

European Laboratory for
Non-linear Spectroscopy

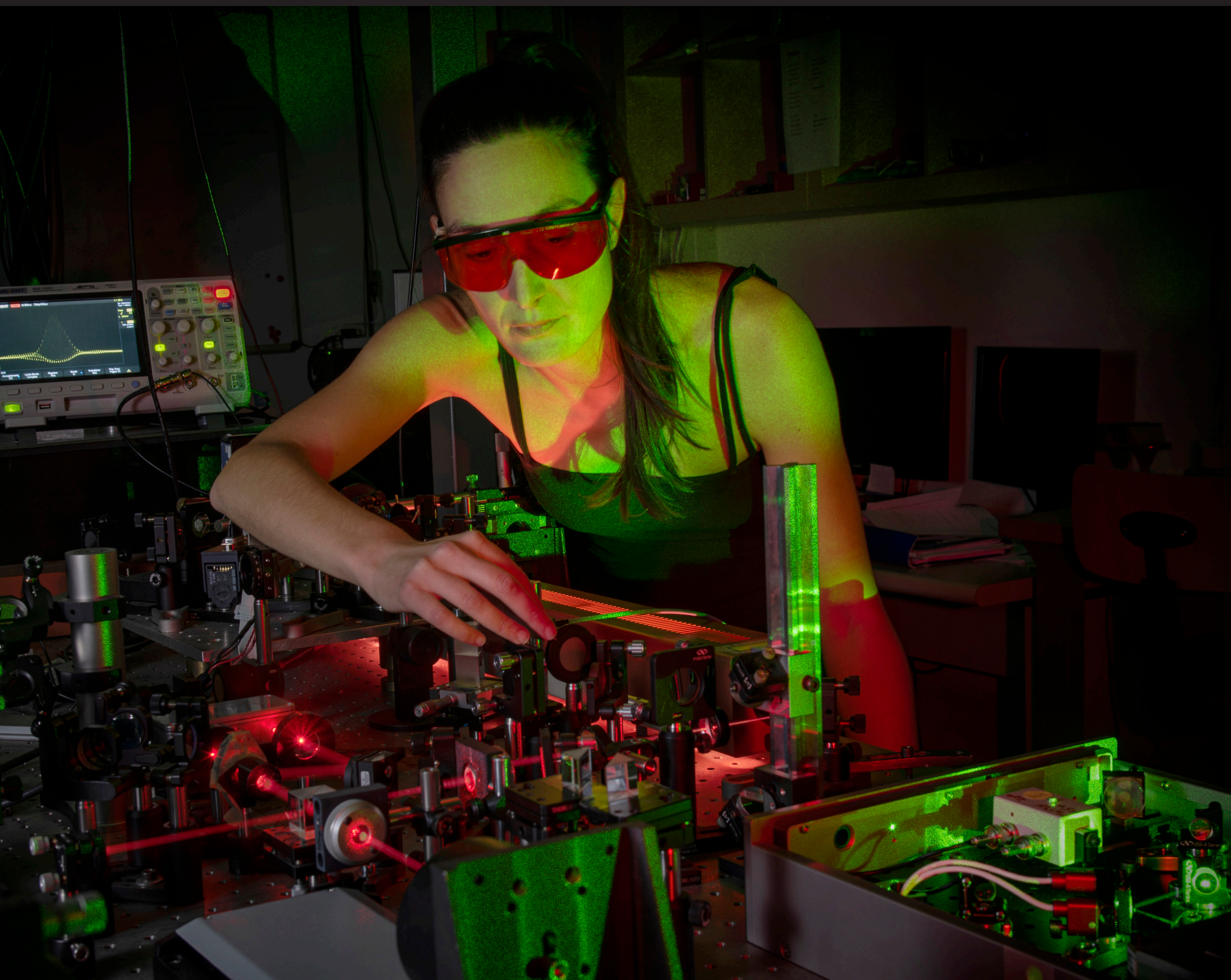
lens



A European reference point for research with laser light, based on a fundamental multi-disciplinary approach. This is LENS, the European Laboratory for Non-linear Spectroscopy, since its birth in 1991 fostered as an international and self-governing infrastructure by the University of Florence.

A place where physicists, chemists, engineers and biologists work together, sharing tools, experiences, research themes, scientific perspectives and ideas with the common aim of using laser light to investigate matter from different points of view and varied conditions.

Research interests include atomic physics, photonics, biophysics, and chemistry, without forgetting advanced training of young researchers, thanks to e.g. a EU Marie Skłodowska-Curie training program, through high quality PhD courses and a rich Post Doctoral fellowship program.





The best ideas from the best minds
in the best research environment:
scientific excellence is our guiding light



People are the real soul of LENS: from the first idea of the early '90s to the dozens of research groups currently active, the excellence of the laboratory depends heavily on the minds that inhabit it and live it, inspired by an international, multidisciplinary and innovative environment.

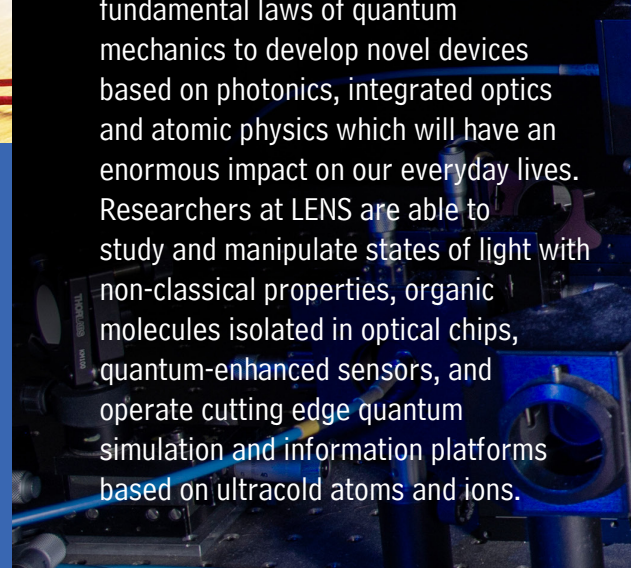
The best European minds meet here to exchange experiences and views, to find answers - but also new questions - to scientific challenges, and finally to push Europe further in its leading role in the application of laser light to fundamental research and future technologies.



The manipulation of photons, atoms and molecules is a key concept in many main research activities at LENS.

In micro- and nano-photonics laboratories, researchers work with individual photons or intense laser beams to study the optical properties of complex mesoscopic systems, ranging from random to periodic ones. The final purpose is to look into the fundamental aspects of the interaction between light and matter and use natural phenomena to build novel materials, to investigate new regimes of wave transport, and to design future opto-electronic and optical circuits.

In quantum science and technology labs, scientists aim to leverage the fundamental laws of quantum mechanics to develop novel devices based on photonics, integrated optics and atomic physics which will have an enormous impact on our everyday lives. Researchers at LENS are able to study and manipulate states of light with non-classical properties, organic molecules isolated in optical chips, quantum-enhanced sensors, and operate cutting edge quantum simulation and information platforms based on ultracold atoms and ions.



From atomic physics to photochemistry. From bio- to nano-photonics. From research on solar cells to quantum computing and biomedical imaging. The diversified and international

LENS



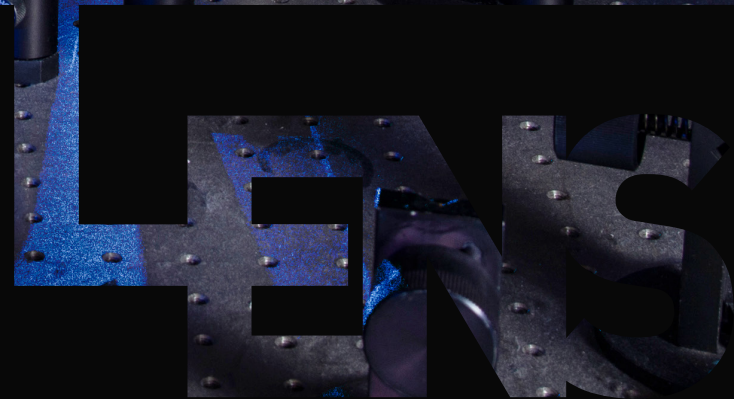
At LENS, physics is strongly connected to chemistry and molecular biology.

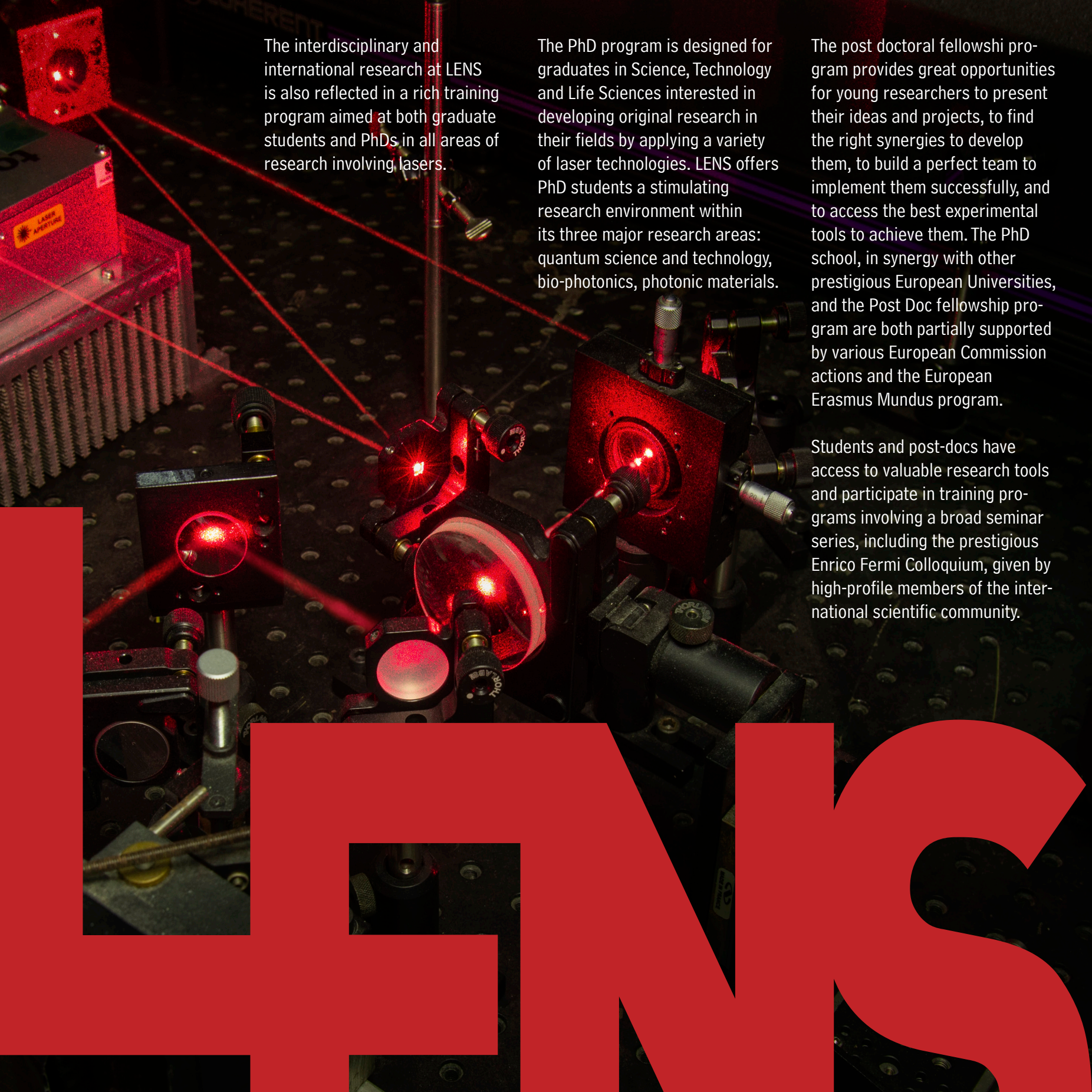
Thanks to femtosecond laser pulses and the possibility of studying isolated molecules in the gas phase, detailed analysis of their equilibrium and dynamical properties can be performed, also under extreme conditions, as very high pressure. Main research lines focus on photo-induced processes, characterization and design of novel light harvesting systems and on providing benchmarks for theoretical quantum chemistry.

In the Biophotonics labs, advanced microscopy is combined with spectroscopy and single molecule techniques to study and comprehend biological systems on multiple scales — from subcellular structures to living animals — and from the structural, chemical and functional point of view. At LENS, novel optical methods are developed to investigate the morpho-functional and spectroscopic properties of biological tissues in physiological and pathological conditions.

research environment, together with the most advanced laser techniques and optical equipment, allows LENS researchers to produce top-level results in fundamental science and technology,

which are consistently rated amongst the best in Europe. The interdisciplinary and international approach is a key concept of the LENS way to face current scientific challenges.



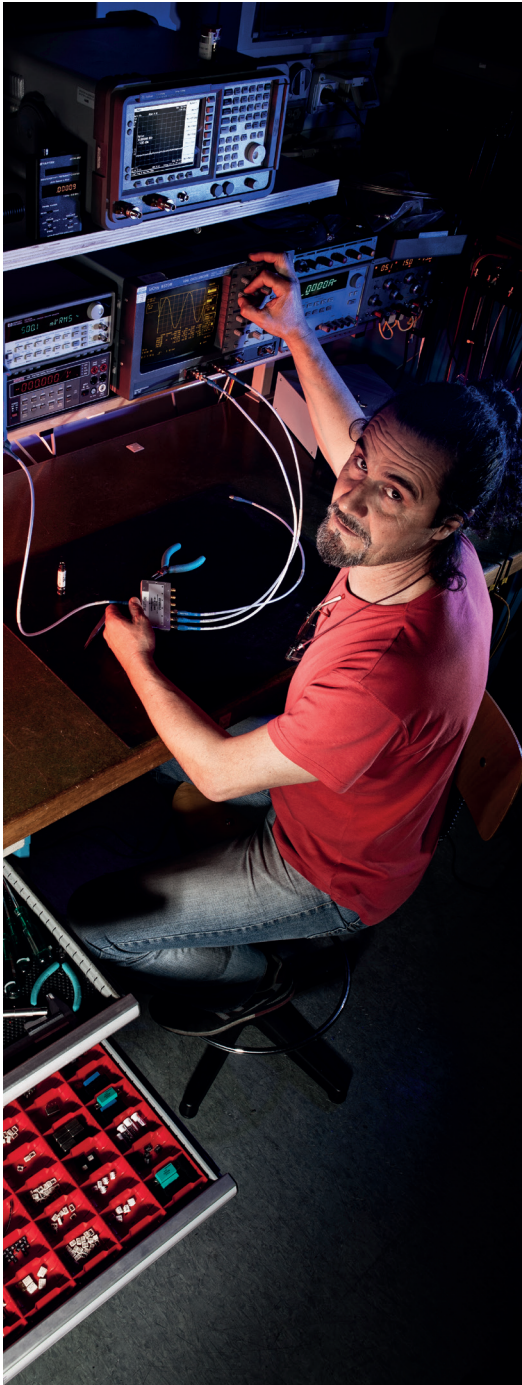


The interdisciplinary and international research at LENS is also reflected in a rich training program aimed at both graduate students and PhDs in all areas of research involving lasers.

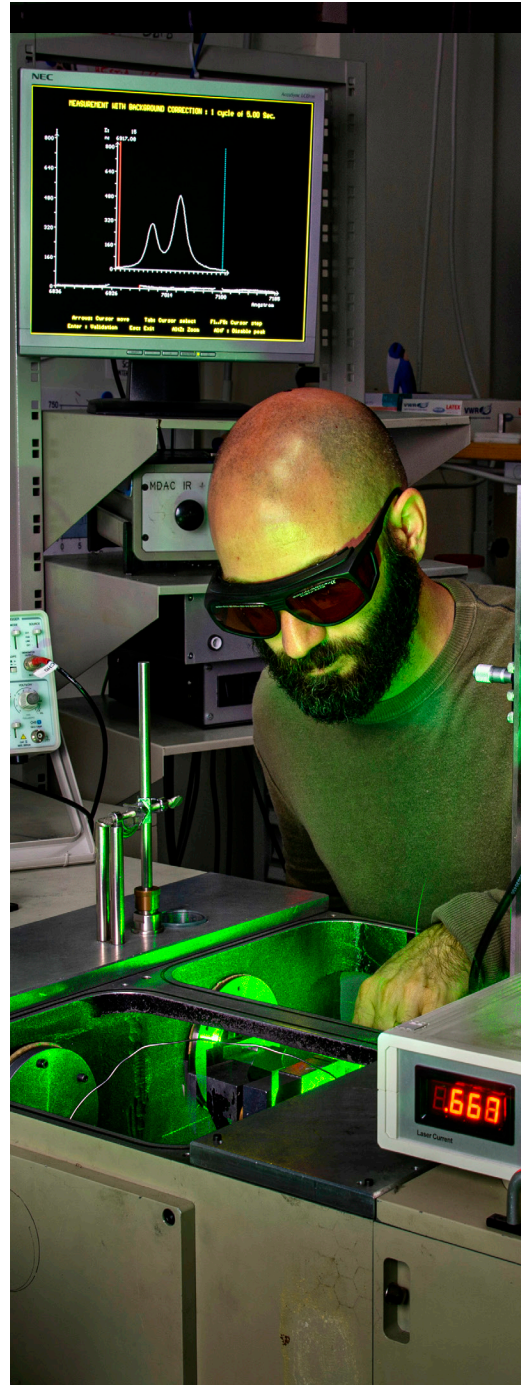
The PhD program is designed for graduates in Science, Technology and Life Sciences interested in developing original research in their fields by applying a variety of laser technologies. LENS offers PhD students a stimulating research environment within its three major research areas: quantum science and technology, bio-photonics, photonic materials.

The post doctoral fellowship program provides great opportunities for young researchers to present their ideas and projects, to find the right synergies to develop them, to build a perfect team to implement them successfully, and to access the best experimental tools to achieve them. The PhD school, in synergy with other prestigious European Universities, and the Post Doc fellowship program are both partially supported by various European Commission actions and the European Erasmus Mundus program.

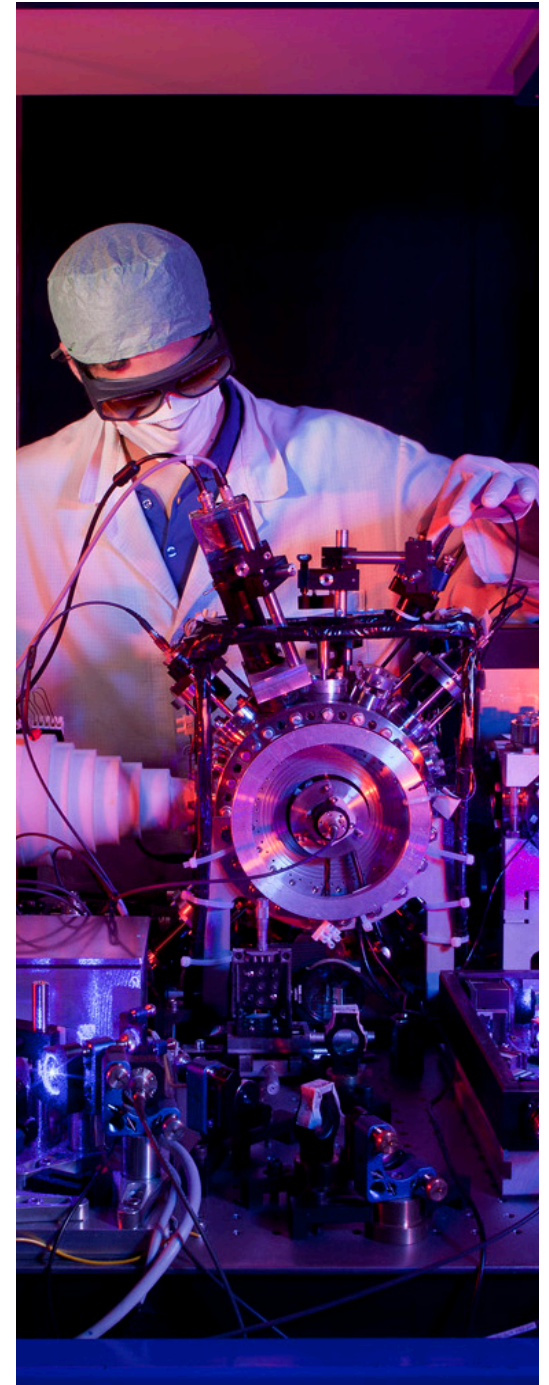
Students and post-docs have access to valuable research tools and participate in training programs involving a broad seminar series, including the prestigious Enrico Fermi Colloquium, given by high-profile members of the international scientific community.



LENS is one of the founders of the Laserlab-Europe consortium, constituted by 35 large-scale laser infrastructures operating in 18 different European countries,



providing access to the most advanced laser equipment and optical systems. Access is open to all researchers from Europe and beyond, on the sole criterion of



scientific excellence of scientific proposals. In addition, LENS is the only national laser facility recognized in the Italian roadmap of large-scale research infrastructures.



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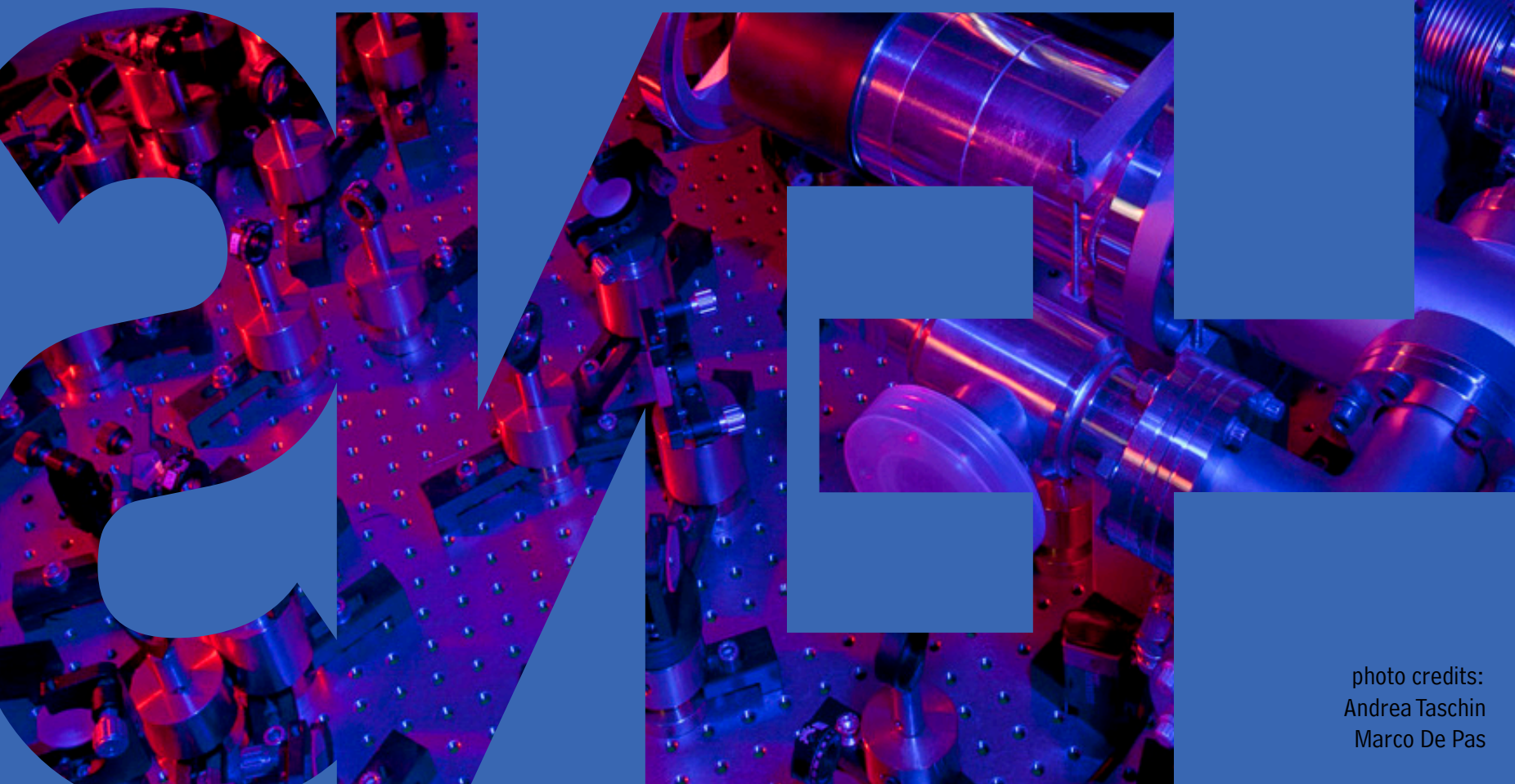


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