


RESEARCH
SEARCH FOR GRAVITATIONAL WAVES: INFN-CNRS AGREEMENT SIGNED FOR THE EGO CONSORTIUM

On 18 September, renewal of the agreement between INFN and CNRS for the Italian-French consortium EGO (European Gravitational Observatory), which manages the VIRGO experiment, the interferometer for the study of gravitational waves based in Italy, in Cascina, in the countryside near Pisa, was signed. Signing of the agreement coincides with the beginning of the first period of scientific activity of the two advanced LIGO (Laser Interferometer Gravitational waves Observatory) interferometers in the United States, which are part of the worldwide network of gravitational detectors, in which VIRGO is also participating. The search for gravitational waves is one of the first examples of global research infrastructure in the sense that the interferometers situated in the various parts of the world (two in the US, two in Europe, in Italy and in Germany, and one in Japan) have been united in a global network, working together, that is, exchanging data and information. The network has also been adopted by the GSO (Group of Senior Officials on Global Research Infrastructures) as a prototype of Global Research Infrastructure, towards which today there is a tendency in other fields. For the EGO Consortium, in which currently Italy and France are participating but which could soon see the presence of Holland, there are therefore all the ingredients for implementing leading-edge scientific research in this field. EGO could also represent the first step towards the establishment of a European Research Infrastructure Consortium (ERIC), in which the infrastructure would take on the role of a veritable European gravitational observatory. ■


RESEARCH
FINAL PREPARATIONS FOR XFEL, EUROPEAN INFRASTRUCTURE THAT WILL SPY THE SECRETS OF THE NANOWORLD

The injector of the XFEL (X-ray-Free Electron Laser), among the most important projects of the European Strategy Forum on Research Infrastructures (ESFRI) roadmap, has entered its final implementation stage in Hamburg. The third harmonic module – fundamental for removing the distortion of the electron beam at the exit of the injector – whose main components have been designed and produced in Italy, with the contribution of the Accelerator and Applied Superconductivity Laboratory (LASA) of the INFN Milan section, in close cooperation with the DESY laboratory in Hamburg, was transferred a few days ago to the beginning of the 3.4 km long tunnel. This is a fundamental stage of the INFN participation in the European XFEL project, to which the Institute is contributing with the delivery of half of the 800 superconducting accelerating cavities and most of the 100 cryo-modules containing them.

XFEL, whose commissioning will start in 2016 to be fully operational in 2017, is a research infrastructure which, thanks to its unique characteristics an energy of 17.5 GeV, 27 thousand X-ray flashes per second, at a very small wavelength, between 0.05 and 4.7 nanometres behaves like an enormous camera, able to capture details in the region of the Angstrom, a tenth of a billionth of a metre. This level of penetration of matter will, for example, allow XFEL to map the atomic details of viruses, film chemical reactions and take 3D images of the nanoworld. ■