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BEYOND RESEARCH

Interview with Speranza Falciano, Vice President of INFN and Technology Transfer representative of the executive board of the Institution.

As a public research organization, INFN carries out its mandate by combining the transfer of knowledge and technologies useful to society with the basic research mission. This takes place in the direct form of communication and public engagement, as well as thanks to technology transfer initiatives, with the transmission of know-how acquired in basic research to the development of technologies of public utility.

How are the technology transfer activities structured in the institution?

The strategy implemented by INFN for technology transfer is mostly based on the exploitation of innovative ideas and techniques that arise in the context of basic research and, subsequently, trying to facilitate and speed up the processes that drive the exchange of knowledge between the research world and society, be it the world of business or any context that can be the recipient of applications, thus allowing new technologies to translate into goods and services usable by the community. To achieve this goal INFN, consisting of several facilities distributed around the country, has set up an organisation specifically covering aspects of an administrative-legal and scientific-technological nature, all coordinated by a steering committee, the National Committee for Technology Transfer (CNTT), whose connection with the central governing bodies is ensured by a member of the Executive Committee constantly attending the meetings. The Committee is supported operationally by the Technology Transfer Department (UTT) that takes care of administrative issues and those of operational support to researchers and is reinforced by qualified human resources with various profiles of expertise (legal/patents, economic, technological), typical of a sector with strong interdisciplinary characteristics.

Technology transfer primarily involves researchers. How do they participate in the strategic decisions?

INFN has also paid a lot of attention and effort in the organisation and training of so-called Local Technology Transfer Representatives, one or two for INFN facility, dealing, on the one hand, with awareness building of

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the scientific network and, on the other, providing initial feedback to researchers who submit questions on the exploitation of their research. As of September 2012, regular meetings are held, attended by the Local Representatives and members of the CNTT. Training is considered an opportunity for communication and sharing of the technology transfer guidelines and for aggregation and feedback with respect to the results achieved.

Finally, the formulation of specific regulations approved by the Governing Board of the Institute has made an important contribution to the development of technology transfer activities by establishing a set of rules on the exploitation of research conducted.

Being part of the institution's mission, the dissemination of skills is somewhat a duty. Who benefits from it?

Basic research needs advanced technologies that often are not yet part of the industrial know-how and require innovative solutions. The search for these solutions continuously provides opportunities for technology transfer to the social and industrial fabric, in particular allows a wealth of expertise that makes our companies more innovative on the world market to be transferred to Industry. The use of highly qualified industry partners allows INFN to be competitive in international collaborations in which it participates to build the complex instrumentation required by our research, and this is definitely an example of a return that benefits us.

More generally, I think it is fundamental to encourage and make an effort on the "third mission" in order to instil in society the idea of research as an indispensable means for the modernisation and competitiveness of the country. This too is an important return that impacts on funding and on the transfer capacities of our know-how.

Which are the most significant examples of fruitful relationships between INFN and the business world?

An excellent example of how frontier technologies necessary for INFN research have produced important effects on the domestic industry in terms of knowledge transfer, economic and innovation impact is the scientific enterprise at the Large Hadron Collider (LHC) at CERN in Geneva that led to the discovery of the Higgs boson. Many Italian industries have built high-tech objects for the LHC, Italy has been able to secure a return on investments in research superior to that of other European countries. For example, in industrial supplies in 2006, year of full construction of the machine, in the ranking of the twenty participating nations, Italy was second in the civil engineering (approx. 23% of the total) and electrical engineering (approx. 30 %) sector, second in mechanical engineering (19%) and third in the vacuum and refrigeration technologies (13%). Overall it was second (18%), preceded only by France (34%, host nation) and followed by Germany (15%). It should be noted that the Italian contribution to CERN, proportional to GDP, is 11%. Besides the domestic industry participation at CERN, INFN has also well-established relationships with numerous other companies, with which we have created and developed new technologies for research purposes,

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which have found a market and have become the subject of large-scale industrial production. The fields of micro-electronics and superconductivity are examples of this. Success stories like these have given rise to contracts or collaboration agreements with two advantages: the possibility to develop technologies for which we have skills but not always the right tools, and the economic exploitation of ideas developed within the institution, which can be disseminated if exploited at the industrial level.

Which tools are most used for exploiting the innovation capacity of INFN?

INFN uses all the traditional tools for the exploitation of its knowledge such as patents, collaborative research and contract work. In particular, collaborative research, more congenial to the research and development activities conducted in our institution, often benefits from external funding to collaborate with companies, making use of regional or national calls. The difficulty of collaborative research is that it must be conducted choosing partners with the procedures of the procurement code and this greatly limits the freedom of research and collaboration. This tool will therefore remain little used until administrative simplification tools have been identified for research institutes. Conversely, INFN conducts a lot of research commissioned for the technologies and methodologies that it possesses, i.e. it is chosen by third parties for research and development.

And which are the projects to strengthen TT activities in the near future?

In the future, TT activities on which the institution will focus most, in addition to those already in place, concern initiatives suitable for systematising the development potential in a given area. This takes place through the creation of an increasing number of skills networks which connect the facilities which inside INFN possess the know-how and technology in a specific sector, making collaboration possible with national Technology Districts and Clusters. Examples are CHnet (Cultural Heritage network) and RADnet (irradiation facility network based on the accelerators of the INFN National Laboratories). In addition, INFN spin-offs and technology incubators developed at CERN and transferred to Italy with very favourable conditions (licenses, training, etc.) will be supported. Start-up incubators may be located with INFN facilities or operating units that have a relationship with INFN (Universities, other Organisations, Consortia or Companies that want to innovate and grow). A CERN-INFN collaboration agreement, already signed, will regulate support to Italian incubators that will form a network coordinated by INFN.

In your opinion, is there full awareness of the benefits of doing TT by institutions traditionally oriented towards basic research, such as INFN?

Unfortunately, the third mission involves and engages only a part of the institution's researchers. A large part is inclined to think that it is a distraction from the main science activities. This should not however limit our strategy in this direction. Everyone has their own preferences and vocation, and I think we can leverage the specific vocation of those who today think of their know-how as a resource that goes beyond the research purpose for which it was developed. Among the goals is that of enhancing our reputation and

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a social consensus towards activities whose purpose is not always understood or shared by the public. Then there is the aspect of access to funding. Increasingly often, projects for which specific funding is requested are better evaluated if presented in collaboration with external parties, or when they highlight the possibility of technology and skills transfer to society. The examples in this case range from the development of technologies for space missions, to medical applications where accelerator physics plays an important role in the treatment of cancer and detectors developed for INFN research become a powerful diagnostic tool. The cultural heritage and the environment are other sectors that benefit from the use of our technologies and the list of applications is certainly not exhaustive.

The researcher is of course not requested to change his job, only to make a small cultural step. Small because the possibility of doing technology transfer is often written in the research or technology that you have in your hands: it's a matter of seeing it, understanding its importance and seeking support to exploit it and make it concrete. As researchers we should have a complete cultural training which enables us to perform our main mission, that of knowledge producers, but leaves room for the ability to understand that a new technology - and thus our doing research - acquires greater value if it finds a useful application in society and encourages innovation and development in the broad sense. ■