PhD Program between Freie Universität Berlin (FUB) and the China Scholarship Council (CSC)

Open PhD Position at Freie Universität Berlin, offered only to Chinese CSC scholarship candidates 2027

Department/Institute: AG Brain and Behavior

Subject area: Neurobiology, behavior, Neural networks

Name of supervisor: Prof. Dr. Julio Hechavarria

Number of open PhD positions: *1 Full Time, Sandwich NOT possible*

Type of the PhD Study: Full-time PhD study only, four years

Project title: **Neural networks for vocalization in bats**

PhD Project description:

Vocal communication is a fundamental aspect of mammalian behaviour, yet how neural activity is coordinated across brain regions during vocal production remains poorly understood. This project investigates how neural oscillations contribute to the control of vocal behaviour, using bats as a mammalian model.

The goal is to study networks involving frontal, motor, auditory and striatal structures during echolocation and social vocalization. We will examine how oscillations and functional connectivity change before, during and after vocal production, and how these dynamics depend on behavioural context and acoustic conditions. The project builds on previous work from our group showing that fronto-striatal oscillations predict vocal output and that information flow between frontal and auditory cortices changes during echolocation (Weineck et al., 2020 PLOS Biology; García-Rosales et al., 2022 Nature Communications).

Methods: We will combine multisite electrophysiological recordings, quantitative behavioural measurements and neural signal analysis to investigate oscillatory synchronization and directional information flow between brain regions. Our goal is to identify network-level mechanisms that predict vocal output and support flexible vocal control in mammals, including mechanisms potentially shared with human speech.

Language requirements:

English: IELTS: 6,5 oder/or TOEFL: 95 ibt

Academic requirements:

The Brain & Behavior group is very multidisciplinary. We welcome students with diverse backgrounds including Biology, Psychology, Mathematics, Physics, Computer Science.

A master degree or equivalent is requiered.

Experience with neurophysiology and programming (preferably Matlab or Python) is welcome but not needed.

Information of the professor or research group leader (website, awards etc.):

Prof. Dr. Julio C. Hechavarría is a Full Professor (W3) of Animal Behavior at Freie Universität Berlin, where he leads the Brain & Behavior research group. He also holds a research group leader position within the Max Planck Society. His research focuses on the neural mechanisms underlying vocal communication, auditory processing, and the coordination of distributed brain networks, with particular emphasis on neural oscillations and cortico-subcortical interactions.

Prof. Hechavarría is the spokesperson of the German Research Foundation (DFG) Priority Programme SPP 2411, *LOOPS: Cortico-Subcortical Interactions for Adaptive Sensing*, a nationwide research consortium investigating how interactions between cortical and subcortical brain structures support sensory processing and adaptive behaviour.

He has published more than 50 peer-reviewed scientific articles, including contributions to *Nature Communications*, *Current Biology* and *PLOS Biology*. His research has attracted substantial competitive funding from the DFG, including the prestigious Heisenberg Programme. He has extensive experience leading research teams, coordinating large collaborative research initiatives, and supervising doctoral researchers.

Website: https://www.julio-hechavarria.com/
Google scholar: https://scholar.google.com/citations?user=l-w_6-4AAAAJ&hl=de

Please note:
In a first step, the complete application should be uploaded to the online portal (https://fuberlin.moveon4.de/form/60acfece5d328710e40bdbd5/eng) for evaluation by January 15th, 2027.