



EA 2527

3 teacher-researchers, 1 engineer and 3
Phd Student

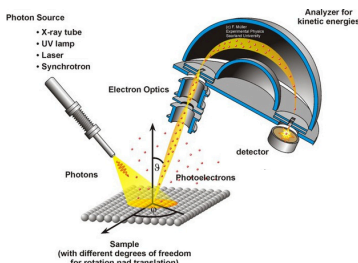
LPMS-DICO/CEA

Laboratory of Physics of Materials and Surfaces Dynamics and Interactions in Condensed matter

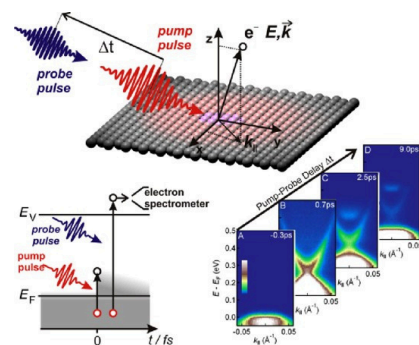
The LPMS is an experimental condensed matter physics and surface science laboratory. It specializes in the study of the electronic properties of solids, magnetism, and radiation-matter interactions using spectroscopy techniques with laser and synchrotron light sources, particularly spin-, time-, and angle-resolved photoemission spectroscopy. The LPMS is associated with the DICO group within the LIDYL laboratory, and collaborates with ATTOLab at CEA Saclay, which provides the laser radiation sources.

KNOW-HOW · SKILLS · EXPERTISE · SPECIFIC FEATURES

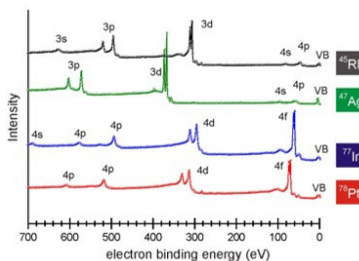
Surface Physics through Spin-Resolved Photoemission: Understanding electron dynamics and spin-polarised electron quantum states for material design.



Electron Dynamics by Pump-probe experiments



Typical XPSpectra



KEYWORDS SCIENCE

- Condensed Matter Physics
- Surface Science
- Spectroscopy
- Quantum Materials
- Ultrafast dynamics of electron and electron spins



KEYWORDS APPLICATIONS

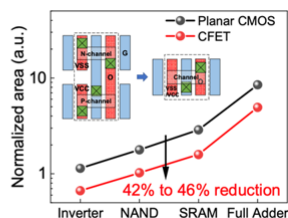
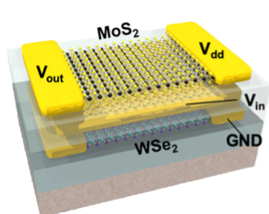
- Material Characterization
- Spintronics
- Nanotechnology
- Magnetic Storage
- Electronic Devices



APPLICATIONS AND INDUSTRIAL SECTORS

LPMS-DICO is concentrated on fundamental research with potential applications in electronic components industry

Transistor from 2D Materials



EQUIPMENT FOR SPECTROSCOPY

- Laser system high harmonic generation for ultrashort soft X-ray pulses.
- Spin-Resolved and Time-Resolved Photoemission Spectroscopy setup.
- Ultra high vacuum system for preparation and characterisation of samples.

PUBLICATIONS :

- M.Pancaldi et al..High-resolution ptychographic imaging at a seeded free-electron laser source using OAM beams. *Optica*, 2024, 11, pp.403-410. <[10.1364/OPTICA.548069](https://doi.org/10.1364/OPTICA.548069)>
- Fatima Alarab, Karol Hricovini, Berengar Leikert, Christine Richter, Thorsten Schmitt, et al.. Nature of the metallic and in-gap states in Ni-doped SrTiO3. *APL Materials*, 2024, 12, pp.011118. <[10.1063/5.0183140](https://doi.org/10.1063/5.0183140)>. <[cea-04453308](https://doi.org/10.1063/5.0183140)> Laser Systems for ultrafast and high harmonic generation studies.
- Silvia Lob, Delphine Neff, Thu-Hoa Tran-Thi, Maria Christine Richter, Charles Rivron. Hydrophobic coating using sustainable sol-gel process doped with carboxylic acids to protect heritage copper artefacts. *Progress in Organic Coatings*, 2024, 186, pp.108035. <[10.1016/j.porgcoat.2023.108035](https://doi.org/10.1016/j.porgcoat.2023.108035)>. <[hal-04264456](https://doi.org/10.1016/j.porgcoat.2023.108035)>

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