

# FLAG-ERA 2021 Project Workshop

## Agenda

*Online*

16-18 March 2021

Seminar objectives:

- *Present FLAG-ERA projects objectives and scientific progress*
- *Provide the overall picture of the Flagship environment for FLAG-ERA projects*
- *Network and Synergy between FLAG-ERA projects and the Flagship Core project*
- *Raise RRI awareness and initiate RRI supporting actions*

### Overview

Tuesday, March 16	Thursday, March 18
<b>Graphene</b>	<b>Human Brain Project</b>
Lunch	Lunch
<b>Graphene</b>	<b>Human Brain Project</b>

**Tuesday 16 March 2021 – Graphene**

Time	Dur.	Item / goals	Speaker									
08:45	0h15	Welcome										
09:00	1h	<b>Introduction</b> <ul style="list-style-type: none"> <li>FLAG-ERA presentation: Coordination of national and regional support to the Flagship (10 minutes)</li> <li>Graphene Flagship presentation: unifying vision, organisation and activities (30 minutes)</li> <li>Graphene Flagship Partner Division and project association (10 minutes)</li> </ul>	<i>Marie-Alexandra Neouze</i> <i>Patrik Johansson</i> <i>Ana Maria Ciubotaru</i>									
10:00	1h	<b>Responsible Research and Innovation (RRI)</b> <ul style="list-style-type: none"> <li>RRI Introduction (30 minutes)</li> <li>RRI in Graphene Flagship (15 minutes)</li> <li>FLAG-ERA RRI priorities and activities (15 minutes)</li> </ul>	<i>Ellen-Marie Forsberg</i> <i>Ursula Hohlneicher</i> <i>Florence Quist</i>									
11:00	0h30	Coffee break										
11:30	1h	<b>FLAG-ERA project presentations 4 parallel sessions</b>										
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15:00	0h30	Coffee break										
15:30	0:40	<b>Scientific and technical integration FLAG-ERA projects and Graphene Flagship</b>	Session Chairs									
		<i>Plenary Discussion</i>										
16:10	0:40	<b>RRI activities and recommendations</b>	RRI Experts									
		<i>Plenary Discussion</i>										
16:50	0h10	Closure	FLAG-ERA									
17:00		End of FLAG-ERA Graphene seminar										

**Session 1** Enabling Science and Materials(Div 1 WP1 & 2)**TopoGraph:** Engineering topological superconductivity in graphene**TATTOOS:** TunAble Twistronics : local tuning and probing of TOpOlogical edge states and Superconductivity in bilayer graphene**SographMEM:** Spin Orbit functionalized GRAPHene for resistive-magnetic MEMories**OPERA:** Nanographene for quantum technologies**MORE-MXenes:** Magnetically Ordered Rare Earth 2D MXenes**ETMOS:** Epitaxial Transition Metal dichalcogenides Onto wide bandgap hexagonal Semiconductors for advanced electronics**DIMAG:** Electrically controlled ferromagnetism in 2-dimensional semiconductors**Session 2**Enabling Science and Materials(Div 1 WP3)**2D-SbGe:** Preparation and characterization of antimonene and germanium nanolayers**GRANSPORT:** Correlations and defects in graphene and related materials: Charge and heat transport**LaMeS:** Layered Structures of Metal Sulfides**H2O:** Heterostructures of 2D Materials and Organic Semiconductor Nanolayers**SIMPLANT:** Synthesis of few layered transition metal dichalcogenides by ion implantation**GRAPH-EYE:** In situ, non-invasive quality control of crystalline quality of GRMs via non-linear optical properties imaging**To2Dox:** Transferable 2D layers of correlated oxides**2DHetero:** hBN/Graphene 2D Heterostructures: from scalable growth to integration**Session 3**Health, Medicine and Sensors (Div 2)**PeroGaS:** Solution-Processed Perovskite/Graphene Nanocomposites for Self-Powered Gas Sensors**MARGO:** MAXillofacial bone Regeneration by 3D-printed laser-activated Graphene Oxide scaffolds**LEGOCHIP:** Multifunctional Nanoporous Graphene Integration in Operational Nanophotonic Biosensor Devices**GRAFIN:** GRAPhene-based Flexible neural Interfaces for the control of Neuroprosthetic devices**EPIGRAPH:** GRAPhene biomolecular and electrophysiological sensors integrated in an “all-in-one device” for the prediction and control of EPileptic seizures (towards a general device for most brain disorders)**DeMeGRaS:** Detection mechanisms in graphene radiation sensors**CO2-DETECT:** Waveguide-Integrated Mid-Infrared Graphene Detectors for Optical Gas Sensor Systems**2D-NEMS:** 2D-Material Heterostructure NEMS Sensors**Session 4**Electronics and Photonics Integration &Energy, Composites and Production (Div 3 & 4)**GRAPHAR:** Graphene enabled optical phased array for LIDAR applications**PROSPECT:** Patterned cOatings based on 2D materials benzoxazine reSin hybrids for broad range Pressure detection**MX-OSMOPED:** MXene–organic semiconductor blends for high-mobility printed organic electronic devices**MELoDICA:** Disclosing the potential of transition metal dichalcogenides for thermoelectric applications through nanostructuring and confinement**MECHANIC:** Modelling Charge and Heat Transport in 2D-materials based Composites**LASERGRAPH:** In-situ laser fabrication of graphene electrodes and interlayers for next generation CIGS/Perovskite solar cells**GraSage:** Modelling of the electrical and thermal transport mechanisms in graphene nano-modified polymer compounds and fibres**GO-FOR-WATER:** Graphene cOmposites FOR advanced drinking WATER treatment**GATES:** nanoporous GrAPhene membrane made without TransfEr for gas Separation**CERANEA:** Multifunctional Ceramic/Graphene Coatings for New Emerging Applications

Time	Dur.	Item / goals	Speaker
08:30	0h30	Welcome	
09:00	1h00	<b>Introduction (plenary)</b> <ul style="list-style-type: none"> <li>• FLAG-ERA presentation: Coordination of national and regional support to the Flagships (<i>10 minutes</i>)</li> <li>• HBP from H2020 to HE (TBC) (<i>10 minutes</i>)</li> <li>• HBP &amp; EBRAINS presentation: unifying vision, organisation and activities (<i>30 minutes</i>)</li> <li>• HBP project association (<i>10 minutes</i>)</li> </ul>	FLAG-ERA EC HBP / EBRAINS HBP
10:00	1h00	<b>Responsible Research and Innovation (RRI)</b> <ul style="list-style-type: none"> <li>• RRI Introduction (<i>2x 15 minutes</i>)</li> <li>• RRI in HBP (<i>15 minutes</i>)</li> <li>• FLAG-ERA RRI priorities and activities (<i>15 minutes</i>)</li> </ul>	RRI Expert HBP FLAG-ERA
11:00	0h30	Coffee break	
11:30	1h	<b>FLAG-ERA Project presentations 2 parallel sessions</b>	
		<b>Session 1</b> <u>Cognition and perception</u> (Humans and NHP) <i>Project presentations</i>	<b>Session 2</b> <u>Brain disease models</u> <i>Project presentations</i>
			PP coordinators
12:30	1h00	Lunch	
13:30	1h	<b>Session 1</b> <u>Brain Circuits and Networks</u> (Human, NHP) <i>Project presentations continuation</i>	<b>Session 2</b> <u>In silico brain imaging processing</u> <i>Project presentations continuation</i>
			PP coordinators
14:30	0h30	<b>Session 1</b> <i>Wrap-Up and conclusions</i>	<b>Session 2</b> <i>Wrap-Up and conclusions</i>
15:00	0h30	Coffee break	
15:30	0h30	<b>Scientific and technical integration FLAG-ERA projects and HBP</b> <i>Plenary Discussion</i>	Session chairs
16:00	0h30	<b>RRI activities and recommendations</b>  <i>Plenary Discussion</i>	RRI Experts
16:30	0h15	<b>Closure</b>	FLAG-ERA
16:45		End of FLAG-ERA HBP seminar	

**Session 1a**Cognition and perception (Humans and NHP)

**SCALES:** Studying Cognitive Activity at two Levels with Simultaneous depth and surface recordings

**MAC-Brain:** Developing a Multi-scale account of Attentional Control as the constraining interface between vision and action: A cross-species investigation of relevant neural circuits in the human and macaque Brain

**MoDeM:** The “Motor-way” to Decision-Making: how the motor system drives cue-triggered decisions

**SoundSight:** The sight of sound: how vision shapes the development of auditory inputs to the occipital cortex

**Session 1b**Brain Circuits and Networks (Human, NHP)

**CAUSAL TOMICS:** Causal connectomics subtending oscillatory spread and information flow in the human brain

**CORTICITY:** Comparative Investigation of the Cortical Circuits in Mouse, NHP and Human

**HIPPOPLAST:** How rigid and plastic circuits contribute to hippocampal function

**PrimCorNet:** Layer-specific characterization and modeling of fronto-parietal dynamics in primate cortical networks

**Session 2a**Brain disease models

**Brainsynch-Hit:** The influence of directional interactions in brain networks in predicting cognitive deficits post-stroke

**DOMINO:** Development of cortical multisensory integration mechanisms at micro- and macro- scales during normal and pathophysiological conditions

**MILEDI:** Multiscale Modelling of Impaired Learning in Alzheimer’s Disease and Innovative Treatments

**HA-CTion:** Hypothalamic histaminergic modulation of brain regions involved in fear memory

**Session 2b**In silico brain imaging processing

**NeuronsReunited:** Neurons reunited: data and software to reconstruct long-range projection neurons, place them in a digital reference brain with high precision, and model their interactions

**SENSEI:** Segmentation of Neurons using Standard and Super-Resolution Microscopy

**SMART BRAIN:** Advanced Morphological Reconstruction of Human Brain Tissue by Multimodal Fusion of Multiscale Optical Imaging Technologies