

Post-doctoral fellowship - ANR-T-ERC Project "NAQI-34T"

A one-year post-doctoral position at the Institute of Mathematics of Burgundy will be funded by the ANR for the ANR-T-ERC project "New Applications of Quantum Invariants to 3- and 4-dimensional Topology". The goal of the project NAQI-34T is to develop new applications of quantum invariants to low dimensional topology, with 3 main objects of focus:

- 1) The study of quantum representations of mapping class groups of surfaces, and their relationship to homological representations coming homology of configuration spaces. In particular, the study of the kernel of those representations.
- 2) In dimension 3, the applications of Witten-Reshetikhin-Turaev invariants and TQFTs to Dehn surgery problems, in particular the cosmetic surgery conjecture and the computation of the Dehn surgery number of 3-manifolds. Also, we will try to develop effective methods to compute skein modules of 3-manifolds, study their finiteness properties and connect them to geometric information (character varieties, incompressible surfaces).
- 3) In dimension 4, extracting new concordance invariants from quantum invariants, and constructing invariants of knotted surfaces and 4-manifolds using the theory of trisections.

Applications displaying expertise in one or more of the following fields will be particularly appreciated: quantum invariants, mapping class groups of surfaces, homology of configuration spaces, concordance, trisections, skein modules.

Conditions of the grant: The post-doctorant will be hired for 12 months. The contract can start between October 1st 2023 and January 1st 2024. The net salary is expected to be 2230 euros per month, and the grant will cover travel expenses related to the project.

How to apply:

Applications files will be evaluated by the principal investigator of the project. To apply candidates must send their files (as a pdf file) to renaud.detcherry@u-bourgogne.fr before June 30th 2023:

- 1) A CV with a publication list
- 2) A short summary of previous research work and projects, precising the possible interactions with the project NAQI-34T.
- 3) A cover letter.

Dates:

- Applications files must be sent before June 30th 2023.
- The decision will be shared with applicants before July 15th 2023.
- The contract can start between October 1st 2023 and January 1st 2024.