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PHILMATH SEMINAR

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

Organizers: Fabrice Pataut (SND) and Francesca Poggiolesi (IHPST)

2nd SEMESTER 2023-2024 PROGRAM
IHPST – salle de conférences (2ème étage)
13, rue du Four, 75006 Paris

Monday March 25: 5pm-7pm

Marie Kerjean

(Computer Science, CNRS, LIPN, Université Paris 13)

**∂ IS FOR DIALECTICA : WHEN PROOFS AND PROGRAMS MEET
DIFFERENTIATION**

Zoom link

<https://pantheonsorbonne.zoom.us/j/97514275593?pwd=aXhKTTh4MWxOTkhybmJWRUtJMDFmUT09>

Meeting ID : 975 1427 5593

Passcode : 767323

ABSTRACT

Dialectica is a proof transformation acting of intuitionistic logic, which factors through Girard's translation, allowing the realization of several semi-classical axioms such as Markov's principle. During this talk, we will see how Dialectica identifies with reverse mode automatic differentiation, a way of computing efficiently the differential of a succession of functions. This talk will be an opportunity to look at Dialectica and differentiation through the lens of denotational semantics and the Curry-Howard correspondence. More precisely, we will see how reverse differentiation and Dialectica can be expressed in proof theory, lambda-calculus, and category theory.