

**Interdisciplinary Laboratory for  
Natural Sciences and Humanities**

***Seminars of History of Science***

**18 January 2017**

**3 pm**

**Big Meeting Room – VII floor**

**Elena Castellani**

Università di Firenze

***Symmetries in physics:***

***historical and philosophical aspects***

Considerations based on the group theoretical notion of symmetry dominate modern physics, at all scales of the physical description. In the philosophy of science community, the role and meaning of physical symmetries is a relatively recent subject and, apart from some notable exceptions, literature devoted to systematic philosophical reflection on the issue started to appear at the beginning of this century. Since then, the subject has flourished and the significance of gauge symmetry, quantum particles, the role of symmetry breaking and the empirical status of symmetry principles have become some of the most discussed topics in today's philosophy of physics. The talk aims at giving a survey of this debate's main points and arguments, highlighting how the issues relate to more traditional problems in the philosophy of science, such as the status of the laws of nature and, more generally, the relationships between mathematics, physical theory and the world. To lend some depth to the survey, the talk begins with some historical remarks, including a brief description of the historical roots and emergence of the concept of symmetry at work in modern physics.