



CharitéCentrum für Neurologie, Neurochirurgie und Psychiatrie

Charité | Campus Mitte | 10098 Berlin

Open positions

For interested future scientists in the field of biomedical science, engineering, data science and machine learning.

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Open Positions – Interventional and Cognitive Neuromodulation group

The Interventional and Cognitive neuromodulation group at Charité Campus Mitte (CCM), Chariteplatz 1 10117 Berlin is recruiting new lab members, with two open PhD positions and one open PostDoc/MD position. Our work is focussing on the physiology of **cortico – subcortical interactions in the human motor system in patients undergoing deep brain stimulation (DBS) for movement disorders**.

Therefore, we are combining multimodal research methods including **intraoperative invasive human neurophysiology (Local field potentials and electrocorticography)**, non-invasive neurophysiology with **magneto-/electroencephalography e.g. using newest generations of optically pumped magnetometers (OPM)**, **structural and functional neuroimaging with access to 3T MRI in the department of neuroradiology**.

Our projects explore **how neural activity is synchronized across multiple nodes of the motor circuit**, how such activity is **implicated in the development of movement disorders** and how these **findings can be used for next-generation brain stimulation** approaches for therapeutic translation. The following key research points are being tackled:

- Principles of oscillatory synchronization in Cortex – basal ganglia loops
- Machine learning based real-time prediction of human behaviour from invasive recordings
- Mechanisms of synaptic plasticity in the pathophysiology of Parkinson's disease
- Development of data science solutions for multimodal clinical neuroscience research data

The positions are **funded through a NIH/BMBF** grant on machine learning for adaptive deep brain stimulation in **cooperation with Prof. R. Mark Richardson, Director of functional neurosurgery at MGH/Harvard University** and associate professor at MIT. Further funding is available through the **Hertie clinical neuroscience program**. Group members will interact closely with international collaborators and will benefit from the research environment of the **Movement Disorder and Neuromodulation Unit** lead by Prof. Andrea A. Kühn at the Department of Neurology at Charité – Universitätsmedizin Berlin.

Developing a diverse and gender balanced research team is the primary focus of our recruitment. The successful applicant is enthusiastic about neuroscience, has as a Msc., in biomedical sciences, engineering, data science and machine learning or is an MD. Programming in Python and Matlab is required for the position. Team work is mandatory. Projects with direct patient interaction are possible for applicants with German language skills, which are a plus but not necessary. Non-german speaking applicants will support experiments and focus on data analyses and organization.

Please contact julian.neumann@charite.de for further information. Visit our **OSF.io** website for a short overview <https://osf.io/qwn5b> .