

TIME-RESOLVED NANOSCOPY

Joint research project between Università Cattolica del Sacro Cuore (UCSC), University of Notre Dame du Lac (ND) and KU Leuven.

The aim of the PhD project is to develop a microscopy-oriented research platform combined with time-resolved optical spectroscopy to study single nanostructures and surface inhomogeneities with a spatial resolution of below 100 nm and a temporal resolution of the order of 100 fs.

One of the goal of this projects will be to harness the capability of super-resolution imaging methods that now can provide spatial resolution that is well below the diffraction limit (nanoscopy), approaching virtually molecular resolution. In particular we will concentrate on label-free and white light super-resolution microscopy based on the detection of evanescent waves. Atomic force microscopy techniques will complement the optical microscopy platform to characterize the mechanical/chemical aspects of the investigated physics. Since these microscopy/nanoscopy techniques comes with novel requirements for the time-resolved optical spectroscopy, new schemes to adapt the standard pump and probe techniques to the microscopy environment will be implemented. Finally, it will be important to pay attention to the data interpretation strategies, also in view of the data storage and management needed in experiments where a great deal of spectroscopic information is potentially available in each pixel of an image.

Profile

- Diploma: Master's degree or comparable qualification in Physics, Materials Science, Electronic engineering or adjacent fields. The title must be obtained before OCTOBER 31ST 2018.
- A strong interest for multidisciplinary research is required.
- Candidates should have a solid background in optics.
- Previous experience in microscopy and/or ultrafast optics will be an asset.
- Good knowledge of the English language, both spoken and written, is essential.
- Strong commitment, ability to work in a team, and eagerness for international mobility is desired.

Opportunities

- Perform experimental research in an interdisciplinary research environment and actively participate to the international collaboration between research groups in Italy, United States and Belgium. The overall tutoring activity will be conducted by experienced staff members at UCSC, ND and KU Leuven.
- There will be the possibility of being involved in teaching duties for a limited amount of time (e.g., guiding Bachelor and Master students with their experiments and research).

Supervisors

- Prof. Gregory Hartland, University of Notre Dame (USA)
- Dr. Eduard Fron, KU Leuven (Belgium)
- Prof. Gabriele Ferrini, Università Cattolica del Sacro Cuore (Italy)

Info

Applications will appear [HERE](#)

Pre-applications available at <http://scuoledidottorato.unicatt.it/phdschools/science-home>

Application deadline: September 28th, 2018

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