

EGU2020-20808

<https://doi.org/10.5194/egusphere-egu2020-20808>

EGU General Assembly 2020

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The Gran Sasso National Laboratory

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In order to explore the highest energy scales that cannot be reached with accelerators, underground laboratories provide the low radioactive background environment necessary to search for extremely rare phenomena. Experiments range from the direct search for dark matter that constitutes the largest fraction of matter in the Universe, to the exploration of the properties of the neutrinos, the most elusive of the known particles and which might be particle and antiparticle at the same time, and to the investigation on why our universe contains only matter and almost no antimatter, and much more.

The Gran Sasso underground laboratory is one of the four Italian national laboratories run by the INFN (Istituto Nazionale di Fisica Nucleare). It is located under the Gran Sasso massif, in central Italy. To date it is one of the largest underground laboratories for astroparticle physics in the world and the most advanced in terms of complexity and completeness of its infrastructures. The scientific program at the Gran Sasso National Laboratory (Laboratori Nazionali del Gran Sasso, LNGS) is mainly focused on astroparticle, particle and nuclear physics. The laboratory presently hosts many experiments as well as R&D activities, including world-leading research in the fields of solar neutrinos, dark matter, neutrinoless double-beta decay and nuclear cross-section measurements of astrophysical interest. Other branches of sciences like earth science, biology and fundamental physics complement the activities carried out. The laboratory is operated as an international science facility and hosts experiments whose scientific merit is assessed by an international advisory Scientific Committee. A review of the main experiments carried out at LNGS will be given, together with the most recent and relevant scientific results achieved.