**Open letter on the teaching of particle accelerators in Italy**

In the last 20 years, particle accelerators have more than quadrupled, reaching today around 45,000 units. Just under two-thirds have industrial applications, about a third are medical, and about a thousand are used for research.

Nowadays accelerators have become a fundamental tool for research, technological innovation, and medicine.

Italy is part of all international collaborations where for design and construction of large accelerators and coliders. Italy also hosts several large laboratories with accelerators for research purposes, and a national center of oncological hadrontherapy with treatment purpose.

Then there are a consistent number of small and medium-sized accelerators distributed in hospitals for producing short-lived isotopes for medical diagnostics or the treatment of tumors, in companies, for ion implantation in semiconductors or sterilization.

Italy is also a leading country in searching for new technologies for increasingly compact and economical accelerators, as evidenced by its leadership in various European projects and the resources the sector has received under the projects included in Italian branch of Next Generation EU (called PNRR). The methodologies and technologies developed at the accelerators are a powerful driver of technological innovation, contributing to the economic growth of leading sectors of the Country.

However, despite the many applications in very different sectors, the number of people which are trained in Italy for mastering these technologies and inventing new ones appears relatively small. This number, also due to long careers and the non-competitive salary and career system, with consequent massive spread of young accelerator scientist abroad, is insufficient to cover the demand coming by large and numerous projects in our country.

Every year in Italy, less than 80 students take courses in accelerator physics and technology. Despite having a small number, the Ph.D. in Physics and Accelerator Technology (at the University of Rome La Sapienza, supported by INFN and serving all Italian Laboratories and Universities) hardly manages to cover all scholarships. Most of the university courses are held by personnel of research institutes (like INFN), rather than by permanent faculty members. The exchange between research institutions and universities is of course very positive, but the current unbalance is not. On one hand, the research institutions themselves do not sufficiently boost the careers of personnel in the sector; on the other hand, the university, due to its strict subdivision into disciplinary and scientific sectors, does not suit those who work in such a transversal sector.

An accelerator is an instrument: designing and using it for physics of fundamental interactions or applied physics makes very little difference to the expertise and know-how a person trained in the accelerator domain.

 Therefore we strongly advocate that people who work in the field of particle accelerators should find room both in the competition sector 02/A1, SSD FIS/01, and FIS/04 (experimental physics of fundamental interaction and experimental particle physics) and in the competition sector 02/D1, SSD FIS/07 (applied physics).

It is not a question of bibliographic indexes or creating *ad hoc* sub-categories. It is a question of recognizing this sector's transversality and interdisciplinarity. Closing the accelerators in a single sector means cutting colleagues out of their academic careers in all those places where, for historical or contingent reasons, there is greater availability of positions in one or other of the aforementioned disciplinary sectors.

And the damage is done not only to people but to the whole sector, which is also so important from an industrial point of view.

The goal of the academic community should be to include, not exclude, which would reflect the interdisciplinary nature of accelerators. The annual congress of the Italian Physics Society also includes accelerators in applied physics to account for their transversal nature rightly.

Faced with the structural fragility of the accelerator teaching system in Italian universities, we ask to put in place all those tools capable of making possible the university careers for those who teach and will teach these topics. At the same time, we ask to recognize the strategic importance of accelerators in research institutions by promoting the careers of the people involved.

In particular:

Raise awareness in the university community to be inclusive in applied physics sector: the word “instrumentation” in the sector description must include by default accelerators and associated technologies for applications of the scientific sector.

Make an effort to open more university positions teaching accelerator physics and technologies.

Insert the courses concerning the physics and technology of accelerators as characterizing courses in the study curriculum.