

The Southern Wide-field Gamma-ray Observatory and its connection to CTA

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CTA-OZ Meeting #1, 2022

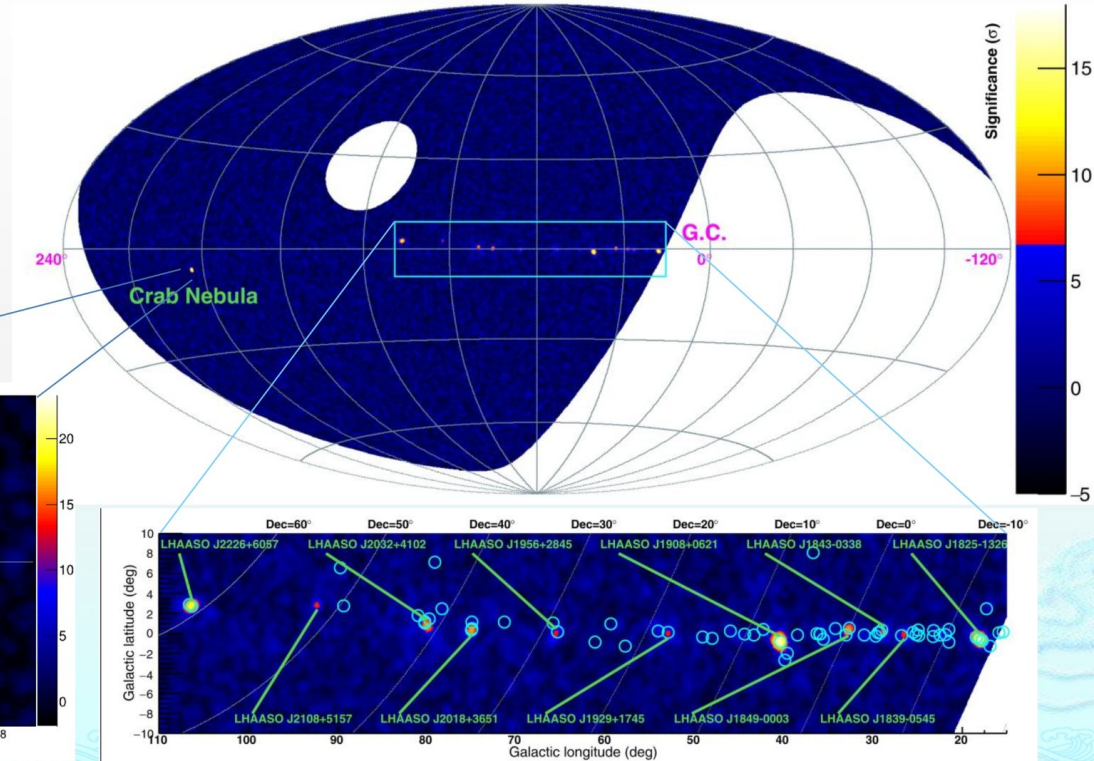
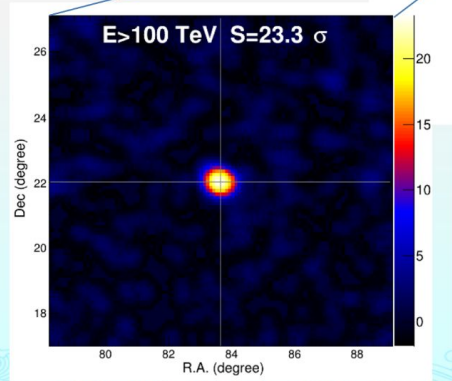
April 13, 2022, Adelaide

In 2021 LHAASO discovered PeV sources in the Northern Hemisphere

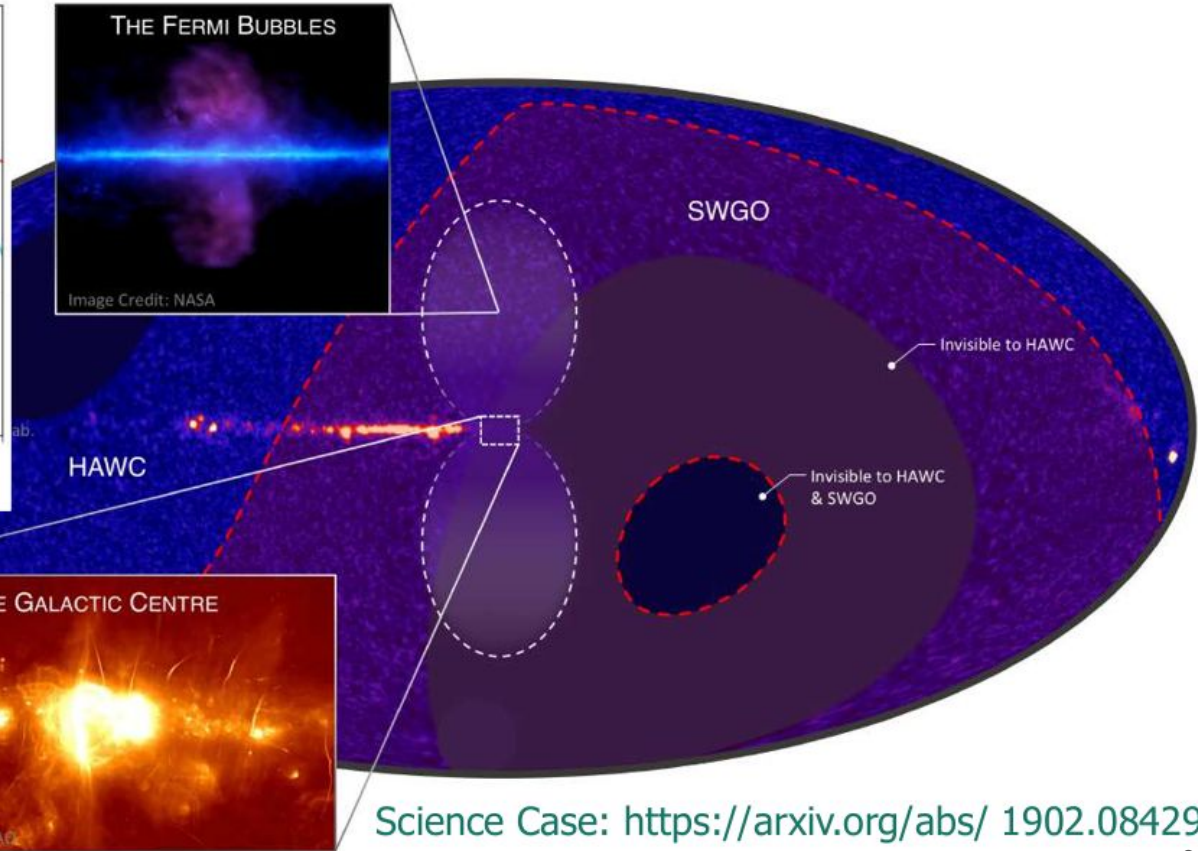
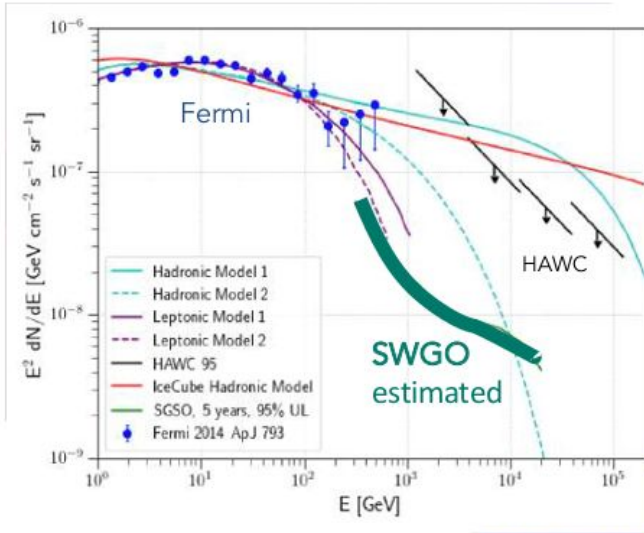
Currently there is not any Gamma ray Observatory capable of mapping the Southern Hemisphere sky in the PeV energy range



UHE γ -ray (0.1-1 PeV) Sky Map



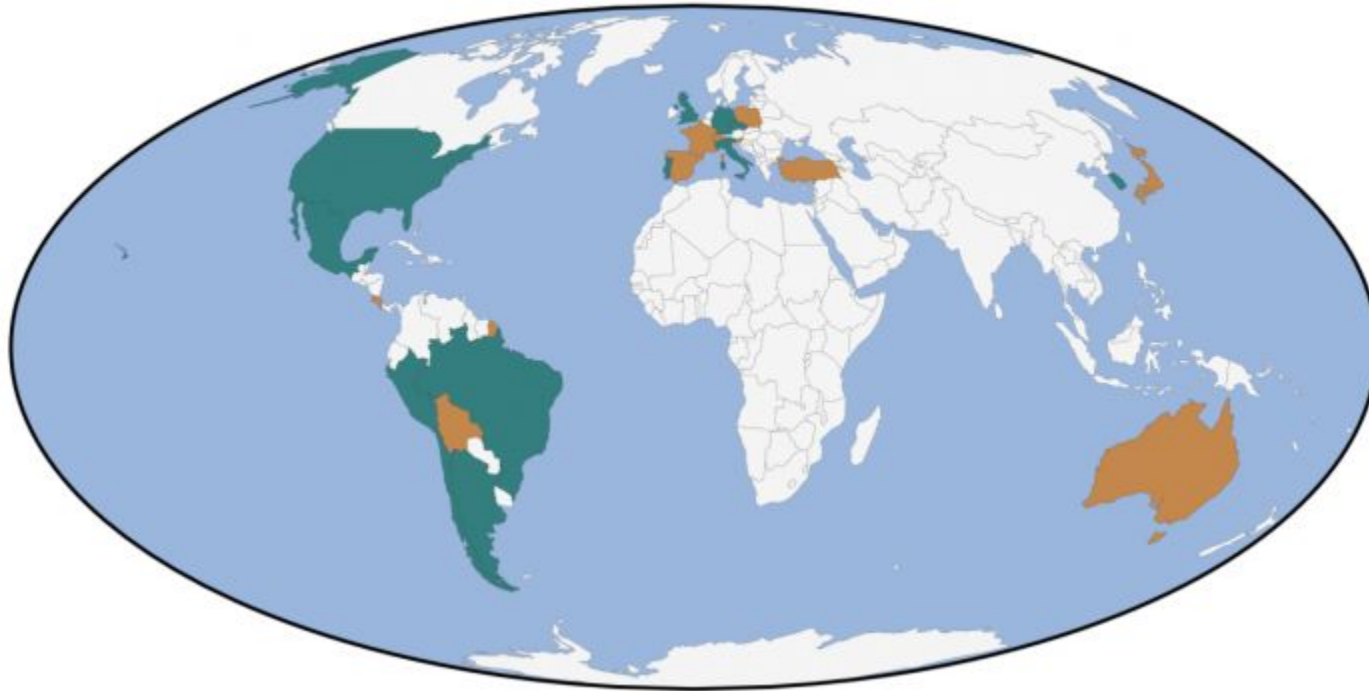
A wide-field observatory in the South is ideal to map Southern Sky in the TeV and sub TeV energy range



Crucial access to the Galactic Plane and the Galactic Center, and a complementary view of the sky with HAWC and LHAASO for cosmic-rays and diffuse emission studies.

Science Case: <https://arxiv.org/abs/1902.08429>

“The Southern Wide-field Gamma-ray Observatory” Collaboration



Countries in SWGO

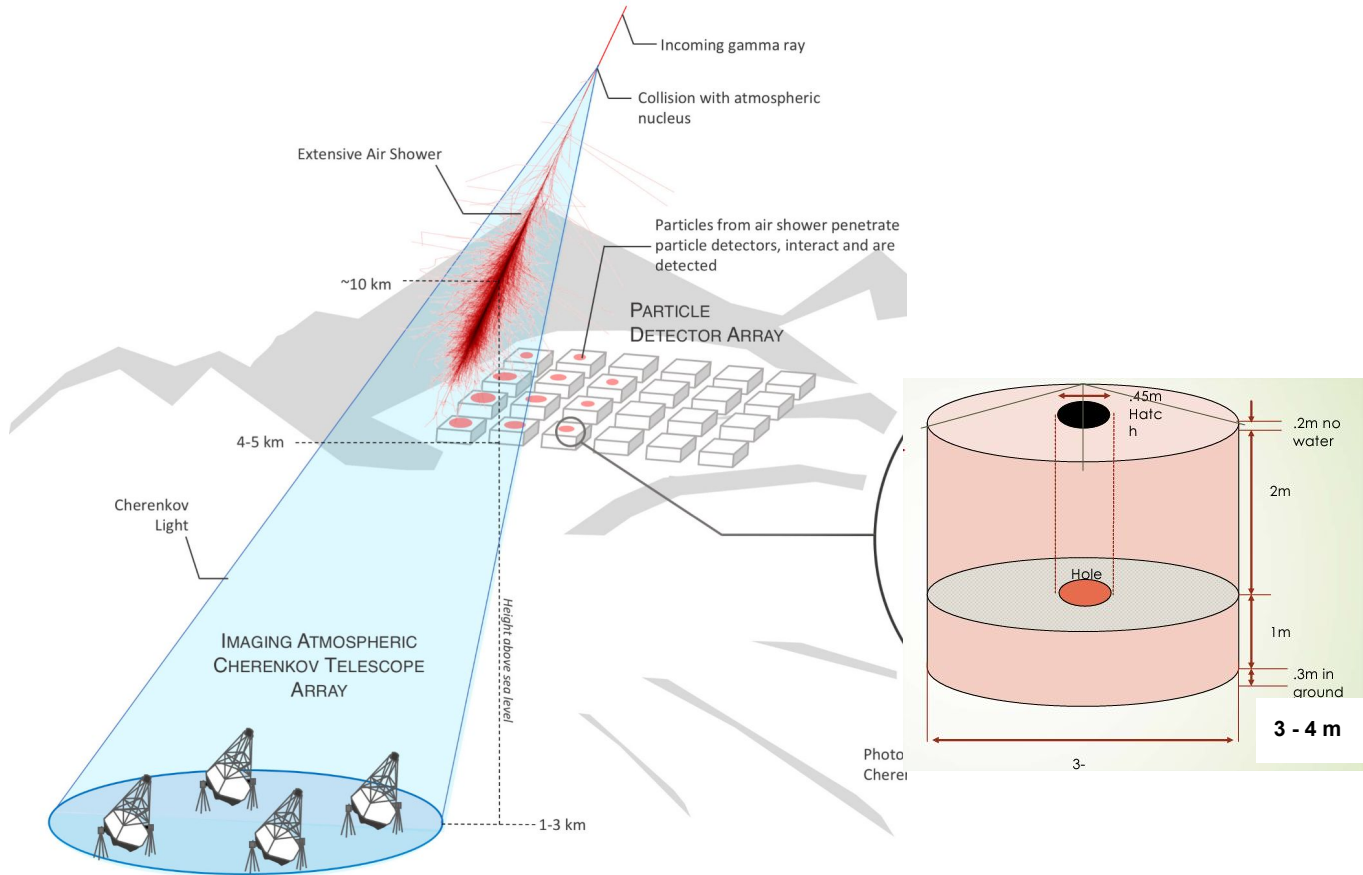
Institutes

Argentina*, Brazil, Chile, Czech Republic, Germany*, Italy, Mexico, Peru, Portugal, South Korea, United Kingdom, United States*

Supporting scientists

Australia, Bolivia, Costa Rica, France, Japan, Poland, Slovenia, Spain, Switzerland, Turkey

**also supporting scientists*



Shower image, 100 GeV γ -ray adapted from: F. Schmidt, J. Knapp, "CORSIKA Shower Images", 2005, <https://www-zeuthen.desy.de/~jknapp/fs/showerimages.html>

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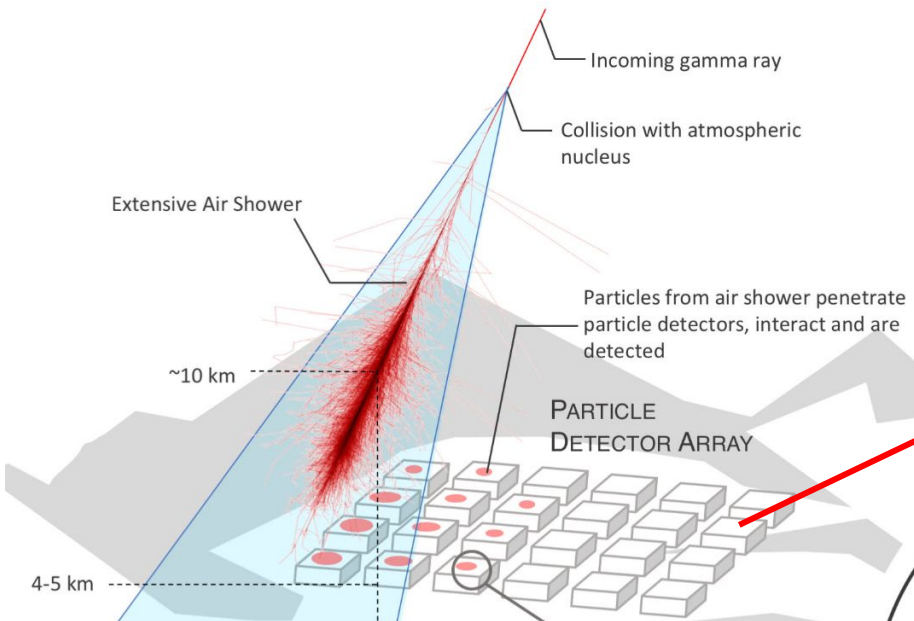
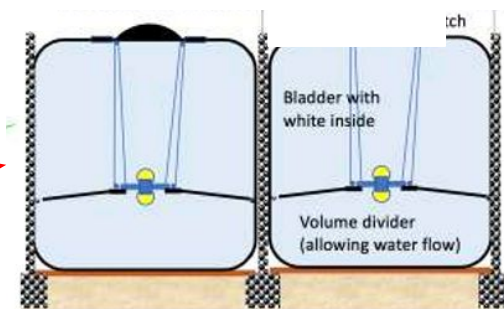
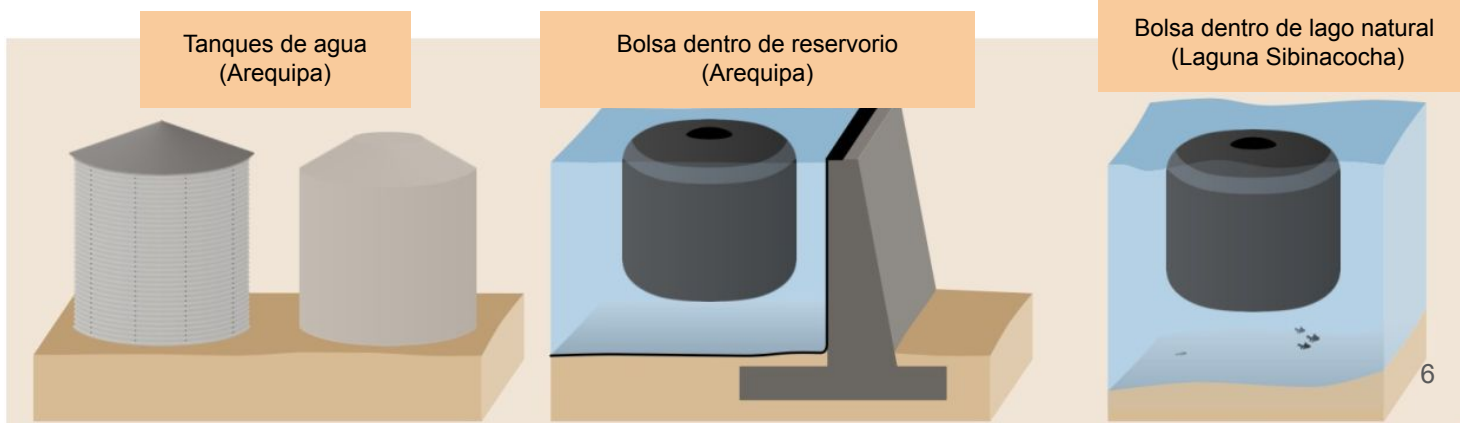


Diagram of the inside of the detector



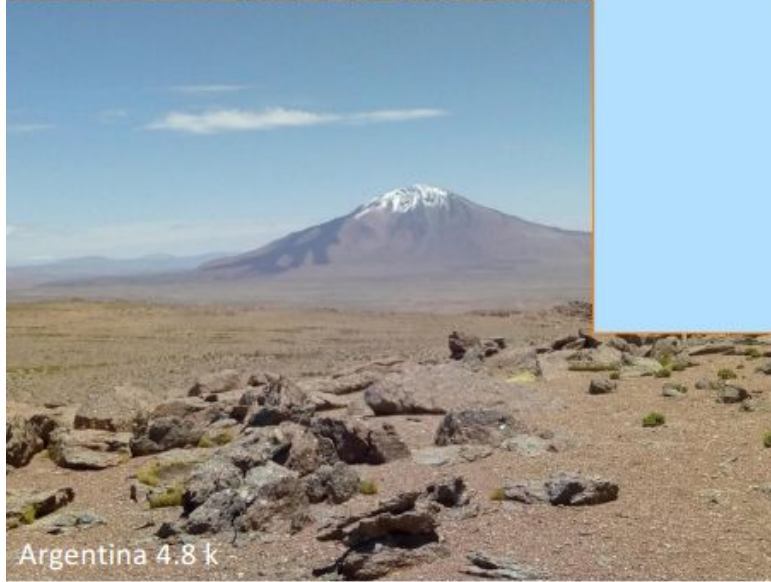
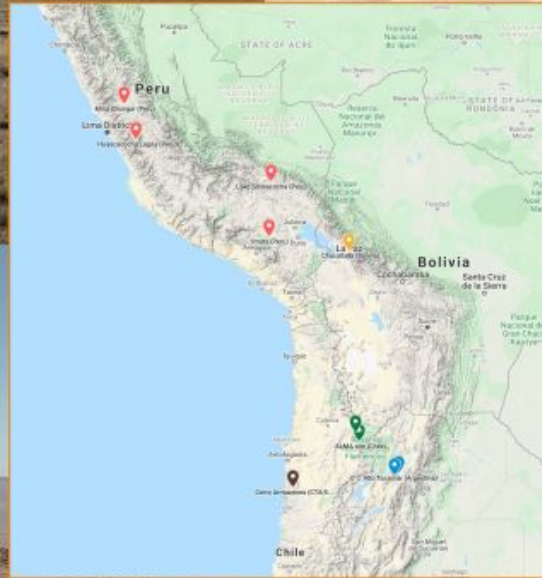
Three detector concepts under study



Bolivia 4.7k

Candidate Sites

Chile 4.8 k



Argentina 4.8 k

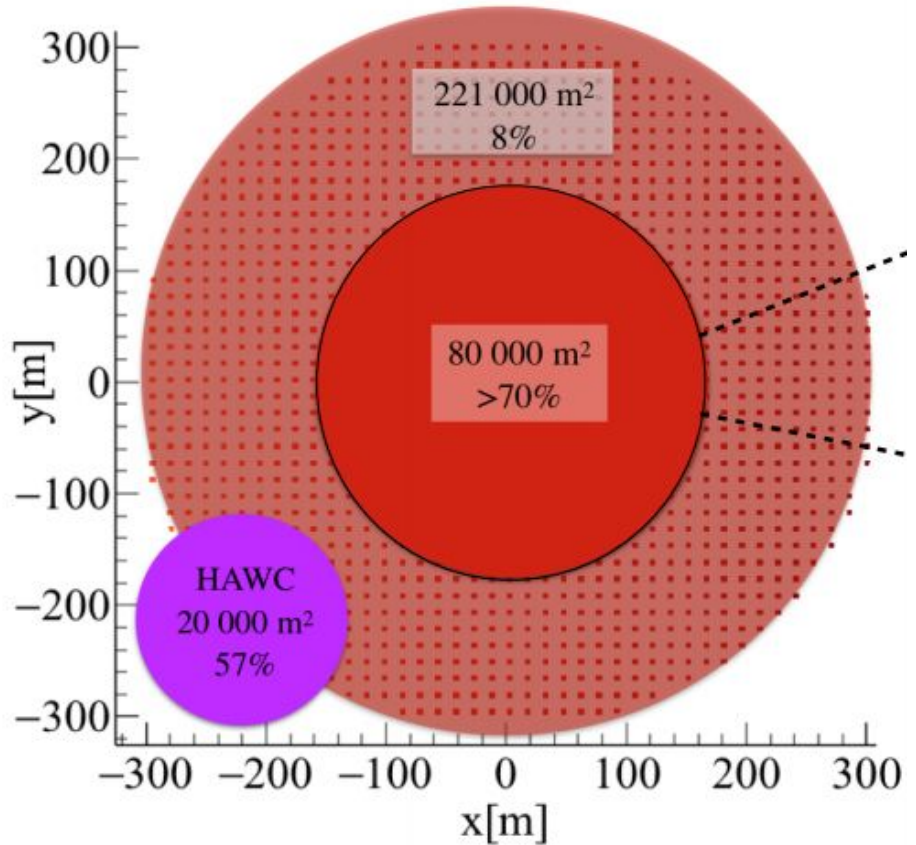


Peru 4.9 k

The SWGO Observatory layout design

Approximately 6500 water tanks are required. The value of each tank is more than US\$5000. So, more than 30M US dollars will be invested by the SWGO collaboration in water tanks.

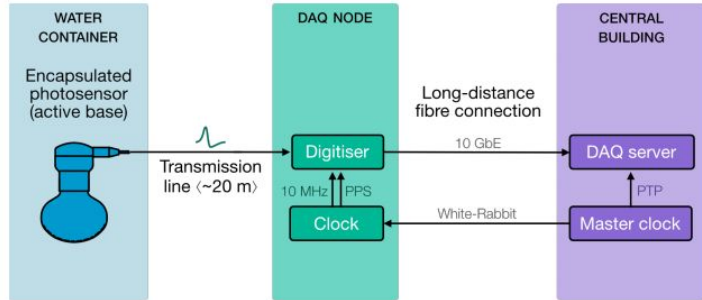
An Australian company has been identified to built the SWGO prototype detector to be deployed at the Peruvian candidate site.



Three prototype detectors will be installed in Perú by September 2022.

(Water tanks are been designed and built in Australia and electronics in Germany)

Los sensores y sistemas de adquisición de datos están siendo diseñados en **Alemania** (Instituto Max Planck) y enviados a Imata



Los tanques de agua y las geomembranas internas están siendo diseñadas en **Australia** y será todo enviado a Imata



HAWC Gamma-ray Observatory (Mexico)



The
prototype
detectors are
nearly ready
to go to
Perú.



SWGGO connection with CTA

SWGGO being a wide-field Observatory means that, at a given time, it observe almost the entire sky above the observatory. Therefore, **SWGGO will be able to observe transient events and send trigger alerts to CTA.**