CONSIGLIO NAZIONALE DELLE RICERCHE
ISTITUTO NAZIONALE DI OTTICA

AVVISO DI SEMINARIO

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Il Prof. ***Davide Bleiner***

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terrà un seminario sul tema:

Short-Wavelength Plasma Radiation for Table-top Nano-Inspection

The characterization and fabrication of nano-structured materials, such as those for plasmonics, nanophotonics, *etc*. demands "enabling tools" for nano-scale imaging or spectroscopy. The factor to boost R&D is that of having *short-wavelength* sources *in the own lab.* In fact, *Extreme UV or X-ray (XUV, λ = 5—50nm)* sources accessible on a beam-time basis, i.e. *accelerator sources* like synchrotrons or free-electron lasers, do bottleneck the research and impede any method-optimization within the approved beamtime shifts. *Plasma*-based XUV radiation combines a number of state-of-art figures-of-merit, such as high brightness, spectral purity, photon counts, and if needed also coherence, with a table-top footprint.
Fundamental and applied research thus contribute to the enabling of a lab-scale nano-inspection tool. The system integration of a facility with "EUV Light for Actinic Nano-inspection" ("ELAN") is an ongoing Swiss National Science Foundation project since 2012. Three main steps are required for demonstrating a competitive lab-scale EUV tool: (i) the integration of a table-top source, and (ii) front-end imaging/spectroscopy units, coupled to a table-top XUV plasma-source; (iii) the comparison of performance with state-of-art accelerator-sources to pinpoint scopes. The expected microscopy resolution is at a level of <10λ, limited by the optics aberration.
Therefore further improvement is shown by means of "lensless" (coherent diffraction) imaging. Complementary spectroscopic inspection by means of photoelectron or photoion "time-of-flight" provides a "morpho-chemical" mapping of the nano-sample. A number of scientific cases in nanoscience will profit from the availability of a lab-scale EUV source in the next few years.