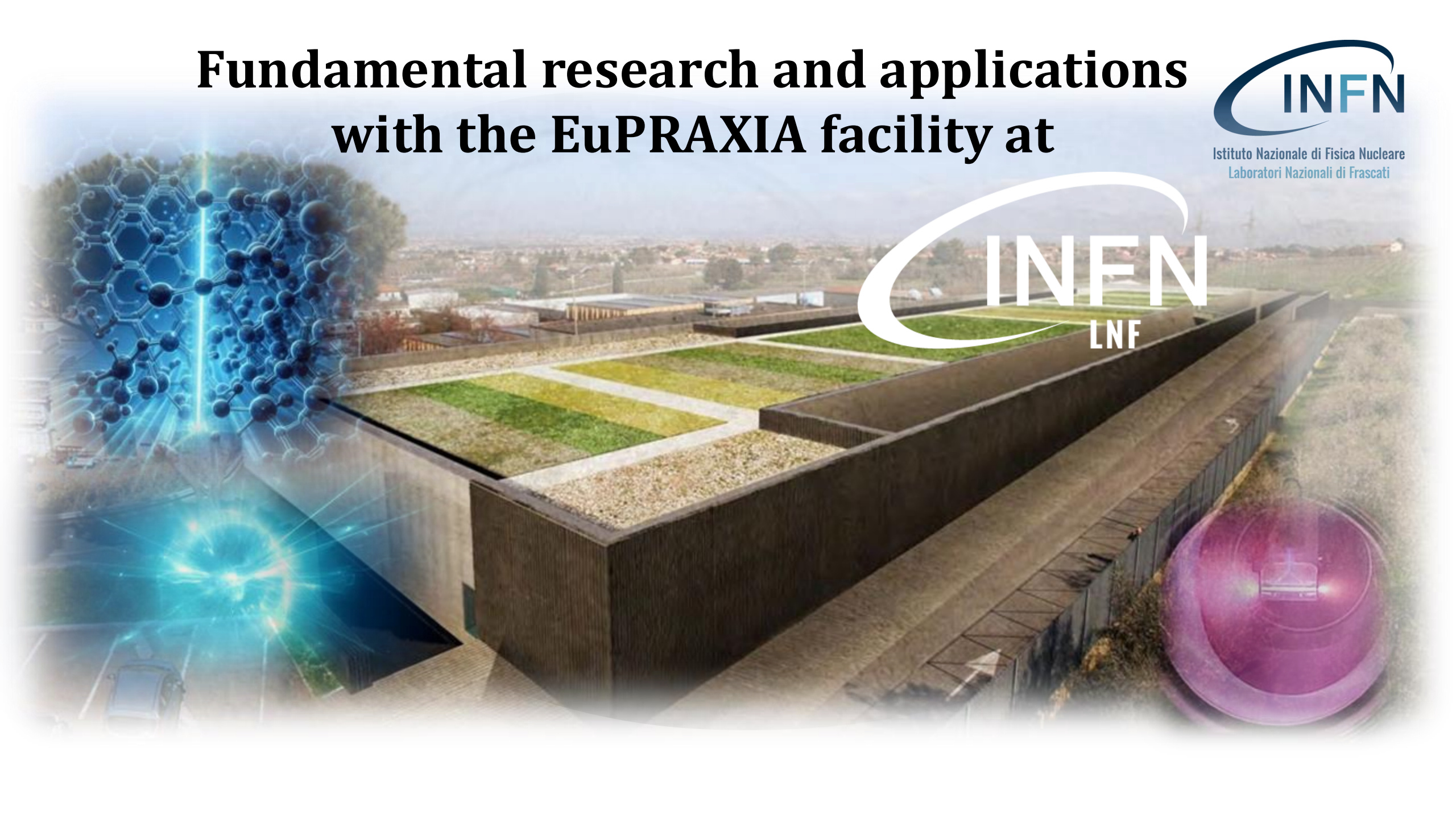


Fundamental research and applications with the EuPRAXIA facility at

INFN
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Laboratori Nazionali di Frascati

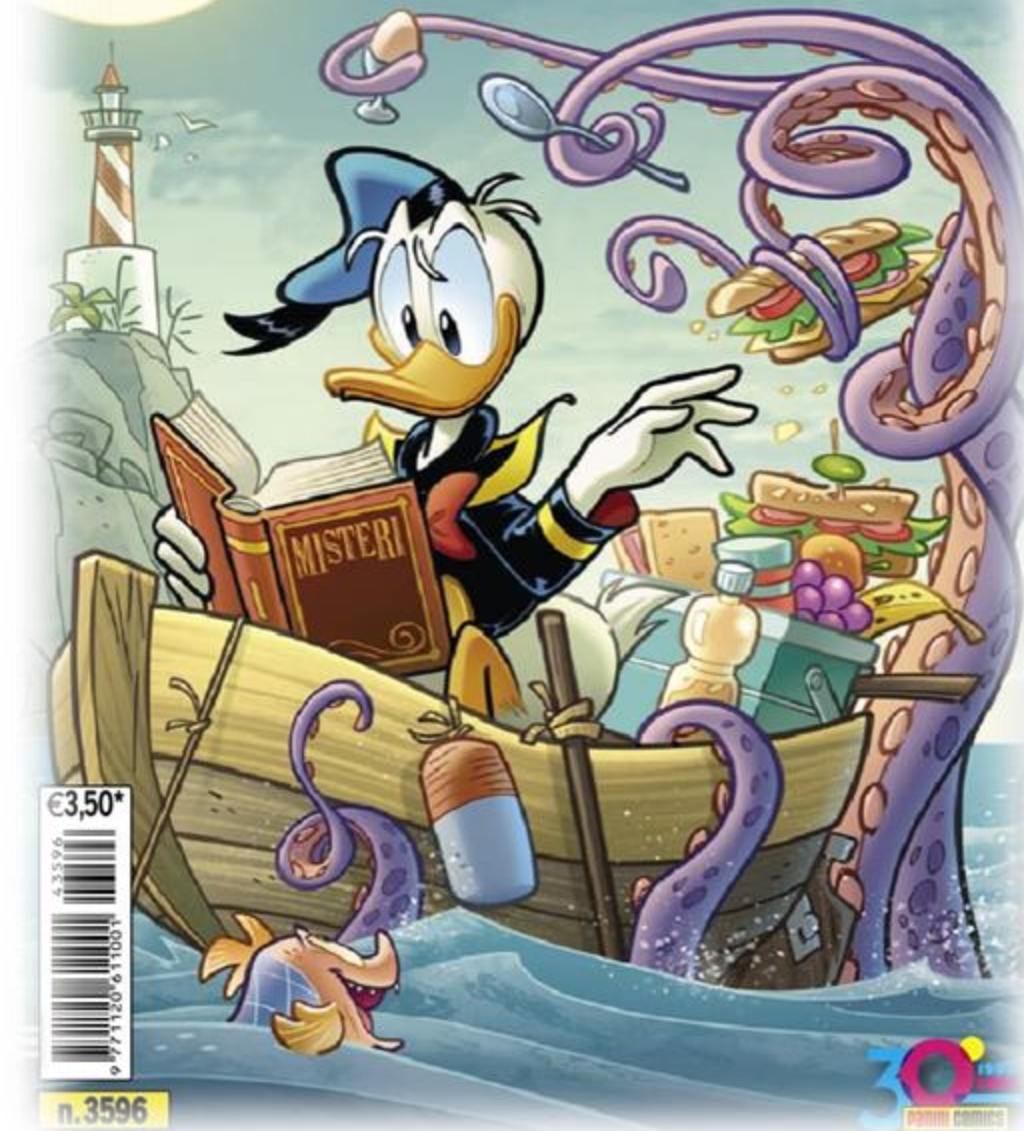
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**Important journals start
publishing papers on how to
exploit light sources...**

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Laboratori Nazionali di Frascati

Important journals start publishing papers on how to exploit light sources...

Issue published on October 23^o, 2024

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Important journals start
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X-ray phase contrast imaging - XPCI

One particular area for XPCI with betatron radiation could be **ultrafast x-ray imaging with femtosecond resolution**.

Except XFEL sources, betatron radiation offers the best time resolution ever achieved for XPCI.

To generate a single-shot image, a large photon number is required. Therefore, for a low noise image the number of photons per shot should be $N \gg 10^6$, assuming the x-rays uniformly fill the detector and are detected. In practice $N \gg 10^8$ is more realistic, given non-uniformities, overfill and detection efficiency.

Phase contrast imaging is approximately a thousand times more sensitive than absorption contrast, but the advantage over absorption contrast will be more prominent in the hard x-ray region.

Although it is not monochromatic, betatron radiation already achieves performances sufficient for XPCI.

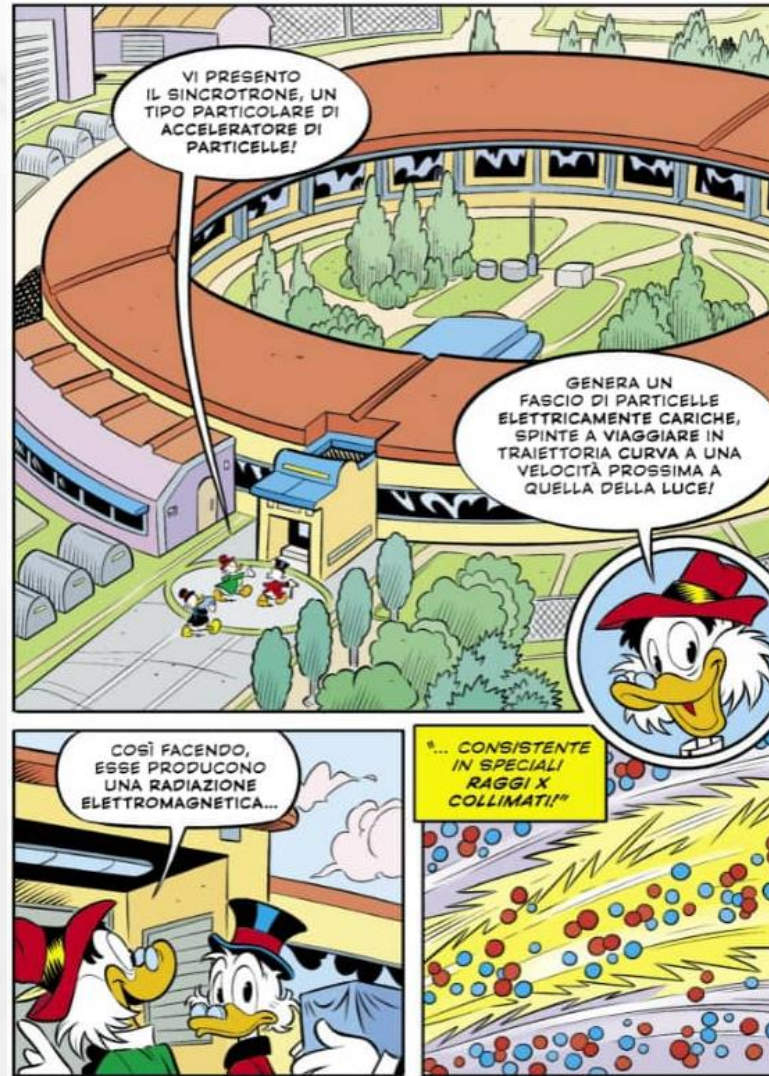
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Sources: FEL	Michele Oromolla
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Sources: betatron radiation	Andrea Frazzitta
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TEX	Fabio Cardelli
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LNF Beam Test Facility	Luca Gennaro Foggetta
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Attosecond molecular physics with FEL pulses	Dr Marco Ruberti
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Fundamental physics

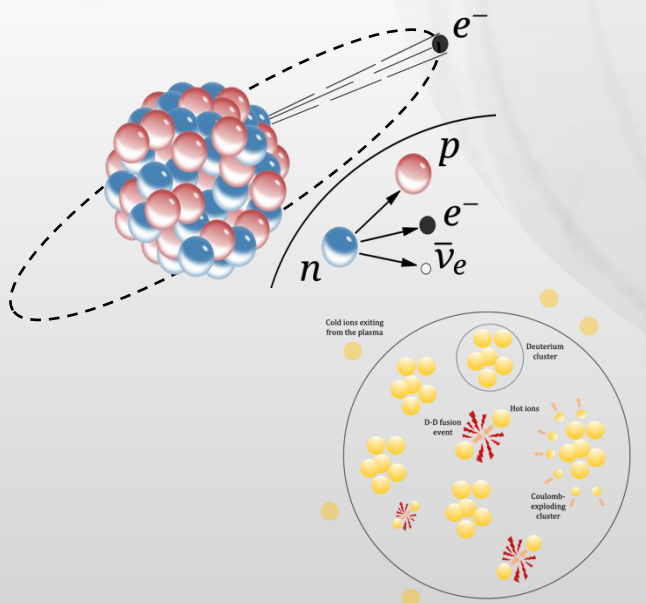
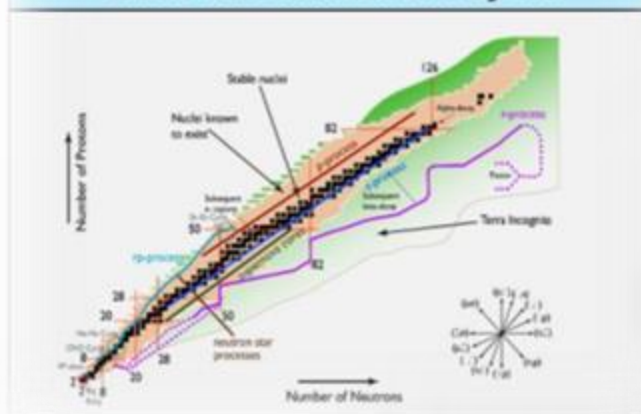
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Laser-induced plasma vs. ECR plasma: perspectives for nuclear physics experiments	Dr David Mascall
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Modern tests of Quantum Electrodynamics in the strong-field regime	Antonino Di Piazza
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EMP reduction techniques	Fabrizio Consoli
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Applied physics

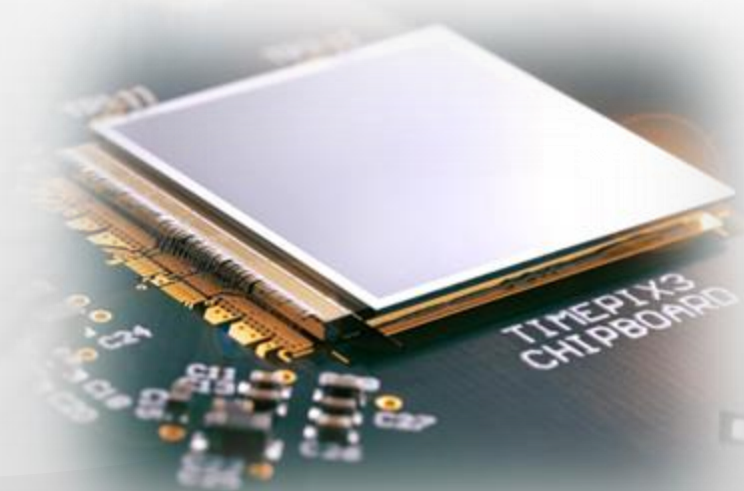
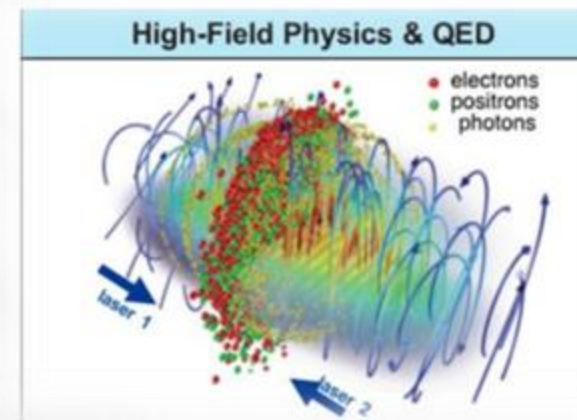
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Scientific opportunities for chemical dynamics using ultrafast XUV spectroscopies	Wojciech Gawelda
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Disruptive Experiments at the FERMI FEL: Unlocking New Potential with EuPRAXIA@SPARC_LAB	Dr Emiliano Principi
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Lattice dynamics in 2D-materials on the pico- and femtosecond timescales	Martina Dell'Angela
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Time resolved photoemission experiments with laser based HHG sources	Barbara Ressel
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Ultrafast coherent Raman spectroscopy: applications and X-ray perspectives	Giovanni Batignani
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Fundamental physics

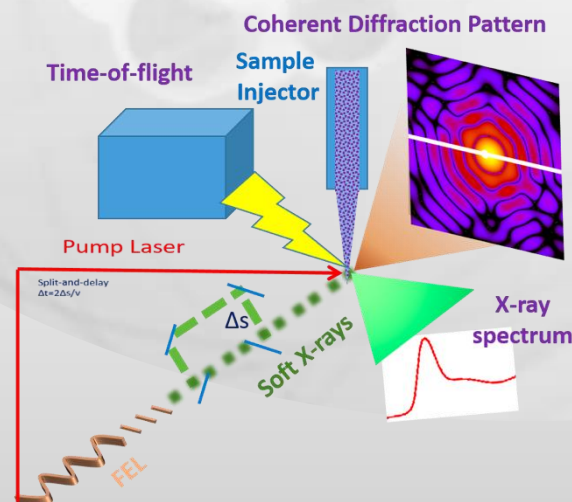
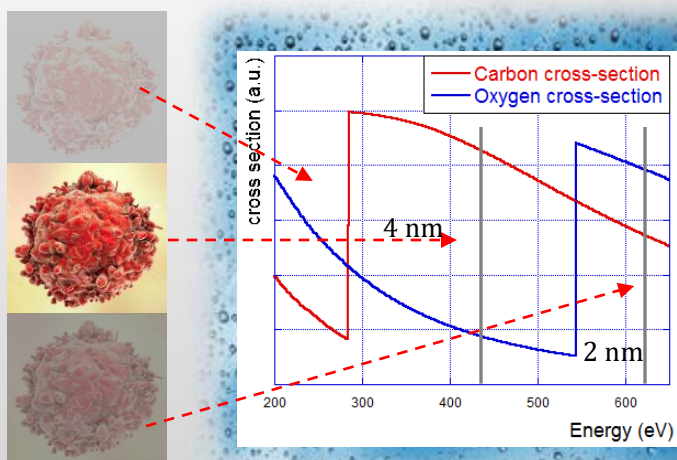
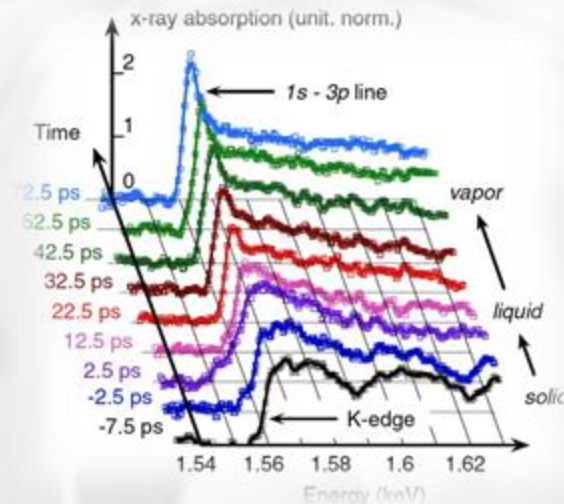
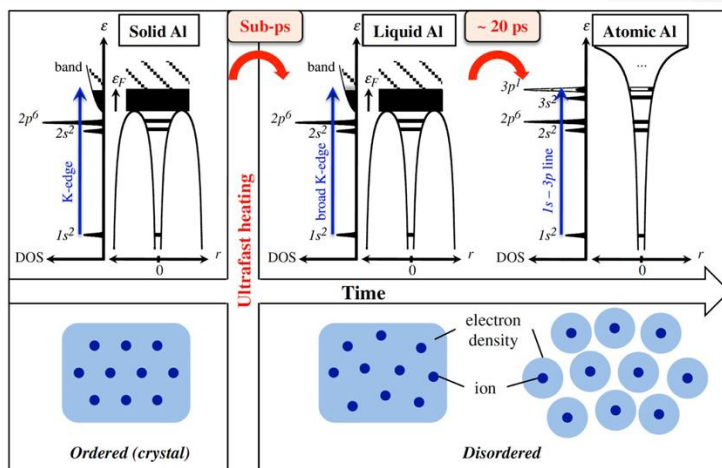
Laser-Driven Nuclear Physics



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