

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

**Head of the Ph.D course:** Prof. Massimo Capone

**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:** 7

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

**Beginning of the Courses:** 1 October, 2020

**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

### First Session

**Deadline for online submission of applications:** 3 March, 2020

**Oral Exam:** from 25 to 27 March, 2020

The results of the academic and scientific qualifications evaluation will be notified by email. Selected candidates will be informed about day and time of the oral exam that, upon request, could be taken by videoconference, preferably through "Skype" (see general announcement).

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