



NEW PROJECTS

SEARCHING FOR DARK MATTER IN AN AUSTRALIAN GOLD MINE

Stawell, a gold mine just under 300 kilometres from Melbourne, could become the first underground laboratory in the Southern hemisphere. Its purpose would be to search for dark matter, a project already underway at the Gran Sasso National Laboratories (LNGS-INFN), and to replicate the DAMA/LIBRA experiment which has been running at the LNGS since 2008. A delegation of Italian scientists, including Antonio Masiero, Vice President of the INFN, and Stefano Ragazzi, Director of the LNGS, has already visited the site and met local representatives to discuss this possibility. DAMA/LIBRA looks for seasonal modulation in dark matter due to the rotation of the Earth around the Sun, and should therefore detect a corresponding modulation at a site where the seasons are inverted. Having a new research infrastructure in the Southern hemisphere would therefore be an opportunity to verify the findings of the DAMA/LIBRA experiment so far. The new laboratory might also house scientific experiments from different fields, involving astrophysics, neutrino detection, biology, geosciences and engineering. ■



SCIENCE

GRAN SASSO LABORATORIES SET NEW RECORD FOR COLD TEMPERATURES

The CUORE (Cryogenic Underground Observatory for Rare Events) experiment at the INFN Gran Sasso National Laboratories has set a world record by cooling a copper vessel with a volume of one cubic metre to a temperature of 6 millikelvins: this is the first experiment ever to cool a mass and a volume of this size to a temperature this close to absolute zero. CUORE, built to study the properties of neutrinos, involves an important collaboration between the INFN and the Milano Bicocca University for the design of the cryogenic system to cool the detectors. "This is an important example of record-breaking performance by Italian scientists in the field of ultra-cold technology and was made possible thanks to the integrated and collaborative effort of researchers, universities and enterprises", commented Carlo Bucci, researcher at the INFN and Italian coordinator of CUORE. The experiment is seeking to detect a rare process called neutrinoless double-beta decay: detection of this process would allow researchers to measure the mass of neutrinos, but also to determine whether or not they are Majorana particles, thus offering a possible explanation for the matter-antimatter asymmetry that characterises our Universe. ■