

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
- 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 + written exam + oral exam (also by videoconference)**

Beginning of the Courses: **2 October, 2023**

Evaluation of academic and scientific qualifications: 10 points

Access to Written Exam: minimum mark of 7/10 on academic and scientific qualifications

Evaluation of Written Exam: 40 points

Access to Oral Exam: minimum mark of 28/40 in the written exam evaluation

Evaluation of Oral Exam: 50 points

Eligibility: minimum mark of 35/50 in the oral exam evaluation

Deadline for online submission of applications: 7 March, 2023

Written Exam: 20 March, 2023

Oral Exam: 21-14 March, 2023

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

Deadline for online submission of applications: 22 August, 2023

Written Exam: 4 September, 2023

Oral Exam: 5-8 September, 2023

All results and the final ranking will be notified by email.