



UNIVERSITÀ  
DEGLI STUDI DI MILANO-BICOCCA

## COURSE SYLLABUS

### **Electronic Excitations in Materials and in Nanostructures: theoretical methods, algorithms and computer tools**

2122-79R-M3

---

#### **Title**

Electronic excitations in materials and in nanostructures: theoretical methods, algorithms and computer tools

#### **Teacher(s)**

Prof. Silvana Botti, Friedrich-Schiller Universität Jena,  
Institut für Festkörpertheorie und optik, Germany

#### **Language**

English

#### **Short description**

1. Introduction to theoretical spectroscopy: the microscopic-macroscopic connection
2. Density Functional Theory
3. Linear response theory

4. Introduction to Green's functions
5. The GW approximation
6. Bethe-Salpeter equation
7. Time-dependent density functional theory
8. Excitonic effects in solids
9. Applications to real materials

**CFU / Hours**

1 CFU/ 8 hours

**Teaching period**

2022: from March 7 to March 11 (14.30-16.30).

UPDATE: COURSE IS POSTPONED. IT WILL LIKELY TAKE PLACE FROM JULY 4th to JULY 8 BUT WAIT FOR FINAL CONFIRMATION

---