

Name of the <i>Helmholtz International Research School</i>	<b>Helmholtz International Research School for Astroparticle Physics and Enabling Technologies</b>
Helmholtz Center	Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany
International partner	Universidad Nacional de San Martín (UNSAM), Buenos Aires, Argentina
German partner university	Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany
Other cooperation partners	–
Spokesperson of each institution	Dr. Ralph Engel (KIT) Prof. Dr. Alberto Etchegoyen (UNSAM)
5-6 keywords	Astroparticle physics, ultra-high-energy cosmic rays, extensive air showers, particle detector development, particle physics beyond collider energies

### Summary

The aim of the *Helmholtz International Research School for Astroparticle Physics and Enabling Technologies* is the development and application of cutting-edge particle detection techniques and corresponding analysis methods in high-energy astroparticle physics. The proposed graduate school will concentrate on the investigation of ultra-high-energy cosmic rays, whose existence is one of the central puzzles in modern astroparticle physics. The school will have an interdisciplinary character by bringing together leading physicists and engineers of the fields of particle detection technologies, data analysis, and model building.

The premier research infrastructure for studying cosmic particles of highest energies is the Pierre Auger Observatory in Argentina. The Auger Observatory has been built and is jointly operated by more than 450 physicists from 17 countries. The data taken since 2004 have led to several breakthroughs in the field of ultra-high-energy cosmic rays but the decisive identification of sources or source regions is still lacking. This question is now addressed by a major upgrade of the Auger Observatory, called AugerPrime.

Germany and Argentina have made major investments to support the Auger Observatory, and scientists and engineers of KIT and UNSAM are leading the upgrade process – without them, AugerPrime would not be possible. The proposed graduate school strategically complements these investment and upgrade activities by ensuring the participation of PhD students not only in the design of the hardware of the upgrade but also in the corresponding data analysis and interpretation.

The proposed school builds on a long-standing and very fruitful collaboration between the partner institutes carried out on the basis of a bi-lateral agreement (MoU) and the recently established cotutelle program *Double Doctoral degree in Astrophysics (DDAp)*.