



## **EXPERIMENTS**

### **GRAN SASSO LABORATORIES: COSINUS, STUDYING THE DARK SIDE OF THE UNIVERSE**

Find experimental confirmation of the nature of dark matter: this is the challenge launched by COSINUS, a new experiment for its direct identification, which has recently received the green light for construction at the INFN Gran Sasso National Laboratories (LNGS). The concept behind the experiment was established in 2016, thanks to an idea of Karoline Schaeffner of the Max Planck Institute in Munich, and Florian Reindl of HEPHY and the Technical University of Vienna: COSINUS aims to identify the interaction of a dark matter particle in a scintillating crystal of sodium iodide held at cryogenic temperatures, close to absolute zero. The energy released by a particle inside the crystal causes a very slight increase in temperature of the system that can be measured using a special thermometer. At the same time, the scintillating properties of the crystal allow the different particles to be identified by exploiting the different light response for the same absorbed energy. The R&D phase of the detector was successfully conducted from 2016 to 2019, thanks to a €289,000 grant awarded to Schaeffner by INFN's 5th National Scientific Committee. Implementation of the experiment will take place thanks to the commitment of the Max Planck Society (Germany), which is contributing to the project with a total of 3 million euros, INFN, in particular LNGS which is contributing in terms of both resources and infrastructure in Italy, and the HEPHY Institute in Austria. The Collaboration was recently expanded with the adhesion of the Helsinki Institute of Physics (Finland). ■