

Title: Innovative MCF amplifier approaches for telecommunications

Host institution: University of Limoges - XLIM, France

Supervisors: Prof. P. Roy

Ultra-high-speed fiber optic telecommunications are now entering the era of multi-core fibers to meet the world's ever-increasing demand for data transfer. Signal regeneration is a key function of future networks, and each core, and eventually each mode, must benefit from controlled gain, so as not to create a gain difference between cores, and to guarantee the balance of the system as a whole. While rare earths, and erbium in particular, are well known to designers of fiber-optic amplifiers for telecommunications, we propose a dual approach. First, gain equalization between the different cores will be addressed by looking for ways to homogenize the intensity distribution of pumping power in the cladding, while maintaining an active fiber geometry (doped with erbium) identical to that of the line fiber. Secondly, we will evaluate the potential of a cladding-pumped Raman amplifier, once again seeking to optimize efficiency and gain equalization in the various cores by designing special optical fibers.

Secondment

- HCT: Dr. K. Schuster M21-26 (6 months duration) "Cylinder drilling, geometrical adaptation towards smaller preforms"
- Iscte: Prof. T. Alves M41-M42 (2 months duration) "Experimental demonstration of long-reach amplified MCF systems"

Application process DC4: <https://match.iscte-iul.pt/phd-candidates-profiles/apply-to-dc-positions/>

