Materials Innovations

V. Sousa
Key Account Manager
CEA-Leti, Grenoble, France

Biography
Coming Soon

References

Raw Materials in Europe – Research and Innovation landscape

M. Simonov
Head of Sector
European Commission, European Health and Digital Executive Agency (HaDEA), Brussels, Belgium

Abstract
Microchips are made from specialized raw minerals sourced from global mining operations. Critical Raw Materials represent the essential mined minerals and metals—such as gallium, germanium, silicon, palladium, and rare earths — that are strictly required to manufacture microchips and semiconductors. In his session we present the portfolio of CRM research and innovation projects co-funded by European Union and managed by HADEA. We also present the funding opportunities for CRM topics under Horizon Europe program in 2027.

Biography
Mikhail Simonov is Head of Sector in Health and Digital Executive Agency seconded by Directorate-General for Internal Market, Industry, Entrepreneurship and SME.

A computer scientist specialised in Cyber-physical (digital) and Artificial Intelligence systems with PhD in an engineering discipline and an economist by training, he has been an official in the European Commission since 2019 in the field of Industrial Policy. First working in the research for policy field within the Joint Research Centre, from 2017 to 2019, he became a scientific officer researching on uncertainty and sensitivity in policy- and decision- making. Next working in the area of product safety legislation within the Internal Market, Industry, Entrepreneurship and SME (DG GROW), he joined the service in charge of industrial policy and became Policy Officer for Machinery Directive 2006/42/EC. Since 2019, his main responsibilities in DG GROW cover the machinery sector of engineering industries. In April 2021, his team has delivered new Proposal for a Regulation of the European Parliament and of the Council on machinery

products to the trialog. The Regulation (EU) 2023/1230 on machinery (adopted 14 June 2023, part of New Legislative Approach) replaces Directive 2006/42/EC and lays down health and safety requirements for the design and construction of physical and cyber-physical machinery, placed on the European market.

Since March 2022, his main responsibilities in HaDEA as seconded Head of Sector cover the policy implementation aspects for critical Raw Materials. Mikhail is a line manager of 15 staff members with a responsibility for a portfolio of EU R&D grants (1.8 BEuro as on 1st November 2023) awarded in the context of Cluster 4 Horizon Europe calls. Mikhail had a chance to act as a Head of Unit (50 staff members) by deputizing.

References

High-throughput modelling for materials in microelectronics

E. Turunen
Executive vice president
VTT Technical research centre of Finland, Digital Systems, Espoo, Finland

Abstract
Material innovations are emerging as a key driver of semiconductor progress as conventional scaling and device architectures approach their practical limits. Future performance and functionality gains will increasingly depend on new materials, advanced integration technologies, and novel semiconductor platforms rather than geometric scaling alone.
The ability to systematically design and run virtual “what-ifs” scenarios in an integrated manner is widely recognised as a way to accelerate the respective R&D&I processes by an order of magnitude compared to trial-and-error approaches. The integrated computational materials engineering approach fuelled by AI-driven machine learning also enables the development of higher-performing materials and the identification of more cost-effective and sustainable solutions.
VTT ProperTune has been developed over the course of the last 20 years and can be applied to a range of material problems and subject domain areas. Most recently, the VTT ProperTune applied to microelectronics material domains has been initiated. In parallel with the development of new building blocks for this novel modelling tool on classical computing platforms, VTT is studying algorithmic concepts inspired by quantum computing to enhance future capabilities.
The objective is to investigate key material properties, including permittivity, piezoelectric coefficients, elastic constants, and density, as well as the differences between single-crystal and oligo-/polycrystalline materials. These properties largely determine the performance of microelectronics, sensors, and power electronics.
A key aspect is the implementation of high-throughput workflows in which computational and experimental tasks are highly automated, in line with the vision of VTT’s Material Accelerator Platform (MAP) initiatives. Equally important is the strong integration with VTT’s design microfabrication and piloting activities.

Biography
Dr. Erja Turunen is the executive vice president of one of VTT’s two business units: Digital systems. As the leader of the unit, Erja’s work involves strategic planning, engaging stakeholders and representing VTT in different organisations. Erja is also a member of VTT’s executive committee. Erja’s current responsibility area is Digital systems covering microelectronics, quantum, flexible electronics, sensing solutions, physical AI, connectivity and cyber security.
Prior to her current role, she used to work as vice president in two different excellence area at VTT. Turunen is also a respected researcher herself. She began her career at the Tampere University of Technology following by Aalto and has done her PhD from material science.
Erja has been at VTT 25 years and having various management positions more than 20 years. Erja has been member for multiple European initiatives and networks. Currently she is active in BoD’s for Kvanttinova Oy, Tamlink Oy and Enter Espoo Oy

References

Accelerating Materials Discovery for the Semiconductor Industry

A. Jatsch
Head of Materials Innovation Pipeline
Merck KGaA, Berlin, Germany

Abstract
As semiconductor technologies advance, materials must deliver increasingly complex combinations of performance, reliability, manufacturability, and sustainability. At the same time, new device architectures and growing process complexity are shortening development and qualification cycles. New materials are therefore becoming an increasingly important lever for future semiconductor performance, while the scientific and experimental design spaces continue to expand. The challenge is not only to discover new materials, but to accelerate the full innovation process from material design through experimentation, characterization, process optimization, and integration.
The effective use of AI in materials R&D depends on accessible, structured, and connected scientific data. Digital laboratory infrastructure, consistent data capture, instrument connectivity, and integrated workflows provide the foundation to make experimental information usable. Building on this, modeling, AI, automation, and data analytics can support better experimental decisions, explore larger design spaces, and shorten learning cycles by combining scientific understanding with data-driven and increasingly predictive approaches.
We will share its perspective on how materials R&D can evolve from fragmented workflows toward connected, data-enabled, and predictive innovation environments. We will discuss how materials and process expertise, digital infrastructure, computational methods, and experimentation can be combined into integrated learning loops. Real use cases from semiconductor materials R&D will illustrate how these principles can accelerate materials innovation.
The presentation will also highlight how Europe can build on its scientific excellence, R&D infrastructure, industrial capabilities, and collaborative ecosystem to advance materials innovation. Connecting internal R&D capabilities with research and industry partnerships can help translate scientific advances into industry-relevant solutions and strengthen Europe’s contribution to future semiconductor technologies.

Biography
Anja Jatsch, Head of Materials Innovation Pipeline within the Chief Technology Office of the Electronics Business of Merck KGaA, Darmstadt, Germany
Anja Jatsch is Head of Materials Innovation Pipeline at Electronics Business of Merck KGaA, Darmstadt, Germany, where she leads the development and advancement of new material platforms with a strong focus on semiconductor materials and technologies. Her work centers on accelerating materials innovation by combining deep materials science with portfolio strategy, digitalization, AI, and external collaboration.
She has more than 16 years of experience in Electronics R&D and innovation leadership. Before taking on her current role, she held several leadership positions in Optronics, including Head of Material Research and Head of Early Innovation, where she worked across OLED materials, display technologies, and emerging Optronics-related fields.
Anja holds degrees in chemistry and business administration and economics and has a scientific background in organic chemistry and advanced materials.

References

Leading the Transition - Cleanroom Filtration without added PFAS.

F. Spehl
Principal Expert Air Filtration
MANN+HUMMEL, Bochum, Germany

Abstract
The semiconductor industry is under increasing pressure to eliminate substances of concern from manufacturing ecosystems while maintaining the highest standards of contamination control. PFAS chemicals are becoming a growing focus of regulators and sustainability programs worldwide.
This presentation showcases how advanced air filtration technology can support the industry's transition toward more sustainable cleanroom operations. Through extensive laboratory and field validation, attendees will learn how filtration products designed without added PFAS chemistry deliver the same trusted performance in efficiency, energy consumption, pressure drop, and lifetime as traditional solutions.
The session will discuss regulatory drivers, lessons learned during product development, and practical strategies for implementing technologies without added PFAS in semiconductor facilities. Participants will leave with a clearer understanding of how sustainability and cleanroom performance can be achieved together.

Biography
Frank Spehl, Principal Expert Air Filtration Solutions at MANN+HUMMEL, brings more than 35 years of experience in air filtration and cleanroom technology. Prior to his current role, he led R&D activities in air filtration, driving the development of innovative filtration technologies and solutions. His expertise spans sustainable filtration concepts, energy-efficient manufacturing environments, contamination control, and advanced solutions for highly regulated industries, including semiconductors, microelectronics, and other high-tech manufacturing sectors.

References

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T. Wipprecht
CEO
Siegert Wafer GmbH, Aachen, Germany

Abstract
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Biography
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References