

Ph.D course in Theory and Numerical Simulation on the Condensed Matter

Head of the Ph.D course: Prof. Giuseppe Santoro

Web site: [Theory and Numerical Simulation on the Condensed Matter](#)

Research lines:

- Non-equilibrium dynamics of correlated systems
- Theoretical Quantum Technologies
- Quantum Monte-Carlo methods
- Methods for many-body quantum systems: Tensor Networks, DMFT
- Mott Physics and topology from solids to heterostructures
- High-temperature superconductivity and strong correlations
- Optical and excited-state properties of complex molecular systems
- Theory and simulation of thermal transport in liquid and amorphous systems
- Relativistic effects in materials
- Validation of pseudopotentials for high throughput applications
- Beyond DFT: RPA and WdWDF
- Electronic simulation of realistic systems by advanced many-body techniques
- Software engineering and the Quantum ESPRESSO project

Fellowships available: 6

Admission: Academic and scientific qualifications + oral exam (also by videoconference)

Beginning of the Courses: 3 October, 2022

Evaluation of academic and scientific qualifications: 30 points

Access to Oral Exam: minimum mark of 21/30 on academic and scientific qualifications

Evaluation of Oral Exam: 70 points

Total Evaluation: 100 points

Eligibility: 70 points

Deadline for online submission of applications: 7 March, 2022

Oral Exam: 21 to 25 March, 2022

Second Session (only if there should still be places available after the first one)

Deadline for online submission of applications: 23 August, 2022

Oral Exam: 5 to 9 September, 2022

The results of the oral exams and the final ranking will be notified by email.