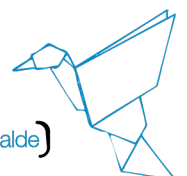


## PhD Position for H2020 Project ASTROTECH (GA no. 956325)

Job Offer	
Organization:	BCAM – Basque Center for Applied Mathematics
Research fields:	Computational neurobiology, biophysics, translational neurosciences
PhD advisors:	<ul style="list-style-type: none"> <li>✓ Maurizio De Pittà, Principal Investigator, Neuron-Glial Interaction Lab, Krembil Research Institute, Toronto (Canada), and External Scientific Member at BCAM.</li> <li>✓ Christophe Bernard, PhysioNet Team Leader at Institut de Neurosciences des Systèmes.</li> </ul>
Contract and offer:	<b>3-year contract. 2-year contract within the framework of the project and one additional year according to BCAM's internal policy.</b>
Salary and conditions:	<p><b>During the first 2-year contract, the salary is defined according to the project's policy and the gross annual salary of the PhD fellowship will be 33,000 per year. Should the researcher have a family at the time of recruitment a monthly family allowance will be paid. Once the project ends, the salary will be adjusted to BCAM PhD standard.</b></p> <p>It will then be on your own responsibility to make your yearly income declaration at the Bizkaia Treasury Agency. Free access to the Public Health System in Spain is provided to all employees.</p>
Application deadline:	<b>15 July 2022 at 14:00 CET (UTC+1)</b>
How to apply:	Applications must be submitted on-line at: <a href="http://www.bcamath.org/en/research/job">http://www.bcamath.org/en/research/job</a>
Job status:	Full-time
Envisaged job starting date:	01/10/2022 (at the latest)

### General Information

The past four decades demonstrated that non-neuronal cells, called astrocytes are emerging as crucial players for brain function & dysfunction. A major obstacle of previous and current initiatives on neurotechnologies is a lack of focus on astrocytes and most of the tools used to probe and sense astrocytes are derived from those developed to study neurons. The ASTROTECH (<http://www.astrotechproject.eu/>) Consortium aims at



pioneering the field of “Glial Engineering,” to develop a consistent range of tools to record, study, and manipulate astrocytes in the healthy and diseased brain.

ASTROTECH will train 15 Early Stage Researchers (ESRs) on research, training and complimentary skills aiming at: (i) engineering biomaterials and nanostructured interfaces to provide *in vivo*-like *in vitro* models for controlled and reliable studies of astrocytes *in vitro*; (ii) fabrication and characterization of nanostructured devices for stimulation, recording and biosensing of astrocytes; (iii) optogenetics tools, optoelectronic device and photonic methods for precise and cell selective stimulation of astrocytes; and (iv) computational approaches to characterize neuron-astrocytes interactions. Specifically, training on state-of-the-art biomaterials interfaces, electronic, photonic devices will be combined with in-depth knowledge on optogenetics, neuroscience, glial physiology and biology and computational approaches to validate the developed tools *in vitro*, *ex vivo* and *in silico* with emphasis on pathological models of glioma, ischemia, epilepsy and depression.

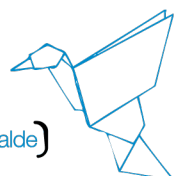
The ASTROTECH Consortium combines 11 funding entities and 14 partners in the academia, public research centers and industrial labs, from 9 European and Non-European countries. The consortium combines interdisciplinary knowledge with soft skills across the private and industrial sectors. ASTROTECH aims to train in every step of the value chain “from benchside to bedside” providing a thorough approach to the understanding of brain health and disorders under the flagship of neuron-glia interactions.

### EU Eligibility Criteria for Candidates

- The ESR can be of any nationality.
- The applicant shall at the time of recruitment be in the first four years of his/her research career and have not been awarded a doctoral degree.
- The ESRs must NOT have resided or carried out their main activity (work, studies, etc.) in Spain for more than 12 months in the 3 years immediately before the recruitment date

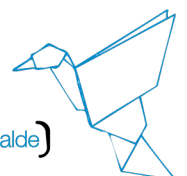
### ESR8 Researcher Profile

- **Title.** Computational Glioscience approach to volume signalling transmission in the Neuron-Glial-Vascular Unit.
- **Objective of the PhD project.** To develop a mathematical model of the neuron-glia-vascular unit (NGVU), based on biophysical principles of volume transmission in the brain parenchyma. The ESR will also collaborate tightly with industry representatives and will implement the model in an open-source simulation platform adopted in the clinical practice. The ESR in conjunction with biologists and medical doctors, will test the NGVU model built by this project by brain-wide simulations of epileptic seizures with emphasis on new venues for their diagnosis and treatment.
- **Mobility.** The ESR will be based in Spain at BCAM and will be enrolled in the University of Basque Country (UPV/EHU) to obtain a doctoral degree. Their supervision will be both in person and remotely by virtual meeting platforms on weekly basis. Completion of this PhD project requires a mandatory training period



of at least 8 months at the Krembil Research Institute in Toronto (Canada). Moreover, depending on their interests, the ESR will also be able to spend periods of training of 1 to 4 months at Aix-Marseille University (Marseille, France); Università Degli Studi Di Bari Aldo Moro (Bari, Italy); Consiglio Nazionale delle Ricerche (Rome and Bologna, Italy), and CODEMART (Romania). Moreover, the ESR will be required to participate at mandatory training schools and technical workshops (3-5 per year) organized by the ASTROTECH Consortium at different locations in Europe, for the entire duration of the project.

Qualifications	
Requirements:	<ul style="list-style-type: none"> <li>- MSc degree, preferably in Physics, Mathematics, Engineering or Computer Sciences.</li> <li>- The candidate MUST NOT have resided in Spain / or has to meet the mobility requirements</li> <li>- High proficiency in spoken and written English.</li> </ul>
Skills and track-record:	<ul style="list-style-type: none"> <li>- Proven record of excellence in the Master's training with knowledge of Partial Differential Equations (PDEs) and numerical methods of solution thereof, specifically in the context of Finite Element methods (FEM) and Computational Fluid Dynamics (CFD) Methods.</li> <li>- Programming proficiency in at least one of the following languages: Python/C++/Julia, and knowledge of FEM/CFD software packages.</li> <li>- Excellent communication and interpersonal skills, with ability to effectively communicate ideas to an heterogeneous audience of biologists, medical doctors, and physicists.</li> <li>- Ability to work in a fast-changing, international environment.</li> <li>- Ability to meet deadlines.</li> <li>- Openness towards inclusive science, racial and LGBTQ+ minorities.</li> <li>- Excellent capacity for planning, independence, and creativity.</li> </ul>
Scientific Profile:	<p>The preferred candidate will have a strong interest in neurobiology, and aims to pursue a career in multidisciplinary research in Neuroscience, Quantitative Medicine and Computational Psychiatry. They must be committed to academic research to the highest standards, capable of enduring stressful conditions, including being able to live, integrate and train in multiple international settings.</p>



Application and Selection Process	
Application:	Required documents: <ul style="list-style-type: none"> <li>▪ CV (max 3 pages)</li> <li>▪ Motivation letter (max 2 pages)</li> <li>▪ 2 Letter of reference</li> </ul>
Evaluation:	Based on the provided application documents of each candidate, the evaluation committee will evaluate qualitatively: (i) the fit of the previous training and career to the offered profile, (ii) the recommendation letters, the main results achieved (papers, proceedings, etc.), (iii) the statement of past and proposed future research and other merits; taking in account the alignment of these items to the topic offered.  The selected candidates will be invited for an interview (on site or on line). The selection committee is constituted by the supervisory team and the coordination team of ASTROTECH project.

