MATHEMATICS IMPACTING PHILOSOPHY

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Titles and abstracts

Michele Abrusci [Università Roma Tre]

Mathematical logic impacting philosophy: some cases

Riassunto/**Résumé** : Mathematical logic - which arose in the nineteenth century - with its methods, its questions and its results has certainly had (or should have) a notable impact on philosophy. Some examples of this impact of mathematical logic on philosophy will be treated and discussed in the talk.

Mirella Capozzi [Sapienza]

Kant on mathematics and philosophy: an incessant comparison

Riassunto/**Résumé** : In the pre-critical period Kant distinguishes the sensible signs of mathematics from the words that are the signs of philosophy. In the critical period he still characterizes the signs of philosophy as words, but he contrasts them with the construction of concepts in mathematics. I will consider how the notion of construction influences his treatment of algebraic signs.

Carlo Cellucci [Sapeinza]

Changes in Mathematics and the Philosophy of Mathematics

Riassunto/**Résumé** : Many philosophers and mathematicians have an inadequate view of the nature of mathematics. Thus, on the one hand, mainstream philosophy of mathematics fails to deal with real mathematics, on the other hand, mathematical practice is still based on views of the beginning of the last century. This is especially relevant today, because developments are coming in physics and biology that involve a change in the approach of mathematics to these disciplines, from top-down to bottom-up. The article argues that only heuristic philosophy of mathematics can deal with this change.

Vincenzo De Risi [Université Paris Cité]

Proving Axioms in pre-Modern Mathematics

Résumé/**Riassunto**: TBA

FRédéric Patras [LYSM]

Category theory impacting Dialectics

Résumé/**Riassunto**: Philosophers of mathematics often talk about category theory as an alternative way of constructing the foundations of mathematics, with the idea that it could, beyond that, have an impact on the theory of knowledge in the way that the shift from a logic of predicates to a logic of relations had an impact on general philosophy at the beginning of the 20th century, from Russell to Carnap, the Vienna Circle and analytic philosophy. Today I'll be talking about similar arguments, but in a different direction: that of the relationship between mathematical categories and dialectics, following Bill Lawvere and his analyses of Hegelian logic.

Thierry Paul [LYSM]

Quant ≠ Kant

Résumé/**Riassunto**: We question the reason for a big luck (according to us) of a true impact of quantum mechanics to philosophy, a situation which seems very different to the one of the influence of classical physics to Kantian philosophy. The drastic change of paradigm doesn't explain fully this difference, and we make the thesis that the mathematics underlying, ontologically according to us, quantum mechanics, which are much more easy than in the way mathematics underlies, non ontologically this time, classical paradigm, provides a bridge between quantum and philosophical fields. This being due to the fact that if quantum mechanics cannot reduce to classical one, its mathematical paradigm has a lot of resonances with our human perception of physical surrounding every day simple phenomena like 3D cinema, music notation and even traffic lights.

Alberto Peruzzi [Università degli Studi di Firenze]

Applications of category theory to the philosophy of language

Riassunto/**Résumé** : The theory of meaning was the core of twentieth century semantics and philosophy of language and, since Frege, the core issue of such a theory was the formulation of an adequate treatment of intensionality. Standard set theory has the axiom of extensionality, which prevents such a treatment. The modal approach through possible worlds semantics was considered as a solution, but as far as mathematics is grounded on set theory, this solution cannot work. Category theory (and, more specifically, topos theory) provides a solution thanks to the autonomy of the notion of morphism from the notion of object, and it calls for distinguishing various forms of extensionality, though the internal language raises another problem to solve in order to have a proper analysis of intensionality.