

EMPIR Work Programme

Call Scope – Fundamental Metrology (2017)

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Research at the frontiers of measurement science is critical to major advances in science, and vice-versa, and the take-up of excellent science from outside the NMIs and DIs is a key element in the long-term development of metrological capabilities.

The call scope of TP fundamental scientific metrology:

- aims at excellent science exploring new techniques or methods for metrology and novel primary measurement standards, and
- shall bring together the best scientists in Europe and beyond, whilst exploiting the unique capabilities of the National Metrology Institutes and Designated Institutes.

The call on fundamental scientific metrology does not predefine specific technical topics. However, it is expected that the R&D will include high risk research proposals. Some examples are:

- Quantum enhanced SI standards, where the quantum strategies will be exploited to increase the sensitivity and accuracy of measurements
- Fundamental metrology on the single photon / single atom / single molecule level to support down scaling of technologies
- Basic research on the interaction between light and matter, on novel materials, and on new structures with revolutionary photonic properties
- New optical clocks, for which there are many potential atomic reference transitions including nuclear transitions where fundamental research is necessary to define the best candidate
- Metrology for space science and technology (e.g., solar cell metrology, time and frequency metrology, sub-nanometre and picometre interferometry, in-situ and on-orbit metrology and calibration, radar metrology)
- Generic statistical and mathematical methods relevant for metrology
- Basic interdisciplinary metrology between different disciplines – physical, chemical, biological

The involvement of scientific excellence from research institutions outside the NMI's and DI's, and the user community such as industry, and standardisation and regulatory bodies, as appropriate, is strongly recommended.

Proposals will be preferred which aim at the development of a joint, sustainable, and coordinated European landscape of metrology capabilities.