

Call for research positions at the
Centro de Astropartículas y Física de Altas Energías
– Universidad de Zaragoza – within the *DarkQuantum* project
1 postdoc position

Job description:

The Centro de Astropartículas y Física de Altas Energías ([CAPA](#)) is a leading institution in the search for dark matter, among other research topics. In particular, the host group of the current position at CAPA has a leading role in the International Axion Observatory ([IAXO](#)) experiment, as well as in the [RADES](#) project. The near-term goal of the IAXO collaboration is the construction and operation of [BabyIAXO](#), an intermediate stage to serve as prototype of the final IAXO systems, but already with a relevant physics program in itself. BabyIAXO is under construction at DESY, Hamburg. Its primary aim is the detection of axions emitted by the Sun, although its 10-m long magnet could host other type of setups. Axions are particles hypothesized to solve the strong-CP problem of the Standard Model of Particle Physics. They are also very motivated candidates to compose the missing Dark Matter of the Universe. The RADES project aims at developing new variants of the *axion haloscope* technique to directly detect axions from our dark matter halo. Part of RADES program will take place inside the BabyIAXO magnet.

The **DarkQuantum** ERC-SyG project recently awarded aims at developing novel quantum sensing techniques, and apply them to the RADES axion haloscopes. The resulting quantum-enhanced RADES setups could enjoy unprecedented sensitivity to dark matter axions. Some of the sensors to be developed within the project are expected to be installed underground in the Laboratorio Subterráneo de Canfranc ([LSC](#)). The DarkQuantum project will be carried out within the RADES international collaboration, and in particular in connection with experts in quantum technologies, like [ENS-Paris](#), [Aalto University](#) and [Kalsruhe Institute of Technology](#).

The position here offered is intended to reinforce the leadership role of the CAPA group in the DarkQuantum project, which involve development of axion haloscopes, quantum sensors, and the corresponding ancillary systems, cryogenics, RF readout, electronics,... It will also include simulation and data analysis tasks. The work will be done in close connection with the rest of members of the RADES and IAXO international collaborations, including first-level institutions like DESY (Hamburg), MPP (Munich) or CERN (Geneva).

This is a partial call for positions of the ERC-SyG DarkQuantum project. Additional calls are foreseen for a later moment of the project.

Candidates:

We seek excellent and motivated candidates with experimental particle physics and/or quantum technologies background. We will value previous experience in laboratory and analysis skills related with quantum sensing, like cryogenic, RF instrumentation, etc. Generic expertise in instrumental developments and software knowledge is also valued.

The post-doc candidate will be expected to take important responsibilities in RADES, manage work packages, supervise the work of students and technicians. For these we will value proof of independence, team work, and presentation skills.

Positions:

The post-doc positions is two-year Unizar postdoctoral research contracts (N1 level), with salary equivalent to *Ramón y Cajal* senior researcher figure in Spain. The candidate will count with resources to perform visits and attend conferences and meetings related with their work. He/she will be allowed to reserve a small fraction of his/her worktime (about 20%) to develop research topics of their own initiative in relation with wider research portfolio of the host group. The candidate will enjoy a lively research environment at CAPA as well as in the IAXO and RADES international collaborations. The DarkQuantum project ensures adequate resources in terms of research infrastructure and equipment during all the postdoctoral period.

The candidate is expected to engage in central aspects of the DarkQuantum project, take important responsibilities, and in doing so enjoy high visibility in the RADES and IAXO collaborations. He/she will have the opportunity to lead particular research tasks, and present their work and represent the group/collaboration in international conferences. In addition, if interested, he/she will have the opportunity to participate in outreach and teaching activities of the department, the latter within the University rules for the involvement of researchers in teaching duties, and always with sufficiently low intensity so that not to endanger the main research activity.

The Universidad de Zaragoza is committed to the “European Charter for Researchers” and the “Code of Conduct for the Recruitment of Researchers”, and has been recognized by the European Commission with the Human Resources Strategy for Researchers (HRS4R) award. <https://hrs4r.unizar.es/en>

Application:

Interested candidates should send their CV, a letter of motivation to:

iaxorecruitment@unizar.es.

Upon request, they should arrange for two letters of recommendation to be sent to the same address.

Deadline:


The starting time of the contracts can be negotiated with the selected candidates and are expected to be fixed by mid 2025. The selection process is expected to take place by 31st March 2024, although candidacies may be accepted at any time, also after that date, until satisfactory candidates are selected.

More info:

More details on the research performed in our group can be found here:
<http://gifna.unizar.es/iaxo/>

Please contact Igor.Irastorza@cern.ch for any addition information.

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