

# Science with the Southern Wide-Field Gamma-ray Observatory

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The Southern Wide-field Gamma-ray Observatory (SWGGO) is the project to build a new extensive air shower particle detector for the observation of very-high-energy gamma-rays in South America. SWGGO is currently planned for installation in the Southern Hemisphere, which grants it a unique science potential among ground-based gamma-ray

detectors. It will complement the capabilities of CTA, working as a wide-field instrument for the monitoring of transient and variable phenomena, and will expand the sky coverage of Northern Hemisphere facilities like HAWC and LHAASO, thus granting access to the entire Galactic Plane and the Galactic Center. SWGGO aims to achieve excellent sensitivity over a very large target energy range from about 100 GeV to the PeV, and improve on the performance of current sampling array instruments in all observational parameters, including energy and angular resolution, background rejection, and single-muon detection capabilities. The directives for the final observatory design will be given by a number of key science goals which are being defined over the course of the Project's R&D phase. In this contribution we will present the core science topics and target performance goals that serve as benchmarks to guide SWGGO's design configuration.

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