



Embassy of
Foreign Artists



Call for applications for a residency and grant for a project within Campus Biotech

1 Introduction

The Embassy of Foreign Artists residency programme is partnering with the Human Neuroscience Platform of the Campus Biotech and Flux Laboratory to offer the opportunity to apply for research and production residencies for a project linked with the thematic proposed.

The purpose of the call is to offer residencies to professional artists from all fields (visual arts, dance, theatre, music, writing, comic books, film, etc.), whose project would take inspiration from the cutting-edge research conducted by the partner laboratories active within Campus Biotech.

The goal of these residencies is to promote exchanges and intersections between scientific practices and artistic practices. They are intended to encourage the emergence of new ways of formulating, perceiving and using both scientific and artistic research. Through connections between two fields, they will foster a better understanding of their respective fields of research.

The reflections and exchanges will lead to the creation of new works, or the adaptation of pre-existing works that could be integrated with, or adapted to, the experiments conducted in the laboratories, and/or complement them. The results of each residency will be presented at a public event within Campus Biotech or in a partner institution. They could be the subject of a publication in specialised scientific journals.

2 Partners

Campus Biotech

Located in Geneva, Campus Biotech breath-taking 40,000m² facility and its unique ecosystem bring scientific platforms, academic, clinical, industrial and entrepreneurial actors together to share knowledge and to forge new pathways in neuroscience, neurotechnologies, genomics, digital and global health.

Swiss center of excellence in biotechnology and life sciences, Campus Biotech was created and purpose built to cross boundaries between disciplines and sectors. Its four founding partners – the Bertarelli Family, Hansjörg Wyss, EPFL and the University of Geneva – share a commitment to working across, rather than between lines.

Campus Biotech's backbone is made up of scientific and technical platforms that support the research and development effort of the entire ecosystem. They are accessible to both Campus Biotech residents and to the wider research community and promote interaction within the research groups and between the complementary worlds of research, industry and start-ups - which are given their own dedicated space to grow at the Campus Biotech Innovation Park.

<https://www.campusbiotech.ch/>

Human Neuroscience Platform

The Human Neuroscience Platform at Campus Biotech in Geneva provides advanced equipment and technical support to read signals from the human nervous system and disturb its circuits, as well as a set of tools to measure behavior in healthy volunteers or patients.

The HNP includes various resources with cutting edge technologies in the fields of neuroimaging, electroencephalography, psychophysiology, virtual reality, neuromodulation and robotics. It also has a clinical and sleep research unit and a Methods & Data facility.

The mission of the HNP is to provide an integrative framework that allows the neuroscience research community to better understand how the normal brain works but also how the pathological brain dysregulates. Indeed, neurological and psychiatric disorders are a major public health issue, as they are difficult to treat and affect the daily lives of patients and their families.

<https://hnp.fcbg.ch/>

Flux Laboratory

Flux Laboratory is an artistic incubator based in Geneva and Athens. It encourages collaborative creation dynamics through experimental and transdisciplinary artistic projects.

www.fluxumfoundation.org

www.fluxlaboratory.com

Embassy of Foreign Artists

The Embassy of Foreign Artists is a residency programme founded and administered by the Laps Association in collaboration with the Office cantonal de la culture et du sport. The goal of our organisation is to welcome artists, cultural actors, active citizens, and researchers, either individually or collectively, and to offer them logistical and financial support to develop their activities. We take advantage of our network to help spread their practices and projects. Our spaces accommodate the various stages of the creative process, from the first thoughts and tentative steps and to its presentation in a completed form. The EOFA also organises meetings between local artists and residents at events revolving around different artistic practices.

<https://www.eofa.ch>

3 Conception and launch dates

1st of June: deadline for applications

15th of July: laureates will be announced on EOFA website

4 Budget

4,200.00 CHF allowance divided into three monthly grants of 1,400 CHF per month.

2,000.00 CHF production budget.

5 Application requirements

Document 1: The Application Questionnaire fully completed with Adobe Acrobat.

Document 2: Your Application File in one PDF document, maximum 15 pages, which includes :

- A text explaining the artistic approach and the link with the theme of the call.
- A description of the project likely to be developed during the residency, providing as much detail as possible
- A portfolio of recent works
- An up-to-date CV

6 Contacts

For EOFA: Richard Le Quellec, residence@eofa.ch

For Campus Biotech: Laura Plassmann, contact@fcbg.ch

Project1: To reveal the living

functional imaging and microscopy

Project contact: olivier.reynaud@fcbg.ch

Description:

Through the lens of a microscope or using the quantum properties of the water molecules nuclei inside our body, novel imaging techniques reveal both the architecture and the cogs and wheels of the living world and the human brain, at the intricate and delicate intersection of the biomechanical, chemical and electromagnetic worlds.

The Magnetic Resonance Imaging facility

Magnetic Resonance Imaging (MRI) has become an essential technique in the field of neuroscience research. It makes it possible to obtain four-dimensional images of the brain with a millimeter resolution and in a completely non-invasive manner.

Thanks to functional MRI, researchers can localize brain activations in response to a given stimulus or requested action. At Campus Biotech, the MRI facility is dedicated to high-risk and high-yield studies in human neuroscience with strong technological, methodological, and/or analytical components. This research demands sophisticated analysis at the forefront of technology.

The strong links between the MRI facility and the other facility of the Human Neuroscience Platform allow the users to conduct multi-modal acquisitions. Thanks to these links, we can combine MRI acquisition with Electroencephalography recordings or non-invasive brain stimulation. It also likewise possible to create virtual reality scenarios within the MRI where the movements of the avatar correspond to those of the participant and display them on MRI-compatible stereoscopic goggles.

<https://hnp.fcbg.ch/home/mri/>

ALICe, The Advanced Lightsheet Imaging Center

ALICe, the Advanced Lightsheet Imaging Center at the Wyss Center, integrates a series of innovative fluorescence microscopy tools in a single pipeline to image whole organs with custom-built microscopes at high spatial and temporal resolution.

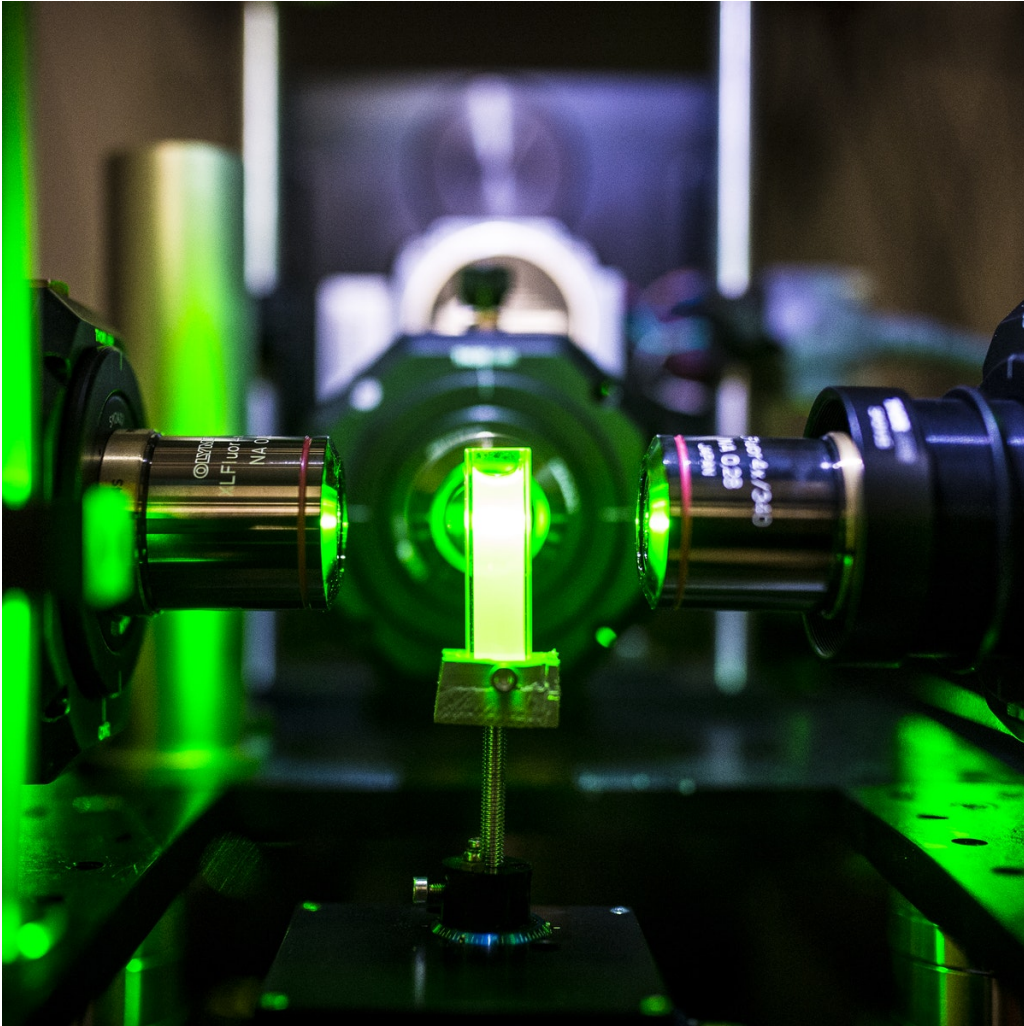
The multidisciplinary ALICe team unites expertise from physics, cell biology, neuroscience and engineering, and joins forces with research teams around the world to image and draw insights into the central and peripheral nervous systems, innervation of organs including the brain and heart as well as human brain samples. Another focus area is brain and spinal cord organization for researchers working to restore movement after paralysis or to investigate neuronal networks involved in cognition, pleasure and drug addiction.

Unlike traditional microscopy in which specimens are cut in slices with a blade before being viewed on a slide under a microscope, lightsheet microscopes optically slice samples with a sheet of light. This optical sectioning captures slivers of image without damaging the sample. The images are then combined to reconstruct a detailed three-dimensional image of a whole organ or specimen.

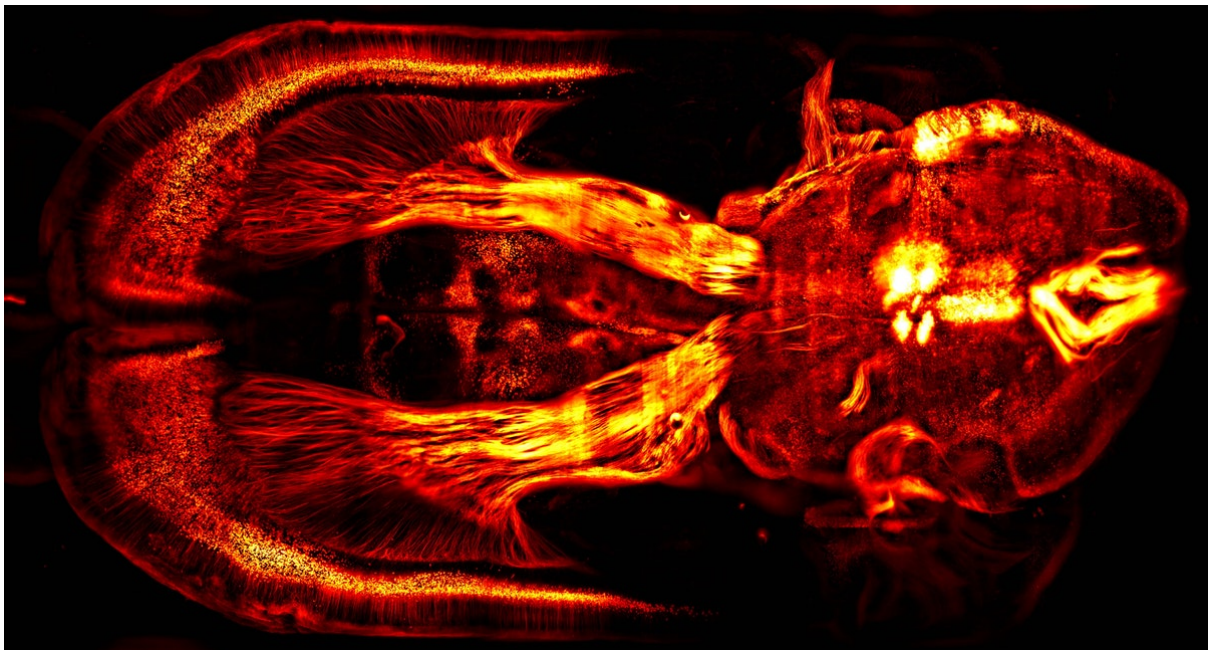
<https://wysscenter.ch/facilities/alice>



3T MRI scanner of the Human Neuroscience Platform



Custom-built lightsheet image acquisition: high spatial and temporal resolution imagin



Lightsheet application: Brain wide labelling of glutamatergic projection neurons - Courtine Lab, EPFL

Project2: At the border of the real and the virtual world

Virtual and Augmented Reality

Project Contact: vr@fcbg.ch

Description:

By blurring the lines between the real and imaginary world, advanced virtual reality reaches beyond our classical three-dimensional space and deepens the extent of the human possibilities, already paving the way for individualized learning and rehabilitation. Paradoxically it also opens a new window into the meaning of own's self, consciousness and what it means to be human.

The Virtual Reality facility

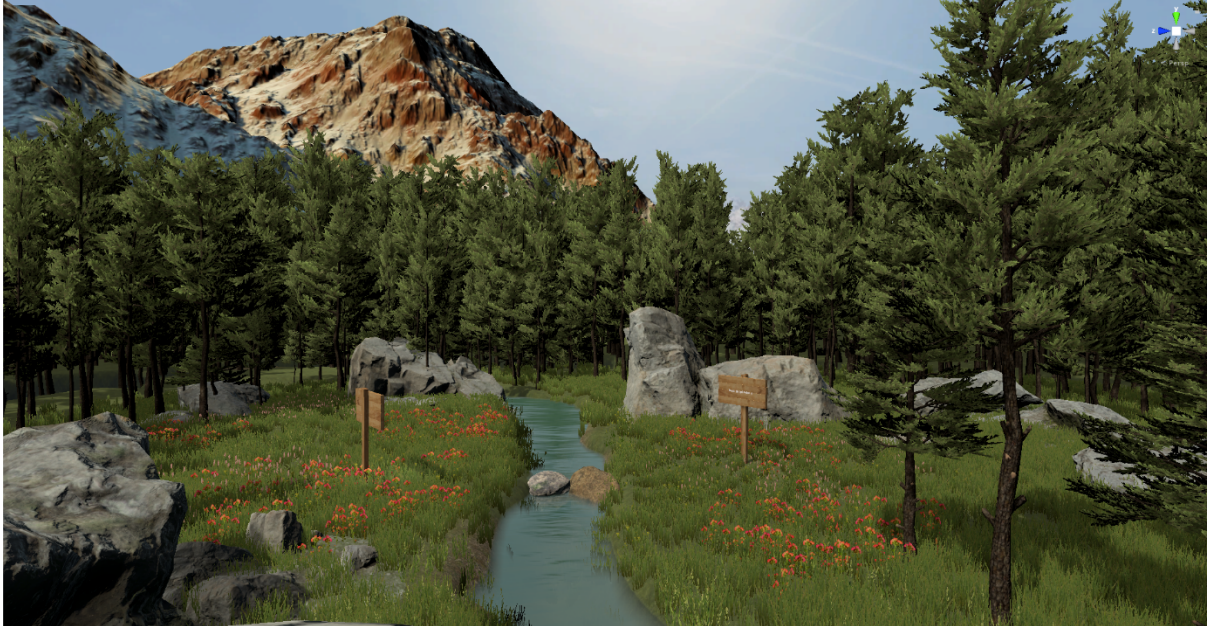
Virtual Reality (VR) technologies give to researchers the opportunity to conduct experiments in life-like virtual scenarios, in a safe, controlled, measurable and repeatable way. Additionally, VR can be used simultaneously with other equipment from the Human Neuroscience Platform (such as EEG and fMRI). The VR Facility team makes knowledge and expertise in the VR field accessible to all users at Campus Biotech and beyond. The VR facility provides support for the development of 3D (mainly focus on VR) content and scenarios, in collaboration with the users (mainly from academia research). A continuously growing library of developed software and technical set-ups is available, allowing faster developments of new experiments as well as on-need demos.

Co-development with research laboratories is also possible for promising and innovative projects which developments could benefit to the entire community.

<https://hnp.fcbg.ch/home/virtual-reality/>



Example of a fully virtual environment: the MRI scanner room



Example of 3D environment: The river in the forest



Multiple interface of movement for Virtual Reality



Use of a 3D environment for rehabilitation



Creation of games with specific game mechanism

Project3: Technology & humanity

Humanizing technologies and vice versa

Project Contacts: humanneuroscience@fcbq.ch

Description:

Humankind is becoming more dependent on technology and technology is becoming more and more human. Not only smart objects redefine the cultural norm and social relations, but technology becomes intertwined both with the human body and mind, via the use of neuro-prosthetics, implantable micro-chips or brain-computer interface devices. This raises important ethical concerns for the future while nurturing the possibility to free humankind from the limits of its own human nature.

The EEG-BCI facility

Electroencephalography (EEG) is an essential method for conducting research in neurosciences. By measuring voltage fluctuations resulting from ionic currents within the neurons, this technique allows to monitor the brain activity with a high temporal resolution. Classical EEG cap contains several electrodes placed over the scalp and applications goes from event-related potentials, spectral power distribution to sources localization and epilepsy diagnosis.

Brain-Computer Interfaces (BCI) provide a direct communication pathway between the brain and an external device, while bypassing the peripheral nervous system. It is based on a closed-loop design where neural data are processed and classified in real-time while a continuous feedback is shown to the user. BCI research is directed at assisting, augmenting or repairing human cognitive or sensory-motor functions. BCI has been used by locked-in patients to communicate or to control a prosthesis limb.

At Campus Biotech, the EEG-BCI facility supports the scientists by providing the latest EEG systems, shielded recording booths and additional electrophysiological measurement units (EMG, EOG, EyeTracker...). The team also provides research consulting with expertise in multi-streams synchronization, EEG analysis or BCI/neurofeedback design.

The Center for Neuroprosthetics (CNP)

Research in the Neuroprosthetics Center encompasses bioinspired neural interfaces, non-invasive brain-computer interfaces, machine learning, biomedical signal processing, robotics and neuroscience. Following an integrative approach, it aims at restoring vision, enabling sensorimotor control after spinal cord injury, stroke or amputation, and alleviating cognitive and psychiatric disorders.

The Centre currently hosts 10 labs from the EPFL School of Life Sciences and EPFL School of Engineering, gathering nearly 180 scientists, engineers and clinicians, driven by translational research. The Center for Neuroprosthetics is establishing a truly interdisciplinary area of study for scientific discovery and neurotechnological design, strengthened by its dual affiliation with the School of Engineering and the School of Life Sciences.

<https://www.epfl.ch/research/domains/cnp/about/>

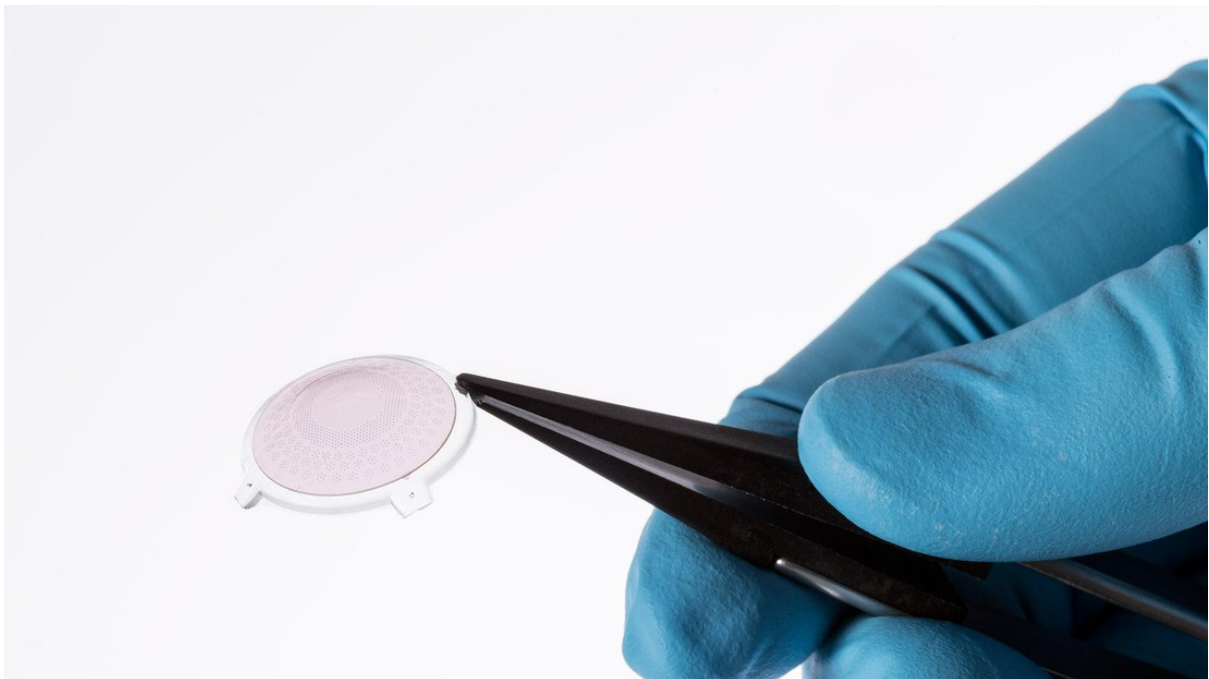
The Neural Microsystems Platform (NMP)

The NMP is a large Micro-nanofabrication facility that provides a range of microfabrication and characterization equipment, and technical expertise to the neuroscience community. The core mission of the NMP is to enable research and development in wearable and implantable neurotechnologies.

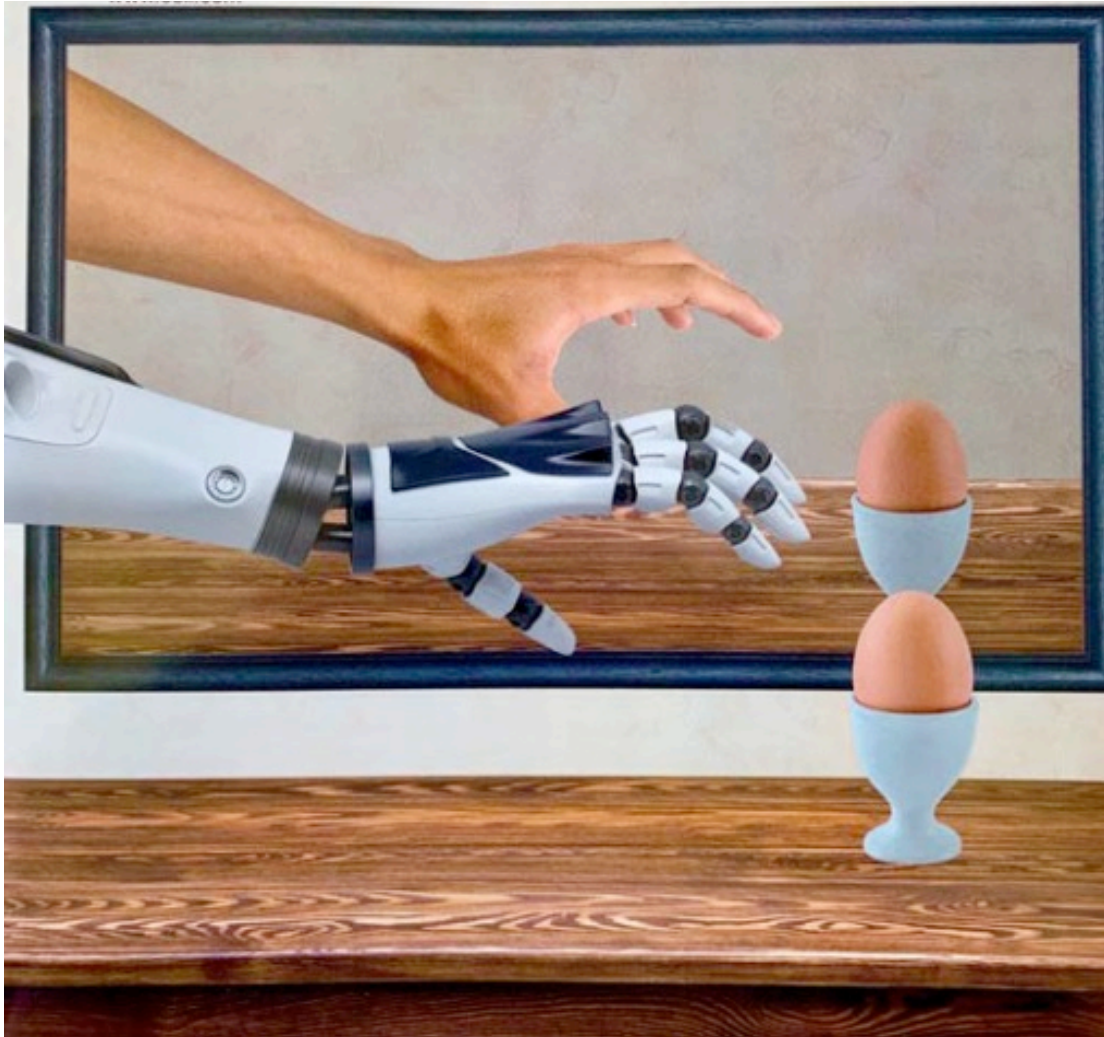
Unique to the NMP is the shared thin-film, organic and inorganic fabrication, and imaging facilities. The NMP supports research in Soft Bio and Physical devices and systems bringing experts in engineering, life sciences and medical sciences to design the next generation technology, devices and systems for human benefits.

The facilities include laser micromachining for diverse materials processing and a nanomaterials lab. For device packaging and hybridization, there is a suite of backend equipment available for wirebonding, 'pick and place', physical testing, ageing and sterilization. Cleanroom staff design and optimize innovative process flows.

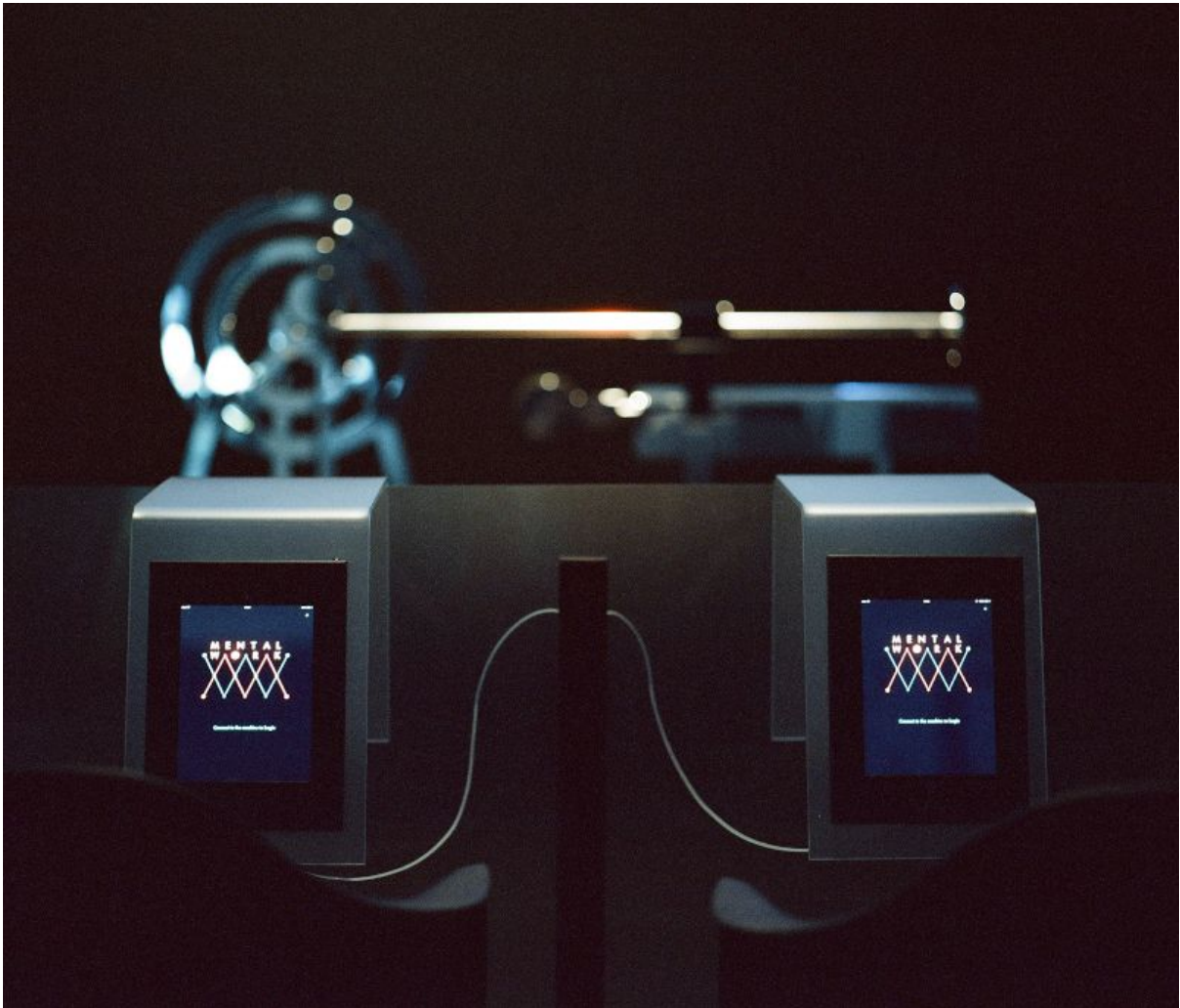
<https://www.campusbiotech.ch/en/platforms/neuronal-microsystems-platform-nmp>

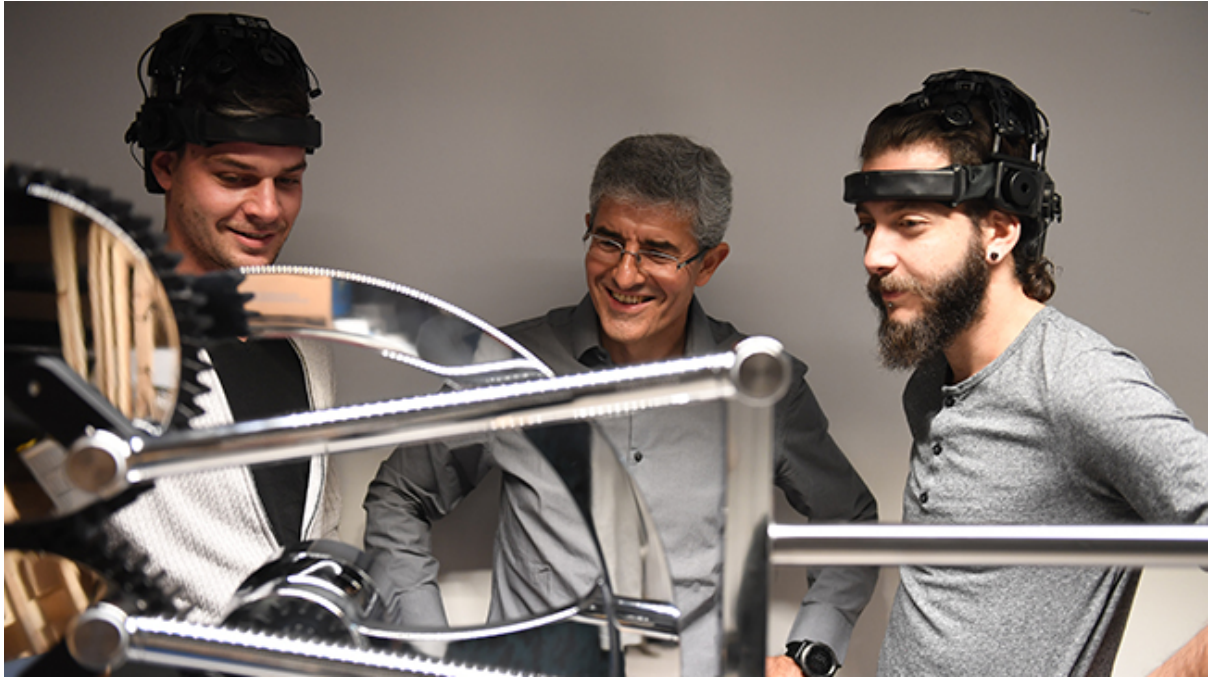


Retinal prosthesis, laboratory of D. Ghezzi



Restoration of touch sensation using biomimetic encoding strategies, laboratory of S. Micera





Mental work. A scientific exhibition by Jonathan Keats where participants control a complex machine via a brain-computer interface. <https://mentalwork.net/>