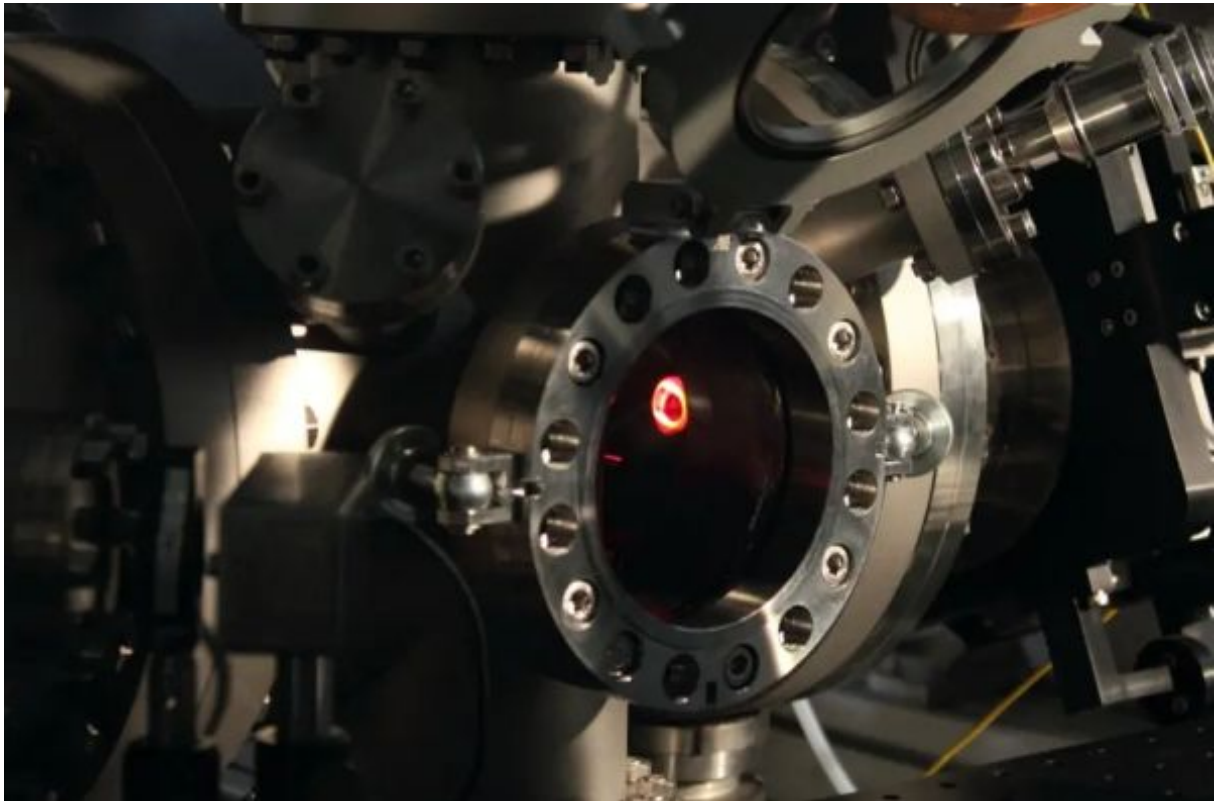




An international network for Non-linear Extreme Ultraviolet to hard X-ray techniques

ICFO Participates in a new COST ACTION Network

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The European Cooperation in Science and Technology (COST) is a funding organisation for the creation of research networks, called COST Actions. These interdisciplinary research networks bring researchers and innovators together to investigate a topic of their choice for 4 years. COST Actions are typically made up of researchers from academia, SMEs, public institutions and other relevant organisations or interested parties.

Through the world-leading attoscience infrastructure at ICFO, the only one of its kind in Spain which was built by the [Attoscience and Ultrafast Optics](#) research group led by **ICREA Prof. Dr. Jens Biegert**, ICFO is now a part of a new COST Action for Non-linear Extreme Ultraviolet to hard X-ray techniques (NEXT).

Extreme Ultraviolet (EUV) High-Harmonic Generation (HHG) table-top sources and soft to hard X-ray Free Electron lasers (XFELs) have opened a new era in science, providing

ultrashort, coherent and tunable pulses that are currently used to perform cutting edge experiments in Atomic and Molecular physics, condensed matter physics, biology and chemistry. Most of the reported studies rely on linear light-matter interactions, which are fundamentally limited in the dynamical information they can provide. Non-linear radiation-matter interactions have proven to be a powerful tool to unravel hitherto inaccessible properties. The advent of the above sources now enable non-linear techniques in the EUV/X-ray range, akin to what occurred with IR-visible-UV non-linear optics, by accessing the properties of materials at the nanoscale level, with femtosecond time resolution, chemical selectivity, high momentum, and polarization control.

The NEXT COST Action will capitalize on pioneering promising results, reported over the last decade, to create the first concerted experimental and theoretical effort aimed at implementing EUV/X-ray non-linear spectroscopy at table-top HHG and XFEL sources. Europe has a strategic leadership role, with its large number of research groups managing world-class table-top sources and hosting 4-out-of-7 XFELs available worldwide. This Action will have a strong impact on technology supporting the development of novel materials, nanodevices, quantum computing and chemistry, as well as on the training of young scientists as the next generation of researchers that will fully exploit these novel methodologies and tools. NEXT will also act as a key research and innovation bridge between academia and industrial partners.