PhD Position Offer

Nonlinear fiber-based optical frequency combs for mid-infrared applications

Deadline for applications: 20 June 2016

Laboratory: FEMTO-ST Institute – Department of Optics (Besançon - France)
ICB Laboratory - Department of Photonics (Dijon - France)

Receiving Institution: University of Bourgogne Franche-Comté (UBFC) – Faculty of Sciences and Techniques – Dijon / Besançon

Time span: 3 years starting from October or November 2016
Field of research: Nonlinear Optics / Photonics

Contacts:
Dr Bertrand Kibler – +33 (0)3 80 39 59 32 – bertrand.kibler@u-bourgogne.fr
Dr Jean-Charles Beugnot - +33 (0)3 81 66 66 46 - jean-charles.beugnot@femto-st.fr

Salary: 1 365 euros net/month (grant from Labex Action / Région BFC)

Context & Work Description

We are seeking a candidate for a PhD scholarship in nonlinear photonics to be part of the Laboratory of Excellence dedicated to Smart Systems (Labex Action: http://www.labex-action.fr/en).
The successful applicant will take part to research activities based on nonlinear light-wave propagation in mid-infrared fibers and its application to optical frequency combs. Optical frequency combs with repetition rates of GHz are really interesting for photonics applications including generation of arbitrary waveforms, optical spectroscopy and telecommunications.
The project aims at combining four-wave mixing processes induced by Kerr effect and Brillouin scattering to design and realize frequency combs operating at wavelengths around or beyond 2µm. We propose to create a new way to develop mid-infrared frequency combs without optical cavities or using very simple resonant cavities. The resulting systems will provide an alternative approach to conventional mode-locked lasers, electro-optic modulators or recent microresonators. Depending on the nonlinear effect, the comb spacing will be fixed or tunable. This project aims to benefit from the remarkable nonlinear effect in infrared fibers and waveguides developed at ICB and FEMTO-ST. It is also based on a long-time collaboration and complementary expertise between the two labs in nonlinear fiber optics and ultrafast optics. Considering the proximity between ICB and FEMTO-ST (80km), the main work can be planned in both laboratories involved in the Labex Action.

Qualifications

Candidates should have a Master's degree in Photonics or Physics. Experience in experimental optics, nonlinear optics and laser physics will be appreciated. Only candidates with very good grades from bachelor and master studies will be considered. Rigorous and motivated, candidates must have good skills in modeling and numerical simulation, as well as a strong taste for experiment.

Application procedure

Applications must be sent to B. Kibler & J.C. Beugnot as one PDF file containing all materials to be given consideration. The file must include: a letter motivating the application (cover letter), curriculum vitae, one/two reference letters, grade transcripts and BSc/MSc diploma. Candidates may apply prior to obtaining their MSc degree, but cannot begin before having received it. The deadline for applications is 20 June 2016.