NETLAS NEWSLETTER 6

This newsletter marks the recruitment of three more ESRs to our ITN, on 1st October 2020.

PhD9: Marie Klufts

Host: University of Lübeck
Secondments: Optores GmbH, University of Kent, Applied Optics Group (AOG)/ with guidance from UCL Institute of Ophthalmology and Moorfields Eye Hospital

PhD Project:
Short wavelength FDML lasers

More than 60% of OCT applications are in imaging the retina of the human eye, 800–1100 nm represents the main wavelength range. There is still no commercially available swept source at 800 nm operating at over tens of kHz tuning rates. The project aims to develop a new fast 800 nm FDML at >1MHz wavelength sweep repetition rate with a tuning bandwidth of more than 60 nm and a long coherence length. This will allow swept source OCT system with the typical image contrast and look known from 800 nm SD-OCT and provide improved transversal resolution. This laser will be used in a OCT system for biomedical imaging.

Previous education: After my preparatory class specialized in mechanics and physics, I continued my studies in biomedical engineering in France. During these 5 years, I had the opportunity to do several internship focusing on photonics. The first one at Femto-st allowed me to discover OCT. Then I had the opportunity to work with MD. Nicolas MOTTET in the study of fetal lung development by elastography. Lastly, I did a 3 month internship at the University of Auckland with Dr. Frédérique VANHOLSBEECK and Matthew GOODWIN on the early detection of osteoarthritis by PS-OCT.

PhD13: Alejandro Martinez Jimenez

Host: University of Kent, Applied Optics Group (AOG)
Secondments: NKT Photonics, CenterVue

PhD Project:
NPR laser followed by time stretch

The nonlinear polarization rotation (NPR) technique developed by Matsas, is a powerful tool for the generation of pico-femtosecond pulses. In the other hand, time stretch is data acquisition method that overcomes the speed limitation of electronic digitizers and enables continuous ultrafast single-shot spectroscopy, imaging and other measurements at refresh rates reaching billions of frames per second with non-stop recording spanning trillion of consecutive frames. In my

project, we develop NPR at different bands of the spectrum and with different repetition rate we can achieve large improvements in different systems, so combine the NPR tool with time stretch technology, to enhance the performance in systems like OCT, microscopy, cytometry.

Education: Bachelor's degree Physical Sciences at the University of Murcia, and it was here that I found my motivation to work in visual optics, participating in Pablo Artal's group. The following year I started an interuniversity master's degree in photonics with the participation of the University of Barcelona, Polytechnic of Catalunya, Autonoma of Barcelona (UB, UPC, UAB) and the Institute of Photonic Sciences (ICFO) where I was able to learn from the world top researchers (Prof. Dr. Maciej Lewenstein, Prof. Dr Niek Van Hulst, Prof. Dr. María García-Parajo, Prof. Dr. Frank Koppens, Prof. Dr. Jens Biegert) in different fields such as non-linear optics, ultrafast, biophotonics.

Master thesis work was on correlations with the HBT interferometer, presenting "*Generation of artificial thermal sources and their characterization by intensity interferometry*"

PhD14: Rene Riha

Host: University of Kent, Applied Optics Group (AOG)
Secondments: Superlum Diodes, CenterVue

PhD Project: Akinetic dispersive cavity mode locked laser (ADCML) tunable laser, with dual mode locking

Research interests: _Next generation of tunable lasers for optical coherence tomography_

Education

September 2018 – July 2020: Master's degree in Physical Engineering and Nanotechnology, Brno University of Technology, Brno, Czech Rebublic

September 2015 – June 2018: Bachelor's degree in Physical Engineering and Nanotechnology, Brno University of Technology, Brno, Czech Republic

Internships: February – July 2019: Erasmus internship in AOG, University of Kent, Canterbury, United Kingdom. Project on speckle reduction in OCT.

From now on we invite all partners to communicate events and ideas to place in our newsletter

Please send any piece of news, on NETLAS activities or anything else happening that may be of interest to the NETLAS community, to Ramona Cernat: R.Cernat@kent.ac.uk and to Adrian Podoleanu: ap11@kent.ac.uk