

New perspectives and complementarities for electron and X-ray spectroscopies

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The aim of this mini-colloquium is to present the state of the art in electron and X-ray spectroscopy, as well as future prospects. Over the past few years, these spectroscopies have made significant advances in terms of spectral, temporal and spatial resolution, use of polarization and special environments (cryogenics, in situ, in operando), driven by major instrumental developments: emergence of small high-current electron probes, high-brightness guns, ultra-high spectral resolution monochromators and improved spectral detection capabilities, on the electron spectroscopy side; advent of new high-brightness and high-coherence X-ray sources, such as 4th-generation synchrotrons and free-electron lasers, on the X-ray spectroscopy side. Topics covered by this mini-colloquium include, but are not limited to, the following:

- Recent scientific results obtained thanks to these advances
- Recent and/or prospective instrumental, experimental and methodological developments
- Advances and prospects in data analysis and interpretation, using theoretical, numerical or machine-learning approaches
- Combined use of several electron and/or X-ray spectroscopies, correlation with complementary techniques

The aim of the mini-colloquium is to bring together electron and X-ray spectroscopies, experiment and theory, in the field of condensed matter. Contributions illustrating the complementary nature of these different approaches are encouraged.

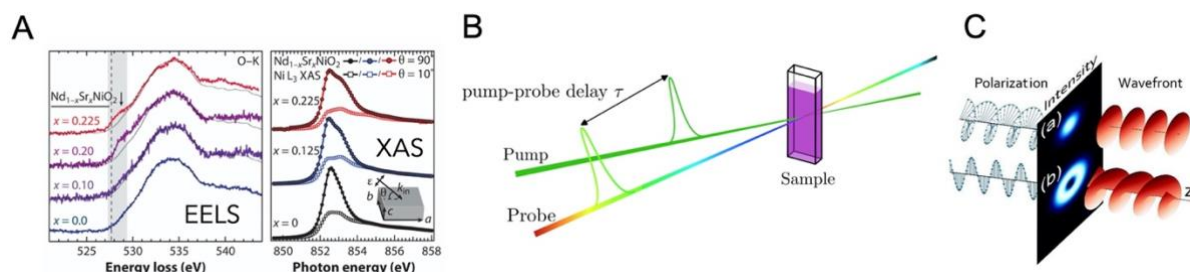


Figure. A. EELS and XAS spectra of nickelates (Wang et al. Annu. Rev. Condens. Matter Phys 2024). B. Pump-probe experiment. C. Use of polarized beams.