

# **The JUAS and ESIPAP graduate schools, essential vectors of European training in particle accelerators and detectors**

## **abstract :**

With the attached text, the authors wish to draw the attention of the high-energy community on the need to include in its strategic plan an exceptional effort towards attracting and training new young talents to particle accelerator and detector physics.

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## **The JUAS and ESIPAP graduate schools, essential vectors of European training in particle accelerators and detectors**

Since the middle of the twentieth century, exploration in particle physics has massively relied on the development of novel efficient higher-energy accelerator and detector techniques. This has become even more valid over the last 20 years or so, with the advent of multi-TeV colliders that have reached values of collision energy and luminosity that now appear to be difficult to surpass with the present state-of-the-art technologies, both technically and economically.

This calls for the development of novel breakthrough technologies, such as new high-field superconducting magnets, high-gradient RF systems, plasma wake-field acceleration, new detection processes, which requires attracting and training new young talents in physics and engineering.

Training in experimental physics can hardly be done without having students follow hands-on lab sessions. However given the increasing level of requested expertise and the rise of the cost of experimental setups, it is more and more difficult to provide regional universities with up-to-date research labs. This is one of the reasons that led to the creation of European schools at the European Scientific Institute (ESI) in Archamps, next to CERN, with the support of many universities. JUAS, the Joint Universities Accelerator School, and ESIPAP, the European School in Instrumentation for Particle and Astroparticle Physics, are intensive and graduating winter schools that offer 8 weeks of training delivered by around 100 prominent world specialists in experimental high-energy physics and particle accelerators. Pedagogy is based on a unique combination of lectures, tutorials, seminars, design workshops, practical sessions and laboratory visits. ESI Archamps is therefore the only place in Europe where such schools can be organized at an affordable cost.

Students attending JUAS and ESIPAP are evaluated by examinations which means partner universities are able to include the courses as components of their master and/or doctoral curricula and therefore deliver ECTS. Both schools hold sessions at the same time of the year, from January to March. Recruitment is truly international, with master and doctoral students in accelerator and detector physics and technology, as well as a few professionals, coming from many countries inside and outside Europe. The undersigned wish to draw the attention of the community on this exceptional fact.

The European Strategy in Particle Physics should also comprise an exceptional effort towards attracting young international talents, and offer them the unique possibility to learn accelerator and detector physics and technology on a wider scale, with the support of CERN, of national institutions, of prominent laboratories and European universities. The JUAS and ESIPAP schools contribute efficiently to this effort.

[www.juas.eu](http://www.juas.eu)

[www.esipap.eu](http://www.esipap.eu)

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