Seminar: Philosophical Foundations of Modern Physics
Robert DiSalle

This course looks at philosophical themes in the foundations of physics as they have evolved, from the origins of modern physics in the 17th century to the 20th century, to form the background to present-day debates. We will consider not only the scientific and philosophical background to modern philosophy of physics, but also the interaction between and among foundations of physics, foundations of mathematics, and the history of philosophy. No knowledge of physics is presupposed, but relevant ideas would beWe will focus especially on two aspects of this history. On the one hand, we consider the philosophical views of matter, force, space, and time underlying conceptual transformations in physics. On the other hand, we consider ideas of the nature of scientific theory and scientific method that informed, and were informed by, theoretical developments. in particular, concerning the methods of theoretical physics, the relations between mathematics and physics, the role of theory and observation, and the relations between formal structure and physical reality. Authors to be studied will include Newton, Leibniz, Euler, Du Chatelêt, Kant, Riemann, Helmholtz, Mach, Poincaré, Einstein, Weyl, Noether, Heisenberg, Bohr, and others.

Requirements: One seminar presentation (accompanied by a short paper), and one research paper.