



UNIVERSITA' DEGLI STUDI DI ROMA "TOR VERGATA"

Laurea in Scienza dei Materiali

Dipartimento di Fisica

Via della Ricerca Scientifica, 1. 00133 Roma - ITALY

2018, January 16, 17, 18, 19; 2:30-4:30pm, Grassano room (on 17 Paoluzi room)
Tor Vergata-Lorraine Teaching Staff Mobility Exchange ERASMUS+

Physics at Surface by Photoemission and Tunnel Microscopy/Spectroscopy

Prof. Yannick Fagot-Revurat

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Physics of Matter and Materials Department, ARTEM - Nancy, France

This course will introduce and discusses some peculiarities of Physics and Chemistry of surfaces, interfaces and nanostructures. X-ray and UV Photoelectron Spectroscopies (XPS, UPS) are coupled to scanning tunneling microscopy and spectroscopy (STM/STS) to investigate the interplay between morphology, structure and electronic properties. After having introduced the experimental techniques, some results obtained in the last 15 years on various materials such as metal/metal interfaces, surface of semiconductors, organic/metal interfaces, graphene-like, correlated and magnetic materials will be presented. The complementarity of angle resolved photoelectron spectroscopy (ARPES) probing the k-resolved band structure (dispersion in reciprocal space), with scanning tunneling spectroscopy (STS), probing the local density of states (LDOS), will be discussed. Playing with surface/interface states and benefiting of their sensitivity to surface modification (surface reconstruction, confinement in nanostructure), basic concepts of solid state physics, such as the nearly free electron model in one or two dimensions as well as the electron-electron and electron-phonon coupling, will be explored.

This cycle of eight hours of lessons is dedicated to the Bachelor and Master students of Material Science, Physics and Chemistry and extended to PhD students, Researchers and Professors of Tor Vergata University and its associated Research Laboratories.

Yannick FAGOT-REVURAT is Professor at the University of Lorraine and researcher at the Jean Institute Lamour (Nancy, France). He has a PhD in Physics since 1998, was appointed Associate Professor in 1999, and is qualified to direct research since 2010. He specializes in the structure/properties relationship in thin films and nanostructures. He is a specialist in ultra-high vacuum experimental techniques such as LEED, STM/STS and XPS/ARPES and users of synchrotron radiation facilities. He has been responsible for the Master of Physics 1st year and Condensed Matter and Nanophysics of the Master of Physics 2nd year.



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