

# ECSEL CALLS 2020

YVES GIGASE



# WHERE DOES ECSEL STAND AFTER 5 YEARS (2014 TO 2018 INCL.)



64 projects

2161 beneficiaries

2 000 person-years

3 385 million Euros in cost

1 174 million Euros in funding

Call 2019:

decision in coming days

3Ccar	DENSE	WInSiC4AP	HiPERFORM
EXIST	PRIME	EuroPAT-MASIP	PRYSTINE
MANTIS	REFERENCE	MICROPRINCE	SECRETAS
OSIRIS	SafeCOP	Productive4.0	AI4DI
RobustSENSE	ENABLE-S3	R3-PowerUP	Applause
SWARMS	EnSO	SCOTT	Arrowhead Tools
ADMONT	IoSense	TAKEMI5	Comp4Drones
InForMed	Semi40	iDev40	CPS4EU
PowerBase	TAKE5	OCEAN12	Heliaus
R2POWER300	AQUAS	POSITION-II	MadeIn4
SeNaTe	AutoDrive	REACTION	NewControl
WAYTOGO FAST	CONNECT	TAPES3	Pin3S
3DAM	I-MECH	WAKeMeUP	PowerToPower
AMASS	MegaMaRt2	5G_GaN2	TEMPO
ASTONISH	SILENSE	AFarCloud	UltimateGaN
DELPHI4LED	TARANTO	FITOPTIVIS	ViZta

# GRAND CHALLENGES



MASP 2020 based on SRA 2020

4 general changes as compared to 2019

- **Technology developments for Artificial Intelligence** were added in all sections
- **Integrated photonics** and **flexible electronics** added in introduction
- The **reduction of energy consumption** of ECS was stressed as key for digitalization and broad implementation of Artificial Intelligence
- In the whole document additions with focus on **software technologies** and **edge computing** were made

# GRAND CHALLENGES



## 1. Transport and Smart Mobility

- Electrification topics to **fight climate change**
- Efficient systems to **convert electricity into hydrogen**
- **High-priority** on secure connected, cooperative and automated mobility and transportation

## 2. Health and Wellbeing

- Inputs of **HEALTH.E** Lighthouse Initiative integrated

## 3. Energy

- **Power consumption** of communications networks
- Digitalisation & Energy – new approaches including AI and Machine Learning.
- Make it happen: **Chapter on Decarbonisation** added

## 4. Digital Industry

- Significantly changed chapter: Inputs of **Industry4.E** Lighthouse Initiative lead to definition of new major challenges

## 9. Computing and Storage

- **Energy consumption** (especially for data centers)
- **Low power and ultra-low power** intelligent computing (**edge and deep edge** computing)
- Development of model- driven **software techniques**
- **Multi-domain/multi-paradigm design and analysis** by holistic approaches, will be required to meet future CPS requirements

# PLANNING



- Call 2020-1 Innovation Action
- Call 2020-2 Research and Innovation action
- Call 2020-3 Joint action with IMI JU complementing Trials@Home project
- Call 2020-4 Coordination and Support Action

# SCHEDULE



Event	Calls 2020 RIA and IA
Call Launch	05/02/2020
Call PO Deadline	05/05/2020
Information regarding the results of the PO phase	2nd week of June
Call FPP Deadline	16/09/2020
Funding decision	02/12/2020

# CALL 2020-I INNOVATION ACTION



## ■ PRELIMINARY INFORMATION

- Similar to call 2019-I
- Weight Innovation/Impact/Implementation: 1.0 / 1.5 / 0.7
- Funding rates LE / SME / OTHER: 20% / 25% / 35%
- Capping: EU contribution per project capped at 25M€ and maximum contribution per partner in a project is limited to 50% of the total EU funding for the project.
- EU Budget: 93M€ (might change)
- Scope: Proposals on all MASP2020 Grand Challenges
- Page limit Innovation/Impact/Implementation: 60 / 100 / 100
- Strive for a National funding to EU funding of 1.2

# CALL 2020-2 RESEARCH AND INNOVATION ACTION PART A



## ■ PRELIMINARY INFORMATION

- Similar to call 2019-2
- Weight Innovation/Impact/Implementation: 1 / 1 / 0.7
- Funding rates LE / SME / OTHER: 25% / 30% / 35%
- Capping: The EU contribution per project is capped at 12.5M€ and the maximum contribution per partner in a project is limited to 40% of the total EU funding for the project.
- EU Budget: 61M€ (might change)
- Scope: Proposals on all MASP2020 Grand Challenges
- Page limit Innovation/Impact/Implementation: 60 / 100 / 100
- Strive for a National funding to EU funding of 1.2



## SOME GENERAL COMMENTS



- Aspects of **ECS value chain integration** are important for the ECSEL programme and the whole European ECS sector, across applications and across capabilities. Consortia are encouraged to submit proposals that take this aspect into account.
- Along the lines of the previous bullet, **proposals that cut across disciplines, support platform building, interoperability, establishment of open standards** are particularly encouraged; even outside the regular ECS sector.
- Description of **the important topics** as proposed by the LIASEs of the ECSEL Lighthouse Initiatives and by DG-Energy in the fields of Mobility, Digital industry, Health and Energy are provided in annex 9; these topics are of special relevance and proposals for the Call 2020 supporting these topics are encouraged.
- For the Call 2020, **proposals supporting specific aspects of ‘edge computing’** are encouraged as described in the below textbox.

# EDGE COMPUTING



Proposals should encompass the design and manufacturing aspects and provides flexibility to accommodate to a broad scope of cases of edge computing and cover one or more of the aspects described in the non-exhaustive list below:

- Test and experimentation of **innovative computing architectures** suitable for embedded and autonomous operation. Of particular interest, computing approaches supporting Artificial Intelligence techniques.
- **Automated and semi-automated tools, possibly based on Artificial Intelligence techniques**, to simplify the development of systems and applications at the edge of the network and guarantee their quality while reducing the skill level required to the developer.
- Techniques and tools to guarantee secure (including privacy aspects), safe and time-critical behaviour in complex and **heterogeneous computing architectures for edge computing**, while guaranteeing interoperability with the environment.
- **Innovative integration of hardware and software** components for efficient operation in embedded edge applications with very limited energy budget.

# MOBILITY



## ENVIRONMENT PERCEPTION, PREDICTION AND ROBUST DECISION MAKING UNDER UNCERTAINTIES

Proposals that would like to contribute could cover some of the below listed aspects:

- Improved architectures, components, sub-systems, Including models, methods and algorithms as well as deep learning **for environment perception.**
- Novel computational architectures components, sub-systems, Including models, methods and algorithms for **effective decision taking in predictive driving functions.** Including automated decision systems to address the driver's reaction time for faster decision in the traffic operation and the related systems behind.
- Methods and tools to validate the models

# DIGITAL INDUSTRY



## ARTIFICIAL INTELLIGENCE (AI) ENABLED INCLUSIVE AND RESILIENT MANUFACTURING – THE HUMAN IN THE LOOP

Proposals that would like to contribute could cover some of the below listed aspects:

- **Integration of AI in optimization processes** such as Condition monitoring, predictive maintenance, (predictive) process optimisation (including humans in the system), predictive scheduling, towards prognosis, self-x ...
- **Combination of data and model-driven AI:** Use of explicit functional models as knowledge in cognitive control loops. Explore model-based and model-driven systems to ease the issues of trust in joint cognitive systems.
- **AI-based interactive learning and training systems**
- **Socio-CyberPhysical Systems** (where humans play a role either as part of the plant, as part of the controller and/or as part of the environment) in manufacturing.
- **Developing and demonstrating how AI-related computations are implemented in distributed architectures, modern embedded-edge/fog-cloud architectures, etc.** Modular, reusable user interface assets for monitoring and visualisation. These assets need to improve the comprehension and reasoning by human users of the behavior of AI agents during its pursuit of high-level mission objectives.
- Investigate how to improve the representation of system behaviour and operative limits in order to **ensure a smart integration of humans and AI agents.**
- **Joint cognitive systems for real-time production scheduling**, where the responsibility of taking decisions to optimize production, including times when a disruption event happens, is shared between human and AI.
- **Investigate systems that learn from user input at runtime, and not design time.**
- **AI for Machine learning made easy for to overcome the lag time required for programming and predictive modeling.**



## ARCHITECTURES, COMPONENTS AND SYSTEMS FOR BIOELECTRONIC MEDICINES

Proposals that would like to contribute could cover some of the below listed aspects:

- Miniaturization of complex heterogeneous systems to allow for **minimally invasive device delivery on the target nerve**;
- **Power management** covering storage (battery or capacitor) and remote charging (inductive, ultrasound, scavenging);
- **Communication with the implant** with an emphasis on data security and privacy;
- **Low-power AI computation** to allow for autonomous closed loop operation;
- **Specificity to stimulate only the relevant neurons** in a nerve;
- **Encapsulation** in relation to reliability, bio-stability, weight, manufacturability and cost;
- Development of **model systems for the validation** of bioelectronic medicines, taking into account biophysical, clinical and regulatory aspects.
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## **ELECTRONICS IN THE ENERGY SECTOR: CONDITION AND HEALTH MONITORING (C&HM) FOR POWER ELECTRONICS IN ENERGY APPLICATIONS**

Proposals that would like to contribute could cover some of the below listed aspects:

- Condition and health monitoring is an **effective method for improving the availability** of power electronic components, converters and systems by monitoring the state of power electronics, estimating end-of-life and estimating most cost-efficient maintenance time (thus also lowering lifetime costs).
- C&HM methods also **enable stress steering of already degraded components** to keep the system in (non-optimal) operating conditions to avoid critical failures until the maintenance is possible. Stress-steering methods are being in development but not often applied yet. Evaluation of benefits of those methods in terms of life extension for already mentioned critical application is necessary to see how beneficial their further development and application could be

# CALL 2020-3 JOINT ACTION WITH IMI



## ■ PRELIMINARY INFORMATION

- Grafts on the IMI JU Project: Trials@Home
- According to RIA conditions
- Late call launch: September ?
- Topic: **Next Generation Digital Technologies for Clinical Trials at Home:** This project should address the issues and gaps to bring all the scattered activities, technologies, platforms to a higher TRL level by addressing the technical, regulatory, compatibility and acceptability issues that at the moment block endorsement by pharma and hospitals:
  - Lack of accuracy (compared to clinical instruments)
  - Data integration (into the workflow of hospitals and pharma)
  - User friendliness (should be straightforward for non-technical staff and elderly)
  - Data security and Privacy (most hospitals don't want to have data outside the hospital)
  - Patch to patch communication (how to prevent latency)

# CALL 2020-4 COORDINATION AND SUPPORT ACTIONS



## PRELIMINARY INFORMATION

- Digital excellence
- EU-Funding: 100%
- Duration: 3 years
- Topic: Different industrial partners described the Generic Semiconductor Data Model and provided production data on this structural basis, which have to be maintained available to develop cutting edge solutions for semiconductor supply chains. The requirement is to make these structural descriptions as well as the corresponding data samples available for future projects and the public in general.
- I phase, call launch same as RIA and IA





# Thank You