Job Title: Postdoctoral Researcher in Neuroimaging and Non-Invasive Deep Brain Stimulation

Location: Centre de Résonance Magnétique Biologique et Médicale (CRMBM-CEMEREM ; amU, CNRS & APHM), La Timone Hospital, Marseille, France
Contract Type: Fixed term (2 years)
Supervisors: Prof. Maxime Guye and Dr. Roy Haast
Project: NAUTILUS (Funded by the Inserm "Impact Santé" call, PI: Pr of. Viktor Jirsa)

Project Background. The NAUTILUS project, led by Prof. Viktor Jirsa, aims to develop a Virtual Brain Twin (VBT) platform that integrates non-invasive deep brain stimulation with a digital twin of a patient's brain. Using Temporal Interference (TI) stimulation, the platform enables focal, high-resolution modulation of deep brain structures without surgery. One of the project's key use cases focuses on developing non-invasive Deep Brain Stimulation (DBS) for movement disorders and epilepsy by targeting subcortical networks with high spatial precision using simultaneous fMRI and TI stimulation.

Key Responsibilities. In this project, the candidate will:

- Acquire and analyze fMRI experiments with simultaneous multiple TI (mTI) stimulation at 3T in healthy volunteers to map BOLD responses and functional connectivity changes during stimulation of the basal ganglia, thalamus, and pallidum.
- Analyze 7T MRI data to compare high-resolution structural and functional connectivity with stimulation-evoked connectivity obtained at 3T.
- Collaborate on the integration of experimental data into the VBT platform for simulating personalized mTI responses.

Qualifications and Skills Required:

- PhD in Neuroscience, Biomedical Engineering, Physics, or a related field.
- Strong background in fMRI, neuroimaging, and/or brain stimulation.
- Experience with fMRI data acquisition and analysis.
- Proficiency in scientific Python programming.

Desirable Experience:

- Knowledge of brain connectivity analysis (e.g., tractography, functional connectivity).
- Familiarity with computational modeling or virtual brain platforms.
- Previous work on TI stimulation or neuromodulation.

Working Environment

The successful candidate will join a highly interdisciplinary and collaborative team within the NAUTILUS consortium, including:

- CRMBM (amU-CNRS-APHM, Marseille, France): A leading center for biomedical MRI, equipped with 3T and 7T MRI scanners, where the postdoctoral researcher will be primarily based.
- INS (Institut de Neurosciences des Systèmes, Marseille, France): A pioneer lab in computational neuroscience, brain modeling, and virtual brain platforms, playing a central role in the development of The Virtual Brain (TVB) and the emerging VBT initiatives.

This collaboration provides a unique opportunity to work at the intersection of experimental neuroimaging, computational modeling, and clinical applications.

Application Process

Interested candidates should submit:

1. A **cover letter** describing their research interests and motivation.
2. A **detailed CV** (including publications and contact information for two references)

Applications should be sent to: Maxime Guye (maxime.guye@univ-amu.fr) or Roy Haast (roy.haast@univ-amu.fr)
Deadline: Open until filled **Start Date:** Now (Q1 2026)