

*WATER TANK FOR
PARTICLE SHOWERS*

6 **I**t may look like a construction site, but it's actually the test facility for a very special kind of observatory. Quite fittingly, the constellation of Orion – with its three characteristic stars forming the belt – can be seen in the sky above, providing a symbolic reference to the cosmos. The tank erected for these tests on the grounds of the Max Planck Institute for Nuclear Physics measures 11 meters across and six meters high, contains 550 metric tons of water – and is used to simulate a lake. But what does all of this have to do with astrophysics?

In the middle of the Chilean Andes, researchers are planning a facility known as the Southern Wide-field Gamma-ray Observatory (SWGGO). One day, this facility will operate around the clock to observe high-energy radiation from the depths of the universe and measure it using an indirect method. The technique takes advantage of a phenomenon in which cosmic gamma photons produce veritable showers of particles in the atmosphere, which can be detected from the blue light they subsequently produce in water. One concept for the observatory envisages using a natural lake, from which water could be extracted, then purified on-site and used to fill balloons. These balloons would then be fitted with internal detectors and suspended in the lake.

The scientists want to use the tank in Heidelberg to test whether this idea actually works. The scaffolding allows them to literally submerge test balloons inside the tank. As part of this experiment, they are testing various balloon materials with regard to both their stability and their optical properties. In addition, a water-circulation and -filtration plant can set the artificial lake in gentle motion – creating the perfect simulation for a new window into outer space.

<https://youtu.be/3ceq75YzE8E>



ON LOCATION

