



**Bureau International des Poids et Mesures**



## **The Metre Convention and the BIPM**

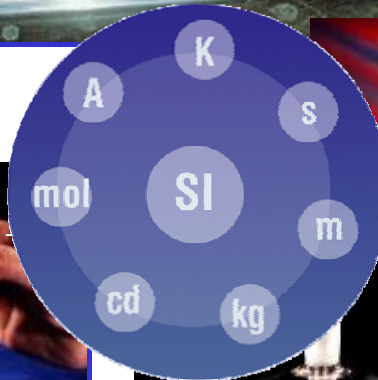
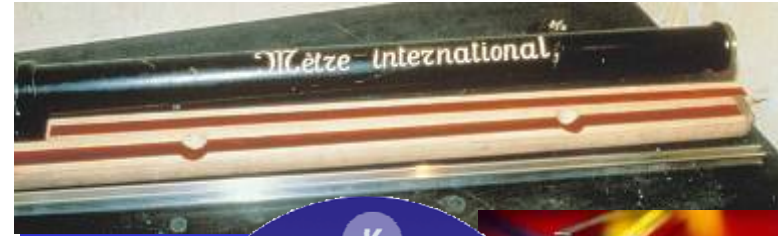
**Prof M. Kühne**  
**Designated Director of the BIPM**



# Brief history of the Metre Convention and the SI

## The Metre Convention and the SI

- ✦ **20 May 1875** - The Metre Convention was signed in Paris by 17 nations. It established the BIPM which is a permanent organizational structure for member governments to act in common accord on all matters relating to units of measurement.
- ✦ **1889** - the international prototypes for the metre and the kilogram, together with the astronomical second as unit of time, create the first international system of units.
- ✦ **1954** - the ampere, kelvin and candela are added as base units.
- ✦ **1960** - the unit system is named as the International System of Units (SI)
- ✦ **1971** - the mole is added as the unit for amount of substance, bringing the total number of base units to seven.



# Bureau International des Poids et Mesures

## The BIPM

It has **headquarters** near Paris, France. It is **financed** jointly by the Member States and Associates, and operates under the exclusive **supervision** of the CIPM.

Its **mandate** is to provide the basis for a single, coherent system of measurements throughout the world, traceable to the International System of Units (SI). This task takes many forms, from **direct dissemination** of units (as in the case of mass and time) to coordination through **international comparisons** of national measurement standards (as in length, electricity and ionizing radiation).

It maintains **laboratories** in areas of: mass, time, frequency and gravimetry, electricity, ionizing radiation, and chemistry.

It has an international **staff** of over 70 .

Its **budget** for 2010 is over eleven million euros.



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# BUREAU INTERNATIONAL DES POIDS ET MESURES



The Pavillon de Breteuil  
today



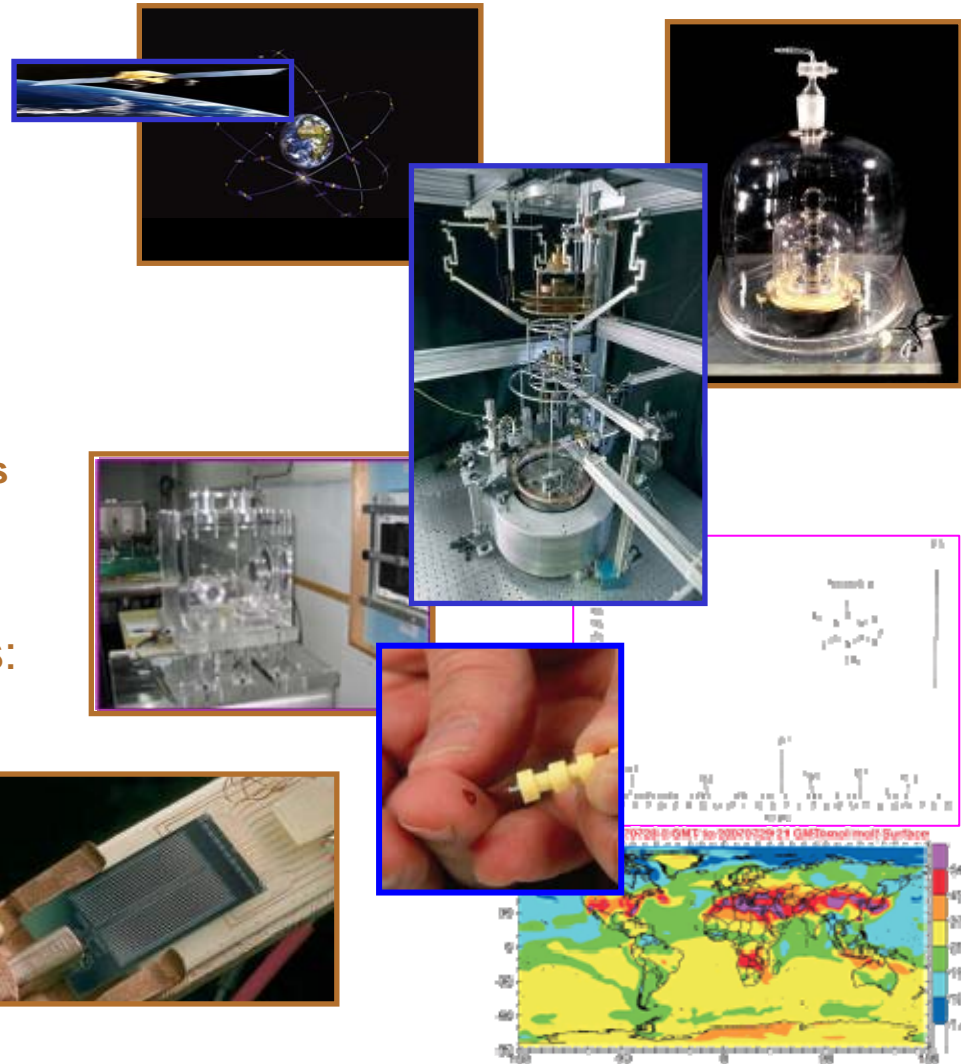
# BIPM Scientific Program

## ✦ The role of the BIPM scientific programme is:

- promote **worldwide uniformity of measurements traceable to the SI** by facilitating comparisons of measurement standards and
- **perform measurement science research** directed at updating the SI as per the needs of society.

## ✦ Current BIPM scientific programmes:

- **Mass**
- **Time, Frequency and Gravimetry**
- **Electricity**
- **Ionizing Radiation**
- **Chemistry**





## BIPM's main technical roles

Maintains and disseminates the kilogram and, after redefinition will continue this task in accordance with the new *mise en pratique*.

Creates and disseminates Coordinated Universal Time (UTC) based on weighted averages of ~ 200 clocks from over 50 National Metrology Institutes worldwide.

Maintains unique world reference facilities e.g., SIR (ionizing radiation and isotopes), ozone spectrophotometers.

Maintains travelling standards to compare fixed national references e.g., Josephson Junctions for the volt, Quantum Hall devices for the ohm, etc.

Coordinates international comparisons and networks e.g., organic chemistry reference materials for laboratory medicine.

Promotes traceable, accurate measurement for physical, engineering, chemical and medical quantities worldwide.

# Comité International des Poids et Mesures

## The CIPM

Is made up of eighteen individuals, each from a different State. Its principal task is to promote worldwide uniformity in units of measurement by direct action or by submitting draft resolutions to the CGPM.

Meets annually and, its duties include:

- ✦ consideration of the work of the BIPM;
- ✦ consideration of reports presented to it by its Consultative Committee
- ✦ consideration of metrological work that Member States decide to do in common and sets up and coordinates activities between specialists in metrology;
- ✦ making appropriate Recommendations;
- ✦ issuing an Annual Report on the administrative and financial position of the BIPM to the Member States;
- ✦ commissioning reports in preparation for CGPMs, and others such as the SI Brochure.

CIPM 1894



CIPM 2007

# Conférence Générale des Poids et Mesures

## The CGPM

Is made up of representatives of the governments of the Member States. Associates States and Economies of the CGPM can attend its meetings.

Meets in Paris once every four years; the 23rd meeting of the CGPM was held in November 2007.

At each meeting

- ✦ it receives a report of the International Committee for Weights and Measures (CIPM) on work accomplished
- ✦ it discusses and examines the arrangements required to ensure the propagation and improvement of the International System of Units (SI)
- ✦ it endorses the results of new fundamental metrological determinations and various scientific resolutions of international scope; and
- ✦ it decides all major issues concerning the organization and development of the BIPM, including the budget of the BIPM for the next four-year period.



# Comité International des Poids et Mesures

## The CIPM Consultative Committees

**CCAUV** Consultative Committee for **Acoustics, Ultrasound and Vibration**

**CCEM** Consultative Committee for **Electricity and Magnetism**

**CCL** Consultative Committee for **Length**

**CCM** Consultative Committee for **Mass** and Related Quantities

**CCPR** Consultative Committee for **Photometry and Radiometry**

**CCQM** Consultative Committee for Amount of Substance (**Chemistry**)

**CCRI** Consultative Committee for **Ionizing Radiation**

**CCT** Consultative Committee for **Thermometry**

**CCTF** Consultative Committee for **Time and Frequency**


**CCU** Consultative Committee for **Units**

# 2010 Membership

## BIPM Members 54

 Argentina	 France	 Mexico	 Thailand
 Australia	 Germany	 The Netherlands	 Turkey
 Austria	 Greece	 New Zealand	 UK
 Belgium	 Hungary	 Norway	 USA
 Brazil	 India	 Pakistan	 Uruguay
 Bulgaria	 Indonesia	 Poland	 Venezuela
 Cameroon	 Iran, Islamic Republic of	 Portugal	
 Canada	 Ireland	 Romania	
 Chile	 Israel	 Russian Federation	
 China	 Italy	 Serbia	
 Croatia	 Japan	 Singapore	
 Czech Republic	 Kazakhstan	 Slovakia	
 Denmark	 Kenya	 South Africa	
 Dominican Republic	 Korea, DPR of	 Spain	
 Egypt	 Korea Republic of	 Sweden	
 Finland	 Malaysia	 Switzerland	

## Associates to the CGPM 28

 Albania	 Lithuania
 Bangladesh	 Macedonia, the FYR of
 Belarus	 Malta
 Bolivia	 Moldova, Republic of
 Chinese Taipei	 Panama
 Costa Rica	 Paraguay
 Cuba	 Peru
 Ecuador	 Philippines
 Estonia	 Slovenia
 Hong Kong (China)	 Sri Lanka
 Ghana	 Tunisia
 Georgia	 Ukraine
 Jamaica	 Vietnam
 Latvia	 CARICOM

2009

2010



# THE CIPM MRA



In 1999, and in support of world trade, the CIPM established a **Mutual Recognition Arrangement (MRA)** of national measurement standards and of calibration and measurement certificates issued by NMIs. The aim of the CIPM MRA is to provide the technical basis for the **worldwide acceptance of national**

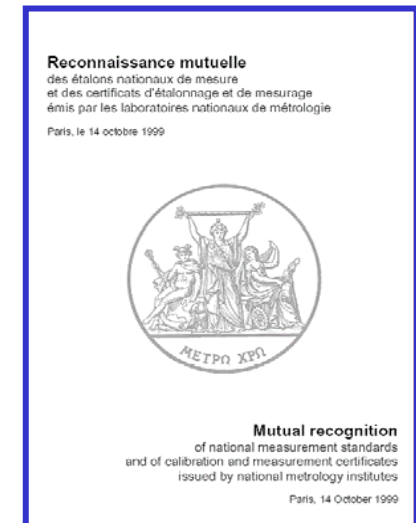
**measurement standards and calibration and measurement certificates of NMIs.**

**Currently, CIPM MRA participants comprise of:**

- ✦ 48 Member States of the BIPM,
- ✦ 3 International Organizations (IAEA, IRMM and WMO), and
- ✦ 26 States/Economies that are Associates of the CGPM.

**Participating NMIs meeting this criteria:**

- ✦ have implemented **quality/management systems** that govern their deliver of services (ISO/IEC 17025 or ISO Guide 34).
- ✦ have their calibration and measurement capabilities (**CMCs**) peer reviewed and publicly declared in the BIPM
- ✦ take part in **key comparisons** that validate their technical proficiency



# CIPM MRA Participation

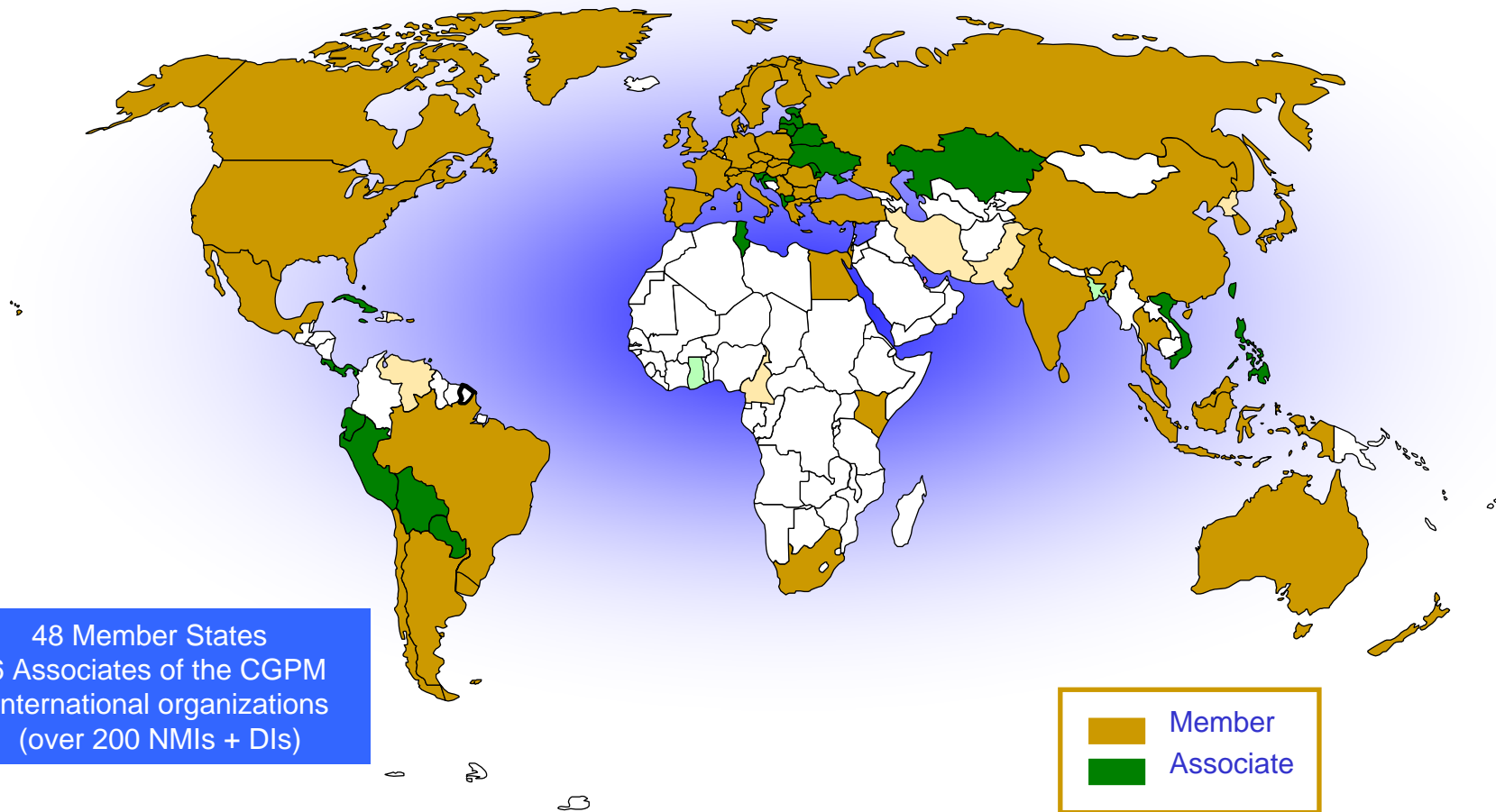
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 Belgium	 Hungary	 Norway	 USA
 Brazil	 India	 Pakistan	 Uruguay
 Bulgaria	 Indonesia	 Poland	 Venezuela
 Cameroon	 Iran, Islamic Republic of	 Portugal	
 Canada	 Ireland	 Romania	
 Chile	 Israel	 Russian Federation	
 China	 Italy	 Serbia	
 Croatia	 Japan	 Singapore	
 Czech Republic	 Kazakhstan	 Slovakia	
 Denmark	 Kenya	 South Africa	
 Dominican Republic	 Korea, DPR of	 Spain	
 Egypt	 Korea Republic of	 Sweden	
 Finland	 Malaysia	 Switzerland	

## Associates to the CGPM 26

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 Ghana	 Tunisia
 Georgia	 Ukraine
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# Participation in the CIPM MRA



# WORLD METROLOGY DAY



The *Salon de l'Horloge* in the French Foreign Ministry in Paris, where the Metre Convention was signed.

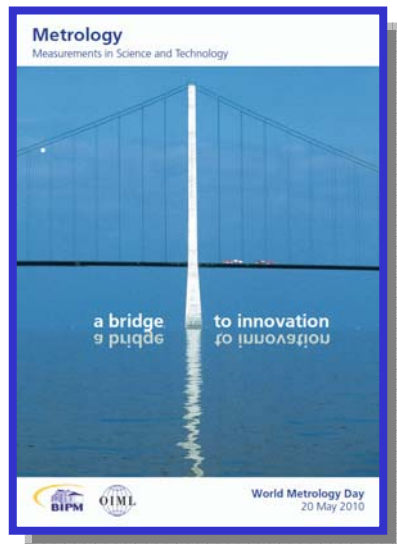
The Metre Convention was signed on 20 May 1875, a date now celebrated as World Metrology Day.

The Convention created the International Bureau of Weights and Measures (**BIPM**) and set the framework for global collaboration in the science of measurement and in its industrial, commercial and societal application.

The original aim of the Metre Convention – the world-wide uniformity of measurement – remains as important today, in 2010, as it was in 1875.

# WORLD METROLOGY DAY 2010

## *Measurements in Science and Technology*



### *Metrology: a bridge to innovation*

#### **Products:**

- Poster (only in English, French, Spanish and Portuguese, and each NMI can do as they wish on their own)
- Website (<http://www.worldmetrologyday.org/>, in English only)
- BIPM Director's message (to the metrology community, in English only)
- Press release (in English only)

#### **Partners:**

BIPM  
PTB

#### **Supporters:**

AFRIMETS	EURAMET
APMP	SIM
COOMET	NCSLI



**Bureau International des Poids et Mesures**

**Thank you for your attention**

**Prof M. Kühne**  
*Designated Director of the BIPM*

