

ICOS

International Cooperation On Semiconductors

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Aim of the Workshop

This Workshop will allow to present:

- EU and International strategies
- International Roadmaps, activities and challenges dedicated to future important semiconductor technologies for many applications
- Main challenges for sustainable electronics to be taken into account in future international collaboration, IRDS roadmap and EIC challenges
- Possible supports and involvement in these areas of startups, also targeted in the Chips Act
- First analysis of the possible gaps between EU activities and most promising technologies highlighted in Roadmaps for developing international cooperation on topics of mutual interest
- Rapporteurs nominated for the main discussions and conclusions to be used in future ICOS studies

Sessions of the Workshop

EIC Programme & EU Chips Act

- Session dedicated to European Innovation Council programs (Horizon Europe Pillar 3) with presentations from EIC program & Challenges, including Start-ups success stories and help for EIC calls
- Session covering the Chips Acts with presentations from DG Connect and International strategies
- Panel "Strategy for International Cooperation - Chips Act "

International Sustainable/Responsible Electronics

- Session on Sustainable Electronics
- Panel session "Challenges and Solutions for Sustainable Electronics"

ICOS "Technology scanning and foresight"

Sessions covering the Future Technologies for Advanced Computing & Advanced Functionalities, including:

- European and International highlights with representatives from Industry, RTO, Academia
- Leaders of the International Roadmaps in the field More Moore, More than Moore, Beyond CMOS, CEQIP, Photonics



ICOS CSA

- ICOS Project started in January 2023 for three years, it is funded by the Horizon Europe research program.

- **Coordinator**



- **Technical co-Coordinator**



- An ambitious project in the framework of the European strategy for semiconductors

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IRDS

Context

Semiconductors & Semiconductor-based photonics are pivotal technologies for almost all existing industrial sectors, as demonstrated by the recent chips shortages.

In particular, semiconductors essential enablers for **digital and green transitions** and for SDGs.

Objectives

- **International cooperation** is key for speeding up technological innovation (e.g. ITRS/IRDS, IPSR-I/Optica)
- To build **balanced semiconductor partnerships** with like-minded countries
- To set out cooperative framework on *initiatives of mutual interest*
- To identify and support the establishment of the **most promising scientific international collaborations**
- To support the growth of the European Semiconductor industry through **focused research alliances** based on awareness of advanced research activities
- To strengthen **Europe's position** in global value chains in this area

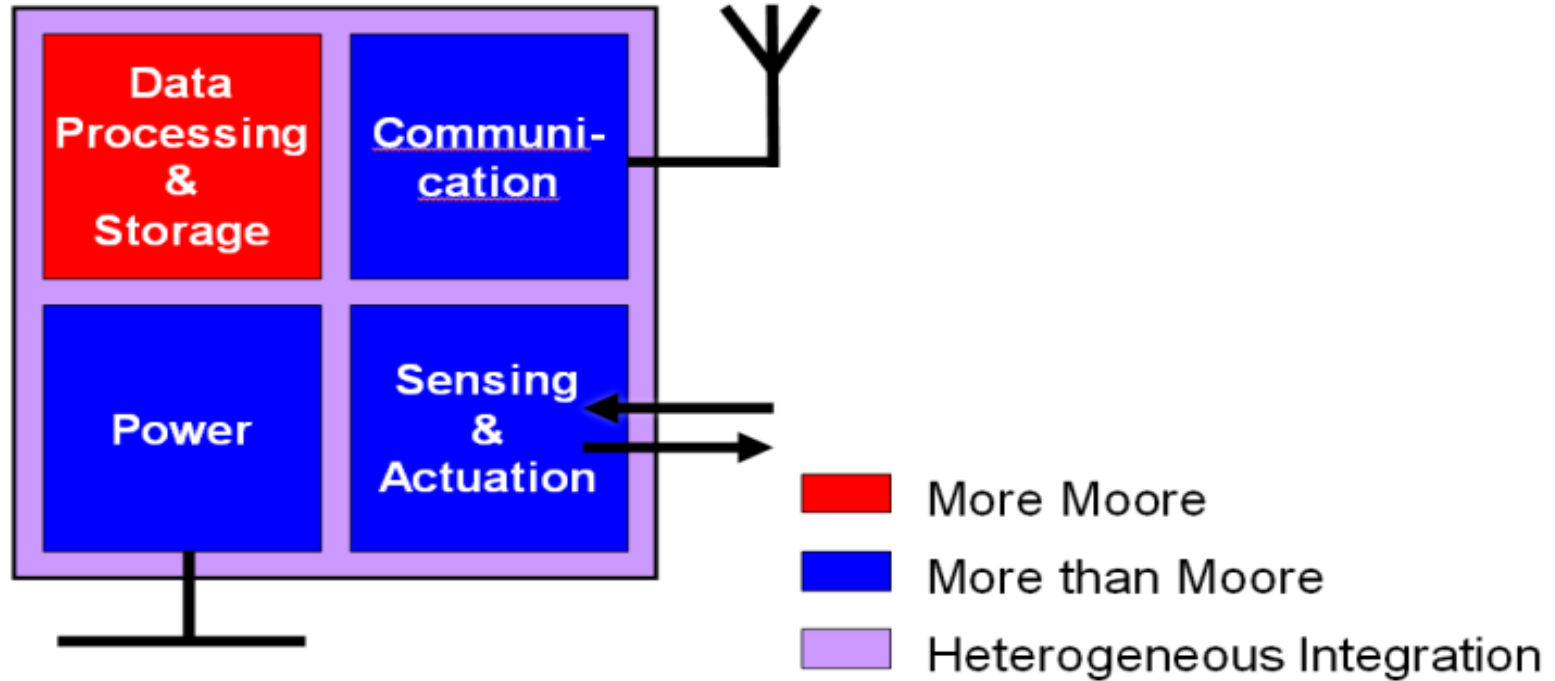
75th anniversary of the transistor

- *Point-contact transistor* by J. Bardeen and W. Brattain in Dec. 1947 (Ge)
- *Bipolar junction transistor* by W. Shockley in Jan. 1948
- *First Si Transistor* in 1958 (TI)
- *Integrated Circuit* in 1958 (J. Kilby)
- *MOS Transistor* by D. Kahng and M. Atalla in 1960 (Si)
- *Microprocessor* in 1971 (Intel)
- *>1B Transistors per die* beginning 21st century

=> **Many innovations accelerated by international collaborations**



Main scientific topics



Advanced computing & Advanced functionalities (sensing, RF & optical communications, optical devices, energy harvesting, power devices, flexible electronics)

Taking into account Technology sustainability, in line with the Green Deal

Holistic approach needed with the combination of two pillars:

- **Electronics for sustainable societies**
 - ⇒ Digitalization of many domains to reduce footprint and improve efficiency
 - ⇒ Electronics monitoring targeting societal challenges (Energy, Biodiversity, Pollution, Health, etc.)
- **Sustainable Electronics** (Energy Consumption, Material availability, Chemicals, E-waste, Circular economy, Responsible applications, etc.)

IMPLEMENTATION

EXHAUSTIVE ANALYSIS OF SEMICONDUCTORS' VALUE CHAINS, FOR ELECTRONICS & PHOTONICS

Identification of :

- EU's economic and industrial strengths & weaknesses
- Strategic dependencies
- Market and cooperation opportunities

IDENTIFICATION OF RESEARCH AREAS FOR INTERNATIONAL COOPERATION

Identification of next generation & emerging technologies, especially in advanced computation and functionalities.

DETERMINATION OF MOST INTERESTING COUNTRIES FOR INTERNATIONAL COOPERATION

Identification of challenges for which international cooperation is critically important.

AGENDA FOR AND INITIATION OF INTERNATIONAL COOPERATIONS

- Dialogue with actors of existing cooperation
- International collaboration with non-EU national authorities
- Define standardisation needs and activities
- Support the European Commission

OUTCOME & IMPACT

- **Raise awareness of the advanced research activities** inside and outside Europe
- **Reduction of the gaps & Increase European Leadership** in Semiconductor & Semiconductor-based photonics
- **Facilitate the European industry in the realization of emerging technologies:** advanced computation & advanced functionalities
- **Reinforce the position of the European industry** through new standards
- **Contribute to the European Strategic Autonomy** through balanced partnership with like-minded leading countries
- Contribute to other European initiatives in this sector : **European Chips Act & Digital Agenda.**
- **Contribute to the realization of the Green Deal:**
 - Digitalisation of many domains to reduce footprint
 - Electronics monitoring targeting societal challenges (energy, health, environment, etc.)
 - Sustainable electronics (energy consumption, critical materials, etc)





THANK YOU



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WORKSHOP - Sustainable Electronics & International Cooperation On Semiconductors

www.icos-semiconductors.eu