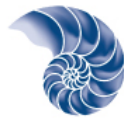


DETERMINANTS OF CREATIVITY
AND INNOVATION
IN SCIENCE, ART AND TECHNOLOGY
@ the 2016 Conference on Complex Systems

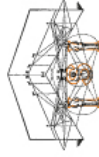
KIWORKSHOP SEPTEMBER 20/2016



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Satellite Workshop @ the 2016 Conference on Complex Systems
Amsterdam, September the 20th 2016
<http://kreyon.net/ccs2016>

Title: Determinants of creativity and innovation in science, art and technology

Organizers: Prof. Vittorio Loreto, Prof. Ilan Chabay, Dr. Pietro Gravino, Dr. Dr. Bernardo Monechi, Dr. Vito D.P. Servedio, Dr. Francesca Tria

Objectives & scope of coverage: The aim of the workshop is to gather scientists from many different disciplines (physics, mathematics, computer science, biology, social sciences, arts, etc.) to address fundamental questions about how people express their creativity and innovate both at the individual and collective levels.

Abstract Innovations are key factors in the evolution of human societies, since they represent the primary motor to explore new solutions in ever-changing and unpredictable environments. New technological artefacts, scientific discoveries, new social and cultural structures, are very often triggered by mutated external conditions. Unfortunately the detailed mechanisms through which humans and societies express their creativity and innovate are largely unknown and no comprehensive mathematical framework has been proposed so far. Creative solutions, novelties and innovation share an important feature: often, innovative events do not happen by chance, rather they seem to be triggered by some previous novelty or innovation. In studies of biological, technological, and cultural evolution, it has been hypothesized that one innovation can lay the groundwork for another by creating fresh opportunities. In our daily lives, a similar process may account for why one new thing so often leads to another. This idea has been beautifully summarized by the notion of *adjacent possible* introduced by Stuart Kauffman. In this picture the advance into the adjacent possible is the driving force for correlating innovative events, and novelties are produced through an exploration of a space - physical, conceptual, technological or biological - that enlarges itself whenever one reaches a point of the space never touched before. The workshop will represent the opportunity to assess where we stand by investigating the determinants of innovation processes and their evolution, progressing in their mathematical modelling, understanding their function and identifying the most thriving contexts (institutions, social organizations, business models, etc.) for creativity and innovation. The workshop will also feature a set of interactive installations and web-based games aimed at engaging participants in “creative” activities (see for instance <https://goo.gl/FM4acs>).

Keywords: Creativity, Innovation, Adjacent Possible, Mathematical modelling, Data science, Gaming

Expected number of presentations: 3 keynote speakers and 6 contributed talks. In addition a session is foreseen with interactive installation and web-based games.

Program of the Workshop on

"Determinants of creativity and innovation in science, art and technology"

Satellite workshop of the 2016 Conference on Complex Systems
Amsterdam, September the 20th 2016.

Satellite Session 1 10:00-12:30

10:00-10:15 Intro

10:15-11:00 Francesca Tria *The Expansion into the Adjacent Possible as a Microscopic Mechanism Driving Innovation*

11:00-11:45 Stefan Thurner *Combinatorial Evolutionary Dynamics as a Prototype for Complex Systems*

11:45-12:30 Contributed 1 (Bernardo Monechi) *Identifying the Features of Popular and Significant Artworks in Popular Music Production*

Satellite Session 2 14:15-16:00

14:15-14:50 Contributed 2 (Hiroki Sayama) *Studying Collective Human Decision Making and Creativity with Evolutionary Computation*

14:50-15:35 Josep Perello, *How creative, participatory and innovation strategies can improve the quality of scientific research?*

15:35-16:00 Contributed 3 (Riccardo Di Clemente) *From Innovation to Diversification: A Simple Competitive Model*

Satellite Session 3 16:30-18:00

16:30-17:15 Raffaella Burioni *Social Networks Evolution with old and new ties: how our Social Circle Grows*

17:15-18:00 Stuart Kauffman *Where are We on the Origin of Life Problem*