# Condensed Matter Physics

**Module No.: MN-P-SP-CondMat, MN-P-PN-CondMat, MN-P-WaMa** Version: 12.02.2014 SG

# Course: Physics of Surfaces and Nanostructures

**Lecturers: Thomas Michely**
**Email: michely@ph2.uni-koeln.de**

| Category | Type | Language | Teaching Hours | CP | Semester |
|---|---|---|---|---|---|
| Specialized Course | Lecture | English | 2 | 3 | |

**Requirements for participation:**

Basic knowledge of solid state physics as provided by the lecture Condensed Matter Physics I

**Type of module examinations:**

One oral examination at the end of the module

**Duration of the course:**

1 semester

**Aims of the course:**

Understanding of the fundamental concepts in surface and nanostructure science
Knowledge of basic fields and important applications

**Contents of the course:**

The lecture introduces to modern topics of surface and nanostructure physics. Basic concepts are illustrated with examples and the link to technical applications is emphasized.

Topics covered are
- Surface structure and defects
- Surface electronic structure
- Adsorption and heterogeneous catalysis
- Thermodynamic aspects of surfaces
- Epitaxy and thin film processes
- Magnetism at surfaces
- Clusters
- Oxide films
- Ion beam processes at surfaces
- Nanotubes and 2D-materials

**Recommended literature:**

Skriptum (available during the course)
H. Ibach: Physics of Surfaces and Interfaces (Springer, Berlin 2006)
K. Oura et al: Surface Science – an introduction (Springer, Berlin 2003)
M. Prutton: Introduction to Surface Physics (Oxford University Press, 1994)
H. Lüth: Solid Surfaces, Interfaces, and Thin Films (Springer, Berlin 2001)
M. Henzler/W. Göpel: Oberflächenphysik des Festkörpers (Teubner, Stuttgart 1994)