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NEWSLETTER 55

Istituto Nazionale di Fisica Nucleare

INTERVIEW

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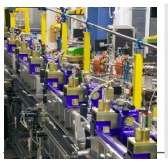

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EXTERNAL FUNDS, A NEW UNIT FOR SUPPORTING INFN INITIATIVES IS BORN

Interview with Amedeo Staiano,
head of the External Funds Division

With the kick-off meeting hosted at the Frascati National Laboratories on 18 January, the new External Funds Division (DFE) was presented to the INFN community. The event, which was attended by both the administrative and scientific representatives of the Institute, was an opportunity to present the structure and services DFE offers to the community: we talked about it with the head of the DFE, Amedeo Staiano.

In which context and why does the INFN External Funds Division arise?

The External Funds Division (DFE) represents INFN's evolution towards an ever-increasing focus on European and other funding calls, and the consequent need to effectively organise the Institute's initiatives. This evolution began with the establishment of the Commission for Relations with the European Union in 2003, which was committed to completing the sixth framework programme (FP) of the European Commission (EC) and a large part of the seventh, and in 2012 it subsequently evolved into the External Funds Service, which concluded the seventh FP and addressed two thirds of the new Horizon2020 FP. The DFE, which we presented to the INFN community in the kick-off meeting a few days ago, was created on the proposal of the Executive Board and of the Director General, with the aim of continuing and increasing INFN initiatives and their impact on European framework programme calls, international calls - such as calls from the Ministry of Foreign Affairs and International Cooperation (MAECI) or non-European funding programmes -, national and regional structural and ministerial calls, and other forms of private or public research funding.

What is the mission of the External Funds Division?

The DFE is mainly engaged in promoting support actions for researchers in submitting projects to the different types of calls, and for the financial officers located throughout the country in the National

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Laboratories and in the Divisions, both in project management and reporting as well as in 1st and 2nd level audits. Design and project administrative management support constitute the two organisational pillars of the DFE, and they represent the two essential activities for effectively raising research funds from external sources. Moreover, in design support, besides drafting, there is another important front of activity: monitoring the calls defined in the new FPs of the European Commission (Horizon Europe that will start in 2021), and of the national and regional calls coming from partnership agreements, as well as their coordination with the scientific and technological research of the Institute, together with an important preventive activity during call negotiation.

How is the External Funds Division structured and organised?

We have proposed the organisation of the DFE following three guidelines. Firstly, continuity of action of the service compared to that done previously, thanks to the commitment of the personnel trained in the former External Funds Service, acquiring over the years the required skills. Secondly, the connection with the sites distributed throughout the country: unlike many departments and offices of Central Administration (CA), it includes personnel belonging to all the structures and operates as a network, in synergy and in close contact with the peripheral units. Thirdly, a clear identification of the roles, skills and perimeters of activity of the units that constitute the DFE. In some Divisions and in all National Laboratories there are local external funds services and it is essential to discuss and collaborate with them, ensuring the necessary support at the central level. The presence of representatives of some of these local services in the DFE is crucial in creating these relationships, as well as for the natural sharing of the many skills acquired at the local level.

More specifically, the DFE structure envisages a cross-sectional service, the Rules, Tools and Training Service, headed by Sabina Pellizzoni, who has the task of formalising common rules and good practices and ensuring their dissemination, building and managing the necessary IT procedures. In parallel, it deals with the training of the personnel of the DFE and of the peripheral structures that deals with external funds. Then, as already mentioned, the DFE has two sub-units: Project Management and Design. Project management and reporting, which is managed by the Project Management service, headed by Sabrina Argentati, coordinates the reporting of all projects related to external funds assigned to the Institute, defining the procedures, providing support to proponents in the pre-assignment and post-assignment of the call, and guaranteeing communication, in particular with Central Administration. This service is divided into two offices, according to the type of project: the International Project Management Office, headed by Simona Petronici, and the National and Regional Project Management Office, headed by Danila Bortot, who liaise directly to the network of financial officers distributed throughout the country.

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The second sub-unit, Design, is divided into two services: International Call Design, headed by Alessia D'Orazio, and National and Regional Call Design, headed by Franca Masciulli. These services are separate because, unlike university departments that operate on a regional basis, the INFN operates throughout the country, and the National and Regional Call Design service must necessarily be active not only at the central level with Ministries, but also with the regional institutions through local structures and departments. The International Call Design service coordinates two offices that are separated based on the call types of the European framework programmes: the Research of Excellence Office, headed by Veronica Valsecchi, takes care of the design and support of individual bottom-up and researcher mobility programmes (ERC, FET, MSCA, etc.). While the Collaborative Research Office, headed by D'Orazio, follows the design and support of collaborative research programmes, thematic networks, research infrastructure networks and monitoring of the call negotiation phase, also at the INFN office in Brussels. Particular attention is dedicated, across the board, to communication and dissemination services that Manuela Schisani oversees.

In carrying out your work, with whom will you find yourself working more closely?
Due to its purpose and its operational cross-sectionality, the DFE will closely collaborate with many INFN services and structures: from the management to many CA departments, from structure administrations to the National Commissions and other Committees, such as the Committee for the Coordination of Scientific Computing, the Computing and Networks Commission, the National Technology Transfer Commission, which has particular relevance and with which skills and commitments are shared, the Committee for the Coordination of the “Third Mission” and the Communications Office. But we will also collaborate extensively with structures outside the INFN, such as the European Commission, the Ministries, mainly the Ministry of Education, Universities and Research (MIUR) and the Ministry of Foreign Affairs and International Cooperation, the Regions and, more generally, with other public research organisations, with private bodies and with the business world.

Which are the main challenges that you will have to face and your primary objectives?
The INFN has decided to invest in this initiative, also by introducing new personnel in order to strengthen and extend the scope of activity of the service. The structure, with a new division of roles, has not had a settling in and running in period because we had to immediately start the operational phase. This was perhaps the first challenge we had to face: the first 2nd level audit for three MSCA-RISE projects came less than two months after the establishment of the DFE.
The priorities of the interventions were defined during our weekly meetings, and working groups were

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trained to address and propose solutions to the most urgent issues. The Project Management priorities include: strengthening of administrative procedures with an important investment in the computerisation of certain management processes, definition of project reporting guidelines, definition of the role of the financial officers and production of common authorisation workflows, restructuring of the portal and project database updating and interfacing. On the Design side: strengthening of the intervention in collaborative research with the injection of new personnel, preparation for the challenge of Horizon Europe, consolidation of the Science Excellence programmes, core business of INFN activity, use of new tools available to researchers for the identification of new types of calls, support in the construction of careers for young people - important today that we have finally restarted a substantial recruitment campaign - and an investment of attention and resources in national and regional projects where INFN has a significant geographical heterogeneity of results, partly due to the nature of the PON calls, but also partly to the different penetration capacity of the Institute in the local realities.

On the other hand, the INFN Ordinary Fund (FOE) has been declining steadily over the last two decades, while revenues with destination restrictions, of which the External Funds represent the largest part, are growing, to the point that today, funds with destination restrictions represent approximately 50% of the FOE fund. The objective of the DFE is therefore to consolidate these revenues, trying as much as possible to facilitate raising financial resources, and to combine the scientific mission of the institute with the varied offer of the national and international research and innovation programmes. ■

EXPERIMENTS

GRAVITATIONAL WAVES: VIRGO AND LIGO WILL BE SWITCHED ON AGAIN IN SPRING

The Advanced Virgo gravitational wave detector and the Advanced LIGO twin experiments will start taking data again this spring, if everything goes as planned in April, when the third observation campaign, in jargon O3, will begin. In particular, for Advanced Virgo, the challenge is to improve further in terms of both observation time and sensitivity.

Before the start of the new observation campaign, Advanced Virgo and Advanced LIGO have planned a series of test data acquisition periods. The last one in 2018, called ER13 (Engineering Run 13th), included a complete test of the warning system that will alert the community of physicists and astronomers whenever a potential gravitational wave candidate is observed. The last test data acquisition period, ER14, is scheduled for March 2019. ER14 will last for approximately four weeks and the plan foresees that, on its conclusion, the start of the new observation campaign will follow.

The expectation of the researchers of the LIGO-VIRGO international collaboration is for a greater number of events in O3, thanks to the progress in the sensitivity of the three interferometers. Also the pointing capability will be better than in the past and will allow astronomers to detect any other cosmic messengers emitted from gravitational wave sources more quickly. ■

EXPERIMENTS

THE PSCT PROTOTYPE OF THE BIG CTA PROJECT INAUGURATED IN ARIZONA

On 18 January, at the Whipple Observatory in Amado, Arizona, pSCT (prototype of the Schwarzschild-Couder Telescope), a prototype telescope for gamma-ray astronomy, which will begin to take data in the coming months, was inaugurated. The aim of pSCT is to provide indications for the construction of the medium-sized telescopes that will be part of the Cherenkov Telescope Array (CTA), the next-generation distributed observatory for gamma photons, in which Italy is participating with INFN and INAF, National Institute of Astrophysics, dedicated to the study of the universe at high energies.

Unlike classic gamma ray telescopes traditionally consisting of a single surface of mirrors, SCT telescopes are medium-sized telescopes consisting of two mirror surfaces: the first consisting of 48 and the second of 24 aspherical mirrors. The innovative features of these telescopes will allow CTA to drastically improve the image quality of large regions of the sky and to improve the detection of weak astronomical sources.

The CTA involves more than 1,400 scientists and engineers from 31 countries in the scientific and technical development of the highest energy and most sensitive high-range gamma-ray observatory in the world, with approximately 120 telescopes of three different sizes, divided between two sites: one in the northern hemisphere at the Roque de los Muchachos Observatory in the Canary Islands, and the other in the southern hemisphere near the existing site of the Southern Observatory of Paranal, in Chile. Once completed, CTA will allow investigation of the most violent astrophysical phenomena that take place in our universe, but it could also acquire valuable information on aspects that are still little known or even unknown, such as the nature of dark matter, which constitutes most of the existing matter in the cosmos. ■

APPOINTMENTS

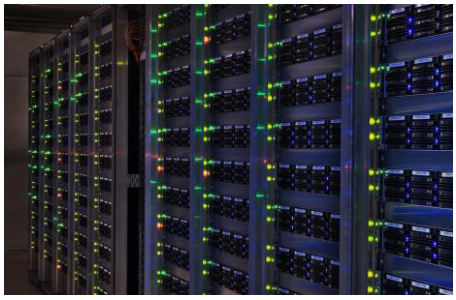
FABIO ZWIRNER APPOINTED VICE-PRESIDENT OF ERC

On 19 December, the European Research Council (ERC) appointed new members of its Scientific Council. The Nobel laureate for Chemistry Ben L. Feringa, from the University of Groningen, Lene Vestergaard Hau, physicist, Professor at Harvard University, and Manuel Arellano, economist, Professor at the Center for Monetary and Financial Studies in Madrid were appointed. In addition, Fabio Zwirner, already a member of the ERC Scientific Council since 2015, a theoretical physicist, INFN researcher and Professor at the University of Padua, was reconfirmed for a second two-year term and appointed Vice-President of ERC, together with Dame Janet Thornton, biologist, Director emeritus of the European Bioinformatics Institute and the European Molecular Biology Laboratory. Zwirner took on the role of Vice-President in January 2019 with particular responsibility for the physical sciences and engineering sector. In his career, Zwirner has worked at the University of California Berkeley, INFN, CERN and at Sapienza University of Rome, and has dealt with various aspects of unified theories of fundamental interactions, supersymmetry and supergravity. ■

AWARDS

THE EPS EMMY NOETHER DISTINCTION FOR WOMEN IN SCIENCE TO CHIARA MARIOTTI

The European Physical Society (EPS) Emmy Noether Distinction for Women in Physics 2018 (winter) has been attributed to Chiara Mariotti, INFN Turin Division's reasearcher. Mariotti has been awarded for her outstanding contributions to the discovery and characterisation of the Higgs boson, for her leading role as founder and coordinator of the LHC-wide Higgs Cross Section Working Group, and for her impressive capacities and achievements in outreach, in particular towards the young generation of physicists. The EPS has established the Emmy Noether Distinction for Women in Physics to bring noteworthy women physicists to the wider attention of the scientific community, policy makers and the general public, to identify role models that will help to attract women to a career in physics. The scope includes personal achievements in areas such as research, education, outreach and industry. Chiara Mariotti graduated in physics in Turin, with a thesis on experimental research at the Fermilab in Chicago. After getting her Ph.D., she began working on CERN's DELPHI experiment. In 1999 she reached the position of research coordinator of this experiment, which engaged 550 physicists from 17 different nations. While keeping her role at DELPHI, in 2002 she joined LHC's big adventure by getting involved in the CMS experiment and becoming one of the people in charge of the Turin group. Since 2008 she has been the main coordinator of CMS analysis for the search of the Higgs boson. ■



TECHNOLOGY TRANSFER

COMPETENCE CENTRE: BI-REX AND SMACT GET UNDERWAY

Innovation, industrial research, guidance and training for companies. These are the key words that define the mission of the eight competence centres, consortia that bring together universities, research institutions, companies and foundations, funded by the Italian Ministry of Economic Development (MISE) to foster collaborations between research and business in "Industry 4.0" technologies. The first two competence centers, BI-REX (Big data Innovation and Research EXcellence) and SMACT (acronym for the technologies that it will deal with Social, Mobile, Analytics, Cloud and Internet of Things) have just got underway and thanks to its expertise in both computing and big data, INFN plays a structural role.
BI-REX, a public-private consortium based at the University of Bologna, will be at the service of companies throughout Italy, providing them with training, advice and guidance in the adoption of technologies related to connectivity, automation, advanced manufacturing and big data. SMACT, a joint-stock consortium company, on the other hand, will manage the Triveneto Competence Centre. With its participation in BI-REX and SMACT, INFN further strengthens its commitment to making available to Italian companies the technological know-how developed with the frontier activities carried out in the field of research in fundamental physics and in the management and development of the enormous wealth of digital information collected from the distributed sensor networks, which underlie the industrial revolution in progress. ■

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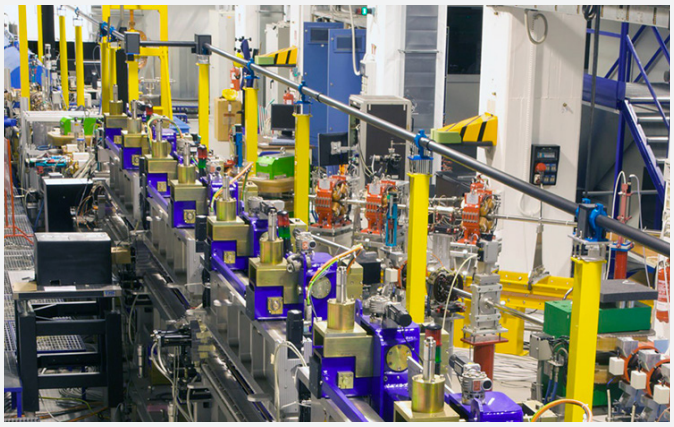

SPARC LAB, RESEARCH IS INTERDISCIPLINARY AT THE FRASCATI NATIONAL LABORATORIES

An innovative research infrastructure, based on the combination of high brightness electron beams with high intensity ultra-short laser pulses, is active since 2013 and is now available to the international scientific community working in the field of particle accelerators and their applications.

SPARC LAB (Source for Plasma Accelerators and Radiation Compton with Lasers and Beams): this is the name of the interdisciplinary laboratory of the INFN Frascati National Laboratories. The SPARC LAB enables the detailed study of the most modern plasma acceleration techniques and the development of leading-edge interdisciplinary research, in a spectrum that ranges from materials science to biology, cultural heritage and medicine: a first step towards the possible future applications of EUPRAXIA (European Plasma Research Accelerator with eXcellence In Applications).

The idea of this unique infrastructure originated in 2013 at the INFN Frascati Laboratories from the fruitful combination of pre-existing projects, with the aim of providing unparalleled performance at world level. Stemming from the integration of a latest-generation photo-injector (SPARC), capable of producing electron beams with energy of up to 170 MeV with high peak current (higher than one kiloampere) and low emittance (less than 2 millimetres per milliradiant), and of a high power (more than 200 terawatt) laser (FLAME) able to generate ultra-short pulses (less than 30 femtoseconds), SPARC LAB has already led to the implementation of innovative radiation sources and the experimentation of new laser particle acceleration techniques.

In particular, a Free-electron Laser (FEL) was realized. The FEL produces coherent radiation with frequency tunability, from 500 to 40 nm. In addition, new operational regimes were observed; for example, the two-colours FEL. A high energy (higher than 10 mJ), narrowband (lower than 30%) THZ source was also made: this led to the publication of a paper about topological insulators on Nature Communications.

There's also another major result: the electrons were accelerated up to 350 MeV in a 2 mm long plasma jet

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excited by the high power laser FLAME. And other experiments on the manipulation of the electron beam with the plasma were run, in order to develop compact focussing elements.
Recently, electrons and photons beam were synchronized with great precision (less than 50 femtoseconds). This is a required condition for the operation of a X Thomson source (around 50 keV) and for future researches on high gradient (higher than 1GV/m), compact accelerators based on external injection of high quality electron beams in a plasma wave excited by a laser or by another electron beam. A new plasma acceleration experiment is currently under development. In the next 5 years, the SPARC_LAB laboratory will allow LNF to establish a solid background on the physics of high-gradient accelerators and to train a young generation of scientists able to face all the challenges raised by the EUPRAXIA project. ■

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Cover

Prototype Schwarzschild-Couder Telescope at Whipple Observatory in Arizona
Credit INFN