Scuola di Dottorato in ICT

Doctoral School in ICT

Research project for a PhD curriculum in ICT – Electronics and Telecommunications

**Tutor**: L. Vincetti

**Foreign Co-tutor**: F. Benabid – University of Limoges (Fr)

**Proposed Title of the research: “Hollow core optical fibers for industrial applications”**

**Keywords: (3) Optical Fibers, Photonic Crystal Fibers, High Power Lasers**

**Research objectives: --(max 10 rows)**

• Theoretical investigation of new and innovative hollow core fibers (HCFs);

• Realization and characterization of HCFs.

• Measurement of the developed HCFs performances.

**Proposed research activity --(max 10 rows)**

Laser systems have been replacing many conventional tools in diverse areas of manufacturing, enabling increased productivity, quality, and functionality. Nowadays they suffer of lack of proper systems for laser beam delivery. Also, fiber sensors and lab on fiber have been proposing as an effective and reliable new platform in bio-photonics, healthcare, and agri-food industry.

Hollow Core Inhibited Coupling Fibers (HCICFs) are good candidates to provide effective solutions in both the applications since they guarantee broad transmission window, very high damage threshold and long interaction length with analytes.

The aim of the research will be the development of innovative HCICFs for high power beam delivery for laser manufacturing and high sensitivity, real time sensors for industry 4.0.

**Supporting research projects (and Department )**

The research activity will be carried on in the PhEm lab of the Department of Engineering “Enzo Ferrari” in collaboration with the GPPMM group of the Research Institute XLIM - University of Limoges (Fr). See http://gppmm.xlim.fr/

**Possible connections with research groups, companies, universities..**

Research Institute XLIM - University of Limoges (Fr), University of Parma (It), Technopole of Mirandola-TMP (It).