SWGO SITE SELECTION

August 12th, 2024

At a meeting at the Brazilian Center for Physics Research (CBPF), in Rio de Janeiro, Brazil, scientists of the SWGO Project, whose goal is to observe the sources of very-high-energy gamma rays in the Universe, announced that the Atacama Astronomical Park in Chile was selected as the site of the observatory.

On 31 July 2024, the Southern Wide-field Gamma-ray Observatory (SWGO) Steering Committee chose to start detailed negotiations for hosting SWGO in Chile.

The SWGO project is an initiative to build the next-generation wide-field ground-based observatory designed for the detection of very-high- to ultra-high-energy gamma rays. The SWGO will consist of an array of specially designed water tanks equipped with the most advanced technology to detect particles originating from the interaction of the highest-energy photon radiation from space with the Earth's atmosphere.

Official efforts at the chosen site towards the construction of the SWGO detectors are expected as early as 2026. When the observatory is operational, the SWGO will be the first ever facility of its kind to survey the sky in the Southern Hemisphere. It will have unprecedented accuracy and superior sensitivity to that of current instruments, providing novel insights into some of the most extreme and violent events in the Universe.

The SWGO project plans to begin gamma-ray observations before the end of the decade. Collaborators estimate the cost of constructing the observatory at approximately 60 million USD. Funding for the development of the SWGO project will come from science agencies of participating nations.

The SWGO Steering Committee is composed of representatives of the member countries Argentina, Brazil, Chile, China, Croatia, Czech Republic, France, Germany, Italy, Mexico, Peru, Portugal, South Korea, United Kingdom, and the United States. After over three years of careful considerations and extensive studies of various candidate sites in Argentina, Chile, and Peru, covering the environmental and cultural conditions, as well as simulations of the science performance and assessment of construction and operations costs and risks, the Steering Committee has decided to start negotiations with Chile for the hosting of the Observatory.

The SWGO site will be located in Pampa La Bola, at the Atacama Astronomical Park, which administers a 360 km2 land concession to the Chilean National Agency for Research and Development, near the town of San Pedro de Atacama, in the Antofagasta Region. Placed on an extensive plateau at the top of the Andes, at an altitude of 4,770 meters, the site vicinities are home to a number of astronomical observatories and facilities, among which is the Atacama Large Millimeter/submillimeter Array (ALMA). This location offers excellent long-term operation conditions for the SWGO.

Jim Hinton, Spokesperson for the SWGO, who presided over the site choice, says "we had three fantastic sites on our shortlist, and this was a very difficult choice. It represents a big step forward for the collaboration. I am deeply grateful to the representatives of, and authorities in, the candidate host countries, for the huge efforts made on our behalf."

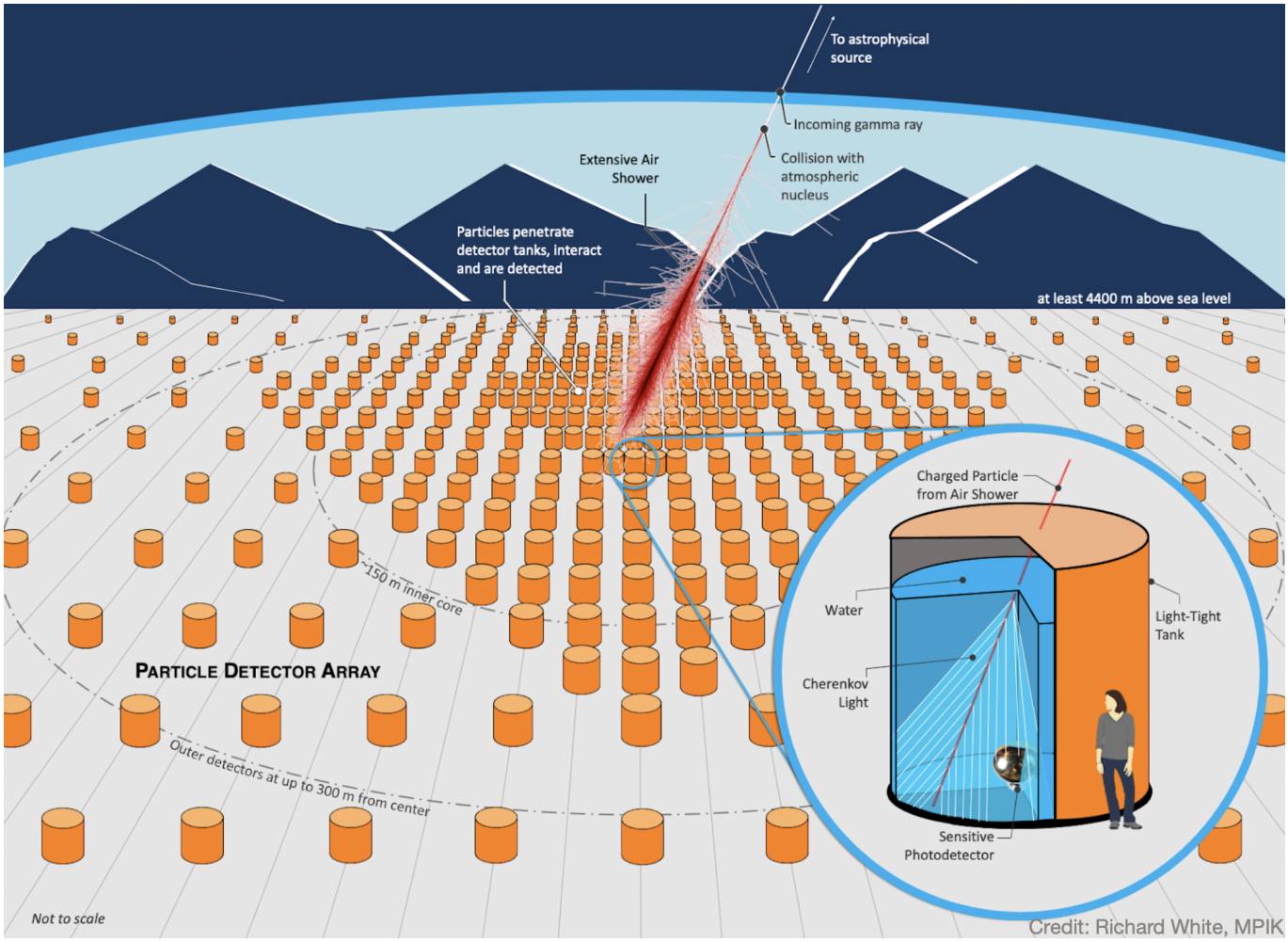
“We are happy to host SWGO, a major research infrastructure that offers the opportunity to strengthen in our country and continent a growing field of science in the world today, which is astroparticle physics; the scientific community of our region, especially the young generations, will be working at the highest level in collaboration with the top specialists in the field worldwide”, comments Claudio Dib, representative for Chile in SWGO. For Cesar Ocampo, director of the Atacama Astronomical Park, “hosting SWGO is precisely within the Atacama Astronomical Park mandate to support the development of astronomy, in a sustainable and local-community conscious way”.

Currently in the end of its research and development phase, determining the observatory site is a critical milestone in the path towards the construction of the SWGO project.

Additional Information

SWGO will be studying gamma rays from outer space which are emitted by the most violent and powerful objects and phenomena in the Universe, such as black holes and neutron stars, gamma-ray bursts, and supernovae. Although this type of radiation does not make it to the Earth’s surface, the SWGO detectors will capture the secondary particles produced when gamma rays interact with the Earth’s atmosphere. When entering the water tanks comprising the SWGO array, these secondary particles produce a characteristic blue Cherenkov radiation due to their interaction with water, which in turn is detected by photo sensors installed inside the tanks. By registering these cascades of secondary particles with many detector units simultaneously, each individual gamma ray can be traced back to its cosmic source, allowing us to create a map of the sky. SWGO will give a unique view of the wide Southern hemisphere sky in these very-high-energy gamma-rays, complementing other very-high-energy observatories including the High Altitude Water Cherenkov (HAWC) Observatory, the Cherenkov Telescope Array (CTA), and the Large High Altitude Air Shower Observatory (LHAASO).

The selection of the SWGO site was performed as a major milestone of the research and development phase of the project, with the Atacama Astronomical Park in Chile chosen as the primary site for SWGO planning and negotiations, and Imata, in Peru, selected as the alternative site. More than 200 scientists from over 90 research institutions participate in the SWGO collaboration and contributed to the site selection milestone. The project will seek an open data policy to the benefit of a wider astrophysics community.



Artistic conception of the SWGO array, showing a detailed view of the individual water Cherenkov detectors. Image Credits: Richard White, MPIK.



View of the Pampa La Bola site chosen to host SWGO. The site is located within the Atacama Astronomical Park in the Antofagasta Region, Chile, at 4,770 m altitude. Image Credits: Cesar Ocampo, AAP.

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