

**Brief description of  
Advanced Condensed Matter Physics II and III  
at the school of Physics  
IPM 2021  
Sunday at 13.00 PM**

*Lecturer: Reza Asgari*

Condensed matter physics deals with the physical properties of materials in which many particles interact appropriately with each other. The low-energy properties of condensed matter systems emergent; collective properties make the whole greater than the sum of the parts. Therefore, understanding correlations between the parts and how the physical properties of condensed matter systems depend on them is the business of condensed matter physics.

The study of condensed matter physics involves measuring various material properties via experimental probes along with demonstrating techniques of theoretical physics to develop mathematical models that help in perceiving physical behavior. Essentially, in the condensed matter physics, we deal with almost all materials around us by asking many questions about materials; for instance you can feel them, manipulate them, change, perturb, and built them for a specific purpose.

This specific course is intended to be accessible and useful to experimentalists and theorists alike, properly providing an introduction both to the phenomenology and to the underlying theoretical description. In this course, we will be following the book:

**Modern Condensed Matter Physics, by Steven M. Girvin and Kun Yang,  
Cambridge 'university press' 2019**

Pursuing our previous semester, in this stage, we will address all the contents of the book.

**Prerequisite:**

It is assumed that the participants are familiar with the basics of *Solid State Physics (as contained, for instance in the book by Kittel)*.