2 PhD POSITIONS

COGNITIVE NEUROSCIENCE & NEUROIMAGING

GIGA - CYCLOTRON RESEARCH CENTRE / IN VIVO IMAGING
UNIVERSITY OF LIÈGE - BELGIUM

Marie-Skłodowska-Curie European Training Networks

LIGHTCAP: LIGHT, Cognition, Attention, Perception

WHAT: MARIE-SKŁODOWSKA-CURIE ACTIONS INNOVATIVE TRAINING NETWORK
WHEN: CONTRACT START BETWEEN APRIL 1ST AND SEPTEMBER 1ST
WHERE: ULIEGE IN COLLABORATION WITH 7 OTHER UNIVERSITIES: BASEL, BERLIN, EINDHOVEN, LAUSANNE, MANCHESTER, SHEFFIELD
DURATION: 3 – 4 YEARS

The LIGHTCAP project is a European Training Network under the Marie Skłodowska-Curie actions framework. LIGHTCAP aims to provide a strong, innovative and necessary impulse to our insights in the intricate and complex relationships between light, perception, attention and cognition.

Cognition, Attention and Perception (CAP) are crucial for professional success, core to educational success, and essential to productive, safe and healthy functioning. Recent research has shown that light directly and indirectly helps to foster CAP, in particular via the activation of a recently discovered photoreceptor in the human eye. However, large-scale migration to cities, increased time spent indoors, and our 24-hour economy have impacted on our light exposure. Disturbance of sleep/wake cycles, fatigue and cognitive failure, mood disorders and even cancer pathologies may be the consequences of ignoring the impact of aberrant light dark cycles on human physiology and functioning.

The goal of LIGHTCAP is to prepare the next generation of experts for the domain of intelligent, human-centric lighting. We promise an international, interdisciplinary, cross-sectional and translational training program. It unites experts from neurobiology, cognitive neuroscience, chronobiology, psychology and lighting technology. It will train a generation of researchers who can look beyond the borders of their discipline and understand the implications of their findings for other fields.
Detailed information about the entire consortium and the other open PhD positions can be find here: https://lightcap.eu

2 PhD positions are available at the GIGA-Cyclotron Research Centre-In Vivo Imaging of the University of Liège.

1. **NIF impact on subcortical brain structures**
   We will establish the fundamental role of the subcortical areas and identified NIF pathways beyond the retina in vivo in human. We will also strengthen our understanding of melanopsin retinal cell contribution to alertness and cognition. Studies will be laboratory based on healthy human participants. The project will use Ultra-high-field high-resolution 7 Tesla MRI geared towards subcortical areas, metameric illumination and analyses based on detailed recordings of melanopsin cell responses in rodents. Results could have implications for treatment of brain disorders.

   Research will be conducted under the supervision of Dr. Gilles Vandewalle and in collaboration with Dr. Balteau, MR physicist, and Dr. Phillips, MR method developer, at GIGA-Cyclotron Research Centre-In Vivo Imaging @ ULiège. We have planned secondments with Dr. Lucas at University of Manchester to integrate data precisely measured in rodents to our research plan and SIGNIFY to be exposed to lighting production and commercialization.

2. **NIF impact on the brain in teenagers**
   Teenagers are high consumers of light through screens. Yet their study in the light context remain scares. First, we will establish whether subcortical areas play an important role in NIF responses to light in teenagers and in the transition to adulthood. Second, we will show whether basic cortical function (as indexed by cortical excitability) is affected by light exposure in teenagers and young adults. We will bring an important piece of information as to how melanopsin cells modulate brain activity beyond subcortical areas in adults and in teenagers, which are increasingly exposed to screen light at any times of the day. The project will use Ultra-high-field high-resolution 7 Tesla MRI geared towards subcortical areas, TMS coupled to EEG to assess cortical excitability.

   Research will be conducted under the supervision of Dr. Gilles Vandewalle and in collaboration with Dr. Balteau, MR physicist, and Dr. Phillips, MR method developer, at GIGA Cyclotron Research Centre-In Vivo Imaging @ ULiège. We have planned secondments with Dr. Cajochen at University of Basel to get training in stickly controlled chronobiology protocol and BALDER to get exposed to real life use of lighting solution for the elderley and for patients..

**Qualifications and requirements**
- Candidate should be skilled, highly motivated, have excellent communication and organizational skills, able to work independently and as part of a team.
ETN-ITN offers funding for early-stage researchers only. To be eligible for recruitment within an ITN project, you therefore must – at the date of recruitment – be within the first four years (full-time equivalent research experience) of your research career and not have a doctoral degree.

The MSCA are a researcher mobility programme. As such, you must not have resided or carried out your main activity (e.g. work, studies) in the country where you have been recruited for more than 12 months in the 3 years immediately before your start date.

Candidates must have an MSc in any disciplines related to the topics of the call (engineering, computer sciences, biomedical sciences, neuropsychology, cognitive neuroscience, biology, etc.).

Mastery of English is a requirement; mastery of French is a bonus. Learning French will be requested from those not mastering the language.

Good statistical skills and pre-exposure to Matlab, R and/or Python are requested.

Experience in cognitive neuroscience is highly appreciated.

Previous experience in EEG, TMS or MRI imaging is also appreciated.

Work environment
GIGA-CRC IVI is a research team including psychologists, neurologists, chemists, physicists and engineers, gathering complementary skills in developing novel technical and methodological tools to better characterise the structure and function of the human brain. Applications and fields of research include sleep and chronobiology, healthy ageing and neurodegenerative diseases, multiple sclerosis, glioblastomas, and many fields of cognitive neuroscience.

The team has direct access to research-dedicated equipment, including a PET scanner (ECAT+, Siemens), a 3T whole-body MRI scanner (Magnetom Prisma, Siemens), neuro-navigated TMS-EEG, high-density EEG system and a sleep and chronobiology unit with five temperature-controlled, light-calibrated, soundproof bedrooms equipped for EEG recordings. A 7T Magnetom Terra MRI scanner was just installed.

Application
Applicants are invited to respond as soon as possible no later than April 14th 2019. Please include all the following documents in PDF format: CV (including list of publications), grade list during your BSc and MSc, contact information for two referees, a brief letter (maximum 2 pages) describing your personal qualifications, research interests and motivation for applying.

Applications or informal enquiries should be sent via email to gilles.vandewalle@uliege.be. Candidates shortlisted for interview may be required to give a short research presentation. Interviews of shortlisted candidates are planned between April 1st and April 30th 2020a.