Laboratoire SPHere, UMR 7219

Séminaire Mathématiques 19e–21e, Histoire et Philosophie (HPM19-21)

Mathematics 19th–21st, History and Philosophy

2022 – 2023

Le séminaire d'histoire et de philosophie des mathématiques modernes est un lieu de présentation et de discussion de textes mathématiques produits aux 19e, 20e et 21e siècles, dans des perspectives aussi bien historiques que philosophiques. Il entend servir de lieu d'exploration (lecture, traduction, explication) de documents mathématiques peu ou mal connus, mais également de présentation de travaux en cours sur ces périodes. L'accent est mis sur la proximité avec les sources textuelles. Les séances prennent, le plus souvent, la forme d'une discussion desdites sources (auxquelles les orateurs donnent accès au préalable), précédée d'un exposé historique ou mathématique

Organisation :
Thomas Berthod, Clément Bonvoisin, Karine Chemla, Sara Confalonieri, Frederic Jaeck (ENS), Nicolas Michel (Bergische Universität Wuppertal, & SPHere), Ivahn Smadja (Université de Nantes, & SPHere), Paul-Emmanuel Timotei

Contact : F. Jaeck

Les séances, mensuelles, le plus souvent les mardis, ont toujours lieu à l'Université Paris Cité.

PROGRAMME

Mardi 17/01	|	14:00-16:00	| Claudio Bartocci / Jean-Jacques Szczeciniarz
Mardi 14/02	|	09:30-12:30	| Peter Ullrich / Valeriya Chasova
Lundi 06/03	|	13:30]16:30	| Walter Dean / Réunion des organisateurs
Mardi 18/04	|	13:30]16:30	| Karine Chemla / Clément Bonvoisin
Mardi 16/05	|	09:30-12:30	| Patrick Popescu-Pampu / Paul-Emmanuel Timotei
Vendredi 02/06	|	14:00-17:00	| Tinne Hoff Kjeldsen / Klaus Volkert

Informations pratiques

SPHere
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RÉSUMÉS

17 janvier 2023 | C. Bartocci / J.-J. Szczeciniarz

Claudio BARTOCCI (DIMA, Università di Genova) et Jean-Jacques SZCZECINIARZ (Université Paris Cité, HPS, SPHere)
L'existence de l'inexistant, une nouvelle problématique, celle du corps à un élément

Trois points seront abordés :

1. Histoire et présentation du problème depuis l'apparition de FUN dans le travail de Jacques Tits (1958) en passant par les résultats de quelques mathématiciens, Manin, Kapranov, Soulé, Deitmar.
2. Une nouvelle présentation à travers les travaux (résumés) de Toën Vaquié, et notre compréhension (CB AG JJS) du problème. Ce qu'apporte le point de vue catégoriel.
3. Philosophie des mathématiques, comment inexister ? Rapide comparaison avec racine de moins 1. La puissance synthétique de la distorsion des objets.

14 février 2023 | Peter Ullrich / Valeriya Chasova

Peter ULLRICH (Universität Koblenz-Landau)
The theory of analytic factorials - a quarrel between proofs and computations

Already at the beginning of the 19th century it was known that the factorial can be interpolated as an analytical function, at least on the positive real numbers, by means of the Gamma integral. However, some mathematicians tried to end interpolations in other ways, by setting up functional equations that these analytic factorials should satisfy and then trying to compute analytic expressions for them. A. L. Crelle, for example, published a whole book on the subject in 1823, which led to a sharp response from M. Ohm in 1829. K. Weierstraÿ brought clarification here, who clearly recognized that the interpolation problem has no unique solution and was thus able to correct Crelle and refute Ohm. Regarding the publication of his results, Weierstraÿ declined Crelle's o er of the Journal für die reine und angewandte Mathematik for this purpose, choosing instead his school's 1843 program. It was not until 1856 that he published an expanded version in Crelle's Journal.

Valeriya CHASOVA (University of Salzburg, dept of Philosophy)
Physical significance versus mathematical surplus in philosophy and history

Not all there is in physical theory has physical significance (in the sense of contributing to predictions or to ontology of the physical world). There are also elements coming from mathematics and usually interpreted as idle. Separating this mathematical surplus from physical content is an important and non-trivial task. I will tell more (where possible in simple terms) about ways to accomplish it and related topics in recent philosophy and in XX century history.

A still common solution in philosophy of physics, going back to Leibniz in his debate with Clarke (1717), is to count as mathematical surplus what varies under theoretical symmetry transformations. However, it has been defended from Kosso (2000) on that symmetry-variant elements have physical significance provided the theoretical symmetries concerned are matched with symmetries in the world or with conservation laws.

Historically, Klein (1917) argued that energy-momentum conservation law is unphysical in Einstein's just formulated general relativity (1915) because of not being linked appropriately with the field equations. However, Hilbert (Klein, 1917) took this to be a hallmark of that theory, while Noether (1918) showed that this feature is characteristic of a class of theories with certain symmetries. But her solution was itself mathematical, and its physical import only got better clarified later on.

[texte 1] [texte 2]

6 mars 2023 | Walter Dean

Walter DEAN (University of Warwick)
On models and computation in geometric consistency proofs

The focus of the talk will be a method for transforming several of Hilbert's (1899) model-theoretic consistency proofs for Euclidean and non-Euclidean geometries into syntactic demonstrations originally exposited by Paul Bernays (1935, 1939). Bernays' method is of historical interest due its apparent relation to the Frege-Hilbert controversy. But it is also of mathematical interest because of the specific combination of proof-theoretic, analytic, and algorithmic techniques which it employs. Time permitting, I will also discuss how this method anticipates contemporary developments in reverse mathematics and automated theorem proving.

Karine CHEMLA (CNRS, SPHere)

From computation to a practice of proof through the introduction of a concept : Poncelet's ideal elements in geometry

In a first part of this presentation, I intend to return to the nature of the "ideal elements" that Jean-Victor Poncelet introduced into geometry, notably in his Traité des Propriétés Projectives des Figures (1822). This analysis will require that I discuss some features of the diagrams used by Poncelet. Moreover, I will examine the use of elements of this kind in the practice of proof to which the Traité des Propriétés Projectives des Figures attests. In a second part, I will turn to the notebooks that Poncelet wrote in Saratov, as a prisoner of war, between March 1813 and June 1814, to shed light on the part played by Poncelet's analytical approaches at the time in the genesis of the concept of ideal elements. This talk is based on joint work with Bruno Belhoste.