



UMR 5814 - CNRS / USMB

Faculty: UFR Sciences and Mountain

PhD school: Grenoble Physics Doctoral School (EDPHY)

FIELD OF TRANSVERSAL SKILLS

Fundamental Science, Earth sciences and Environment

KEY WORDS

*Particle • Astroparticle Physics • Microelectronics
• Electronics • Computer network • Real time
computing • Mechanics • CAO/IAO*

SECTORS

*• Fundamental Physics and instrumentation •
Scientific calculation and modelisation*

PRESENTATION

LAPP (Laboratory of Annecy-le-Vieux for Particle Physics) is a high energy physics laboratory located in Annecy le Vieux, which is 50kms from Geneva. The lab was founded in 1976 and is one of the 19 laboratories of IN2P3 (National institute of nuclear and particle physics), which is in charge of coordinating research activities in the fields of nuclear physics, particle and astroparticle physics. LAPP is also a member of the University de Savoie. Close to 140 people are working at LAPP: researchers, professors, support staff, students and visiting scientists. The lab researchers are working in the field of elementary particle physics and their interactions, as well as in the field of astroparticle physics.

RESEARCH THEMES

The different ongoing projects are the following :

- **Particle physics on colliders LHC au CERN**
 - ATLAS : study of the Higgs boson properties and direct search for new physics (new particles)
 - LHCb: precision measurements of particles containing beauty or charmed quarks and search for indirect evidence of new physics in their decays
- **R&D for future accelerators**
 - Beam magnets stabilization
 - Development of beam position sensors
 - Design and development of equipment for experiments coming
- **Astroparticle physics**
 - VIRGO : direct detection of gravitational waves produced in - extragalactic cataclysmic events.
 - HESS and CTA : study of high energy photons emitted by - cosmic sources.
 - AMS (on the International Space Station): precise - measurements of the flux and of the nature of high energy cosmic rays
- **Neutrino physics and oscillations**
 - OPERA: search for tau-neutrino appearance in a muon-neutrino beam produced at CERN, with the OPERA experiment - at Gran Sasso in Italy
 - Future neutrino experiments: Research on neutrino-less double beta decays (Super NEMO) – Research on sterile - neutrinos in an experiment based at the ILL nuclear reactor in Grenoble (STEREO) – Future long baseline neutrino oscillation experiment project (Laguna/LBNO).

SPECIFIC EQUIPEMENT AND EXPERTISE

- CAD in mechanics and electronics
- Vibration analysis apparatus
- Three-dimensional measuring machine
- Equipment for design and tests of electronics systems
- Computing mesocenter tier2 : grid and analysis facility, scientific computing

NETWORKS / PARTNERSHIPS

Academic cooperations

- CERN
- Several international universities throughout the world: all the LAPP experiments are large international collaborations
- Member of Labex ENIGMASS

Institutional cooperation

- Departmental council of Haute-Savoie

Industrial cooperation

- Particle and astroparticle physics require huge experiments at the top of modern technology. Therefore, LAPP works with many industrial partners in the fields of mechanical construction and electronics

INTERNATIONAL RELATIONS

- Host PhD students and foreign colleagues through the ENIGMASS Labex project
- CIPHEA: Host foreign researchers working in the field of LHC physics. This programme is funded by the departmental council of Haute-Savoie (CG74).

KEY DATA*

- **38** researchers and professors
- **72** administrative and technical staff
- **13** PhD students and **8** post-doctoral students
- **7** emeritus professors

* Academic year 2014-2015