

HISTORY AND PHILOSOPHY OF THE LAWS OF NATURE

3 December AULA VERRA, Via Ostiense 234

Dipartimento Filosofia Comunicazione Spettacolo

9.30 10.30

Laws and Necessities: On the Ineffective Reasonableness of Mathematics (Robert Di Salle, Philosophy UWO)

Newton's Principia advanced the idea of a world governed by strict mathematical law. Hume's admiration for Newton's laws did not prevent him from advancing his well-known skeptical argument against the idea of necessary connections in nature. But Newton himself anticipated some of Hume's skeptical concerns. I will show how, in facing those concerns, Newton took a far-sighted view of the power and the limitations of mathematical laws, and the subtle relations between natural powers and our mathematical pictures of them. Along the way, he articulated what it means to take a realist perspective on laws that are probably wrong.

10.30-11 Coffee break

Paolo Pecere (Philosophy, Roma 3)

"Forces, Laws and Grounds: Kant's Newtonianism and the limits of cognition"

I will present and analyse connections between Kant's philosophical account of Newtonian physics and his theory of knowledge. I will show, on the one hand, that Kant does not merely provide a "foundation" of Newton's physics, but rather thinks that scientific knowledge necessarily requires a "metaphysical" element – indeed, this metaphysical part of science even leads to a partial correction of Newton's original insights. On the other hand, I will argue that this framework involves an intrinsic limitation of scientific knowledge, and human cognition in general, as it is summarized in the "Logic" and in different passages of the Critical works. This is a further step of Kant's deep and original engagement with Newtonianism as a philosophical alternative to Rationalism.

11.00-11-1200 Coffe Break

12.00-13:00

What Breathes Fire into the Equations? (Barry Loewer, Philosophy, Rutgers)

Since the 17th century discovering the fundamental laws of nature has been the primary goal of fundamental physics. While it is the task of scientists to discover what laws there are, it is the task of philosophers to explain what laws are. In Stephen Hawking's words the philosophical question is "What breathes fire into the equations?" In recent metaphysics there is a debate tween Humean and non-Humean answers to Hawking's question. In the course of dealing with some serious objections to Lewis' account I sketch an alternative, "the Package Deal Account" (PDA). The PDA transcends the dispute between Humean and non-Humean accounts in a manner that may strike one as a kind of Kantian compromise. In my talk after some table setting I explain and defend the PDA of laws

15.16 Nino Zanghì (Physics, Genova)

Relational Laws of Motion

abstract: I'll give an overview of the relational approach to mechanics in the classical case (Barbour and collaborators) and the quantum case (recent work of Duerr, Goldstein and myself).

Discussion