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What is a complex system?

28 December 2022

On September 13 and 14 2022, IAS was honored to have philosopher of science professor James Ladyman and physicist professor Karoline Wiesner visit the institute. They took part in a 2 day workshop discussing pertinent issues, challenges, and opportunities raised by complexity sciences, organized around their 2020 book “What is a complex system?”.

Taxonomy of complex systems

The book is the result of an ongoing collaboration between Ladyman and Wiesner that began in 2007, starting with the opening of the Centre for Complexity Sciences at the University of Bristol where they both were teaching at the time. In this book, they aspire to expose and remedy important sources of confusion that they take to beset the relatively young field of complexity sciences. One such important source of confusion is the notion of a ‘complex system’. They aim to address this problem by developing a taxonomy of complex systems, informed by examples from among others physics, biology, and social science.

Ladyman is well known for, inter alia, his work in philosophy of science on scientific realism and structural realism, naturalized metaphysics, and complexity science. On this latter topic he has collaborated for over a decade with Wiesner, whose research focuses on building a quantitative framework for understanding and measuring the dynamics of complex systems. To this end, she has done extensive research on, amongst others, the philosophical and mathematical foundations of complexity, and on information theoretic measures of ‘stability’ and ‘critical transitions’, both key characteristics of complex systems.

Clarifying issues from various angles

In this event, James Ladyman and Karoline Wiesner presented work from their recent (2020) book ‘What is a complex system?’ and a number of panelists helped explore and clarify a variety of pertinent issues and questions related to the philosophy and practice of complexity sciences, approaching these from various angles. These angles ranged from clinical psychology and educational perspectives, to physics, social science, philosophy of the humanities, and philosophy of science perspectives on complex systems. Guiding questions for this exchange of ideas were: ‘What

did you learn from the book that is worth spreading into your field/community?'; 'What else do we need to work out to make complexity approaches more widely used?'; 'What does 'complexity' add to your field?'; and 'What is the next big challenge about complexity?'

The workshop sparked lively debate, in which timely and relevant ideas were exchanged and, importantly, also made for a lot of fun.

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