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PHILMATH SEMINAR

Research seminar in the philosophy of mathematics and the philosophy of logic

Organizers: Fabrice Pataut (SND - UMR 8011 Sciences, Normes, Démocratie, CNRS et Sorbonne Université) and Francesca Poggioli (IHPST - (UMR 8590, Institut d'Histoire et de Philosophie des Sciences et des Techniques, CNRS et Université Paris 1 Panthéon- Sorbonne)

Lundi 19 juin 2023, **17h-19h**, salle des conférences de l'IHPST, 13, rue du Four, 75006 PARIS
(format hybride)

Bartosz Więckowski

(University of Frankfurt)

Titre : Towards a modal proof theory for reasoning from counterfactual assumptions

Résumé : In current research on structural proof theory, counterfactual inference is typically studied from a model-theoretic perspective. In this perspective, possible worlds models are methodologically basic. Model-theoretically defined consequence relations come first, and structural proof systems, usually transmitted via Hilbert-style axiom systems, have to be defined for these consequence relations.

Structural proof theory is thus methodologically secondary. Importantly, the logics usually extend classical logic. By contrast, on the proof-theoretic perspective on counterfactual inference, we start from a certain primacy of inferential practice and proof theory.

Proof-theoretic structure comes first. Meaning is explained in terms of proofs. Models are required neither for the formal explanation of the meaning of counterfactuals nor for that of counterfactual inference. Taking a proof-theoretic perspective and a constructive stance on meaning and truth (cf. BHK), we extend the rudimentary intuitionistic subatomic natural deduction system for counterfactual implication presented in [1] with rules for conjunction and disjunction. The proof system is modal insofar as derivations in it make use of modes of assumptions which are sensitive to the factuality status (factual, counterfactual, independent) of the formula that is to be assumed.

[1] Więckowski, B. (forthcoming). Counterfactual assumptions and counterfactual implications. In T. Piecha and K. F. Wehmeier, eds., Peter Schroeder-Heister on Proof-Theoretic Semantics. Outstanding Contributions to Logic, Springer.

<https://pantheonsorbonne.zoom.us/j/96702337143?pwd=VkNzM29tN2l1QS9wMWxXRXZlOXlmZz09>

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