



JOHANNES GUTENBERG
UNIVERSITÄT MAINZ



In the frame of the PRISMA excellence cluster, the University of Mainz has established a new working group for experimental astroparticle physics. Starting immediately, we offer

3 PhD positions

to work on the next generation upgrade of the IceCube neutrino telescope.

In neutrino telescopes, Cherenkov light from charged particles is detected in a transparent medium. Using a volume of 1km^3 of glacial ice, the IceCube detector at the geographic South Pole has recently detected — for the first time — high energy extra-terrestrial neutrinos.

Following this success, upgrades are planned for the IceCube detector to extend its physics potential both at the highest and at lower energies. With its denser spacing of photo-sensors, the PINGU detector will offer unprecedented statistics for detecting neutrinos at GeV energies. This will allow us to precisely measure oscillation parameters, to determine the neutrino mass hierarchy and to significantly improve the sensitivity to WIMPs. With a significantly larger sensor spacing than IceCube, the High-Energy Extension will allow for accurate measurements of the extra-terrestrial neutrinos flux detected at PeV energies, with the aim to identify its sources.

Possible PhD topics include R&D towards new photo detectors for the IceCube upgrades as well as improvements to the analysis with PINGU.

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