

## RESEARCH PROJECT FOR PHD STUDENT OR MASTERS THESIS WORKER (PHYSICS / ENGINEERING)

Kuopio University Hospital and University of Eastern Finland are looking for an MSc thesis worker / PhD student in the field of physics or engineering to an international research project. The duration of the first part of the project will be 5-6 months, after which there is a good opportunity to continue as a PhD student. The one to be hired will join the Biophysics of Bone and Cartilage research group ([luotain.uef.fi](http://luotain.uef.fi)). The project will be launched in June and the position will be filled immediately when a suitable applicant is found.

### **Description**

- Development and application of optical imaging systems, signal processing, image analysis
- Pre clinical and laboratory measurements
- Scientific reporting

### **Requirements**

- MSc in physics or engineering or a postgraduate nearing end of MSc studies.
- Experience of a suitable programming language, such as MATLAB or LabView.
- Knowledge of optical physics

### **Work environment**

*This project is an international research project involving Kuopio University Hospital, University of Eastern Finland and Utrecht University. Collaboration is done also with other international universities and research centres. Our research group provides an inspiring, active and young work environment. We are developing high quality, internationally acclaimed diagnostic techniques for osteoarthritis diagnostics.*

### **Description of the research group and the project**

One of the aims of our research group is to develop and improve diagnostic techniques for osteoarthritis. For the research project in question, we have developed arthroscopic techniques involving optical coherence tomography (OCT) and near-infrared imaging (NIR) for diagnostics of osteoarthritis and chondral injuries. Numerous international articles have been published, and several PhD's theses have been written about the findings within the subject.

In this project, we intend to study the feasibility of techniques based on OCT imaging in the early detection of osteoarthritis and chondral injuries and novel ways to optically characterize articular cartilage properties. The aim is to provide future orthopedic surgeons with information pertaining to the state of the individual patient's cartilage collagen network, extent of possible damage, and other structural abnormalities when making clinical decisions.

Due to the collaborative nature of this project, parts of the research will be conducted in Kuopio, Utrecht, and Dresden (Finland, the Netherlands, and Germany, respectively), making travelling a requirement of this position.

This first part of the project is well suited for a MSc. thesis or as an initial step in PhD. research, with the possibility of extending the work as a PhD student in the future.

**Please send applications via email by 31-May-2018.**

**Professor, chief physicist Juha Töyräs, PhD, p.+358 40 3552026, [juha.toyras@uef.fi](mailto:juha.toyras@uef.fi)**

**Assistant physicist Pia Puhakka, PhD, p. +358 40 5166377, [pia.puhakka@uef.fi](mailto:pia.puhakka@uef.fi)**