

COURSE ON THE ELECTRONIC STRUCTURE OF SOLIDS AND SURFACES (FYS240).

When

On Monday, March 24 at 15:15, there will be an introductory meeting at Kurslab (lecture hall H420) during which you can register to Prof. Almbladh. He will also hand out some course material plus a home assignment and answer questions.

On Monday, March 31 at 15:15, Prof. von Barth will give the first lecture.

Why

The physics of molecules, solids, and surfaces are of extreme importance to technology and to everyday life. Clearly, the theoretical description of these very complicated many-body systems appear to be beyond the grasp of the human mind. Fortunately, present-day theories based on relatively simple one-electron equations have proven to be extraordinary powerful tools for the quantitative description of many interesting physical properties, e.g., binding energies, geometrical structures, reaction barriers, vibrational frequencies, etc.. Also dynamical properties like photoemission spectra and the emission of electromagnetic radiation can be approximately described within the one-electron framework. Of course, much of our knowledge of the properties of solids is based on such spectral properties.

In the present course we will give some hints as to why the simple one-electron approach is so successful. We will use it to elucidate the basic physics of molecular binding. Finally we will try and convey a hands-on knowledge of the different standard techniques used for solving the ensuing one-electron equations. It is our aim that the participants themselves, at the end of the course, will be in a position to use standard soft-ware packages to calculate some physical properties of real systems.

For whom

This course is intended as an optional course for those who have already finished their third year of basic education and would like to have a somewhat deeper insight into some of those topics taught at the basic course on solid state physics (FYS023). Thus the course will also be useful to those at the level of postgraduate studies who wish to use the techniques to interpret experiment. The course will also serve as an entrance to those who wish to specialize in theoretical studies. The course gives 5p both at the basic level and at the postgraduate level.

How

The course will start on Marh 31 with a two-hour lecture. From then on until May 30 there will be two double-hour lectures per week with four full-days of computer work interposed among the lectures. The examination will be from June 5 to 9 in the form of a computational task followed by an oral examination during the following week.

Where

The intruductory meeting will be at Kurslab in room H420. The first lecture well be in Sem. Room. F at Mathematical Physics, Third Floor, House K, Sölvegatan 14A.

Report interest in the course or get more information from Ulf von Barth at 046-2229069 or e-mail barth@teorfys.lu.se or from C.-O. Almbladh at 046-148396.