

Metodi sperimentali per la determinazione di struttura e proprietà elettroniche di sistemi aggregati di bassa dimensionalità/Experimental methods to investigate structural and electronic properties of low-dimensionality materials

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crediti: 6 - periodo/nizio: Gennaio-Maggio 2020 /

Syllabus:

Introduction to the collision spectroscopies: collisions with electrons.  
Introduction to the photoelectron spectroscopy: theoretical background, the three-step model, atoms and molecules, low-dimensional solid systems, experiments with angular resolution, time-resolved experiments. Instrumentation: charged particles, Auger electron spectroscopy and resonant photoemission.  
Theoretical background of absorption. Multiple scattering theory: a method for the observation of the electronic states and spectroscopy measurements. Surfaces and low-dimensional systems, electronic properties. Core-level photoemission and surface core-level shifts. Angular resolved photoemission, electronic band structure. Band structure of exemplary 1D and 2D systems. Electromagnetic radiation sources, synchrotron radiation. Introduction to the free-electron laser: a coherent source of radiation from UV to X rays. X ray absorption spectroscopy, EXAFS and XANES: fundamentals and applications. X ray elastic and anelatsic scattering. Diffusione elastica ed anelastica di raggi X. Resonant scattering, magnetic scattering. Magnetic circular dichroism.

- modulo "Tecniche di Micro- e Nano-fabbricazione" / "Micro- and Nano-fabrication Techniques" (Dr. V. Foglietti, CNR)

- CFU:  
4+2 (40 ore + 20 ore modulo)

- periodo: Gennaio-Maggio 2020