



UNIVERSITÀ DI PAVIA
Dipartimento di Fisica
"Alessandro Volta"

Avviso di Seminario

Martedì 7 Aprile 2026
Ore 14:00 - Aula Dottorato

Automatic-Differentiation-Based Parameter Optimization for Near-Field Single-Shot Ptychography

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Near-field single-shot ptychography (SSP) is a novel a high-fidelity, high-resolution adaptation to ptychography that combines the temporal-resolution of SSP with the spatial resolution of near-field ptychography. Near-field SSP paves the way for a more robust table-top and facility scale single frame phase resolved coherent diffractive imaging technique with paths towards multiplexing and three-dimensional imaging. With near-field SSP we have demonstrated the first ptychographic images of free-electron plasmas and shown its ability to extend towards imaging in the x-ray regime at facilities like FERMI. Here, I will cover the current state of technique and how we utilize automatic-differentiation with various error metrics to optimize physical system parameters, such as propagation distance and object positions, to increase the resolution and fidelity of the technique.