

Talent shortage - Gender imbalance - Public defiance towards technology ... Can science help us?

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Create impact
by collaborative
Innovation!
For an autonomous and
sustainable Europe

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AENEAS, EPoSS & Inside

Promising Technologies for ECS

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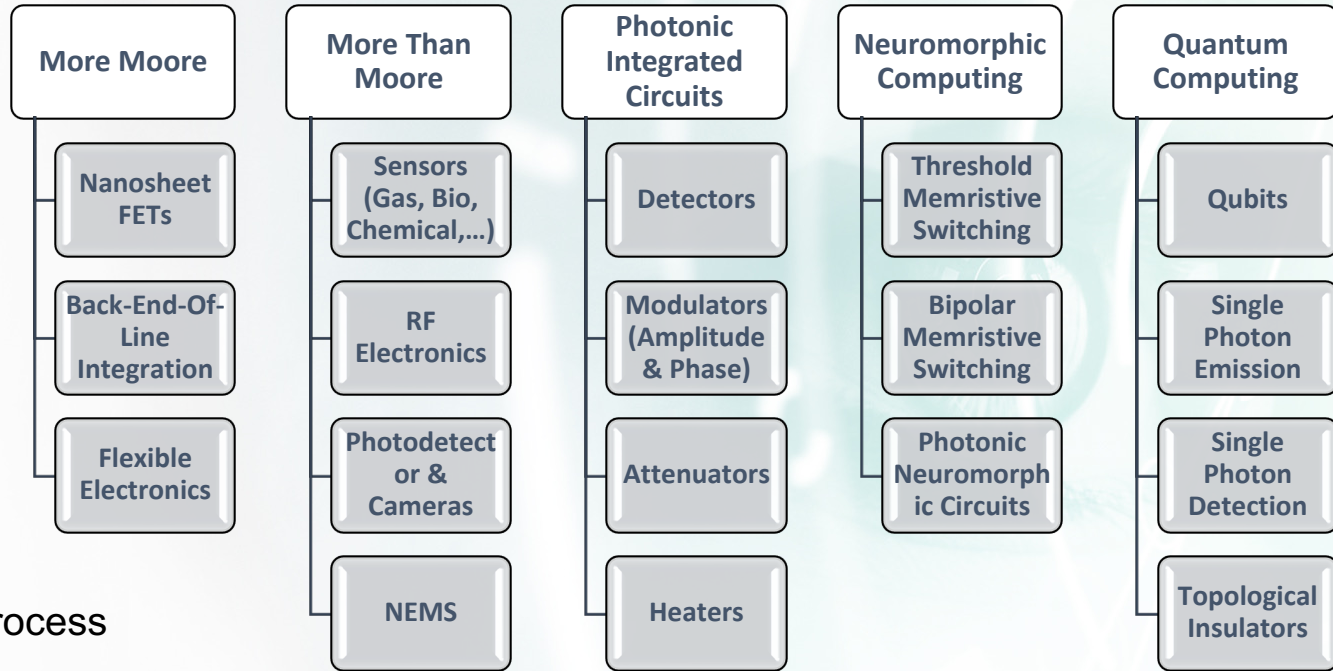
- SRIA Long Term Vision Chapter Update
- Exploration of promising technologies with high potential
 - Three topics identified
 - Artificial Intelligence for Safety Critical Systems
 - 2D Materials for Future Heterogeneous Electronics
 - Roadmap Towards Sustainable Electronics
 - Similar structure: Overall presentation followed by panel discussion
 - Goals
 - Provide inputs for the LTV chapter evolution
 - Offering options / insights to the community regarding potential focus topics
- CHIPS Act Capacity Building Stream - Pilot Lines
 - Presentation by the EC
 - Panel with EC and RTO representatives

Artificial Intelligence for Safety Critical Systems

- Need to pave the way towards the development and certification of AI-based safety systems
 - Need for AI safety standard(s) definition and consolidation, complementary with functional safety standards.
 - Many ML technical challenges: training data coverage (e.g., corner cases), understandability, testability, verifiability, etc.
 - Evolution of HPC challenges (HW / SW): integration of functions of different criticality in a HPC safe execution platform:
 - Safety compliance of ML libraries and parallel programming languages.
 - Temporal and spatial independence.
 - Thermal and energy requirements.
 - Trustworthiness: Engineering, Ethics and Legal
 - Safe and secure update of systems

2D Materials for Future Heterogeneous Electronics

- Opportunities



- Challenges

- Growth
- Transfer process
- Etching
- Encapsulation
- Electrical contacts

Roadmap Towards Sustainable Electronics

- Motivation for sustainability in electronics manufacturing
 - Global electronic waste doubling within 16 years, only 20% collected/recycled properly
- Required changes of paradigms
 - Materials – From fossil-based, rare to bio-based, renewable, abundant
 - Manufacturing – From etching-based processes to additive manufacturing
 - Printed and hybrid electronics
 - End-of-life management - From e-waste to circular economy
 - Design – from designing only for performance and cost to designing also for circularity, durability, and energy-efficiency
- An on-going revolution

Pilot Lines

- RTO expectations towards pilot lines
 - Opportunity to transition better and faster from basic research to production
 - Build on the strengths (HW and design) to move fast
 - Developing skills in RTO and academia close to industry needs
- Adequation between pilot line mechanism and identified topics
 - AI for safety critical systems – Holistic approach required for test and reliability
 - 2D materials
 - Need to select topics mature enough for pilot lines
 - Size of infrastructure needs varies widely across the 2D technology spectrum
 - Sustainable electronics – Pilot line could help to move from etching to printing
- Governance
 - Establish plans for industrialisation from day 1
 - Avoid to have only short term objectives
 - Ensure engagement of every stakeholder, connect to all players
 - Embed flexibility, allow for redefinition of objectives

ECS in Europe – Moving forward



- Large ambitions
- Technical challenges and opportunities
- Financial challenges and opportunities
- Non-technical challenges
 - Where do we find the people?
 - How do we ensure public acceptance of technology?

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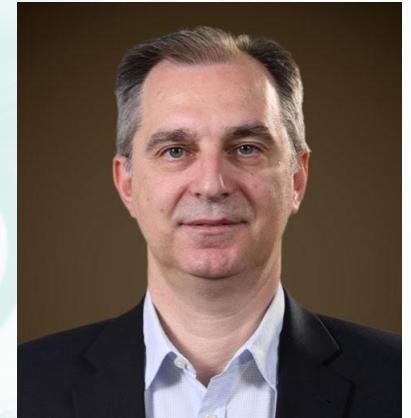
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