Random Matrix Theory
Mathematical Statistical Physics
Theoretical Machine Learning

European Research Council Project

Two postdoctoral fellowships
starting fall 2022

The Quantitative Life Sciences (QLS) section of the Abdus Salam International Center for Theoretical Physics (ICTP) seeks applications from outstanding scientists of any nationality with a strong research record for **two postdoctoral positions, possibly including one at the senior postdoctoral level**, both starting fall 2022.

The positions are linked to the project CHORAL on the « Computational Hardness Of RepresentAtion Learning » funded by the European Research Council, with Dr. Jean Barbier as Principal Investigator.

The ICTP is a UNESCO Category 1 research institute supporting science and education in the developing world. It promotes worldwide initiatives for the career development of Women in Science. The QLS section provides a unique international research environment for postdoctoral fellows with about 15 group members, an intense program of workshops and conferences, close collaborations with local institutions (SISSA, ICGEB, Univ. Trieste) and internationally renowned ones (ENS Paris, EPFL, IPhT, UCSD, NTNU, MPIPKS, Aalto Uni, Toronto Uni, Minnesota Uni, etc). The QLS section has expertise in a broad range of fields including statistical physics of information processing, information theory, high-dimensional probability and statistics, statistical learning and inference, reinforcement learning, algorithms, stochastic processes and thermodynamics, theoretical ecology etc. Postdoctoral fellows are encouraged, and supported, to participate in activities in developing countries in order to promote the ICTP mission.

The selected postdoctoral researchers are expected to carry out active, independent and multidisciplinary research in the broad area of:

Statistical inference and theory of neural networks: statistical mechanics, random matrix theory, information-theoretic and algorithmic aspects

Appointments will be made for **two years, with the possibility of renewal for up to two additional years**.

Candidates should have a background in one (and ideally two or more) of the following disciplines:

- Random matrix theory
- Multi-matrix models (as appearing in QCD, string theory or map enumeration)
- Statistical mechanics, disordered systems and spin glasses (maths or physics)
- High-dimensional statistics, high-dimensional probability
- Information theory, theoretical signal processing, statistical inference
- Theoretical machine learning, theory of gradient-based dynamics
- Theory of (approximate) message passing algorithms

Experience in the numerical implementation of inference and machine learning algorithms in addition to the analytic skills is a plus but is not mandatory.

The net monthly salary ranges between 2100–2,700 EUR depending on seniority. Benefits include a private health insurance, a pension contribution, special allowances for family members, competitive travel funds as well as computer equipment.

Applications and expressions of interest are welcome. Applications should include a cover letter, an updated Curriculum Vitae including the full list of publications, a statement of research interests, and two or more letters of recommendation. Applications must be submitted on-line at: ***online application***. Incomplete applications will not be considered.

Additional information about the project can be found: ***here***.

For additional enquiries and expressions of interest, please contact: ***qls@ictp.it***

Application deadline: **March 20th, 2022.**