

Development of simulation tools for quantum applications of hollow core fibers

PhD position at the Department of Engineering “Enzo Ferrari” of the University of Modena and Reggio Emilia.

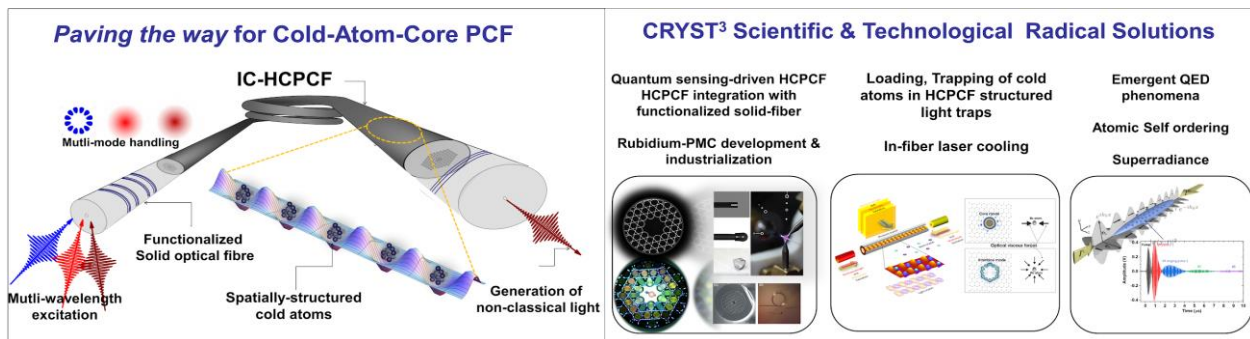
We offer a great opportunity for a dynamic and motivated PhD student candidate to join an international project and work on the design effort of cutting-edge hollow-core photonic-crystal fibers for nanophotonics, sensing, and quantum applications.

The PhD student will carry out his/her research activity as part of *European project CRIST³* (see www.cryst3.com and below for details) focused on quantum sensors based on hollow-core fibers. We will work in close collaboration with the Gas-Phase Photonic and Microwave Materials (GPPMM) research group of XLIM laboratories in Limoges (Fr) (<http://gppmm.xlim.fr>). GPPMM is a worldwide leader in design and fabrication of hollow-core fibers based on inhibited-coupling light guidance.

We seek for motivated students holding a master’s in Electrical or Electronics Engineering, Physics, Mathematics. A background in electromagnetics or numerical methods for differential equations will be preferred. Applicants are required to hold a MSc degree or to obtain it no later than October 2022.

If you are interested and love photonics and quantum technologies and you want to join PhEmLab (www.phemlab.unimore.it), email to luca.vincetti@unimore.it a brief cv and max 1 page motivation letter.

The call for PhD position is available at the link: <https://www.unimore.it/bandi/StuLau-Sdott.html> Section: “3) PhD Programme in “INFORMATION AND COMMUNICATION TECHNOLOGIES (ICT)” Topic: “Development of simulation tools for quantum applications of hollow core fibers” page 33 of the pdf document. The **deadline** for application is **July 28, 1pm** (Italian time)



CRYST³ is a four-year project funded by Horizon 2020 action “FET Open – Novel ideas for radically new technologies” involving research groups from eight partner institutions, many of which are world leaders in the field of photonics and quantum physics: University of Bologna (It), University of Limoges (Fr), University of Modena and Reggio Emilia (It), University of Innsbruck (At), Institut d’Optique Théorique et Appliquée (Fr), Wigner Research Center (Hu), ALPhANOV (Fr), GLOphotonics (Fr).

Quantum technology is the technology enabled by quantum physics, and the purpose of this engineering effort is to develop knowledge and techniques useful to produce quantum devices and systems. The main issue in achieving this goal is how to create, control, measure, and protect quantum coherence inside such devices. Today, this can be obtained by deploying huge systems which, thanks to their size, dramatically reduce the interaction of particles among them and with the environment. Hollow-core fibers combined with laser technology promise to deliver such effects inside a volume several orders of magnitude smaller. This will open up the application of quantum devices to everyday life, an exceptional result delivered by the synergy of engineering and quantum physics, which already brought about the successful development of semiconductor devices more than fifty years ago.