CALL FOR APPLICATIONS - January 2022

Research Assistant Position

Donostia International Physics Center (DIPC) is currently accepting applications for Research Assistant positions. This is a unique opportunity for highly motivated students, recently graduated from the University in Physics or related fields, to gain research experience in one of DIPC's high-profile research teams. A description of each of the available openings, contact information and deadlines can be found on the following pages.

Although candidates are welcome to contact the project supervisors to know further details about the proposed research activity, please be aware that the application will be evaluated only if it is submitted directly to the email address listed as "application email".

Applications received by the deadline will be evaluated by a Committee designed by the DIPC board on the basis of the following criteria:

- CV of the candidate (60%)
- Adequacy of the candidate's scientific background to the project (20%)
- Reference letters (10%)
- Other: Diversity in gender, race, nationality, etc. (10%)

Evaluation results will be communicated to the candidates soon after. Positions will only be filled if qualified candidates are found.

The DIPC may revoke its decision if the candidate fails to join by the appointed time, in which case the position will be awarded to the candidate with the next highest score, provided it is above 50 (out of 100).

However, the selected candidate may keep the position if, in the opinion of the Selection Committee, the candidate duly justifies the reasons why he or she cannot join before the specified deadline, and as long as the project allows it.

Ref. 2023/04
Simulation of quantum matter and gauge theories with tensor networks

Supervisor(s):
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Duration*: *1 year*

Application Deadline: *03/01/2023* ***Application Email:*** *jobs.research@dipc.org*

In the age of quantum technology, where noisy intermediate-scale quantum (NISQ) devices are accessible, quantum information tools to guide their development play a critical role. With the expected increasing complexity of available NISQ devices, its classic simulations, which drove its development thus far, will soon no longer keep up.

Therefore, there is an urgent need for increasingly powerful diagnostic tools that can be applied to quantum devices even in the quantum advantage regime. We plan to systematically develop quantum-inspired algorithms to benchmark, certify, and validate quantum devices. At the core of quantum-inspired algorithms are tensor networks (TNs), one of the most powerful paradigms for simulating many-body quantum gauge systems, both in and out of equilibrium.

The results of this thesis will be an essential tool to advance our understanding of dynamic and strongly correlated effects in quantum matter beyond the NISQ era. The results will have applications ranging from condensed matter physics to high-energy physics, quantum information theory, the design of new materials, and efficient chemical reactions.

Interested candidates should submit an updated CV and a brief statement of interest to the application email listed above. Reference letters are welcome but not indispensable. The reference of the specific opening to which the candidate is applying should also be stated in the subject line.

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EUSKO JAURLARITZA GOBIERNO VASCO

ikur estrategia