

# IN2P3

## National Institute of Nuclear and Particle Physics



### Probing the infinite: from particles to the cosmos

The CNRS National Institute of Nuclear and Particle Physics (IN2P3) acts as national leader and coordinator in the fields of nuclear, particle and astroparticle physics, technological advances and their related applications, especially in the health and energy sectors. This research aims to explore particle and nuclear physics, fundamental interactions, and the links between the infinitely small and the infinitely large.

cnrs

[www.cnrs.fr](http://www.cnrs.fr)

## SCIENTIFIC FIELDS

- Particle physics and hadronic physics
- Nuclear physics
- Astroparticles and cosmology
- Neutrinos
- Computing and data
- Research and development of accelerators
- Back-end of the nuclear fuel cycle and nuclear energy
- Medical applications

## STRATEGIC PRIORITIES

- **Fundamental research: understanding matter and the Universe, their composition, and the laws that govern them**  
Subatomic physicists and their colleagues across the world strive to answer three fundamental questions: what are the elementary constituents of the subatomic world? What is the structure of nuclear matter? What is the Universe made of and how does it behave?
- **Close ties with other disciplines**  
The Institute's scientific and instrumental expertise benefits other scientific fields at the CNRS, such as astrophysics, chemical sciences, materials physics, and the life sciences.
- **Interaction with society and industry**  
The IN2P3 is involved in the design of new instruments for medical diagnosis and therapy; in research into the fate of radioactive waste and future methods of nuclear energy production; and in the dissemination of high-tech resources to the business world. The Institute's expertise in computing very large amounts of data (grids and cloud computing) is available to all disciplines.

## TRANSNATIONAL PROJECTS AND RESEARCH TOOLS

The IN2P3's research relies on very large instruments and infrastructures and is therefore carried out mostly through collaborations and research projects at the European or international scale. The basic instruments used in the discipline are:

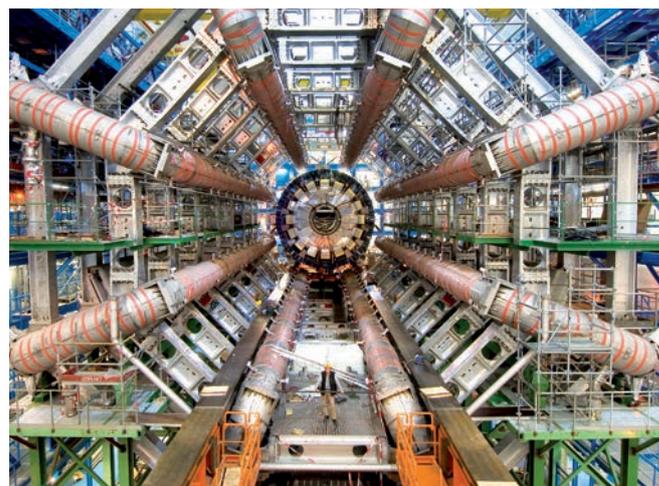
- particle accelerators;
- particle detectors placed near high-energy accelerators and in underground laboratories;
- instruments for space-based, ground-based or undersea observation of high-energy cosmic rays. They are used to study violent phenomena in the Universe;
- vast arrays of ultra-sensitive sensors to observe the Universe in its cosmological dimension, in relation to particle physics;

To facilitate the pooling and optimization of its resources and expertise, the Institute is divided into a limited number of large laboratories, infrastructures and technology platforms, working closely with each other and with other CNRS and CEA institutions, as well as with universities and organizations abroad.

## TECHNOLOGY TRANSFER AND INDUSTRIAL PARTNERSHIPS

The economic and social exploitation of research results is one of the Institute's strategic priorities.

Through a network of laboratory correspondents and a national coordinator, the Institute seeks applications for its research results. These and the expertise developed in the IN2P3 technical services prove particularly useful in areas such as health (especially medical imaging), the aerospace industry, the environment (measurement of weak radioactivity through the Becquerel network) and electronics.



Central view of the Large Hadron Collider (LHC)'s ATLAS detector.

## Key figures

**1,000** researchers and academics  
(including **500** from the CNRS), **1,500** engineers and technicians, **1,300** of whom are from the CNRS, and **500** PhD students and postdoctoral fellows\*

**25** service and research units  
**10** very large-scale research facilities

**10** international associated laboratories  
**30** international scientific cooperation projects  
**10** joint research projects or international exchange agreements

**30** patents and software programs filed and  
**10** start-ups created since 2010

\*As at 31<sup>st</sup> December 2015 (personnel, structures and business partnerships) and 1<sup>st</sup> January 2016 (international projects).  
Source: Labintel – processed by the CNRS / SAP2S, WebContrats

Institut national de physique nucléaire et de physique des particules  
CNRS

3 rue Michel-Ange – 75794 Paris Cedex 16 – France  
www.in2p3.fr

Photo credits: © Cern / © Hess collaboration /  
© Fred Hulin - Scavo - Université Paris-Sud /  
© CC-IN2P3/CNRS / © CSNSM / © Cern  
Graphic design: Romuald Maurel  
May 2016