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# CPEM 2018 - Precision Electromagnetic Measurement in Paris

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Observatoire de Paris - PSL Centre de recherche en astronomie et  
astrophysique

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**The Laboratoire national de métrologie et d'essais (LNE), in collaboration with the Centre national de recherche scientifique (CNRS) and the Observatoire de Paris, organize the 2018 Conference on Precision Electromagnetic Measurements (CPEM).**



#### **Logo de la conférence CPEM**

This event is the most important scientific and technological conference in the domain of electromagnetic measurements at the highest accuracy levels. For the first time in 26 years, France will host the prominent event with a focus on the future revision of the International System of Units.

The field of electromagnetic measurements answers numerous present and future challenges regarding industry and society in sectors such as Energy, Information and Communication Technology (nanomaterials, internet of things ...), quantum engineering, Industry 4.0, etc.

## **The most important conference in the domain of electromagnetic measurements**

More than 500 scientists, from national metrology institutes as well as researchers from university laboratories, from industrial and government standards laboratories and representatives of manufacturers, will gather from July 8 to 13 July, at Maison de la Chimie, to share knowledge on research in electromagnetic metrology. This prominent event is held for the first time in 26 years in France and is once again organized by LNE.

Numerous prestigious speakers will animate three special sessions. Among them two Nobel Prize laureates, Serge Haroche, awarded in 2012 for ground-breaking experimental methods that enable measuring and manipulation of individual quantum systems, and Klaus von Klitzing awarded in 1985 for the discovery of the quantized Hall effect.

## **The revision of the International System of Units at the heart of CPEM 2018**

2018 is expected to be a watershed year in the history of the international system of units (SI), with the adoption of the new definitions for the kilogram, the ampere, the kelvin and the mole. All the SI units will then be based on a set of seven defining constants. CPEM 2018 will provide a privileged opportunity to mark this milestone of the SI through a natural focus on quantum devices that relate electrical measurement standards to fundamental constants of physics.

### Special sessions

- Redefinition of the SI : Monday 9 July, 14:00 - 16:00
- Electrical measurements for small mass and force metrology : Tuesday 10 July, 10:50 - 12:30 and Friday 13 July, 10:50 - 12:30
- Metrology and quantum technology : Wednesday 11 July, 16:00 - 18:00
- Electrical measurements for micro-nanoelectronic devices : Thursday 12 July, 10:50 - 12:30
- Nanomagnetism and Spintronics : Friday 13 July, 15:50 - 17:10

### Topics addressed during the week :

- Fundamental Constants and universality tests
- Redefinition of the SI and its implementation
- Realisation and dissemination of the kilogram in the revised SI
- Time and frequency
- Quantum electrical standards
- Quantum electrical standards
- Photonics and optical metrology
- Novel Sensors and Measurements
- Current
- Voltage
- DC Resistance
- Impedance
- Magnetism
- Power and Energy
- High voltage and current
- Radio Frequency / Microwave

*"The organization of an event of international stature as CPEM, which brings together more than 50 nationalities, testifies once again of the LNE's position as one of the most important research organization in metrology in the world, and even more so in electrical metrology. It is thanks to the work of its researchers in electromagnetic that LNE is one of the major players in the kilogram and the ampere revision, set to novembre 2018."*

**Thomas Grenon, LNE's Managing Director**