



PRESS RELEASE
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PARTICLE ACCELERATORS AND LIGHT SOURCES: WORLD EXPERTS REUNITED IN VENICE FOR IPAC'23

The 14th edition of IPAC, the main international conference on accelerators, the most powerful tools for exploring matter at the level of its fundamental constituents, opens on Sunday 7 May and continues until the 12th at the Palazzo dei Congressi in Lido di Venezia. Enhancement of major laboratories, future frontier projects, applications, and knowledge transfer for medicine, environment, and cultural heritage are among the major themes addressed in over 2,000 contributions from over 1,500 participants in the conference, and in the large exhibition involving over 100 companies, many of which are among the most innovative in the world in this field.

What will be the technologies of future accelerators and what will we discover? How can we build smaller and cost-effective accelerators suitable for medical use in cancer therapies? How can we improve the reliability of quantum computers? How can we harness superconductivity for energy efficiency? These are just a few of the major themes that will be at the center of the International Particle Accelerator Conference, which brings together the world's leading experts in particle accelerator science and technology, and which will be hosted at the Palazzo dei Congressi in Lido di Venezia from 7 to 12 May. It is the major international event dedicated to the most powerful machines ever made to investigate the secrets of matter, of which best-known example is LHC, the super-accelerator of CERN. The conference, in its 14th edition, called IPAC'23, brings together over 1,500 scientists from 50 countries on three continents and 100 industries, many of them Italian, who have established themselves in highly technological sectors by collaborating with the world's leading physics laboratories. IPAC'23 is organized by Elettra Sincrotrone Trieste and the INFN National Institute of Nuclear Physics with its Legnaro National Laboratories, on behalf of the European Physical Society - Accelerator Group which oversees the organization of IPAC conferences in Europe.

"IPAC arrives in Europe every three years and the competition to host it is extremely challenging: we are proud we were able to put Italy at the center of the international stage, to highlight the role that Italian science, INFN and Elettra, play in the world of particle accelerators," underlines **Alessandro Fabris**, of Elettra Sincrotrone Trieste, co-coordinator of the local organizing committee of IPAC'23. "Elettra and INFN have a long tradition in the design, construction, and management of many machines dedicated to acceleration of electrons and hadrons, both linear and circular. In addition, both Elettra and INFN promote a synergy approach between public and private partners to develop new accelerators for fundamental research. IPAC'23 will offer the most comprehensive showcase of new ideas, results, and technologies. This year, we also offer a very rich program for students and, for the first time in IPAC conferences, we have a two-day tutorial program that provides students with an overview of the different types of accelerators and technologies: paying attention to young people is essential, they will be the ones to continue accelerators tradition, and on the other hand, they will have to devise effective solutions for a sustainable future," Fabris concludes.

The scientific and technological research, today more than ever, has to work with vision and taking into account the context in which it operates. For this reason, the community gathered at IPAC'23 will also discuss possible solutions to the current challenges of our society, such as energy sustainability, from reducing the impact of research activities to improving supply systems, paying attention to both the development of one's scientific activities and how the proposed solutions for research can be successfully applied and integrated in other sectors.

From the origin of our universe to the identification of the Higgs boson, from research on dark matter to the properties of the elusive neutrino: the future of fundamental physics is closely linked to the technologies of future accelerators and detectors. At a time when the global scientific community in particle physics is facing the scientific and technological future of the sector, IPAC'23 plays a key role as a moment of sharing and exchange, to identify which technologies will be implemented in future particle accelerators to ensure the success of their scientific objectives. But during the conference, it will also emerge how the role of particle accelerators is fundamental for daily life. Superconductivity, cryogenics and vacuum technologies, precision electronics and mechanics, quantum technologies: these are some of the sectors where research and development work, conducted in collaboration between the world of research and industry, generates a push for innovation that often leads to real paradigm shifts, not only for science but



also for society: from environmental protection, to energy, from medicine to cultural heritage, the development of technologies born from basic research today benefits many disciplines and the most diversified sectors. Applications of accelerators are widely used, for example, in the field of fine analysis of matter, nanotechnology and nanoscience, and in the development of innovative materials. Paradigmatic is the use of accelerators in medicine to show the repercussions of basic research can be both unpredictable and beneficial: invented by physicists to investigate the secrets of matter at the nuclear level, they are commonly used today in hospitals for oncological therapies.

"The use of accelerators outside scientific research is more common than one might guess. Indeed, accelerators are used, for example, in medicine, in security and in the energy sector," explains **Giovanni Bisoffi**, from INFN, co-coordinator of the local organizing committee of IPAC'23. "In addition, cutting-edge technologies, developed and implemented for particle accelerators, have a great economic impact and are exceptional drivers for innovation and progress. Cross-sectoral collaboration with industry is a key tool for advancing the field of accelerators. Therefore, the participation of industry in IPAC'23 is a fundamental resource that the conference offers to participants. We cannot build our accelerators without the technological skills and production capabilities of companies. On the other hand, our needs trigger new technological advances and business opportunities for our partners. All the new technologies presented at IPAC conferences aim to be adopted one day by industry and, once in the hands of industry, new ideas spread. The two worlds of research and industry have always observed each other with interest: while we bring the freshness of innovative ideas, industry often masters the organizational skills and professional quality of a product," Bisoffi concludes.

The conference is structured into five days of work, organized in plenary sessions and parallel sessions. In total, over 2,000 contributions will be presented, focused on the latest developments in the field of research and development of cutting-edge accelerators, on new accelerator projects and on updates on the main acceleration structures around the world. Significant space is dedicated to young researchers, both male and female, who will participate not only as speakers but also in daily sessions of scientific poster presentations, through which several hundred projects will be showcased. Of great importance is also the session dedicated to industry, as well as the large exhibition that will welcome over 100 showcases from companies operating in the field, including large and small-medium enterprises that stand out in the international landscape for their high specialization, working within the world of research. This will not only be a moment of sharing and comparison but also an opportunity to create new relationships and opportunities for synergies and collaborations.

During IPAC'23, the most prestigious European awards of the Accelerator Group of the European Physical Society (EPS-AG) will be awarded. These awards are recognized to those who have made an exceptional contribution to accelerator science and technology, and who have committed to their peaceful use and collaboration.

MORE INFO

Find out IPAC'23 **Conference**: <https://www.ipac23.org/>

Find out IPAC'23 **Programme**: <https://www.ipac23.org/scientific-program-and-schedule/>

Find out all IPAC'23 **Speakers**: <https://www.ipac23.org/speakers/>

Find out IPAC'23 **industry Sessions**: <https://www.ipac23.org/industry-session/>

Find out all **Industries** at IPAC'23: <https://www.ipac23.org/exhibitors-sponsors/>

Find out all IPAC'23 **Guides**: <https://www.ipac23.org/guidebooks/>

Hosting institutions



Istituto Nazionale di Fisica Nucleare



Elettra Sincrotrone Trieste