LIÈGE université
GIGA
CRC In vivo Imaging

Liège, January 31st 2019

POSTDOCTORAL POSITION
MRI PHYSICIST UHF – 7T TERRA
GIGA - CYCLOTRON RESEARCH CENTRE / IN VIVO IMAGING

Summary

A postdoctoral position is available at the *GIGA – Cyclotron Research Centre / In vivo Imaging* (GIGA-CRC IVI), University of Liège, Belgium. The successful candidate will be part of a multidisciplinary team developing methods for studying the human brain at ultra-high field (UHF – 7T). You will develop advanced neuroimaging data acquisition techniques at 7T, with particular focus on ultra-high resolution quantitative and microstructural MR imaging, in collaboration with research centres of excellence across Europe (Leipzig, London, Hamburg, Maastricht).

Responsibilities – main function

You will be in charge of developing and validating MRI techniques at 7T in close cooperation with the neuroimaging application team. The position includes the following responsibilities:

- Your own project: focus on one research project to develop, optimize and validate innovative MRI techniques for at least one of the following applications: ultra-high resolution MRI for quantitative and microstructural MRI (relaxometry, magnetization transfer, susceptibility mapping), delineation and automated segmentation of the brainstem and subcortical nuclei (in particular: locus coeruleus, substantia nigra, subthalamic nuclei), robust metabolic imaging (in particular GluCEST). Data acquisition and image reconstruction will be combined with the development of advanced processing methods.
- Optimizing and validating MRI protocols based on established sequences for neuroimaging studies.
- Developing quality assurance and quality control tools for 7T data.
- Publishing results at scientific congresses and in high-quality peer-reviewed journals.

GIGA-R – Cyclotron Research Centre/In Vivo Imaging Unit
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Your work will be carried out in collaboration with other UHF centres (see work environment) and with the support of Siemens Healthineers (research and collaboration agreement and financial support). The research will be supervised by Dr Evelyne Balteau and Dr Christophe Phillips, in collaboration with Siemens Healthineers.

Qualifications and requirements

- PhD degree in physics, medical physics, engineering, computer sciences, or a comparable subject. If not already held, the PhD must be obtained by the agreed start-date.
- In depth knowledge of MRI physics. A strong background in MRI pulse sequence design and/or image reconstruction is essential, ideally with experience in Siemens IDEA sequence development environment (SDE) and image calculation environment (ICE).
- Outstanding programming skills, in one or more of the following languages: C/C++, Python, Matlab.
- Experience in developing advanced MRI methodology and data analysis, in particular for quantitative and microstructural MRI (e.g. relaxometry, magnetization transfer mapping, susceptibility mapping, diffusion modelling, automated segmentation and volumetry).
- Autonomy, communication and cooperation skills within a multidisciplinary team, to discuss and address questions relevant to neuroscientists and clinicians.
- Good general knowledge of the scientific and clinical research applications of MRI.
- Ideally, experience in one or more of the following fields: parallel transmit hardware and concepts, shimming and static field homogeneity, dynamic shimming.
- Commitment and reliability.
- Creativity and innovation.
- Good spoken and written English.
- The applicant should be able to demonstrate a consistently outstanding academic record, including a history of publishing in MRI scientific journals.

Work environment

GIGA-CRC IVI is a research team that includes 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.

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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 equipment, 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 (Siemens) is being installed (operational in April 2019) with parallel transmit and multi-nuclear (23Na, 13Ca, 31P, 19F) capabilities. It will be equipped for functional MRI and complemented by ultra-fast optical prospective motion correction devices.

In the fields of *in vivo* histology using MRI (hMRI – http://hmri.info), quantitative MRI and UHF MRI, the GIGA-CRC IVI works in close collaboration with other research centres such as the Max Planck Institute, Leipzig (Dr Nikolaus Weiskopf), the Wellcome Centre for Human Neuroimaging, UCL, London (Dr Martina Callaghan), the Maastricht Brain Imaging Centre, Maastricht University (Dr Benedikt Poser), the Department of Systems Neuroscience, Medical Center Hamburg-Eppendorf, Hamburg (Dr Siawoosh Mohammadi) and the Laboratoire de recherche en Neuroimagerie, Lausanne (Dr Antoine Lutti). Additionally GIGA-CRC-IVI has research and collaboration agreements with Siemens.

Contract duration

The position is for 2 years, extendable for at least one more year after evaluation, and can start from April 1st 2019 and no later than October 1st 2019. Monthly salary will be provided upon request and follows Belgian regulations.

Application

Applicants are invited to respond as soon as possible and **no later than March 25th 2019**. Please include all the following documents in PDF format: CV, list of publications including software contributions (GitHub, Bitbucket, ...), contact information for two referees, a brief letter (maximum 2 pages) describing your personal qualifications, research interests and motivation for applying, and copies of up to two of your publications. Applications should be sent via email to rh.giga@ulg.ac.be. Candidates shortlisted for interview will be required to give a short research presentation. Contact for informal enquiries regarding the post: Dr Evelyne Balteau (e.balteau@uliege.be).

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