besides of printed material and what should we preserve in the huge data flow? – Thus, summarizing, higher education is not only a wonderful part of our life but also a most important and

indispensable prerequisite for our culture, now and in the future. Let us all feel responsible for its prospering and well-being, for our culture of living!

FuturICT – Global Participatory Computing for Our Complex World

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The ultimate goal of the FuturICT flagship project is to understand and manage complex, global, socially interactive systems, with a focus on sustainability and resilience. Revealing the hidden laws and processes underlying societies probably constitutes the most pressing scientific grand challenge of our century and is equally important for the development of novel robust, trustworthy and adaptive information and communication technologies (ICT), based on socially inspired approaches.

Integrating ICT, Complexity Science and the Social Sciences will create a paradigm shift, facilitating a symbiotic co-evolution of ICT and society. Data from our complex globe-spanning ICT system will be leveraged to develop models of techno-socio-economic systems. In turn, insights from these models will inform the development of a new generation of socially adaptive, self-organized ICT systems.

FuturICT as a whole will act as a Knowledge Accelerator, turning massive data into knowledge and technological progress. In this way, FuturICT will create the scientific methods and ICT platforms needed to address planetary-scale challenges and opportunities in the 21st century. Specifically, FuturICT will build a sophisticated simulation, visualization and participation platform, called the Living Earth Platform. This platform will power Crisis Observatories, to detect and mitigate crises, and Participatory Platforms, to support the decision-making of policy-makers, managers, and citizens.

More information see www.futurict.eu

Synthetic biology announcing the coming technological revolution

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Improvements in technology enabled us to determine the genetic blueprint of any organism on Earth, although we still do not understand well the functional organization of even the simplest bacteria. Biological systems comprise complex interaction networks that can respond to different environmental signals, process information, produce complex molecules etc. Biological systems have many exciting properties, such as self-replication, adaptability, robustness, structural definition at the nanoscale, high energy efficiency and others praised by engineers.

We have been able to modify biological systems rationally rather than by chance since the introduction of methods of recombinant DNA technology several decades ago. Now we are entering an era when we will be able to modify the biological systems to an unprecedented level, introducing or reengineering complete functional modules such as biosynthetic or signaling pathways and even synthesize complete genomes. On the other hand we can also use the building blocks of biological macromolecules to create nanostructures that do not exist in nature and could be used in many new technological applications.

The exciting potential of synthetic biology can be used in areas such as health, environment, energy, information processing, biosensors etc. Additionally the constructive principle of synthetic biology is a powerful tool to test and improve our understanding of biological systems, in agreement with a remark by Richard Feynman: »What I cannot create I do not understand«.

Synthetic biology is a powerful platform to engage our creativity that could improve the quality of life in many aspects of human activities but we have to be prepared

to deal also with potential dangers as in any type of technology.

The Lure of the Media: Discourse as Social Cognition

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The talk addresses issues of social cognition through interactive verbal behavior called discourse. The central findings of the analysis of the nature of argumentative discourse (inner speech and public discourse alike), conversational practices and cultural narratives, and the subsequent claims challenge the traditional views of pragmatics according to which discourse is fundamentally communication-driven for the purposes of rational consensus building in the speech community. The outcomes of my investigations concerning discourse as the means of primary socialization suggest and enhance the view that the creation of social meanings is a mental exercise originating in our human capacity of adaptation to the conceptualizations of situations and mental contexts. Thus, human cognition is shown to be sensitive to context-creation and contextual framing for discursive reasoning. Information sharing and consensus seeking in argumentative discourse driven by rationality are shown to be of secondary importance in relation to the plasticity and flexibility of discursive reasoning based on creative and innovative cognitive processes, such as mental space blending and conceptual integration.

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From flirt to innovation - How to establish network ties between science and industry

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Open innovation is a promising approach to combine both internal and external sources for the creation of novel products, processes and services. Organizations are increasingly looking beyond themselves for help with innovation, working with customers, research companies, business partners and universities. In a highly connected world, innovation networks are a logical result of the increasing complexity of innovative products and services. These networks represent an organizational solution for product and service innovation, since they integrate different organizational skills focused on a common goal.

The main benefits of R&D collaborations include risk sharing, exploitation of economies of scale and scope, reduced duplication of research efforts, access to complementary assets and reduction of time to market. Firms undertaking R&D collaboration acquire new capabilities and improve their ability to monitor, absorb and exploit external knowledge. Major objectives of firms to join collaborative R&D are to foster the establishment of new relationships, to get access to complementary resources and skills, technological learning and cost sharing, and to keep up with major technical developments.

University-industry collaborations exist in a number of distinct forms, like R&D joint ventures and partnerships, licensing and cross-licensing agreements, sharing of equipment and research tools, R&D contracting, industry financing of university research, university spin-offs and licensing as well as a hiring of university researchers. Informal interpersonal ties between industry and university researchers are in some cases utilized as vehicles for establishing new contacts and partner selection, in other cases a more explorative contact-making approach

is pursued. In our opinion, the process of the formation of such networks shares many features with social interaction – i.e. ‘flirting’. This type of interaction between human beings is originally intended to get to know each other. In industrial practice, there is a strong need to identify and approach potential partners in order to explore and exploit new knowledge and future-oriented technologies.

The presentation covers a couple of aspects of open innovation, social network analysis, and case studies of successful implementation science-industry networks and practice-oriented approaches to collaboration. It provides a field-tested framework how to establish network ties between science and industry. Different types of collaborations and their different places within the innovation process are discussed, followed by methods for the analysis of evolution and characterization of R&D networks. With focus on the front end of innovation we demonstrate that activities similar to ‘flirting’ are key to identify potential partners as the basis for future collaborative projects. Using network analysis of internal and external networks we will provide data that highlight the evolution, functionality, and benefit of social network structures to building effective collaborative ties. In addition, we show how weak and informal network ties are transformed into formal project structures on demand.

How to make the world and humanity aware of the worst sufferings of people: The case of Sudan

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Nowhere on the planet is the humanitarian crisis worse than on the border between what is left of old Sudan and the new South Sudan. Nowhere on Earth is the ruling dictatorial regime accused of more crimes against humanity, including genocide – and nowhere have the indigenous people that are being exterminated preserved a more harmonious, more primeval and symbiotically with nature living culture than in the area between the largest sand desert, the Sahara, and the largest swamp regions in the world. Nowhere do the global powers engage in a more concealed fight for control of natural resources over the backs of cheaper slaves. Nowhere have the mainstream media along with independent reporters, including UN agencies and humanitarian NGOs, more betrayed their mission. Nowhere does humanity shut its eyes to the truth stronger than in the Sudanese provinces with mainly African populations that after the declaration of independence of South Sudan on July 9th last year remained north of the non-agreed border, in what remains of Old Sudan. Nowhere does the international community forfeit more than on the sacrificial altar of 2012 in Blue Nile, the Nuba Mountains, Abyei and Darfur.

These facts and my 20 visits to the area since 1979 are the reason that, together with friends and supporters in Sudan, Europe and America, I initiated the action of connecting victims to perpetrators of violence, using the cheapest video cameras available and satellite modems to transfer recordings to the Web.

In my contribution, I will try to present briefly the experience gained.

More: www.tomokriznar.com, www.slotraveler.com/hope

From Matter to Life: Chemistry? Chemistry! *De la Matière à la Vie : Chimie? Chimie!*

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The evolution of the universe has generated more and more complex matter through self-organization, up to living and thinking matter. Animate as well as inanimate matter, living organisms as well as materials, are formed of molecules and of the organized entities resulting from the interaction of molecules with each other. Chemistry provides the bridge between the molecules of inanimate matter and the highly complex molecular architectures and systems which make up living organisms. Molecular chemistry has developed a very powerful set of methods for constructing ever more complex molecules. Supramolecular chemistry seeks to control the formation of molecular assemblies by means of the interactions between the partners. The designed generation of organized architectures requires the handling of information at the molecular level in a sort of molecular programming, thus also linking chemistry with information science. The field of chemistry is the universe of all possible entities and transformations of molecular matter, of which those actually realized in nature represent just one world among all the worlds that await to be created. Conceptual considerations on chemistry and science in general will be presented.

L'évolution de l'univers a généré des formes de plus en plus complexes de la matière, jusqu'à la matière vivante et pensante, par auto-organisation. La matière animée tout comme la matière inanimée, les organismes vivants ainsi que les matériaux, sont formés de molécules et d'ensembles organisés résultant de l'interaction des molécules entre elles. La chimie établit le pont entre les molécules de la matière inanimée et les systèmes moléculaires hautement complexes qui constituent les organismes vivants. La chimie moléculaire a développé un ensemble de méthodes très puissantes pour la construction de molécules toujours plus sophistiquées. La chimie supramoléculaire se fixe comme but l'édification d'assemblées de molécules au moyen des interactions entre les partenaires. La formation spontanée d'architectures organisées repose sur la mise en œuvre d'information au niveau moléculaire, en une sorte de programmation moléculaire, qui établit ainsi un lien entre chimie et science de l'information. Elle constitue la base de la capacité d'auto-organisation qui a conduit de la matière à la vie. Le champ de la chimie est l'univers de toutes les espèces moléculaires et de toutes les transformations possibles de la matière. Celles effectivement réalisées dans la nature ne forment qu'un seul monde parmi tous les mondes possibles en attente d'être créés. Des considérations conceptuelles sur la chimie et la science en général seront présentées.

The Music of Life

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Metaphorical stories and music from *The Music of Life* (Noble, 2006) will be used to show that genes did not 'create us body and mind' (Dawkins, 1976). The genome can be compared to a large cathedral pipe organ. The organ pipes are essential for the music to be played, but they did not compose the music and it is the musician who plays it. The systems, organs, tissues and cells of the body 'play' the 'organ' that is the genome. The Nobel-prizewinner, Barbara McClintock (1984), realised this when she called the genome 'the organ of the cell'. The possible ways in which a human genome of around 25,000 genes can be played vastly exceeds the number of fundamental particles in the whole universe, thus guaranteeing that we are all unique and that we cannot be reduced to the actions of our genes. I will show that this view of biology is revolutionary. In addition to changing biology (no more 'central dogma') it also illuminates our ideas of self and of mind-body relations. The self should be seen as a process rather than an object. This mirrors the Buddhist ideas of self, so the closing story of the lecture will be based on a Buddhist parable: the oxherder.

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Towards a Biophilic Future: Culture and Human Nature

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During the past two decades, the profusion of architectural publications as well as the spectacular character of the internationally publicized projects indicates that we have been experiencing an unforeseen era of architectural ecstasy and euphoria. The recent accumulations of wealth, global fluidity of capital, and the world-wide competition for commercial visibility seem to have generated this development. Besides, new material technologies and novel computerised design methods have opened up unforeseen technical possibilities for architecture and made practically any conceivable formal invention feasible. As a consequence of this architectural hubris, astonishing structures have arisen in most of the commercial capitals of the world.

This horizon of the unlimited possibilities and the tendency of architecture to become a vehicle for economic and business interests, devoid of deeper cultural or ecological responsibilities are, however, awakening concerns and doubts. Architecture used to be the most important means of concretising cultural and societal order, as well as expressing the specificity of place and culture. Yet, today's globalised, instrumentalised, technologised and commodified construction eradicates forcefully all sense of specific place and identity. Instead of serving purposes of cultural rooting and human empowering, the constructions of today's consumer culture tend to heighten estrangement and social discrimination, the "existential alienation" that Edward Relph identified, or "The Fall of Public Man", a theme of Richard Sennett [1].

Architecture is becoming aestheticized and detached from its historicity and existential ground. As Guy Debord has remarked, "All that once was directly lived has

become mere representation" [2] We live in an obsessively materialist culture that turns everything into consumption and aestheticisation. Politics, behaviour, personality, and even wars, are aestheticised today, and we are all becoming consumers of our very lives. Debord calls our mode of culture "The Society of the Spectacle", and he defines spectacle as "capital accumulated to the point where it becomes an image." Hal Foster, art historian, has noted that nowadays also the reverse is true: spectacle is "an image accumulated to the point where it becomes capital". [3]

Instead of evoking experiences of dignity, the celebrated projects of today frequently appear as forced and shallow formal inventions, devoid of human meaning and empathy. The fact of the human mental world is that meaning cannot be invented, it can only be identified and re-discovered because human meaning arises from a lived existential ground, not marketing strategies and brands. The lack of authentic experiential ground in today's architecture makes new projects often appear strangely and paradoxically repetitious.

Globalisation has so far primarily served the purposes of multi-national businesses and the battle for economic and political hegemony. In architecture, universalised values and aesthetic fashions, combined with routinely traded and applied technologies, materials and fashions, have largely advanced the erosion of local cultures, skills and traditions. We cannot, of course, speak of contemporary architecture, or its global character, as a singular phenomenon. Regardless of the general tendency towards uniformity, there are still regional and local architectural cultures in the world. Along with the architecture of

spectacle, that seeks visual effects and the lure of newness, buildings keep emerging around the world that are rooted in the historicity, reality and specificity of culture, as well as in the lived and authentic human experience.

Today's fashionable architecture seeks to seduce the eye, but it does not usually contribute to the integrity and meaning of its setting. Yet, instead of disparaging and disgracing their neighbours of lesser value, profound buildings always improve their contexts and give even commonplace settings an enhanced significance. Most often, the overall quality and integrity of the environment has a higher value than any individual foreground buildings, and that is why the primary responsibility of architecture is to contribute to the integration and harmonisation of the landscape, cities and villages. Even the most radical of profound architectural works eventually confirm the continuity and understanding of tradition and they end up completing a cultural and collective narrative instead of shattering it. Architecture is a matter of slowly and patiently improving the inherited human habitat, not inventing a New Brave World. Even true radicality is always embedded in a deep cultural understanding and sense of responsibility and compassion; the most radical works end up reinforcing the course of tradition.

The call for an ecological ethics, life style, and sustainable architectural thinking is surely the most important force of change in architecture since the breakthrough of modernity a century ago. Architectural history is seen as a succession of stylistic canons, but today's challenge calls for a new understanding of architecture itself as well as understanding ourselves as historical and biological beings. We continue to see ourselves and our artefacts

independent of Nature, but the challenge of today is likely to alter this received polarity between nature and human artifacts. This challenge calls for a new understanding of goals and processes, aesthetics and performance, form and function, rationality and beauty, artistic objectives and ethics, and, finally, of ourselves as children of Mother Earth.

We architects are used to think in terms of space and material form; we think of objects rather than systems, aesthetics rather than processes, visual qualities rather than existential issues, metaphors rather than facts, and the present rather than the temporal continuum. As George Lakoff and Mark Johnson, two philosophers, have convincingly shown in their book *The Metaphors We Live By* (1980), language, thought and action are essentially metaphorical: "[...] Metaphor is pervasive in everyday life, not just in language but in thought and action. Our ordinary conceptual systems, in terms of which we both think and act, are fundamentally metaphorical in nature", the authors proclaim. [4] Today we are in need to replace our mechanistic and digital metaphors into guiding patterns deriving from the processes of the biological world

Recent research in neurobiology provides promises of a new understanding of our own brain activities in general, and the meaning of aesthetic judgement and pleasure. Semir Zeki, neurologist, suggests the possibility "of a theory of aesthetics that is biologically based". [5] I personally have no doubt about it; what else could beauty be than one of nature's powerful instruments of selection. Zeki also argues that "art [is] an extension of the functions of the visual brain in its search for essentials" [6]. No doubt, architecture is similarly an extension of our neural

system to facilitate our constant search for meaning and a satisfactory relationship with the world. Architecture increases the order and predictability of our world, in other words, architecture domesticates the world.

Along with the inspiration brought about by biological models, a deeper understanding of our own biological and cultural historicity is needed. To head enthusiastically into a digital, computer generated virtual world forgetting where we have come from, seems careless to me. I see the defence of our biological and historical essence as a crucial task of art and architecture altogether, but especially in our era of technological euphoria. A "mental ecology" is needed to expand the notion of ecology into the human mental world, as the real issues of ecology and sustainability cannot be dealt with merely in technical terms.

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About the Cultural Center of the European Space Technology-KSEVT

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In the village of Vitanje near town of Celje originated the mother of Slovenian space visionary Hermann Potocnik - Noordung. Hermann visited elementary school in Maribor. Vitanje has already since a few years the memorial room dedicated to Noordung. The room was designed by the group of artists: Miha Tursic, Dragan Zivadinov and Dunja Zupancic, with extraordinary efforts and dedication of locals especially the Mayor Slavko Vetric and administrative director Mr. Srecko Fijavz. These people are also the main protagonists in bringing "KSEVT" to realization. In 1999, on the 70th anniversary of publication of Noordung's book (1929) "Das Problem der Befahrung des Weltraums, Der Raketen Motor"- "The Dangers of Space Travel", the University of Maribor under the leadership of Professor Ludvik Toplak organized International Symposim. The bust of Noordung stands in front of the main university building. In Vitanje, since the summer of 1910 the "Cultural Center of the European Space Technology "(in Slovenian KSEVT) is under construction. The funding originates from the EU and partially from the Slovenian and local government. The presentation will outline the Noordung's visionary contribution to the exploration of space and especially the construction and visionary purpose of the KSEVT center.

Quantum physics out of equilibrium: A new paradigm of computation and information

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It has been realized already by Richard Feynman in 1980's that completely new ways of making computation and manipulating information can emerge from basic laws of quantum physics. For certain tasks this so-called quantum computation can be qualitatively more efficient than any computation that classical computers can do [1]. It is likely that quantum information and computation will largely influence many future technologies, once we overcome a severe practical (but non-principal!) problem of decoherence. After describing fundamental principles of quantum mechanics, I will discuss some new ideas on how to treat and fight decoherence. A particular intriguing is the effect of chaotic dynamics, which can – quite counterintuitively – sometimes help in making quantum information processing more robust [2]. Furthermore, despite these obstacles, a special type of quantum computers – quantum simulators – are already successfully implemented in the labs today, namely in the realm of non-equilibrium physics with ultra-cold atoms [3]. These simulations have the potential to help in solving some outstanding problems in condensed matter physics.

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How to Improve Fundamental Research in Developing Countries: UNESCO Diploma Program in Mathematics and Physics at ICTP

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Talented young science students from developing countries are often limited in achieving their full potential at home due to the absence of advanced training at postgraduate level, and up to standard international criteria. In 1991 the UNESCO Abdus Salam International Centre for Theoretical Physics in Trieste, Italy (ICTP) began an educational program in the main research fields of the centre, with the aim of filling this gap, called Postgraduate Diploma Program.

This program consists of rigorous, one-year long pre-doctoral course work, with a small part devoted to independent projects. It initially had only three specializations: High Energy Physics, Condensed Matter Physics and Mathematics. Recently ICTP has added Earth System Physics and Physics without specialization. The goal of these programs is to bring best students from some of the least developed countries and educate them so they can then compete for admission to the graduate programs in any university in the world.

In my lecture I shall present my personal experience from teaching topology courses in the Mathematics program, from the very beginning of the project. In my experience this job is both rewarding and challenging, since students generally arrive with several handicaps. Almost none of them has been taught by an active researcher, the standards of the course work in their countries are insufficient, the students have often not absorbed or sufficiently understood what they have studied; some of them have language difficulties and have never faced an audience, etc.

Therefore their experience at this stage would not enable

them for admission into a good PhD program. However, these students are very bright and quite capable of hard work in a proper environment. To transform them into competitive researchers, primarily through their own efforts, under the watchful eye and guiding hand of their teachers at ICTP, is the highly rewarding part.

Omnipresent sensor systems - the pros and cons of monitoring almost every aspect of our world – environment, processes, humans

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Sensors are essential tools in any sector of the industrialized world and their number increases by approximately 10 % per year. At the very moment they cross the bridge from industrial space to human space, from advantageous to dubious use. They will be more extensively applied in almost all aspects of every day's life: in production process and environmental monitoring, control of food production and food quality, critical infrastructure and traffic control, cars, appliances and in health care as diagnostic tools and to monitor critically ill patients. Especially the demand in patient monitoring and in-line control of production processes is rapidly increasing. Main detection parameters are:

- Physical and chemical parameters and analytes
- Food and beverage quality parameter
- Metabolic compounds, point of care diagnosis
- Authenticity of pharmaceutical products
- Person identification and movements
- Observation of human mobility and behavior

There is - beside these important and helpful applications - also a wide range of socially very doubtful and critical use. This includes aspects as person monitoring, tracking of person's motion and also aspects of incapacitating people due to detained responsibilities and need to make own decisions.

The basic principles of sensor systems - electrical, optical and sensor types – physical, chemical, biosensors - will be presented. Their main applications will be discussed

especially in food quality control, environmental monitoring, diagnostics and patient monitoring. The demands and development trends with positive impacts and possible negative impacts will be lined out.

Sensor systems are also an excellent example for an open innovation process. The development of new sensor principles is an interdisciplinary task. It requires basic research in chemistry, biology, medicine, physics, and electronics. Each essential part is highly complex and needs the contribution of specialized teams willing to cooperate in scientific networks. Despite the components complexity the development of sensor systems is manageable which allows research groups from public institutions to handle these tasks successfully. Several of these developments were transferred into industrial production and were commercialized demonstrating successful technology transfer processes. However even these successful transfer processes illustrate the obstacles and show the difficulties of technology transfer. They make reasons evident for so called "valley of death" experienced by many innovation processes - the gap between the lab and the marketplace.

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What can we learn from microbes?

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As a microbiologist I see a world from a specific perspective, because by studying microbes several parallels to macro world emerge. Microorganisms are very tiny living beings and some of them representing the gray zone between living and non-living. Although some microbes can also harm us by causing the diseases, most of them live on us and protect us. They in part define who we are and even how we think. Microbes are very adaptable, they are present everywhere and can use practically every substance on Earth as a food source, what is used e.g. in bioremediations, biofuel production and several industrial processes. Microbes are the ones that make our life on Earth possible by cycling the main elements such as carbon and nitrogen. In addition, they make life possible in environments without solar energy, such as deep sea and caves and can be important when planning future space colonies. Microbes were responsible for a first global pollution millions of years ago when atmosphere changed from anoxic one to aerobic one. They can talk to each other and collaborate, but can also harm each other when competing for food and space. They teach us that diversity is good, but that diversity as well as tolerance have to be well regulated.

So, when looking for new ways to improve the culture of living we might learn something from micro-civilization that exists on this planet much longer than we.

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New development in the therapy of basal cell carcinoma

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Basal cell carcinoma is the most common tumour in men. It is also the most common skin cancer. It is approximately ten times as frequent as squamous cell carcinoma. The tumour is rarely metastatic, but causes great problems due to its destructive tendencies and its localisation on the face. The nose is the most frequently involved region. The etiopathogenesis could be clarified in recent years. Ultraviolet irradiation is the most important etiologic factor. In the molecular pathogenesis, mutations in the sonic hedgehog pathway (shp) play an important role.

Important progress has also been made in the treatment of basal cell carcinoma. Surgical treatment remains the mainstay of therapy, but small tumours can also be successfully treated by photodynamic therapy and topical immunostimulators such as imiquimod. Inhibitors of the sonic hedgehog pathway are being tested in experimental models. For the prevention of basal cell carcinoma sun protection by education of patients and application of sun blockers is of great importance.

Buddhist Philosophy and Modern Society

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The modern civilization proclaims that the modern society is highly advanced with its achievements in scientific inventions and discoveries and technological innovations. Yes, there have undeniably been remarkable strides taken in the material world with the objective of making our life happier and easier. It is not needless rather worth asking if these advancements and developments have contributed substantially to the human society to be better in terms bringing more peace and genuine happiness? Still our world is ravaged by inequality, injustice, oppression, war, violence and consumerism. The rate of suicide in both the developed and developing countries itself is a clear indication of the fact that we have badly failed in making this world a better place to live in with peace and happiness. Ideologically, a fundamental mistake was committed by setting the parameter of development based on external and material advancements. Had the material objects been the ultimate source of happiness, the modern people should have been much happier than the people of that time when there was no material advancement compared to other own time. But the sequence of wars and number of people killed in wars in twentieth century alone has outnumbered those of the several centuries of pre-modern era. Even in a highly developed country where people live with every possible amenities, the quality of peace in the society and level of happiness of the individual person is drastically belies the expectation.

The main reason behind the mistake committed is that the inner world and inner values have been disregarded altogether, which in fact are the primary factors to be taken into consideration in order to bring about peace in individuals and thereby in the society. The distinguished

ancient Buddhist master Shatideva has said:

In order to achieve happiness and destroy suffering, people wander fruitlessly, because they have not concentrated their mind on the sacredness of happiness.

According to Buddhism peace and happiness are to be cultivated from within and they cannot, by any means, be generated from external phenomena.

Therefore, Buddhist philosophy emphasizes on the law of causality and at the same time demonstrates a sophisticated psychological system in great details. The only way to bring genuine peace and happiness is to bring about a transformation in the mind of individual persons though the cultivation of inner values like tolerance, patience, love, compassion, altruism and others. If we try to find the root causes of the crises that we encounter in our improperly so-called developed society, we would find selfish, intolerant, uncompassionate, and motive unloving, with no concern for others as the fundamental drives from where states of unhappiness and peacelessness in persons and society come to prevail.

Hence according to Buddhism the problems are to be addressed in a relevant manner taking into account the law of the matrix of cause and effect. We cannot reduce and eliminate the problems with a wrong approach by identifying the causes of crises and prosperity. Unless the inner values are taken seriously and the ways to cultivate them are implemented the modern society would not be able to come out the present critical situation.

In order to make this change happen, the education system requires to be changed significantly to bring about the desired mental transformation, with no resource to religious dogma, i.e in an open secular manner. Thereby the approach of the world policy makers needs to be changed so that they could address the issues reaching the causal level instead of giving a superficial cosmetic dressing up.

UNESCO's contribution to global challenges

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As a specialized agency of the UN system, UNESCO (United Nations Educational, Scientific and Cultural Organization) contributes to the building of peace, the alleviation of poverty, sustainable development and intercultural dialogue through education, the sciences, culture, communication and information.

In fulfilling its mission, UNESCO carries out for the international community five established functions:

1. laboratory of ideas, including foresight;
2. standard-setter;
3. clearing house;
4. capacity-builder in Member States in UNESCO's fields of competence;
5. catalyst for international cooperation.

The UNESCO Medium Term Strategy for 2008-13, which sets out the strategic objectives and expected outcomes for the Organization's work during this period, is focused on according priority to Africa and to gender equality.

Within the Medium Term Strategy, five programme-driven overarching objectives for the entire Organization define areas where UNESCO has a unique profile and comparative advantage in the multilateral field:

- Attaining quality Education for All;
- Mobilizing scientific knowledge and science policy for sustainable development;
- Addressing emerging ethical challenges;

- Promoting cultural diversity and intercultural dialogue;
- Building inclusive knowledge societies through information and communication.

Specific targeted action is envisaged for youth, the least developed countries (LDCs), and small island developing states (SIDS). UNESCO will further respond to the needs of the disadvantaged and excluded groups, as well as the most vulnerable segments of society, including indigenous populations.

As recently stated by Irina Bokova, UNESCO's Director General, UNESCO should have in the future, "a leading role to play in building a global human community", (laying the foundations for a lasting universal human community,) drawing on the fundamental values of humanity and on the resources of the mind as the stakes of the Organization's "new humanism approach."

The UNESCO Regional Bureau for Science and Culture for Europe, established in Venice in 198... originally only for Science, has now the mandate to foster regional cooperation, contribute to capacity building and to provide specialized expertise with special emphasis on the South East Europe and the Mediterranean.

The activities elaborated and implemented by the UNESCO Venice Office in SEE are aimed at:

- Enhancing peace and stability by supporting the process of self-sustainability and the promotion of cross border cooperation in science and culture

- Sharing responsibility by promoting corporate governance and participation
- Preparing for the future regional challenges through innovation, knowledge and capacity building
- Contribute to UN Reform with expertise and impact oriented actions

Sustainability of Automobile Fuels

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Automobiles and road transport are one of the most fundamental needs of this civilization without which much of the industrial, mining, and agricultural business and distribution would come to a dramatic halt. However, unless new inventions and discoveries are made, or new national and international plans initiated and a significant paradigm shift be made, this is exactly what may happen. The resources that fuel automobile propulsion are in limited supply. For instance, gasoline is slated to be exhausted within about 30 years at the given consumption and growth rate; hydrogen fuel cars will suffer from a shortage of platinum that can last only an estimated 25 years if all cars were run exclusively on hydrogen fuel cells. Biofuels such as corn-based ethanol require more arable land than exists to fuel all the cars that people want and aspire to. Natural gas also has a limited supply. And rare earths and elements for electric cars also have a strategic production bind or else are limited in ground resources, depending on the type of electric car. Ethanol from sugar production holds a reasonable chance of success but requires a major policy shift in land usage. While it is necessary to plan for the future, such planning can only be done with the technology of today, but never can be done with assurance on the hope of discovery and invention. This presentation will talk of the resource limitations that can visit the earth in the near future, and will discuss the possible and not-so-possible solutions.

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Beta testing

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In the wild environment a mammalian organism strives to ensure sufficient plasma glucose level and levels much below 1 g per liter are life threatening due to diminished brain function and subsequent loss of consciousness. At least 5 hormonal systems contribute to ensure sufficient plasma glucose levels. Elevated plasma glucose level is in the wild environment a rare condition, but when it happens after a sporadic meal, it triggers the release of insulin from the pancreatic beta cells. Insulin as a key anabolic hormone enables ingested nutrients from the meal to enter the cellular storage compartments and in this way also lower plasma glucose levels to close the homeostatic feedback loop. Another major peril for such an organism is a complete lack of insulin due to beta cell failure, the condition where the body size exceeds the reserve of insulin that can be produced or due to tissue insulin resistance. The lack of insulin function leads to overt catabolism, body wasting, which can again result in a life-threatening condition due to acidification of the body fluids and impairment of the brain function. The only way for an organism to escape catabolism due to lack of insulin function is to keep increasing plasma glucose levels all up to the levels that result in the loss of glucose through the kidneys (in fact, a major sign of diabetes mellitus). I will discuss why this seemingly futile production of glucose and glucose-related tissue damage is negligible compared to depletion of major energy stores in triglycerides and loss of structure and function due to catabolism of proteins. Finally, I will review the advantages and disadvantages of the use of molecular and cellular biology in testing the beta cell physiology.

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Observing the brain to know ourselves

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The human brain has about 85 billion neurons, of which about 15 billion are part of the cortex. Cortical neurons communicate with each other via tiny electrical pulses called spikes. Since a typical neuron fires about 10 spikes per second, the neurons in our cortex emit about 150 billion spikes per second – that is more than twenty times the number of people in our planet – per second! This neural activity, made up of a very large number of very tiny events, underlies our sensory perceptions, our thoughts, our decisions, our actions. One of the central problems in modern neuroscience is to develop experimental tools for monitoring and recording these spatial and temporal patterns of neural activity. Experimental techniques range from the noninvasive, such as fMRI (functional Magnetic Resonance Imaging) and EEG (ElectroEncephaloGram), to more invasive intracranial recordings of the activity of single or multiple neurons. As our ability to monitor neural activity improves, we face the increasingly complex problem of understanding the observed patterns of activity so as to interpret them and assign meaning to them. The theoretical physicists, mathematicians, and computer scientists whose goal is to extract information of neural activity face problems similar to those encountered when decoding an unknown language. Each neuron changes its state from activity to inactivity tens of times per second. Networks of interconnected neurons continuously change their collective state, depending on which neurons are active and which are inactive at any given time. These patterns of activity are akin to words whose meaning we try to uncover as we slowly build a dictionary to translate neural activity in information about perceived objects and intended actions.

The last ten years have seen dramatic progress in our ability to record and decode patterns of neural activity. These advances have not only deepened our understanding of brain function, but have also made it possible to build functional interfaces between brains and artificial devices such as computers and artificial limbs. Research into the development of such interfaces has yielded impressive demonstrations of rodents, nonhuman primates, and humans controlling robots or computer cursors in real time. Much of this effort has concentrated in recording and decoding neural activity in the motor cortex, an output area of the brain that controls movement through its projection to muscles via the spinal cord. Experiments based on the implantation of multielectrode arrays that record neural activity in awake behaving monkeys have allowed us to monitor the activity of about one hundred neurons in motor cortex during the execution of sequences of reaches to externally specified targets. Our theoretical efforts have resulted in models that capture the underlying relationship between neural activity and movement, thus allowing us to predict the direction and extent of each reach before the movement is executed. This prediction signal can then be used to move a robotic arm, demonstrating that sufficient information is present in the sampled neural activity to reconstruct arm movements in nearly real time. The performance obtained in open-loop paradigms based on motion prediction can be improved by providing sensory feedback to the subjects. In closed-loop control paradigms, performance improvements require learning. Neural plasticity allows the brain to acquire a cortical representation of the external device, whose movements can then be guided in a biomimetic fashion. Sensory feedback usually provided

by vision closes the loop, but does not substitute for fast proprioceptive feedback. Recent experiments have begun to explore mechanisms for artificially conveying proprioceptive information to the subjects via magnetically activated extended physiological proprioception (EPP) or via functional electrical stimulation (FES).

The potential of this approach to restore motor behavior in severely handicapped patients motivates pioneering interdisciplinary research in Brain Machine Interfaces (BMIs), a new area at the frontier of systems neuroscience. Many aspects need to be developed: biocompatible implantable recording devices, sophisticated real-time decoding algorithms, encoding and stimulation methods for providing fast feedback about the state of the external device. As these various challenges are addressed, we get closer to the ultimate goal of building artificial prostheses that can be directly and efficiently controlled by neural signals. In the process, we increase our understanding of how networks of neurons adapt to the demands of information processing and information exchange both within the network and with the external world.

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Social Business: A way to solve society's most pressing problems

Muhammad Yunus

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Muhammad Yunus was born on June 28, 1940. He is the founder of Grameen Bank which pioneered microcredit – a method of banking where small loans are given to the poor, mostly to women, without collateral, for income generating activities, with high repayment rate, to help them get out of poverty.

The third oldest of nine children, Yunus was born in the village of Bathua, Chittagong. His father was Haji Muhammad Dula Mia Shawdagar, a jeweler, and his mother was Sofia Khatun. In 1944, his family moved to the city of Chittagong, and he studied at Lamabazar Primary School. Later, he passed the matriculation examination from Chittagong Collegiate School.

During his school years, he was an active Boy Scout, and traveled to West Pakistan and India in 1952, to Europe, USA, and Canada in 1955 and to the Philippines and Japan in 1959, to attend Jamborees. In 1957, he enrolled in the department of economics at Dhaka University and completed his BA in 1960 and MA in 1961.

Following his graduation, Yunus joined the Bureau of Economics, Dhaka University. Later he was appointed as a lecturer in economics in Chittagong College in 1961. In 1965, Yunus was offered a Fulbright scholarship to study in the United States. He obtained his Ph.D. in economics from Vanderbilt University in the United States in 1969. From 1969 to 1972, Yunus was an assistant professor of economics at Middle Tennessee State University in Murfreesboro, TN.

During the Liberation War of Bangladesh in 1971, Yunus founded a Citizen's Committee in Nashville, TN, published a newsletter named, Bangladesh Newsletter, and ran the

Bangladesh Information Center in Washington DC with other Bangladeshis living in the United States, to raise support for liberation of East Pakistan, and lobby at the US Congress to stop military aid to Pakistan. Inspired by the birth of Bangladesh in 1971, Yunus returned to Bangladesh in 1972, and joined the Economics Department of University of Chittagong after a brief spell in the Planning Commission. He became actively involved with poverty reduction after observing the famine of 1974, and established Rural Economics Programme as a part of the Department's academic programme. In 1975, he organized Nabajug (New Era) Tebhaga Khamar (three share farm) which the government later adopted as the Packaged Input Programme.

In 1976, during visits to very poor households in the village of Jobra near Chittagong University, Yunus discovered that very small loans could make an enormous difference to a poor person's life. Jobra women who made bamboo furniture had to take out loans at usurious rates for buying bamboo, and had to give up their profits to the moneylenders. Shocked by this reality, he lent USD 27.00 from his own pocket to 42 people in the village to help them pay back their loans to the loan-sharks and be free.

When he approached traditional banks to lend to the poor, he found that they were not interested as the poor were not considered creditworthy. Yunus strongly believed that given the chance the poor will repay the borrowed money, and that it would help the poor work their way out of poverty. After many efforts, Yunus finally succeeded in securing a credit line, offering himself as the guarantor, for his project from Janata Bank to lend it to the poor in Jobra in December 1976. On October 2, 1983, the project

was converted into a full-fledged bank named as Grameen Bank (Village Bank), specialized in making small loans to the poor.

As of May 2009, Grameen Bank (GB) has 7.5 million borrowers, 97 percent of whom are women. With 2,554 branches, GB provides services in 84,237 villages, covering more than 97 percent of the total villages in Bangladesh. It has lent over USD 7 billion to the poor people with near 100 percent repayment rate, since its inception. All its money comes from the depositors of the bank.

Yunus has also founded a number of companies in Bangladesh to address diverse issues of poverty and development. These include Grameen Phone (a mobile telephone company), Grameen Shakti (Grameen Energy), Grameen Fund (Social Venture Capital Company), Grameen Textile company, Grameen Knitwear company, Grameen Education company, Grameen Agriculture company, Grameen Fisheries and Livestock company, Grameen Business Promotion company, Grameen Danone Foods Ltd, Grameen Healthcare Services, among others. He is also founder of Grameen Trust which extends the Grameen microcredit system all over the world.

In October 2006, Muhammad Yunus was awarded the 2006 Nobel Peace Prize, along with Grameen Bank, for their efforts to create economic and social development. The Norwegian Nobel Committee stated "Muhammad Yunus has shown himself to be a leader who has managed to translate visions into practical action for the benefit of millions of people, not only in Bangladesh, but also in many other countries. Loans to poor people without any financial security had appeared to be an impossible idea.

From modest beginnings three decades ago, Yunus has, first and foremost through Grameen Bank, developed micro-credit into an ever more important instrument in the struggle against poverty". Muhammad Yunus became the first Bangladeshi and third Bengali to ever get a Nobel Prize.

He has won a number of other awards, including the Ramon Magsaysay Award, the World Food Prize, the Sydney Peace Prize. Within Bangladesh, he has received the President's Award (1978); Central Bank Award (1985); and Independence Day Award (1987), the highest national award. Bangladesh government brought out a commemorative stamp to honor his Nobel Award.

Yunus was inducted as a member of the Legion d'Honneur by President Chirac of France. In January 2008, Houston, Texas declared January 14 as "Muhammad Yunus Day". He is one of the founding members of Global Elders chaired by Nelson Mandela. He was the 2008 commencement speaker at MIT on June 6, 2008.

Yunus has been awarded 28 honorary doctorate degrees and serves on the board of many national and international organisations. He is the author of two New York Times bestsellers - Banker to the Poor (1997) and Creating a World Without Poverty, Social Business and the Future of Capitalism (2008).

Muhammad Yunus is married to Dr Afrozi Yunus, and has two daughters, Monica, and Deena.

Insights on self management from life of Mahatma Gandhi

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The term of „Media Society“ marks an epochal social and cultural change saying that the societies globally increasingly turn to be or to assert what their media status is like. Societies more and more get constituted in the mode of media, its aesthetical and social design. Even if the term of a media society is a myth, it is the myth and the facts of media change that pushes societies into a new and so far unknown formation.

Society is what its communication is like. Both, society and communicates as culture as well, are constructs done and used in the interest of social and cultural sustainability. Any communication is defined by its mediality as this is the structural environment of social communication. But media has the tendency to shape or even to dominate the message since media is the frame of reference for comparability of status, prestige, identity, and need of social observation.

For long time most of the organized societies get used with their internal and external communication structure in relation to politics, economy, everyday life culture etc. to a media order in the manner of the distributive mass media (massmedia communication). Facing now the new media development (social media) the traditional structures of communication, mostly following the industrial models of Taylorism and Fordism - partialisation of media competence in roles of production and consumption, and doing that with increasing automatization – makes us aware that organized societies have “democratized” economical structures, but not communication culture. There is an aporia of how to develop social changes sustainable.

The future of media communication will be: more communication, less organization, less logics of sorrow, more logics of experiment, which is indeed a post-modern phenomenon.

The future of media communication will count more with competences of authenticity, situativeness, networkability and less with organizational (domination) interests.

The lesson to be learned: ecological culture of social attention: diversity, inter-culturality, value of difference and public value of media competence.

Conventional religiosity and New age beliefs as predictors of subjective well-being in Europe

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The relationship between religious beliefs and involvement and different dimensions of well-being (e.g., self-rated happiness, life-satisfaction and health) has been the focus of numerous investigations over the past three decades. A vast majority of studies, especially those carried out in the U.S., have shown a positive link between religiosity and well-being (see, for example, Milot and Bryant Ludden, 2009; for a review see Koenig, 1998; Paloutzian and Park, 2005; Green and Elliott, 2010; for a meta-analysis see Witter et al., 1985). Some studies, on the other hand, show that there seems to be no positive association between religiosity and well-being outcomes, especially in European countries, where religiosity levels are relatively low (e.g. Snoep, 2008).

Because of these findings it has recently been argued that the effect of religiosity on well-being is context-dependent. Snoep (2008) argues that the positive effect of religiosity found in the U.S. will not necessarily be found in other contexts, for instance in Europe, which differs from the U.S. on numerous structural and attitudinal macrovariables. For example, in countries that are relatively well-off religiosity is less prevalent and in these societies religious and non-religious individuals either experience similar levels of subjective well-being or less religious respondents report higher well-being (Snoep, 2008; Diener et al., 2011; Eichhorn, 2011). Context-dependent results were also presented by Eichhorn (2011) in his study of 43 European and Anglo-Saxon societies using the World Values Survey data. He found attitudinal religiosity to be associated with higher levels of life-satisfaction only in societies where attitudinal and practised religiosity levels were higher on average as well.

In low religious environments, low-religious individuals were found more satisfied with their lives. Eichhorn concludes that “positive effects of religiosity may not be intrinsic [...] it appears to be that happiness through religiosity can mainly be derived through conforming to the standard in their country—in particular the visible standard.”

Most recent studies thus draw our attention to the contextual (societal-level) characteristics when examining the link between religiosity and subjective well-being. Building on these studies we argue that the nature of this link might not only be context-dependent, but also belief-dependent. In other words, a key problem with much of the literature regarding religiosity and well-being link is that they predominantly focus on conventional/traditional religious beliefs and involvement (religious affiliation, church attendance, doctrinal beliefs, frequency of prayer, etc.). Yet in the past decades new/alternative forms of “spirituality” (i.e. New Age beliefs) have gained importance and have been studied extensively (see, for example, Heelas, 1996; Lavrič, 2002; Hanegraaff, 2005; Houtman and Aupers, 2007). Many scholars stress that “New Age strongly favours a holistic—interconnected, essentially the same, basically unified—outlook” (Heelas, 1996, p. 33; Hanegraaff 2005). There are several key elements of New Age, among them the mystical idea of one’s inner self, millenarianism, and eclecticism (for a review, see Flere and Kirbiš, 2009).

An important limitation of previous studies on the positive effect of religiosity then is that despite the growing popularity of New Age beliefs, past research 1) usually does not differentiate between “conventional”

and “spiritual/New Age” beliefs and practices (see, for example, Hadaway and Roof Clark, 1978; Diener et al., 2011; Snoep, 2011); and 2) mostly examines U.S. data (Witter et al., 1985; Robbins et al., 2008; Stark and Maier, 2008). Potential differences in the direction and strength of associations between religiosity and New Age on the one side and well-being measures on the other are therefore yet to be systematically examined. When studies taking into account different dimensions of supernatural beliefs were carried out, they were either content analysis (Berg, 2008), have dealt with non-European contexts (e.g. Glik, 1990; Idler et al., 2003; Astin et al., 2004; Garcia et al., 2006; Hasnain et al., 2011) or were carried out on non-representative student samples (e.g. Zullig et al., 2006).

The aim of the present study was to investigate the link between measures of conventional/ theistic religiosity and New Age beliefs in European context. We employed the newest (2008) wave of European Values Study. Representative national samples from thirty-six countries were included in our analysis. We formed three groups of countries: 1) twenty established EU democracies, 2) nine Eastern and Central European EU member states (ECE9); 3) six non-EU post-Yugoslav countries; 4) and lastly, we compared these groups with Slovenian survey data.

Subjective well-being was our main dependent variable and was tapped by three items assessing the respondents’ degree of happiness, satisfaction with life and self-rated health. We recoded all three items so that higher values represented greater subjective well-being (SWB). A principal component analysis was performed on three items and a one-factor solution emerged in all country-groups. The SWB scale was summed across the three items

and standardized to 100 points for ease of interpretation. Internal reliability of the SWB scale proved satisfactory in all observed environments ($.65 < \alpha < .71$).

A distinction between conventional religious (CR) and New Age (NA) beliefs was tapped with two items. On the first item respondents chose between believing “in personal God”, “spirit of life force”, or rejecting belief in both (atheists). On the second item respondents chose between two CR answers (“there is only one true religion” and “there is one true religion, but other contain basic truths”), one NA item (“there is no one true religion, but all great world religions contain some basic truths”), and a rejection of both.

Descriptive analysis showed that SWB levels were highest in EU20 group (MSWB = 73.0), followed by Slovenia (MSWB = 68.0) and post-Yugoslav group (MSWB = 67.4). Respondents in the ECE9 group reported the lowest SWB scores (MSWB = 62.2). A CR belief in “personal Gold” was most widespread among post-Yugoslav respondents (40.1 %), followed by EU20 (38.4 %) and ECE9 (35.5 %), while only 23.2 % of Slovenes chose this answer. On the other hand, a New Age belief in “spirit or life force” was most widespread among Slovenes (50.0 %) and post-Yugoslavs (43.5 %), followed by respondents from ECE9 (36.6 %) and EU20 (33.5 %). The percentage of atheists was between 5.1 % in post-Yugoslav group and 14.3 % in EU20 group.

To examine the impact of supernatural beliefs on SWB, a series of regression analyses were performed. Since our independent variable (type of belief) was a nominal predictor, each category of belief was recoded into a dummy variable, with conventional religious belief being

a reference category. Among sociodemographic variables, age and monthly household income had the highest positive impact on SWB in the compound sample. After controlling for sociodemographic variables, type of belief explained minimal additional variance in SWB in the four environments. In EU20 group, on one item there were no significant differences in SWB between CRs and NAs. On the second item, NAs had significantly higher scores than CRs. In both cases atheists had lowest SWB scores. In ECEg countries there were no differences between both main categories, and atheists again reported the lowest SWB scores. In post-Yugoslav country group the results were similar, while in Slovenia there were no differences between CRs, NAs and atheist on either of belief measures.

Our study of European countries shows that the impact of conventional religiosity and New Age beliefs on SWB is context-dependent and belief-dependent. When investigating the impact of supernatural beliefs, researchers should in future studies examine potential differences between conventional religiosity and New Age beliefs. Authors of the present paper make a tentative conclusion that if in Europe either of the two processes continue to take place (secularization, in the form of decline of conventional religion and religiosity; or privatization of religion), New Age beliefs might play a growing role in determining the levels of subjective well-being in European context.

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Flow as a resource of education quality at universities in Slovenia

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In the contemporary educational system quality of education is an issue that provokes many debates on different levels (Cheong Cheng & Ming Tam, 1997). By our opinion the quality changes in every working environment start in every individual. Therefore, the focus of our research was set on the concept of flow, the mental state of operation in which a person is fully immersed in an activity, experiences a feeling of energized focus, full involvement, and success in the process of the activity (Csikszentmihályi, 2002).

The aim of the presented paper is to explore the flow among higher education teachers at universities as a resource of educational quality. Our propositions were tested on higher educational teachers in Slovenia (N = 293; 46.8% of which were female). The participants indicated their levels of job resources (e.g., variety - the scope of skills utilized during work) as well as their level of job demands (i.e., workload - the level to which participants perceive their job as demanding) and flow using the Slovenian version of Work-related Flow Inventory (WOLF; Bakker, 2005) and Job Demands-Resources Scales developed for the purposes of the study.

Using hierarchical multiple regression, we found that our propositions were by and large confirmed. First, the results showed significant main effects of control variables (gender, age and academic rank) on flow. University teachers with higher ranks experienced higher flow levels. Second, the interactions between workload and variety significantly predicted flow levels. Our findings support research findings of several studies (Bakker, 2005; Salanova, Bakker & Llorens, 2006), but also break a new ground by considering job demands not just the resources

and the interaction between demands and resources in the higher educational environment. According to our findings the flow among higher education teachers should be promoted by finding the optimal balance between workload and variety. Since the flow is one of the most important resources of university quality, the educational policy should put an effort on finding concrete strategies how to increase the variety at the workplace of higher educational teachers and promote optimal workload.

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Achieving economic, social and environmental benefits by supporting culture-based creativity

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We have entered the “all cultural” age where the value of meaning prevails over material value (Dru, 1996). The economy is being transformed from a giant factory to a grand theatre (Rifkin, 2000). In the “experience economy” (Pine and Gilmore, 1999) the special place belongs to the creation of dialogue with consumers. In the new economy marketing is as important as production and the ability to create social experiences and networking by memorable events that touch individuals emotionally is an important factor of competitiveness. According to Florida (2002) the creativity is the new source of wealth.

The importance of culture for creativity arises from the fact that artists and creative professions share in common the ability first, to think laterally, second, to communicate and third, to challenge traditional solutions and visions. They are constantly inspired by art and culture as a source of ideas. In relation to the economy culture-based creativity is a form of innovation that helps businesses and institutions to drive marketing, communication, human resources or product/service innovation. Culture-based creativity can contribute to disrupting routines and linear thinking in business management. It is recognised as a tool to create emotional experience, to empathise and influence human behaviour (KEA European Affairs, 2009). Culture-based creativity contributes to making companies stand out from

competition, through branding, better design or user interface. It is capable of adding another meaning to the act of consumption, giving a sense or ethical or aesthetic value to production and facilitating product or service differentiation.

At the heart of the new economy, also labelled as the “creative economy” (Howkins, 2001), are the creative industries. According to the European Commission (2010) creative industries use culture as an input and have a cultural dimension, although their outputs are mainly functional (architecture, design, advertising), whilst cultural industries comprise the traditional arts sectors (performing arts, visual arts, and cultural heritage), film, DVD and video, television and radio, video games, new media, music, books and press. The analysis of the European CCIs has shown that these sectors grow at a higher pace than the rest of the economy. With their direct and indirect socio-economic impacts CCIs contribute to competitiveness, more and better jobs, sustainable development, innovation and cohesion. CCIs generate important economic performance in non-cultural sectors, in particular in the ICT sector as well as in relation to local development.

The present problem of cross-country comparison of European CCIs is three-fold: first, there is no uniform definition of CCIs accepted all over the Europe, second, the current NACE statistical classifications are not capable of covering all sectors of CCIs and

third, data is neither comprehensively nor efficiently collected at national levels. Thus, the overall economic and social weight of the European CCIs is largely underestimated. According to the last gathered figures, the European CCIs generated a turnover higher than the car manufacturing industry and the ICT manufacturers (€ 654 billion (2003) in comparison to € 271 billion in the car industry (2001) and € 541 billion in the ICT industry (2003)), contributed 2.6% to the European GDP and their growth rate was 12.3% higher as the growth rate of European economy in general in the period from 1999 – 2003 (KEA European Affairs 2006, p.67). CCIs contributed on average 1.9% of value added to national GDP in the EU27 and herewith followed the manufacture of food, beverages and tobacco that contributed on average 2.3% of value added to national GDP in the EU27. In Slovenia CCIs contributed the same share of value added to the national GDP as the manufacture of machinery and equipment (2.2%) and herewith followed the manufacture of chemicals, chemical products and man-made fibres that contributed the highest share of value added to the national GDP (3.4%). In the new EU member states (EU12)¹ the value added to GDP grew on average at the highest level in the period 1999-2003 (24.5%). The highest levels of value added growth in the observed period have been registered in Lithuania (67.8%) and Czech

¹ After 2004 and 2007.

Republic (56.0%). Among the 12 new EU member states with available statistical data on this indicator Slovenia has registered the lowest growth of CCIs value added to GDP (5.4%).

The recent study (European Commission, 2011) shows that regions with high concentrations of creative and cultural industries (CCIs) have Europe’s highest prosperity levels². European CCIs’ clusters dominate in large urban areas and capital city regions. The highest shares of CCI employment (CCI Focus)³ and the highest regional specialisation (CCI LQ)⁴ among the EU27 member states belong to Sweden (7.30%, 2.01), Finland (6.05%, 1.66), the Netherlands (5.45%, 1.50), Latvia (5.41%, 1.49) and the United Kingdom (5.39%, 1.48). Concerning the annual employment growth in CCIs in the period from 2003–2009 the first three places among the EU27 member states belong to new EU member states: Cyprus (25.79%), Slovakia (25.60%) and Estonia (11.48%). With 3.33% share

² If no other factors are taken into account, regional creative and cultural specialisation explains approximately 50% of the variance in regions’ GDP per capita.

³ CCI Focus indicates the share of the nation’s total employment in the CCIs sectors.

⁴ Measured by the location quotients (LQ). CCI LQ is an indicator of CCI employment relative to the total employment of the region, where $LQ > 1$ indicates an over-representation of CCI employment.

of CCI employment and location quotient of 0.92 Slovenia ranks as 24th among the EU27 member states. In comparison to the average compound annual growth rate of employment in CCIs (CCI CAGR) in the new EU12 member states⁵ (9.2%), Slovenia achieved for almost 64% lower annual CCI employment growth (3.34%) in the period from 2003-2009.

Policy has a crucial role in setting the appropriate conditions to emerge culture-based creativity and to support the development and growth of CCIs. Culture must be seen as a resource for creativity by policy makers and be given greater prominence in the broader policies (KEA European Affairs, 2009): innovation policy should foster multi-disciplinarity and interactions between art, sciences and business; cultural policy should stimulate the cross-cultural collaboration and circulation of local cultural expressions; regional policy should research links between culture and regional economic and social development, make investment in culture a priority in regional policy instruments as a part of the innovation strategy and promote cross regional partnerships to improve market access of local culture-based creativities; social policy should use a culture as a resource for social innovation; education policy should promote the role of art and culture in developing creativity as well as the value of intellectual

property and value of competence in creative skills; environmental policy should mobilize creators - artists, architects and designers – and creative SMEs for the objective of environmental sustainability and it should raise awareness on environment through culture; foreign policy should promote the principle of cultural diversity by encouraging cultural exchanges and use technical assistance programmes with third countries to promote trade in the creative sector and cultural exchanges. Policymakers should give a greater value to imagination and disruptive creative thoughts by the promotion of art and culture in lifelong learning, the recognition of the value of alternative education methods whose focus is on the development of individual creativity, the encouraging of interdisciplinary activities at university level and creative partnerships between the education, cultural and entrepreneurial activities. The awareness about culture as a resource for creativity and innovation should be raised by the assurance of relevant statistical data at national level to enable monitoring creativity and intangible assets⁶. The attention should be given to CCIs access to finance,

⁶ At the European level the European culture-based creativity index is a statistical framework for illustrating and measuring the environment promoting culture-based creativity. It consists of 6 pillars of culture-based creativity: human capital, institutional environment, openness and diversity, technology and social environment (KEA European Affairs, 2009a).

establishment of creative clusters, development of creative entrepreneurship and promotion of cultural diversity through the mobility of cultural and creative works, artists and cultural practitioners within the European Union and beyond.

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⁵ Not available data for Malta and Poland.

Female students as victims of sexual violence

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The paper consists of three parts. The first one overviews some research findings on female student victims of sexual violence (primarily of sexual assault and rape) as well as some victimization theories rooted in criminology and victimology, psychology, social psychology, sociology and feminist studies, all allowing for different interpretations of female victims of sexual violence, including female students. Further, it outlines the shift in the approach to women victimization in contemporary criminological and victimological studies from that of »blaming the victim« to that of »victims needs« and »victims human rights«.

In the second part, the empirical data about female student sexual victimization from the 2009 survey Attitudes on crime is described and analysed. The survey was done in spring 2009 on a convenient sample of more than a thousand of female and male respondents of several faculties in the fields of law, criminal justice, social work, education and sociology at two Slovenian universities (Ljubljana, Maribor). The questionnaire was a standardised one, applied also in an international project done by Helmut Kury from Max Planck Institute, Freiburg, Germany. Also presented is a short comparison with the data from the survey Attitudes on crime 2006: the questionnaire was the same, but besides the students of the Faculty of Criminal Justice and Security and the two faculties of Law (Ljubljana and Maribor), the sample of respondents also included Slovenian police officers. In our comparisons, male respondents were excluded.

The questionnaire was pretty long and complex; it contained 250 questions about socio-demographic characteristics, general societal worries, individual insecurities, insecurities of women, appropriate

measures for combating crime, adequate state measures against particular crimes, experience of victimization, attitudes towards death penalty and four vignettes about personality of Miss Novak (as ordinary woman, as a victim of rape, as victim of burglary and as battered women by husband). The questions about life sentence and the harshness of criminal penalties are included in the Slovenian questionnaire. The students filled the questionnaire individually and without any assistance in the classroom before the beginning of lectures. The time limit was 30 minutes.

In the empirical part of the article, the data on victimization of female students are selected and analysed. They show there is a certain continuum of types of sexual violence, from relatively less serious forms of aggressive behaviour (unwanted touching and misunderstandings regarding sex) to more serious ones (sexual assault and rape).

The prevalence of victimization (during lifetime) depends on a given definition of sexual violence. In its broad meaning (encompassing both less and more serious types of sexual violence), more than 40 per cent of the female students have been exposed to unwanted and unpleasant experiences, while in the narrow meaning of the term (i.e. including sexual assaults and rapes only), the number of the female students victimized in violent attacks and rapes amounts to about 5 per cent.

The answers of female respondents also showed that the majority of unwanted experiences remained unreported either to the police or to close friends and relatives. A victim is more likely to report an unwanted experience or an attempt of an unwanted sexual contact or intercourse if

the offender is a stranger, especially if a particular episode relates to a more serious sexual assault and attempted or accomplished rapes. The data also showed that alcohol and drugs were present in some cases of women victimization. Some female students reported multiple victimization.

Although a great deal of female students worry a little about different types of unwanted sexual actions, a considerable proportion of them worried a lot (about 25 per cent). They were careful, but their level of fear of unwanted sexual activities involving men was higher than the general level of worries caused by other unwanted life events.

The analysis of differences and similarities between victims and nonvictims done by way of anova and descriptive discriminant analysis taking into account sociodemographic characteristics, worries about daily problems, feelings of insecurities, fears of victimization, and the support to repressive and restorative measures aimed at tackling crime showed some smaller but inconclusive differences between victims and nonvictims.

In the third part of the article, some of the results are discussed from several theoretical perspectives emphasizing different sources of problems and different measures proposed for their solution. The first perspective finds a source of the problems in psychological characteristics of individuals and their family relationships, the second in male power and dominance, and the third in a general social structure and a patriarchal ideology. The three perspectives propose different solutions. The proponents of the first one aim at identifying pathologies and side with physical and psychological treatments

spanning counselling, medical care, and strategies to handle conflicts in marital relations. The adherents to the second emphasize the importance of assistance and help to specific victims, law reforms and equality between males and females. The supporters of the third perspective are sceptic about the transformational potential of the law as regards violence against women and highlight the importance of empowerment of women, community-based programs, and a wider social change. There is also a discussion about a(n) (im)possibility of elaborating a general theory of (sexual) violence in relation to the existing plurality of theoretical and empirical approaches to the problems of victims of sexual violence.

Can we teach out of the box thinking?

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Creativity is regarded as one of the cornerstones for economic and social progress [1]. Based on outcomes, we can recognize different kinds of creativity [2], as follows:

- cultural (artistic) creativity involves imagination and a capacity to generate original ideas and novel ways of interpreting the world, expressed in text, sound and image;
- scientific creativity involves curiosity and a willingness to experiment and make new connections in problem solving;
- economic creativity is a dynamic process leading towards innovation in technology, business practices, marketing, etc., and is closely linked to gaining competitive advantages in the economy.
- technological creativity involves all of the above and is oriented toward finding practical solutions.

Additionally, one should recognize the difference between big 'C' creativity as a complex set of behaviours and ideas exhibited by an individual and small 'c' creativity located in the processes and products of collaborative and purposeful activity [3].

Creative people, regardless of whether they are conforming adapters or rule-breaking innovators [4], are valuable resources in limited supply. There are two possible ways to get creative people to work for an enterprise or community. The first is by attracting creative employees by good working conditions – a solution for those who can afford such an approach [5]. For communities that are not so rich, the only solution is to foster creativity by education [6], through building effective, small-network, innovative

communities [7] and by the development of a culture of innovation and creativity [8].

In Slovenia, proposals for nourishing creativity and innovations emerge from the government [9, 10] thus forgetting that creativity does not start at University or on the first day of employment, what can be recognized by absence of creativity in the White paper on Education [11], the key document which is going to shape Slovenian educational arena for next couple of years [12].

To increase creativity, immediate action should be taken throughout the educational system, recognizing that society needs not only creative artists but scientists, economists and engineers as well. Through the analysis of the legislation, syllabi and textbooks used in Slovenian schools, it can be recognized that they do not promote or even allow creativity in science education; even more, they can be regarded as creativity killers [12] with prevailing transmissive teaching methods [13]. To improve science creativity teachers must be educated to use methods that increase creativity in students, with the aim of producing open minds that will be able to work in a creative way, and recognizing that creativity is a prerequisite for wisdom. As stated by Sternberg [14] 'A fundamental idea in teaching for wisdom is that one teaches children not what to think, but rather, how to think', and that 'such instruction would place an increased emphasis on critical, creative, and practical thinking in the service of good ends — ends that benefit not only the individual doing the thinking but others as well'.

If we accept that creative thinking assumes, among other things, the ability to generate a variety of original ideas, to

see different viewpoints and elaborate on ideas [15], then small 'c' creativity is what can be nurtured systematically in formal education without the need for dramatic change in the educational system but through changes in teaching and learning methods and strategies. Even better news is that many of the methods and strategies to enhance small 'c' creativity, like problem-based teaching, are not unknown, but the problem is that they are rarely used in teaching [12].

From this perspective two actions should be taken. Legislation and key documents should be changed and immediate work with teachers is necessary. Because public schools cannot choose students by their creativity potential, what must be changed are teaching, legislation, and school climate. Creative teachers need autonomy and the resources to work in a creative way, goals that can be achieved by opening up the curricula and allowing freedom to create their own teaching materials. A much greater problem involves uncreative teachers. Because they are not going to produce out-of-box solutions, they must receive bullet-proof materials or be forced to use methods that will enhance creativity in students even in the absence of teacher creativity. In such case, both creative and uncreative students can gain. The first will gain by nurturing their creativity, and the second by learning algorithms that can result in producing creative solutions for problems. Strategies that promote cognitive flexibility, such as inquiry- and problem-based methods, can be implemented, to allow students to imagine creative solutions, viewpoints and possibilities [16]. Work with scientists from research institutes can help in building research skills and in narrowing the gap between educators

and scientists [17] and helping to build a creative school climate [8] by exchange of ideas. Teachers should cease to think of creativity as something that cannot be learned. Thus they must be educated in the use of strategies and appropriate methods. Additionally, teacher will need support to build sufficient self esteem to be aware that not knowing something is not a shame but a starting point for inquiry [18].

As a result we should not expect that all of the students will become out of the box thinkers but that, at least, are going to think in larger boxes.

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