

CHALLENGES AND OPPORTUNITIES FOR FUTURE DETECTORS



To address technology prospects and possible choices, the communities that deal with Research and Development (R&D) into detectors in various scientific sectors met in Bari from 17 to 19 October at the 2022 INFN Future Detector. This was the third of a series of workshops launched in 2014 by INFN involving world leaders in the development of detection techniques and avant-garde technologies. The development of future particle detectors is a key issue both at the European

level, for implementing the European Strategy of Particle Physics (ESPPU) within which a specific roadmap was developed in the initial implementation phase at CERN, and at the global level since a similar process is concluding in the United States where a lot of focus was placed on detector R&D and the need to preserve the related expertise, in a context of international collaboration. All this poses new opportunities and challenges, while the development of innovative detectors requires not just a great variety and complexity of expertise, but also the capacity to propose new ideas and plan new experiments. During the workshop, experts and young researchers discussed prospects, ideas, and strategies, highlighting the different experimental needs, in order to identify also a shared orientation in facing a changing landscape. It is significant that those who work in different scientific sectors can advance their R&D activities, finding suitable space at all levels and in coordination with the international communities, not just the ECFA (European Committee for Future Accelerators) that is supporting the work of the scientific community as part of the ESPPU, but also the affiliated organisations: APPEC for astroparticle physics and NUPPEC for nuclear physics. During INFN Future Detectors, frontier issues of increasing topicality were also addressed, such as quantum technologies, without neglecting technology transfer, given the importance that it holds for the development and competitiveness of the industry, and for the impact with which it can benefit society.