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The European Partnership on Metrology

Quantum metrology Workshop

November 2022

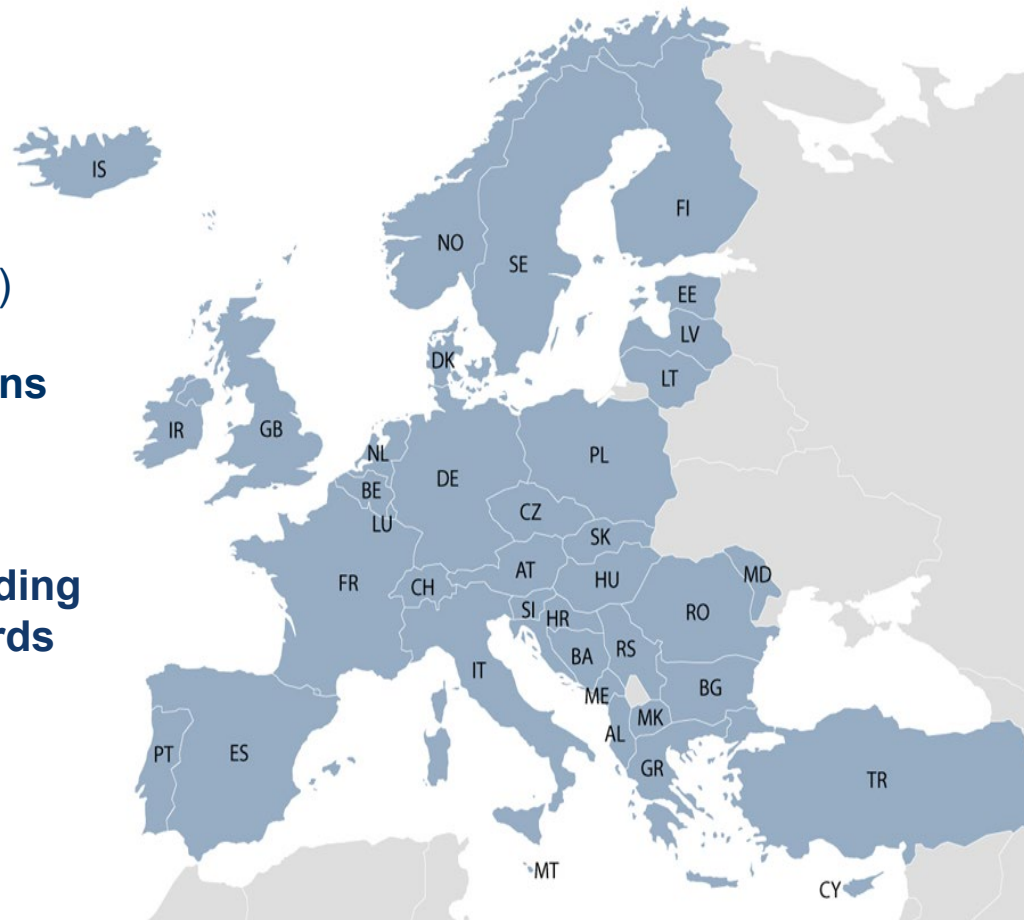
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EURAMET e.V.

The European Association of National Metrology Institutes



- **37 National Metrology Institutes** (Members)
- **77 Designated Institutes** (Associates)
- **16 international Liaison Organisations** (e.g. IAEA, BIPM, OIML, WELMEC, Eurolab, Eurachem, EA)
- Providing stakeholders with **world-leading measurement solutions and standards**
- Securing **world-wide trust and acceptance** of measurements, for all aspects of business and society
- Implementing **Metrology Research Programmes**



European Partnership on Metrology



Objective: To create, by 2030, a world-class sustainable and coordinated system for metrology at European.

- A robust, **sustainable, excellent and coordinated** European Metrology Infrastructure
- To ensure state-of-the-art metrology R&D taken up by **innovators**
- **To increase impact** of metrology (industry, Society..)
- Address **European and global challenges**, including:
 - European Green Deal
 - UN Sustainable Development Goals
 - The Digital transition, European Industry strategy, KET
 - Better Health for All



Budget ambition
~ 690 M€

- 390 M€ from Member States
- 300 M€ EC funding
- 23 countries (hope more...)
- 2 countries considered as associate partners (**CH & UK**), no EC funding

Further information: <https://www.euramet.org/partnership>

- **General Objectives:**

- to develop a sustainable, excellent and coordinated metrology system at European level
- to ensure that state of-the-art metrology capabilities are taken up by ecosystems
- to increase the impact of metrology on societal challenges

- **Specific objectives** include:

- to develop new research capabilities which are built within the framework of new European metrology networks
- to support the use and adoption of the new metrology capabilities in key emerging and enabling technologies
- to unleash the potential of metrology among end users, including SMEs and industrial stakeholders

European Metrology Networks



Objective: Create sustainable structures in areas of strategic importance for the future of European metrology



The Networks...

- cover areas of major strategic importance, with a **European dimension**
- establish close links with a wider **stakeholder community**, including other European Partnerships
- develop and coordinate a **common metrology strategy & infrastructure** to support innovation, public policy, and regulation (develop SA's and SRA's)
- Complement the work of the Technical Committees, which govern the CIPM MRA processes under the Metre Convention

Metrology Partnership

Call topics and schedule



2021	Green Deal
2022	Health, Integrated European Metrology, Digitalisation
2023	Fundamental, Industry
2024	Green Deal, Digitalisation
2025	Health, Integrated European Metrology
2026	Fundamental, Industry
2027	Green Deal



- Normative (& regulation) each year
- Research Potential (CB) the first 5 years
- “*Integrated European Metrology*” = SI development with a focus on joint capabilities and infrastructures



EPM – call topics & schedules



Call 2021
16 JRPs

2021	Green Deal → 10 JRPs
2022	Health, Integrated European Metrology, Digital transformation – on-going (JRPs)
2023	Fundamental, Industry
2024	Green Deal, Digitalisation
2025	Health, Integrated European Metrology
2026	Fundamental, Industry
2027	Green Deal



- **Normative (& regulation) – call 2021 → 6 JRPs**
- Research Potential (CB) the first 5 years
- “*Integrated European Metrology*” is SI development with a focus on joint/coordinated capabilities and infrastructures

Participant Portal: <https://www.metpart.eu>

Examples of joint research projects on Quantum



- Two-species composite atomic clocks (TSCAC-20FUN01)
- Memristive devices as quantum standard for nanometrology (MEMQuD -20FUN06)
- Microwave metrology for superconducting quantum circuits (SuperQuant -20FUN07)
- Single- and entangled photon sources for quantum metrology (SeQuMe – 20FUN05)
- Two dimensional lattices of covalent- and metal-organic frameworks for the QHR standard (COMET-20FUN03)
- Next generation ultrastable lasers (Nextasers-20FUN08)

Browse through our joint research projects

<https://www.euramet.org/research-innovation/search-research-projects/>

Examples of Metrology Impact:

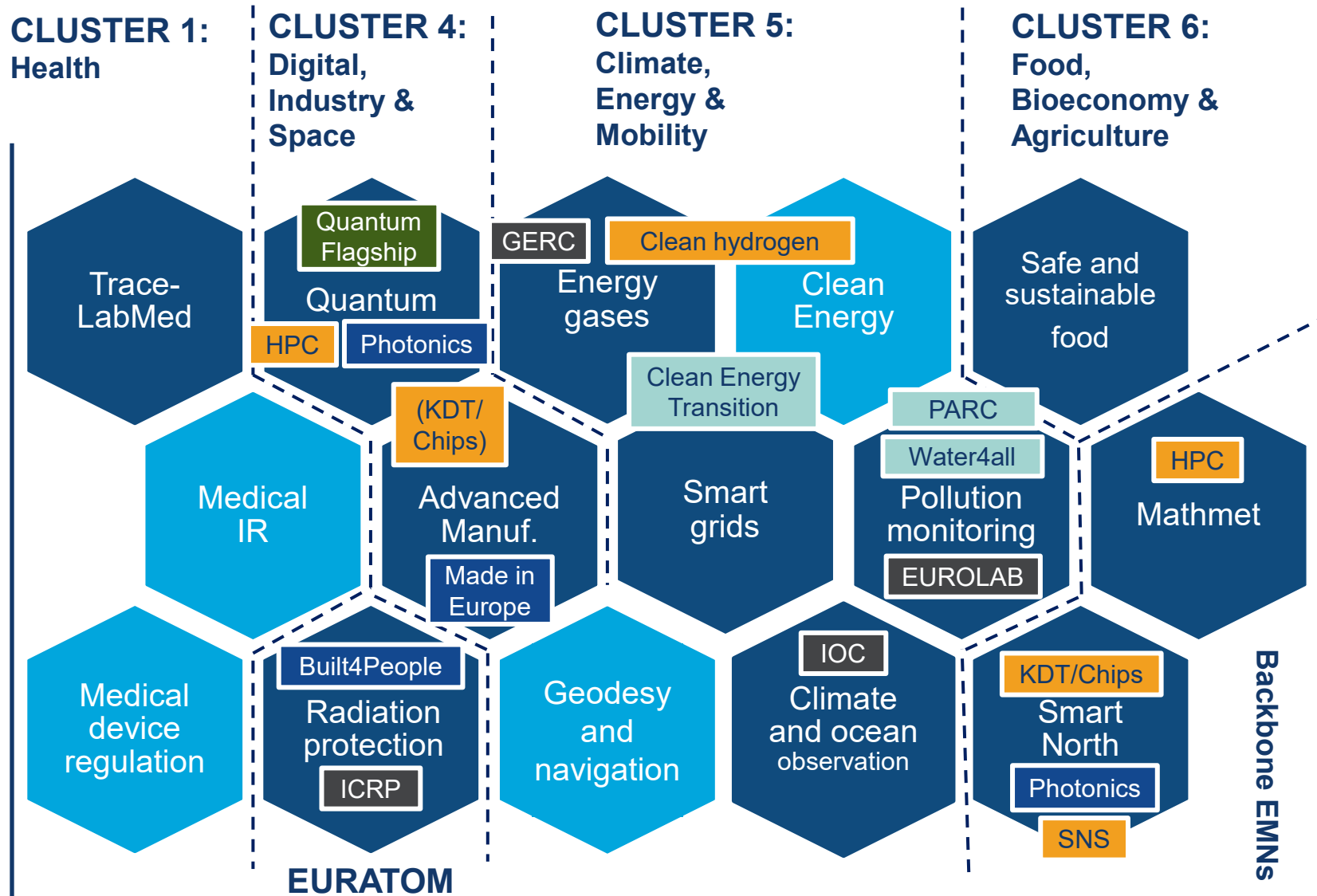
<https://www.euramet.org/metrology-for-societys-challenges/>

Examples of joint research projects on Quantum – call 2017



17FUN03	USOQS	Ultra-stable optical oscillators from quantum coherent and entangled systems
17FUN04	SEQUOIA	Single-electron quantum optics for quantum-enhanced measurements
17FUN05	PhotOQuant	Photonic and Optomechanical Sensors for Nanoscaled and Quantum Thermometry
17FUN06	SIQUST	Single-photon sources as new quantum standards
17FUN07	CC4C	Coulomb Crystals for Clocks
17FUN08	TOPS	Metrology for topological spin structures
17FUN10	ParaWave	Josephson traveling wave parametric amplifier and its application for metrology

Established EMN Liaisons with other European Partnerships & Initiatives



Steering group



DRÖLL Peter (Co-Chair, Director of the Prosperity Directorate EC DG R&I)
KOLIBOVÁ Natália (Co-chair, Czech Office for Standards, Metrology and Testing)

other Partnerships

DIDERICH Michael (Clean Hydrogen JU)
AMIHALACHIOAE Cornelia (Made in Europe)
GIGASE Yves (Key Digital Technologies/Chips Act JU)
PINTO SEPPÄ Isabel (Built for People)

Standardisation, Regulation

COBBAERT Christa (LUMC)
FRIEDL Anna (LMU)
TARASOVA Oksana (WMO)
GANESH Ashok (CEN/CENELEC)

Science

GÜNES Minna (U Aalto)
IMKAMP Dietrich (ZEISS)
RASTELLO Maria Luisa (CIPM)
SKLIAROV Volodymyr (NSC-IM)

EURAMET Chairperson

