

# INNOVATION HUMAN BRAIN PROJECT

Newsletter

N#2 · January · 2021

**HBP INNOVATION  
AWARDS**

**NEUROMORPHIC COMPUTING &  
ENGINEERING**

**INNOVATION  
TEAM SERVICES**

**EUROPEAN INNOVATION  
COUNCIL**



**NATIONAL INNOVATION  
COMMUNITIES**

**NEW MARKET  
ANALYSIS**



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**MARKET REVIEWS AND  
ANALYSIS AS AN INSTRUMENT  
FOR HBP INNOVATION**

**TRAINING COURSES SUMMARY:**  
Technology Exploitation and  
Protection Plans

**EUROPEAN COOPERATION  
IN SCIENCE & TECHNOLOGY:**  
COST ACTIONS



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# FROM THE EDITORS

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Dear subscribers,

**T**he Innovation team is extremely encouraged by how well our Innovation newsletter has been welcomed by the HBP community.



It was a great pleasure to see that more than 200 subscriptions were received in only a few weeks after launching. This reflects the attractiveness of Brain innovation, a field on which Society is increasingly placing its hopes for developing effective solutions to mental diseases and brain disorders as soon as possible. Efforts to understand cognitive mechanisms and embed them in machines make the field even more appealing, as advances in Neuromorphic computing and Robotics will certainly help materialise long-standing ambitions of creating devices that improve our quality of life and accelerate human progress.

Such a warm welcome to our newsletter also brings with it a clear message: HBP is about to experience its innovation momentum. Presenting practical and impactful technology advances in times as these we are living in, when people increasingly need to rely on Science, is a factor that will most probably boost that momentum. In fact, after seven years of arduous research work, the HBP has already outstanding results, some of them mature enough to be proudly offered to the end-user markets. All of them will have indeed a place in successive releases of this newsletter. To recognise the immense work these results have required we have also designed the “HBP Innovation Awards”, an initiative in which all HBP members are participant.

We have in the horizon plenty of exciting innovation news and initiatives to share with you... but for now we would just be delighted to know that more and more subscribers have enjoyed this edition.

*Guillermo Velasco*

HBP Innovation Team  
Technology transfer and Innovation Mgr.  
Universidad Politécnica de Madrid

# HBP INNOVATION AWARDS

Background: EBRAINS

In the first issue of this Innovation newsletter, we presented the idea of the **HBP Innovation Awards**, an instrument to recognise and give visibility to the innovation efforts in the SGA3 phase of HBP and increase the awareness on the exploitation of HBP results.

We are very glad to inform you that the proposal was finally endorsed by the DIR last December 15<sup>th</sup>, 2020, and will be implemented as follows:

The Innovation team will work, together with the Communication team, to generate specific dissemination information, including a video of an interview with the awarded innovator and his/her team, and where the recognized innovation could be explained to media.

**The process will start in January 2021 with an internal communication to Work Packages and the Innovation team will propose the first set of potential winners to the DIR next March 2021.**



Awards will be granted every six months during 2021 and 2022 (four in total in the SGA3 phase).



A series of candidates will be proposed by the Innovation team, in coordination with the WP project managers, based on their impact in the exploitation of HBP results and by fulfilling a set of criteria.



Three ranked candidates, with an explanatory dossier, will be proposed to the DIR by the Innovation team on each award edition.



The DIR will select one of them as the "Innovation award" of the semester.

# Training on Innovation and Commercialisation of Research Results

Background: Pixabay

One strategic task of the Innovation Team to reinforce HBP researchers' orientation to the exploitation of EBRAINS is the organization of capacity-building modules on innovation and commercialisation of research results.

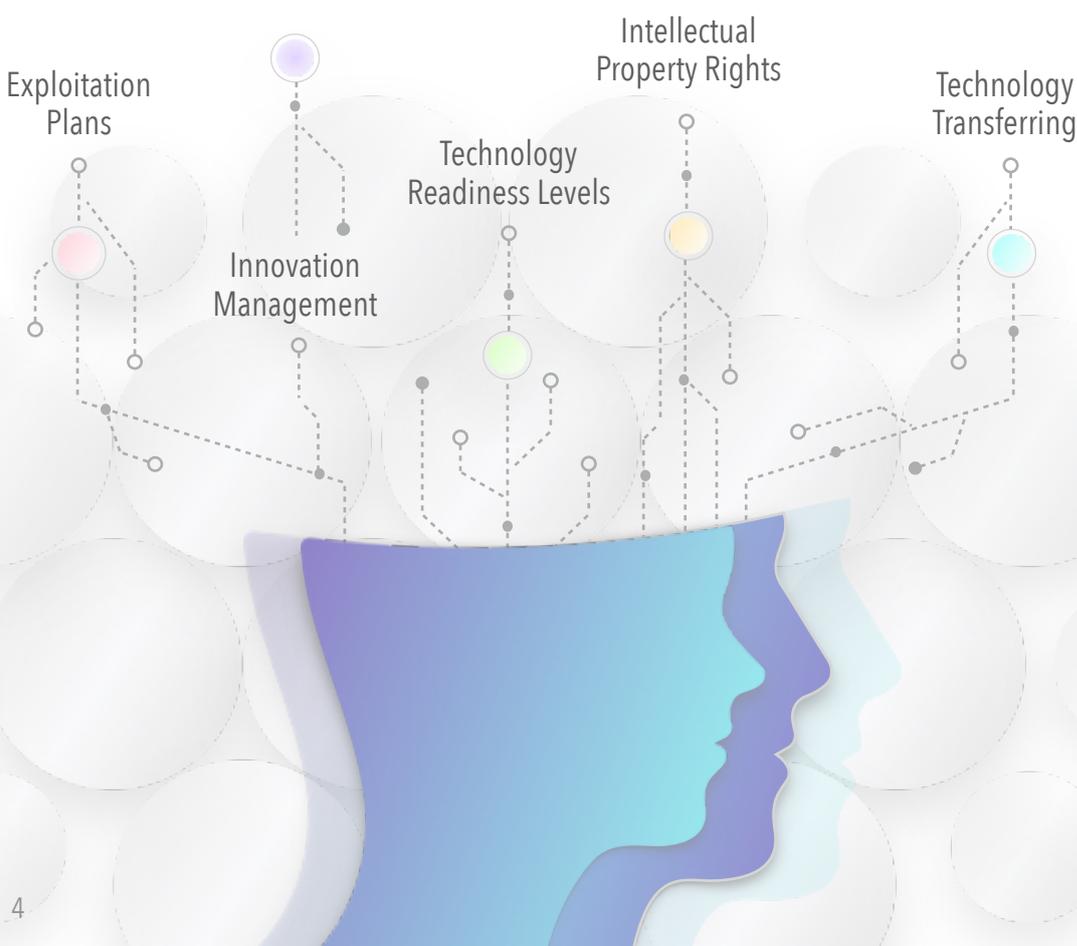
With that objective in mind, the Innovation team has launched a series of two-days courses that will provide HBP members, during SGA3, with the minimum but necessary training on exploitation aspects like technology readiness levels (TRL), elaboration of exploitation plans, innovation management, mechanisms to protect intellectual property rights, technology transferring, software licensing, new modalities of research funding, horizon scanning, road-mapping and technology foresight.

This training offer will allow attendants to explore innovation from multiple and diverse perspectives

and contribute to consolidate a culture on exploitation in HBP. Two pilot courses have been already delivered in November and December 2020: the TRL assessment module and the Guidelines for the exploitation of HBP technologies (which included practical recommendations for the elaboration of exploitation plans).

**The courses include practices and selected cases in the specific areas where the audiences work on**

Both courses will be repeated in 2021. Around fifty HBP researchers, developers and managers have taken part in these courses, and expressed a high level of interest in understanding and discussing how to measure and leverage the potential of their most promising results.



## Upcoming Free Courses



### March

Plans for the Exploitation of HBP Technologies  
- Course Repetition

### April

Innovation Management

### May

Technology maturity level assessment (TRL)  
- Course Repetition

### Registration

Per-email to:  
barbara.gasset@upm.es

# MARKET REVIEWS AND ANALYSIS AS AN INSTRUMENT FOR HBP INNOVATION



The success on exploiting, commercially or non-commercially, the HBP results largely depends on the contextual circumstances surrounding the research and development processes. These circumstances include, among other aspects, the presence (or not) of a space for innovation in the technologic landscape, and the perception, by potential users, that there are still relevant problems in the neuroscientific and/or industrial communities to be solved with creative solutions. That perception makes entrepreneurs and investor's expectations grow and encourages them to anticipate strategies that help materialise the introduction of those solutions into the markets.

Another factor of success is related to the role adopted of people when assessing the possibilities of technology commercialisation or directly confronting innovation management problems. In this sense, the influence that diverse stakeholders, like venture partners, competitors, start-ups, brokers, and even other research colleagues, acting as

individuals, households, groups, firms, institutions, communities, or sectors, may have in our own innovation decisions cannot be underestimated. In fact, innovation objectives cannot be often properly fulfilled if we do not connect with or mobilise the right persons. In other occasions lack of incentives hinder the possibilities of technology transfer and commercialisation.

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**Commonly, researchers cannot devote enough resources and time to analyse aspects like the two ones described above. The Innovation team can fill this gap.**

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Through specific market reviews and roadmaps, our analysts can provide researchers with a big picture of the technology landscape, emerging initiatives, key actors, market insights and expected trends in their area of work. These analyses aim to enable HBP members to take strategic directions more easily and identify opportunities for exploitation more quickly.

The analyses, conducted with the approval and collaboration of the respective research groups, are focused on the key technology areas of HBP, and address at least the following questions:

- ▶ What is the problem or challenge to be addressed?
- ▶ How can the technology contribute to solve the problem?
- ▶ Why should the technology be considered an innovation and what are its main competitive advantages?
- ▶ What is the contextual background of the technology (actual developers, financial support, sponsorship, collaborations, current users, references, ownership, IP initiatives)?
- ▶ How could the technology evolve in relation to existing technology trends and what opportunities could emerge by positioning the technology within those trends and in relation to existing market trends?
- ▶ What are the characteristics of the exploitation and innovation system in which the technology or service could operate?
- ▶ Who are the key actors in that system, e.g. alternative competitors, potential funders, regulation and governmental bodies, potential partners?
- ▶ What is the maturity level of the technology and what is needed to reduce the distance to the users' markets?
- ▶ What is the size and main characteristics of the targeted market and users?
- ▶ What are the drivers that may influence the exploitation of the technology through EBRAINS and related market decisions?
- ▶ What is the current status of the intellectual property rights (IPR)? Are there patents (software registers, licenses) filled or granted?
- ▶ What sort of the IP strategy could be adequate for this technology in the context of HBP?
- ▶ What do exploitation activities imply in terms of needed and available resources (identify resources constraints)?
- ▶ What sort of exploitation modalities could be recommended?
- ▶ How exploitation activities should be undertaken in terms of time (roadmap plan)?

We hope you enjoy the short summary of the VEP market review presented in this issue. In upcoming editions of this newsletter, you will have the opportunity to learn more about some other HBP areas and technologies whose analysis are already in-process.

### Upcoming Market Analyses 1st Semester 2021



- Spiking network modelling and Training
- HBP applications and tools for hospitals
- Brain Simulation & NEST
- Brain Atlases
- The Medical Informatics Platform (MIP)

# NEW MARKET ANALYSIS: THE VEP

Background: Adobestock- kras99

“The study of the central nervous system, of its structure and functions, is interesting and important to everyone, and not necessarily only to specialists, such as neurologists, anatomists, and physiologists” argued the renowned British neurosurgeon Victor Horsley, a pioneer in neurosurgery for epilepsy patients, a remarkable feat for the times given the non-existence of current medical imaging technologies. The rise of subsequent innovations related to presurgical evaluations such as EEG, MRI and stereotactic devices opened the way for a refinement in diagnostics and the collaboration between different medical teams focusing on epilepsy, which continues to affect more than 50 million people worldwide (WHO, 2019).

Within the scope of contributions in the field of neurotechnologies related to epilepsy, a group of medical doctors and engineers of the Human Brain Project has been working for the last decade on the model of the Virtual Epileptic Patient (VEP).

**This is a software with the potential to identify the zones susceptible to surgical intervention in those patients with refractory epilepsy.**

Considering that VEP is in the clinical trial phase with almost 400 patients, a preliminary review has been conducted and discussed with doctors and engineers of recognized expertise, within and outside the developing team, to enrich the scope for a forthcoming introduction of the tool and open reflection in the context of the epilepsy. In 2013, The Virtual Brain paved the path for a generation of solutions orchestrated by the Human Brain Project in a constant and productive work in laboratories and hospitals in Europe, and although some of them still in their early stages, they will certainly constitute invaluable knowledge instruments for medical specialists.

The VEP software has become one of those solutions, and in this newsletter edition we announce the publication of a contribution to its eventual implementation into the market: questions like *What is the level of effectiveness achieved in the simulations?*, *Why can VEP enhance medical specialisation skills in an industry of constant change and competition?*, *Could it be beneficial for all patients with refractory epilepsy worldwide regardless of the technical resources available in hospitals?* are actually addressed in a recently published “VEP Market review”. This review is one from the series that the UPM is already elaborating on the most innovative and promising HBP technologies.

## References

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# INNOVATION TEAM SERVICES FOR HBP MEMBERS

To accelerate innovation processes in HBP we must facilitate the commercial and non-commercial application of the most mature HBP technologies in the scientific and industrial markets.

With this objective in mind, the HBP Innovation team (UPM) has elaborated a set of exploitation oriented services. These services are focused on the practical utilisation of HBP tools through the infrastructure EBRAINS, the consolidation of a culture of innovation in HBP partners, and the creation of sustainable linkages between HBP and Industry.

Services include:

- Supporting HBP researchers and developers to create exploitation plans of their developing technologies.
- Delivering capacity-building courses and seminars in areas like technology maturity assessment and IP protection (among others).
- Assisting HBP members in the elaboration of technology sheets (to be included in a Technology catalogue).
- Supporting the assessment of the maturity of the results (TRL assessment).
- Providing HBP members with selected market analysis and roadmaps in their specific area of work.

In addition, the Innovation newsletter provides a platform to disseminate HBP members' achievements internally and externally, and across several industrial, clinical and scientific communities.

These services are available for HBP members in the Engagement Strategy Guidelines internal collab, in the Results Exploitation Guidelines section.

# UPDATES FROM THE HBP INNOVATION COMMUNITIES

One of the scheduled support activities for improving the exploitation of HBP results was the creation of “Innovation communities” composed of industries and Hospitals in several European countries. Furthermore, the successful development of EBRAINS will require to consolidate a large community of users of the services categories within the industrial and clinical sectors which complement the users from the academic research community.

Despite the COVID-19 pandemic, which made it difficult to organize face to face meetings, in these last months we moved this strategy forward by consolidating the Spanish innovation community, and too the first steps to create similar ones in three additional countries.

Preliminary movements are being conducted for Switzerland, Belgium and France. In the case of Spain, we have recreated the pre-existent SGA2 community by incorporating 14 hospitals which have signed the Memorandum of Understanding (MoU) to become part of it.

The Spanish innovation community has subsequently grown to 26 members, all of whom are interested in the HBP and EBRAINS services. Five of these entities are industrial associations grouping hundreds of members.

*“EBRAINS should be a facilitator and accelerator for brain science and brain-related innovation: facilitating the sharing of and access to data, analysis tools and models, on a platform designed with the understanding of the brain in mind”*

-Mavi Sánchez Vives,  
WP2 leader, HBP

After several general meetings, a set of detailed presentations are being organized to offer them a view of some innovative results. The first one was conducted by Mavi Sánchez-Vives (leader of WP2, IDIBAPS) and Pau Gorostiza (IBEC) last January 14th to explain the activities related to WP2 and their interest in industries and hospitals, and to discuss opportunities for exploitation.

Furthermore, we are preparing new presentations for the first quarter of 2021 where other relevant HBP innovation results will be presented by researchers with innovation activities.

Our plan is to have four innovation communities up and running in July 2021 to be able to launch additional communities during the second semester of the year.



**More than 26 companies, industrials associations and biomedical institutions have joined the Spanish Innovation Community:**

## Biomedical Institutions:

- Fundación de Investigación San Joan de Deu
- Fundación para la Investigación e Innovación Biomédica Hospital Universitario Infanta Leonor y Hospital del Sureste
- Hospital Universitario Virgen de la Macarena. Equipo Provincial TIC Sevilla
- Instituto de Investigación Aplicada a la Educación en Ciencias de la Salud
- Instituto de Investigación Biomédica Hospital Universitario La Paz
- Instituto de Investigación Biomédica Ibis Granada

- Instituto de Investigación Biomédica De Bellvitge - IDIBELL
- Instituto de Investigación Biomédica de Málaga
- Instituto de Investigación e Innovación Biomédica De Cádiz
- Instituto de Investigación Sanitaria Bioaraba
- Instituto de Investigación Sanitaria Hospital Clínico San Carlos
- Instituto de Investigación Sanitaria Hospital Universitario Marqués de Valdecilla
- Instituto de Investigación Vall D’Hebron

## Companies:

- Additum
- Allinky
- Biocross
- Effectia
- Merck
- Newmanbrain
- Nimgenetics
- Noraybio
- Oncovisión
- Qubiotech
- Quirón Salud
- Smart Health TV
- Starlab
- Technalia
- Vicomtech

## Industry and Clinical Associations:

- AMETIC
- ASEBIO
- ASPE
- Farmaindustria
- FENIN
- FIPSE



# COST ACTION “THE NEURAL ARCHITECTURE OF CONSCIOUSNESS” (NEURALARCHCON) CA18106

The Action was started 05/04/2019 and will be finished on 04/04/2023. More than 30 EU countries participate in this Action and some Institutions from Japan, the Russian Federation, and South Korea. The Action itself is broad and inclusive, and supports researchers working on any aspect of consciousness.

The main objective of the Action is to examine the role of cortical neural architecture in consciousness. To establish the relationship between neural architecture and consciousness, investigators from different countries across Europe will use advanced statistical modelling, including machine learning.

The clinical aspect of this Action is particularly timely as the last few years have seen a great increase in the possibilities for neuroarchitectural mapping (e.g. quantitative MRI sequences and vast improvements in, for example, diffusion MRI), which could push the value of MRI to a level where it is clinically useful in many more cases than it is currently. Successfully reaching the clinical sub-aims can result in a substantial increase in the predictive accuracy of prognoses for disorders of consciousness.

From the perspective of Innovation, this Action is highly relevant, as it may build collaborative bridges between groups using large scale neuroarchitectural mapping tools and those working with detailed mapping of conscious behaviour; collaboration to combine advanced biophysical modelling with statistical analyses may certainly accelerate the understanding of disorders of consciousness and foster innovation processes in the area.

Participation in this Action could be interesting for investigators of HUMAN BRAIN project to establishing new collaborations and exchange ideas and knowledge. If you need more information about this action and would like to join, please read: <https://neuralarchcon.org/>

## NMC Journal

A new open access journal -Neuromorphic Computing and Engineering- has been recently launched on artificial neural networks research and neuromorphic computing systems.

It is a cross-disciplinary publication (IOP Publishing, IOPP) that will address engineering, materials science, physics, biology, neuroscience, and computer science domains from both the academic and industrial perspectives.

Brain-inspired computing is an extremely challenging area of research that presents exceptional prospects for innovation.

Explore the journal [here](#)

# EUROPEAN INNOVATION COUNCIL: OPPORTUNITIES FOR THE EXPLOITATION OF HBP RESEARCH RESULTS

**W**ith the final approval of the multiannual financial perspectives last December 2020, the next Framework Programme “Horizon Europe” (HE) will become a reality with €95.5 billion over the next 7 years. This represents a 30% increase vis-à-vis the current research and innovation programme, Horizon 2020 (comparing Horizon Europe against Horizon 2020 for EU27, in constant prices).

The final structure of HE as represented in the next figure is organised on three main pillars. The third pillar, Innovative Europe, includes the formal creation of the European Innovation Council

(EIC) after a set of pilot projects launched during H2020 (2018-2020).

The goal of the EIC is to position Europe firmly at the forefront of the next wave of breakthrough innovations: support to innovations with breakthrough and disruptive nature and scale-up potential that are too risky for private investors. The EIC, which is already running in a pilot phase, will receive over €10 billion in budget to provide support for emerging and breakthrough innovations by small and medium-sized enterprises (SMEs), start-ups, and midcaps.



“Europe is about to take a big step forward with the establishment of the European Innovation Council (EIC), a new EU programme and an Investment Fund (the EIC Fund), which will champion and scale up breakthrough and disruptive innovations that create new markets, building on the wealth of excellent science in Europe.”

MARIYA GABRIEL Commissioner for Innovation, Research, Culture, Education and Youth

The EIC is organised around three main instruments:

**Pathfinder:** for advanced research on breakthrough/game-changing technologies (TRL 1-4). Grants of up to EUR 3million (open) or EUR 4 million (challenge driven).

**Transition:** for transforming research results into innovation opportunities (TRL 4-6). Grants of up to EUR 2.5million.

**Accelerator** for individual companies to develop and scale up breakthrough innovations with high risk and high impact. The accelerator fund offers companies grant funding of up to €2.5 million. Companies can also opt for equity investments of up to €15 million backed by European Investment Bank money.

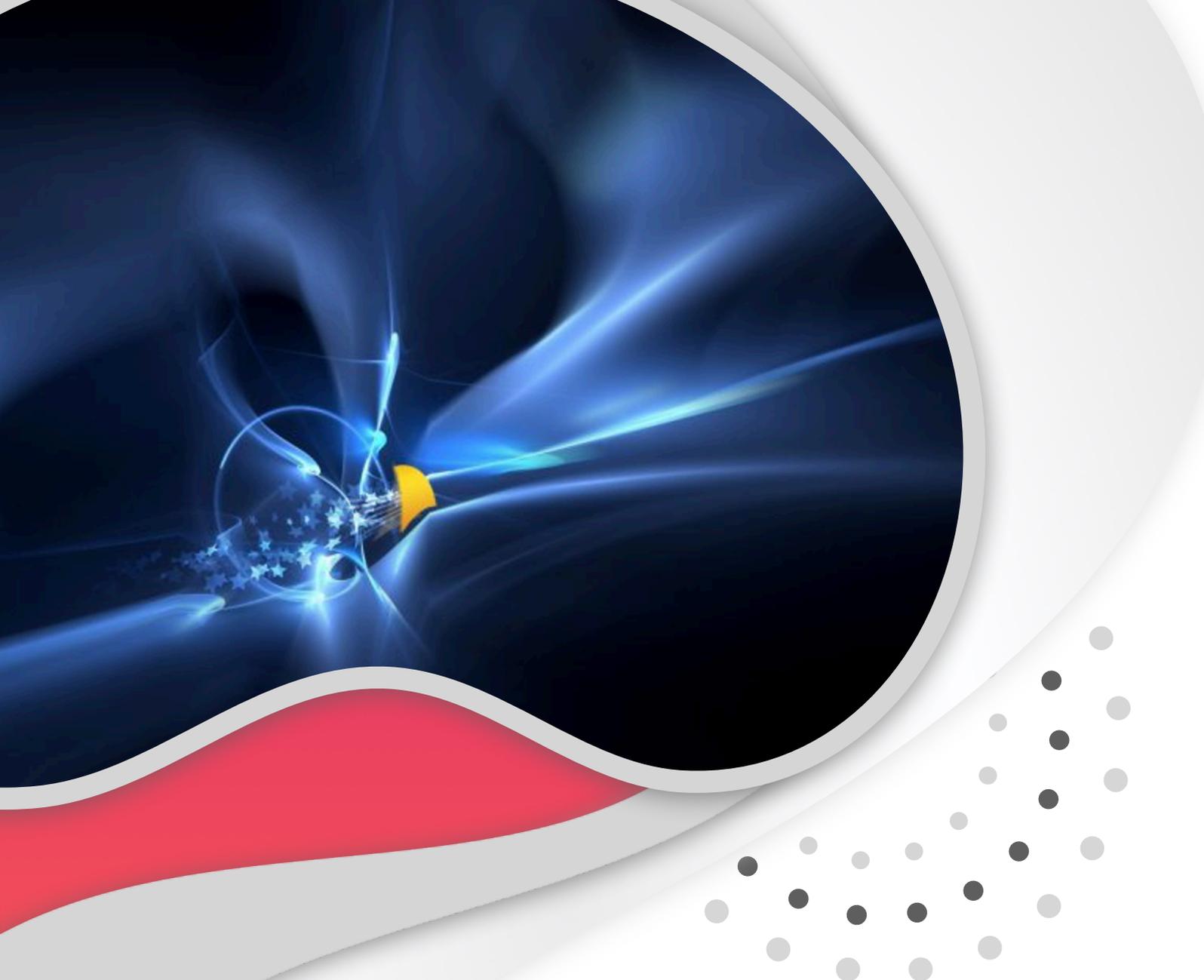
We firmly believe that HBP will be able to create a handful of start-ups to exploit disruptive results obtained during its execution; some of them are under way. Once created, the access to the European Innovation Council instruments, and specifically the EIT Pathfinder and Transition calls (open and challenge-based) will be very useful to launch those start-ups. The HBP innovation team will work with potential spin-offs projects aimed at exploiting HBP results and identify opportunities in the EIC to support HBP entrepreneurs in this journey.



The EU-UK agreement last December explicitly gives the UK access to five EU programmes, namely Horizon Europe, the Euratom nuclear research programme, the ITER project to build the world's first functioning nuclear fusion system, the earth monitoring project Copernicus, and EU satellite surveillance and tracking services. UK will not get access to special military-only signals from the Galileo satellite navigation system. UK-based companies will not be allowed to compete for financing in the European Innovation Council's accelerator fund (but will be allowed to compete for financing in the Pathfinder and Transition instruments).

#### *Further information*

- [https://ec.europa.eu/info/sites/info/files/research\\_and\\_innovation/funding/documents/ec\\_rtd\\_horizon-europe-overview.pdf](https://ec.europa.eu/info/sites/info/files/research_and_innovation/funding/documents/ec_rtd_horizon-europe-overview.pdf)
- <https://www.consilium.europa.eu/media/47388/cm-5358-2020-init.pdf>
- [https://ec.europa.eu/info/horizon-europe\\_en](https://ec.europa.eu/info/horizon-europe_en)
- <https://sciencebusiness.net/framework-programmes/news/uk-eu-research-deal-glance>



# THE FLAG-ERA JOINT TRANSNATIONAL CALL 2021 IS OPEN!

For HBP Research and Innovation JTC areas:

- 1. Studying genotype-phenotype relationships related to Brain Function.**
- 2. Tackling Psychiatric Diseases.**
- 3. Accelerating the diagnosis and the development of therapeutic approaches for rare diseases affecting the nervous system.**

The FLAG-ERA Joint Transnational Call 2021 is designed to expand the current FET Flagships

with new research contributing to the Flagship objectives in selected areas.

New researchers and researchers already in the Flagships are equally eligible. Selected projects are expected to be integrated in the Flagships as Partnering Projects.

Find out more about the [FLAG-ERA Joint Transnational Call 2021](#).



# HUMAN BRAIN PROJECT

*León, G., Velasco, G., Strange, B., Kireev, R., Gasset, B., Durmaz, B., Duran, T., Sánchez A., Fernández, A.*