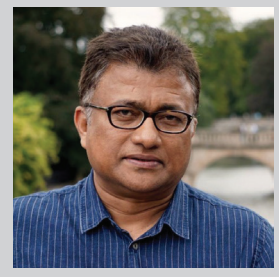
10 day course on

EMER-GENCE AND UNDER-STANDING OF A COMPLEX WORLD

Committee Room
SLL & CS I (212), JNU

10 – 21 January 2025
1.00 – 5.00 p.m.

Prof. Dr. Fausto Fraisopi
Amidex Excellence Chair
Aix-Marseille University
Marseille
France



Coordinator
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For registration : http://www.jnu.ac.in/gian

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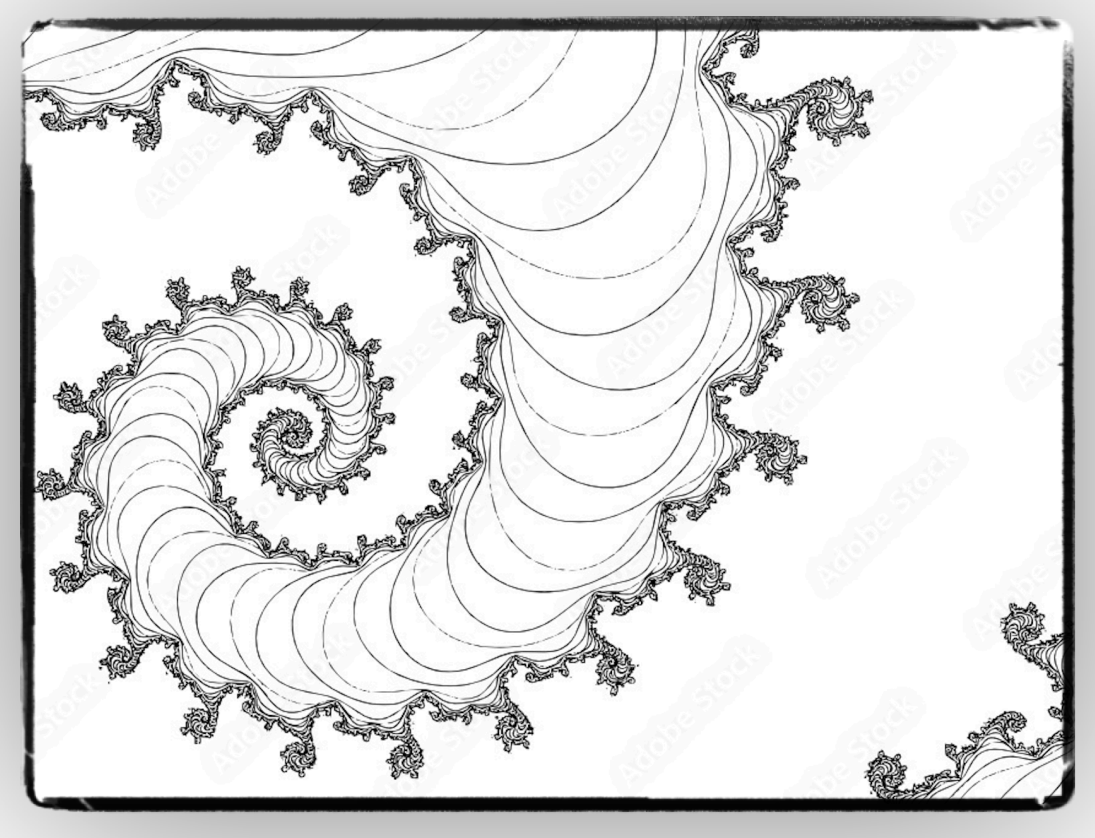

OVERVIEW

"The twenty-first century would be the century of complexity!" This is how Stephen Hawking answered the question about the characteristic of the coming century in January 2000. The award of the Nobel Prize for Physics 2021 to three physicists (Klaus Hasselmann, Giorgio Parisi, Syukuro Manabe) who have contributed significantly to complexity research seems to confirm the prediction. Indeed, complexity as a research object and at the same time as a research perspective plays a prominent role in various sciences today, in addition to physics, for example, also in climate science, sociology and economics. This fact allows us to speak of a (scientific) "revolution of complex systems". At the same time, the social challenges we face today are also complex in an unprecedented way - think of climate change, economic and geo-political crises, global migrations and eco-migrations. More and more frequently, we are forced to make decisions in the fields of economics, ecology and geopolitics within the framework of increasing complexity, the scope of which we can hardly foresee. But are we even capable of thinking about the complex in such a way that we can do justice to such situations? And what is "complexity" anyway? What exactly distinguishes "complex phenomena" that we speak of as a matter of course? And why do they actually present our philosophical, scientific and technical rationality with such almost insoluble problems?

The lectures cycle proposed here attempts to provide a deep (and philosophical) understanding of the challenge posed by complexity. It focuses on a constellation of crucial problems for rationality and for the role that a new way of thinking and conceiving phenomena can play in a global (and globalised) world today. The "theory of complex world" to be unfolded will thereby attempt to implement and harmonise the concept and shapes of complexity within the framework of conceptualisations and contemporary debates in philosophy and the sciences with the help of historical means (history of science and culture) and theoretical means (i.e. epistemological and theory of science).

Although words like "complexity" and "complex" play an increasingly important role in everyday, scientific and philosophical discourses today, the "complex" has hardly become a topic of philosophical research so far. Thus, the new challenge that this poses to thinking, which also has implications for the education of the younger generation, for example, has hardly been penetrated so far. The same applies to expressions such as "transdisciplinarity" or "interdisciplinarity", which are often coupled with complexity from the point of view of scientific practices. It is true that there is a struggle to make global phenomena such as economic crises [Markose, 2005], climate change, the spread of pandemics, etc. comprehensible as "complex" phenomena that defy one-dimensional (disciplinary) descriptions and, above all, simple solutions. However, our (philosophical) culture still lacks conceptually sharpened tools to adequately describe and understand such complexity and its associated trans-disciplinarity.

COURSE OBJECTIVES

The challenges of our time ask for a rational and philosophical raise of a new global form of rationality. The main objective of the course is to give tool to identify, question and approach the scientifically described and personally experienced complexity of the world and the associated cultural change in a new systematic way. In doing so, it must be grounded in epistemology and scientific theory. At the same time, however, it must go beyond these boundaries in order to do justice to the cultural, social and political scope of the problem. Only such philosophically oriented research, informed by the theory and history of science, can clarify the relationship between the science of the complex and society. The lectures cycle does not aim to propose from above (top-down), in a speculative way, a conception of complexity as a holistic worldview, but to describe methodologically, from below (bottom-up), in a descriptive-structural way, from the philosophical and scientific dealing "with complex phenomena" [Bechtel-Richardson, 1993], a new and critical and scientifically informed approach to our world and to our strategic policies. The lectures cycle is divided into three main parts, which correlate on the one hand with the main essential topics.

(a) **History of science and transformations of knowledge** (with reference back to the emergence of the modern paradigm of knowledge and to its crisis, which gave rise to contemporary complexity science);

(b) **Epistemology and theory of science** (with a particular focus on the content and practice of modeling, as well as trans-disciplinarity of research design);

(c) **Ontology with special regard to the problem of emergence from theory of mind to eco-systems theory**

The course objectives are:

a) provide master students and doctoral students as well as post-doc researcher from all backgrounds (natural sciences, humanities but also business school) with conceptual tools to interpret - from an epistemological and philosophical point of view - the complexity of phenomena on a global scale

b) provide a solid epistemological and cultural basis on which to interpret the global challenges of our time such as sustainable development, global migration, political and socio-economic uncertainty (VUCA Model)

COURSE DETAILS

Week 1 (10 – 14, January 2025)

INTRODUCTORY LECTURE

Day 1, 10th January 2025 (3 hrs)
Lecture Topic: **The Idea of a Complex World: Complexity Science, Economy and Global Challenges**

Tutorial: **Thinking Complexity in a global Perspective**

FIRST PART: THE EMERGENCE OF COMPLEXITY

Day 2, 11th January 2025 (3 hrs)
Lecture Topic: **The establishment of the modern paradigm of science and the worldview (Weltbild) of the "simple": from Renaissance to Laplace**

Tutorial (1 hr): **Questioning and methods in history of ideas, history of science and philosophy**

Day 3, 12th January 2025 (3 hrs)
Lecture Topic: **The negative issues of the modern (Galilean-Cartesian) worldview and the foundational debate of the sciences: from Riemann to Quantum Mechanics and Gödel**

Tutorial (1 hr): **What do we understand under "foundational crisis of science"?**

Day 4, 13th January 2025 (3 hrs)
Lecture Topic: **The rise of a new open worldview in the twentieth Century**

Tutorial (1 hr): **Methods of complexity thinking**

SECOND PART: FEATURES OF COMPLEXITY

Day 5, 14th January 2025 (3 hr)
Lecture Topic: **Essential features of complex phenomena**

Tutorial (1 hrs): **Defining complexity from experience to science to policy making**

Day 6, 17th January 2025 (3 hrs)
Lecture Topic: **The essential features of complex phenomena and their epistemological manifestation: models and simulations, AI.**

Tutorial (1 hrs): **Handling with and interpreting the new technologies as tool**

Day 7, 18th January 2025 (3 hrs)
Lecture Topic: **Epistemic understanding of complex phenomena. The relationship between theory, model (model validation) and ontology**

Tutorial (1 hr): **What do we mean with "multiple scenarios". Case Study: IPCC Scenarios**

THIRD PART: THE UNDERSTANDING OF COMPLEXITY AND GLOBAL CHALLENGES

Day 8, 19th January 2025 (3 hrs)
Lecture Topic: **Ontological problems of complex phenomena: the concept of emergence**

Tutorial (1 hr): **Ontology in philosophy (western and eastern)**

Day 9, 20th January 2025 (3 hrs)
Lecture Topic: **Fixing and understanding what a complex phenomenon is: meta-theoretical approaches and meta-ontology**

Tutorial (1 hr): **Meta-ontology in philosophy and information theory**

Day 10, 21st January 2025 (3 hrs)
Lecture Topic: **Understanding and dealing with complex phenomena: meta-ontology and trans-disciplinary (theoretically oriented) approach**

Tutorial (1 hr): **What is inter-disciplinarity and how we learn inter-disciplinarily?**

TEACHING FACULTY

Prof. Dr. Fausto Fraisopi
Amidex Excellence Chair
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"Transdisciplinarity and Complexity Research "
Aix-Marseille University

Gilles Gaston Granger Center UMR 7304
Philosophy and Comparative Epistemology
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Fausto Fraisopi, born and raised in Rome, graduated from the University of Rome 'La Sapienza' and continued his doctoral and post-doctoral training in Paris (University of Paris IV, ENS) and Freiburg (Germany). Habilitated at the University of Freiburg in 2015, he taught there as Professor until 2024. He currently holds the Excellence Chair

"τ-co.re@AMU" - Transdisciplinarity and Complexity Research "at Aix-Marseille University (France).

Among his publications: [in preparation] with B. Balschun, *Topoi* der Erfahrung. *Noema*, Horizont, *Eidos* aus der gegenwärtigen Perspektive, 2025. Philosophie und Frage, Freiburg i.B. - München, Alber-Verlag, 2016.Vol. I. Über Metaphilosophie Vol. II. Untersuchungen über die Formen der *Mathesis*.La complexité et les phénomènes. Nouvelles ouvertures entre science et philosophie, Paris, Hermann (coll. Vision des sciences), Mars 2012, 580 pp. (with a preface of Jocelyn Benoist). L'ouverture de la vision. Kant et la « phénoménologie implicite » de la *Darstellung*, Hildesheim-Zurich-New York, Olms Verlag, 2009 (468 p.).

AREAS OF SPECIALISATION:
Theoretical Philosophy, History of Philosophy (Ancient, Modern and Contemporary), Epistemology, Theory of Science, Complexity Theory, Ontology, Phenomenology.

AREAS OF COMPETENCE:
History of *Mathesis universalis*. History of Logic and History of Science (Philosophy of Nature, Modern Science, Foundational Crises of Sciences), Sustainability, Transcendental Philosophy and German Idealism.Ancient Philosophy and Culture, Aesthetics.

WHO CAN ATTEND

Student students at all levels (B. A./M. A./BTech/MSc/MTech/PhD) and Faculty Memebers and Postdocs

Venue

Convention Centre, JNU, New Delhi

Registration and Fees

Prior registration is mandatory for all students as per the procedure provided on the GIAN web portal.

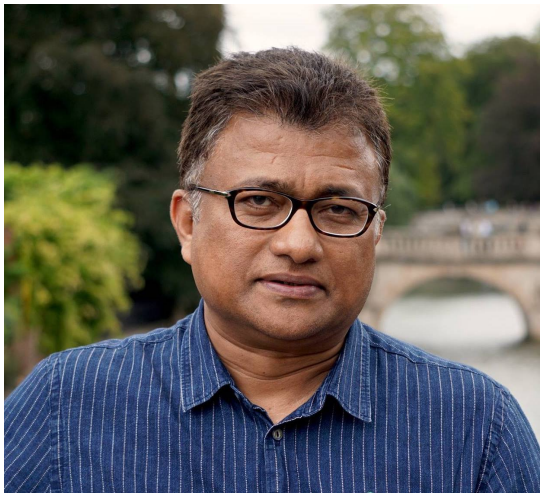
B.A/M.A Students: Rs. 100

Ph.D. Students: Rs. 300

Professionals/Teachers/Research Fellows: Rs. 2000

Registration starts from 15 December 2024

Course Coordinator:



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