

Fernando Gil International Prize in Philosophy of Science 2015

awarded to **Professor Michael Friedman** (Stanford University).

Award Ceremony, 4th of April, 2016, Calouste Gulbenkian Foundation, Lisbon.

Presentation by **Jean Petitot** (École des Hautes Études en Sciences Sociales, Paris)

Honorable President of the Calouste Gulbenkian Foundation, Mister Artur Santos Silva, Honorable Minister of Science, Technology and Higher Education, Mister Manuel Heitor, dear Professor Friedman, dear Danièle Cohn, dear President Gillies and Esteemed Colleagues, Ladies and Gentlemen,

On behalf of the Scientific Committee of the *Fernando Gil International Prize in Philosophy of Science*, it is a great pleasure to present Professor Michael Friedman, the winner of the 2015 Prize, for his book *Kant's Construction of Nature. A reading of the "Metaphysical Foundations of Natural Science"* published in 2013 by Cambridge University Press.

It is also with considerable emotion that I unite our acknowledgement of Michael Friedman as such a great specialist of transcendental philosophy together with the memory of Fernando Gil. Fernando was an eminent specialist of Leibniz and Kant who worked passionately on several controversies Michael Friedman discusses in his book. He would surely have appreciated this reading of the *Metaphysical Foundations* which honors the Prize created in his name in 2009 by Minister José Mariano Gago, himself an exceptional scientific and political personality who, alas, passed away a year ago.

Michael Friedman's opus, more than 650 pages in length, is a tremendous book representing, as he tells us, "the culmination of an intellectual journey of more than thirty years". It is already a classic work of reference. As Michael's colleague, Tom Ryckman, an eminent specialist of Einstein and Weyl, declared in the announcement of the Prize at Stanford University, it is

"a stunning new interpretation of Kant's profoundly deep insights into Newtonian mechanics as well as into its difficult problems with Absolute Space and Absolute Motion."

The *Metaphysical Foundations* were published in 1786 between the first and second editions of the *Critique of Pure Reason*. It is a central text for the development of the critical philosophy as a whole. Michael Friedman's reading is an enormously erudite and contextualized philological analysis of Kant's complicated transcendental arguments in physics. It is a 'triangulation' of critical viewpoints at the convergence of the

Clarke/Newton VS Leibniz controversy, the contributions of Leonhard Euler, Johann Lambert, and many others, and Kant's own precritical writings such as the *Physical Monadology*. As Michael confirms at the end of the book,

“one of the central ideas that have guided [his] reading from the beginning” [was that] “Kant's strenuous efforts to transform the essential concepts of Leibnizean metaphysics are primarily aimed (...) at providing a radically new kind of metaphysical foundation for specifically Newtonian mathematical physics.” (p. 562)

Michael Friedman is currently Professor at Stanford University. He earned his PhD in philosophy of physics at Princeton University in 1973. Subsequently, he taught as professor or visiting professor at Harvard, at the universities of Pennsylvania, Konstanz, Illinois (Chicago), Berlin (Max Planck), Berkeley, and at Indiana University where he was Chair of the *Department of History and Philosophy of Science* from 1995 to 2000. He joined Stanford University in 2000 and is currently the Director of the *Patrick Suppes Center for the History and Philosophy of Science*, and, as of 2015, Suppes Professor of the Philosophy of Science.

Professor Friedman has received many Fellowships, Honors, and Awards. He is in particular a fellow of the *American Academy of Art and Sciences* and a Member of the *Institut international de philosophie*. He has also many responsibilities as an editor. He belongs to the Editorial Board of numerous significant journals, in particular *Philosophy of Science*, *Philosophy and Phenomenological Research*, *The Kantian Review*, *Philosophique*. He joined the Governing Board of the *Philosophy of Science Association* in 1989 and became its President from 1997 to 1999. Since 2002, he is also on the Editorial Board of the *Complete Edition of Works of Rudolf Carnap*.

The first important book by Michael Friedman (1983), was *Foundations of Space-Time Theories. Relativistic Physics and Philosophy of Science*. Analyzing mathematically, physically, and philosophically, and with great acumen, the formalisms of modern differential geometry used in General Relativity, the book concludes that the approach of logical empiricism was insufficient. Michael then began to develop a neo-transcendental alternative. This book was awarded the *Franklin Matchette Prize* of the *American Philosophical Association* and the *Lakatos Prize for Philosophy of Science*.

Ten years later, a second book, *Kant and the Exact Sciences*, explained how Kant succeeded, with the limited means of his time, in constructing an *adequate* philosophy of Newtonian physics. Accomplishing this task involved a deep reconsideration of the links between

empirical phenomena, objectivity, concepts, principles, and judgments and, in addition, required Kant to overcome the inadequacy of the logic of his era. This enduring effort played a fundamental role in the genesis of his critical philosophy.

The main difficulty in bringing transcendental philosophy into contact with present day physics is to overcome the drastic and seemingly devastating critiques raised against it by logical positivism. For that, it is necessary to evaluate this epistemological development. This Michael did in the volume *Reconsidering Logical Positivism* published in 1999 by Cambridge University Press.

Let me emphasize this point. Behind the dispute between the developments of modern logic, essentially quantified predicate calculus, and Kant's concept of *synthetic a priori*, there are deep problems concerning the relations between logic and geometry in physics. In fact, the Kantian *synthetic a priori* role of space and time in physics corresponds to what is called today a *background structure*. Riemannian geometry, Helmholtz-Lie-Engel conception of space, group theory, fiber bundles and Cartan connections, etc., deeply changed the background structures of physical theories but not their *synthetic a priori* role. For instance, in General Relativity, the metric of space-time with its Poincaré relativity group is no longer a background structure, but the *differentiable* structure of space-time with its relativity group of diffeomorphisms remains a synthetic a priori background structure.

Therefore, to reconstitute transcendental philosophy, one has first and foremost to elucidate these delicate questions concerning logic and geometry. In discussion with Hintikka's, Beth's and Strawson's interpretations, Michael Friedman explained that

“The kind of quantifier reasoning that we take to be paradigmatically logical, he [Kant] took – in a way that was reasonable given the state of logic at his time – to be synthetic in his terminology.” (*The Reasoner*, 7, 5, May 2013, p. 53)

The book *A Parting of the Ways: Carnap, Cassirer, Heidegger* (2000), revisited the links between logical empiricism and neo-Kantianism. The 1999 *Kant's Lectures* at Stanford, published as *Dynamics of Reason*, articulated the project of generalizing transcendental principles into an historical dynamics. The thesis is

“That the objectivity and rationality of scientific progress can be articulated and defended using (...) a relativized and dynamical conception of a priori mathematical-physical principles, which change and develop along with the development of the

mathematical and physical sciences themselves, but which nevertheless retain the characteristically Kantian constitutive function of making the empirical natural knowledge thereby structured and framed by such principles first possible.” (p. 31)

In 2014, the *Spinoza Lectures*, advocated “*A Post-Kuhnian Philosophy of Science*”. The presentation of the lectures emphasized that,

“encouraged by Kuhn’s own description of his approach as ‘Kantianism with movable categories’, (...) Michael Friedman aims to provide a more adequate philosophical response to the conceptual incommensurability between succeeding Kuhnian paradigms”.

Dear Michael,

Allow me to add some more personal comments to this short presentation. As you know, I also devoted a part of my philosophical works to the *Metaphysical Foundations*. My starting point as a student was the 1955 book of Jules Vuillemin *Physique et Métaphysique kantienne*. For many years, I discussed this stuff with Fernando Gil who, with his deep analyses of intuition, evidence, belief, and conviction, enlightened for me the sense of rationality and scientific explanation. After the *Carnation Revolution*, Fernando trained a new “magical” generation of young philosophers. He invited me here in Lisbon many times. I well remember, in particular, the long seminar in April-May 1986 organized with the *Gabinete de Filosofia do Conhecimento* he had created with Manuel Villaverde Cabral. Many colleagues involved at that time are present today. We discussed Kant's relations with Leibniz in the pre-critical and the critical periods, the transition (the *Übergang*) of the general metaphysics of the *Critique of Pure Reason* into the specialized metaphysics of physics of the *Metaphysical Foundations*, and the *Opus Postumum*. We discussed also the *Critique of Judgment* and Kant's legacy, for instance, in Goethe's *Morphology*. And also the generalization of the Kantian doctrine in Cassirer and the Marburg school or in Husserl's phenomenology.

So, dear Michael, we are all very much looking forward to your talk.