

OPEN POSITION FOR PHD STUDENT FOR 3 YEARS AVAILABLE!
ITN MARIE CURIE

Nicolaus Copernicus University (NCU), Toruń, Poland has an open position for an **Early Stage Researcher (ESR)** to pursue a **PhD degree**, funded for a period of **36 months**.

The project entitled

Advanced BiomEdical OPTICAL Imaging and Data Analysis (BE OPTICAL)

provides a unique and structured training programme to 14 ESRs in a wide range of optical imaging technologies and signal processing tools, including fluorescence spectroscopy and microscopy, optical coherence tomography, optogenetics, engineered nanomaterials and signal processing tools.

Comprising 7 leading academic groups and 2 non-academic partners in 5 European countries, the project **BE OPTICAL** brings together an interdisciplinary team of physicists, engineers and medical doctors, with complementary expertise in optical imaging, nanotechnology, computer science, complex systems and data analysis. The non-academic partners are a leading company in fluorescence instrumentation and an internationally recognised ophthalmology clinic, with the most advanced technology and expertise in ocular diseases.

The training programme will provide the ESRs with a broad understanding of how a wide range of optical imaging technologies and data processing tools work, and will open for them a wide range of job opportunities. The ESRs will apply this knowledge to advance the early diagnosis of highly significant diseases. The ESRs will also gain insight into clinical studies of novel imaging technologies and the commercialization process, which will further improve their employability.

Place of Work

The Early Stage Researcher will be registered as a PhD student and **employed at Nicolaus Copernicus University (<http://www.umk.pl/en/>) with full employee benefits**. The ESR will join **Optical Biomedical Imaging Group** at Institute of Physics NCU (<http://obig.fizyka.umk.pl>) and will be supervised by **prof. dr hab. Maciej Wojtkowski** and **dr. Ireneusz Grulkowski**. He/she will work closely with other BE-OPTICAL researchers at Max-Planck-Institut für Dynamik und Selbstorganisation (Germany), University of Glasgow (UK) and Ocular Microsurgery Institute (Spain) with secondment visits to these partners.

The ESR hosted by NCU will **explore the potential of swept source OCT for organ-scale imaging with focus on multi-scale non-invasive structural and functional diagnosis of the heart**. OCT technology will allow 3D morphological imaging of heart tissue. Simultaneously, the information about motion of heart tissue will be extracted by depth-resolved determination of the Doppler frequency of the interferometric signal. Mechanical motion can also be obtained from the local displacement of the optical speckle pattern using a cross-correlation technique. Determination of function of cardiac tissue will be realized by using two complementary approaches based on the analysis of the depth-resolved light signals: (i) the reaction of the tissue in response to electrical stimulation can be measured by monitoring the changes in tissue optical scattering properties and (ii) indirectly, by measuring hemodynamics via Doppler flow imaging where phase changes in the reflected/scattered light are measured to extract motion.

Requirements

The applicant is required to satisfy the eligibility criteria for ITN-ETN - Training Networks Early Stage Researchers, i.e.:

- must be within the first four years (full-time equivalent) of their research career and not have a doctoral degree;
- must not have resided or carried out their main activity (work, studies, etc.) in Poland for more than 12 months in the three years immediately prior to the recruitment.

The applicant will also be expected to have a MSc (or equivalent) undergraduate degree in physics, optics, electrical engineering or a related discipline.

Applications should include: 1) a CV (publication record is advantageous), 2) scanned copy of Master's degree certificate (or equivalent), 3) a statement of the candidate's research interests, experience and skills, and 4) contact information for at least two references. All materials should be submitted via email to:

Monika Fojt mfojt@fizyka.umk.pl

