PhD position in experimental direct dark matter detection
(all genders)

TU Wien and the Institute of High Energy Physics (HEPHY), Vienna, Austria
Experimental group for rare event searches – direct search for dark matter

The group for rare event searches, jointly run by TU Wien and HEPHY, is a member of the direct dark matter detection experiments CRESST and COSINUS, the neutrino experiment NUCLEUS, and the low-energy calibration effort CRAB. The group is heavily involved in data analysis and simulation for these experiments and develops their DAQ systems. The group is a member of the collaborative research center "Neutrinos and Dark Matter in Astro- and Particle Physics" www.sfb1258.de.

We are looking for a **doctoral researcher (PhD)** working on data analysis, software development and Monte Carlo simulations for CRESST-III and future low-mass dark matter search experiments.

Technology advances in cryogenic detectors in the last decade opened up the search window to dark matter particles much lighter than $1GeV/c^2$. However, a new background appeared, denoted low-energy-excess, that slows down further sensitivity improvements. The successful candidate will join the collaborative efforts to fully identify and mitigate the low-energy excess and contribute to the subsequent dark matter analyses. To increase detector prototype and electronics testing capacity we are in the process of setting up our own cryogenic facility in Vienna. Contributions to DAQ, electronics and the new planned cryolab are possible and will be appreciated.

Keywords: Dark matter, (Astro-) particle physics, Data analysis, Monte Carlo simulations, DAQ

Tasks:
- Data analysis and statistical inference (maximum likelihood framework)
- Monte Carlo Simulations (with Geant4)
- On-site support at LNGS (Italy)
- Participation in international conferences and summer schools (travel costs will be covered)
- Cooperation and day-to-day supervision of undergraduate students
- Optional: participation in hard and software development of the data acquisition system
- Optional: contributions to the setup of the new cryolab
- Optional: tasks may include methods of machine learning

Required qualifications/skills:
- Scientific interest in particle physics and dark matter
- Strong background in statistics and in programming (Python is required, C++ and/or Julia of advantage)
- Team-oriented and communication skills to work in an international and diverse collaboration
- Ability to perform independent, creative and innovative research
- MSc or equivalent in physics, computer science or related (completed or close to completion)

Studies show that often suitable candidates self-select because they do not fulfill one of the criteria. We encourage everyone who is interested in the position to apply! The TU Wien is an equal opportunity employer. We affirm diversity and engage in creating an inclusive working environment for everybody.

The position will be opened for a period of four years. For this position, a minimum salary of € 2786,10 gross per month (14x a year, pay grade B1 of the Austrian collective agreement for university staff) with an employment for 30 hrs/week is offered, including full health and social insurance. Additional benefits for employees may be found in the Fringe-Benefit Catalogue of TU Wien. More information about the Institute of High Energy Physics of the Austrian Academy of Sciences and the TU Wien may be found at: https://www.oeaw.ac.at/hephy/ and at: http://ati.tuwien.ac.at

Your application should include a CV, a research statement (max. 2 pages) and two people which we may contact for further reference. Please send your application to Ass. Prof. Dr. Florian Reindl (florian.reindl@tuwien.ac.at).

The deadline is **March 09**, but we will receive and consider applications until the position is filled