
RISE PROJECT: GRAND DETECTION OF HIGH-ENERGY ASTROPHYSICAL PARTICLES

Participation in the following project offers the opportunity to support the development of measuring high-energy cosmic particles by air-shower radio emission with the GRAND Observatory.

PROJECT DESCRIPTION

The Giant Radio Array for Neutrino Detection (GRAND) is a future observatory with unprecedented sensitivity to ultra-high energy neutrinos and cosmic rays (<https://grand.cnrs.fr/>). GRAND is planned as an array of wide-band radio antennas, which will cover a total area of 200 000 km² and will be optimized for detecting particle showers in the atmosphere. Due to its large size, the vital component of the observatory is the trigger, which needs to reliably distinguish air-shower events from noise.



Night sky over Dunhuang, China, a possible GRAND site.

This project will focus on studies of air-shower radio emission at the GRAND observatory. The candidate will gain insights on cosmic ray physics and in particular the radio emission from air-showers. Potential topics range from theoretical and computational analyses to machine learning. The analysis of different signal models, preparations for the development for the autonomous trigger, or match filtering with machine learning are possible. The candidate is also encouraged to contribute own ideas and interests within the field of air-shower radio emission.

KARLSRUHE



Karlsruhe Palace and city center

Karlsruhe is the second-largest city in the German state of Baden-Württemberg. The city center offers impressive historical sights such as the Karlsruhe Palace and a wide range of exciting cultural events (<https://www.karlsruhe.de/>).

The Karlsruhe Institute of Technology is one of the largest research universities world-wide and has a highly ranked physics department. Its Institute for Astroparticle Physics (IAP) is one of the world-leading institutes for experimental astroparticle physics. The candidate will profit from working among scientists in various projects such as GRAND, IceCube and the Pierre Auger Observatory.

CONTACT

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