ATELIER 3 / WORKSHOP 3

"Émergence dans les systèmes complexes"
"Emergence in complex systems "

Animateur (Chairperson) : Gianfranco MINATI

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http://www.AIRS.it

Programme

SESSION : Mercredi 21 Septembre, 16:30 à 18:00 / Wenesday September 21, 16:30 -18:00 pm

Gianfranco Minati (Italy, Italian Systems Society) :
"General system theory" as theory of emergence.
Marco Giunti (Italy, Professor Università di Cagliari) :
Emulation, reduction and emergence in dynamical systems.
Meike Tilebein (Germany, Research Assistant, University of Stuttgart) : Levers of Emergence :
A Generic Framework of complex adaptative systems in Management science.

During the workshop presenters introduced and discussed some issues related to Emergence, General Systems Theory (GST) and applications to corporate management.

Professor **Minati** introduced the issue related to a still, current reductionistic usage of the concept of system intended established through organization rather than processes of emergence. This view made for some time GST far from considering *collective phenomena*. On the other side considering processes of emergence focuses on the active role of the observer, as for constructivism, allowing for removing a reductionistic objectivistic view. Thanks to the need to deal with problems related to complexity it has been possible to consider the different levels of description use by the observer to describe and realize processes of emergence.

In this view the reductionistic view of the concept of system is not anymore possible. In this framework we are now facing the change **from *General System Theory* to *Theory of Emergence*.**

There have been questions focused on the lack of a robust Theory of Emergence. The computational approach seems to be not sufficient for going far from simulation-based models.

Professor **Giunti** introduced a particular view of *reduction* intended as *emulation* (intuitively, a dynamical system DS_1 emulates a second dynamical system DS_2 when DS_1 exactly reproduces the whole dynamics of DS_2) of a system through another one. By considering the case of *discrete* systems the *representational* view of reduction is compatible with the existence of structural properties of the reduced system that are not also properties of the reducing one.

The discussion focused on some aspects of the mathematical formalization and on some comments about the general usability of the concept for non discrete systems.

Dr. **Tilebein** introduced a review of some general concepts fundamental for emergence and complexity. She then used the introduced concepts to propose a view to consider some dynamic problems related to corporate management, such as the *balancing* between efficiency and effectiveness. She focused on the ability to adapt as systemic property established and used during processes of emergence. She particularly introduced levels of emergence in firms. She used this description to consider examples from the literature that apply ideas from complexity science to different organizational levels.

The discussion focused on the possibility of concrete application of the approach.