

# BIPM Report to the 49<sup>th</sup> CIML Meeting

Dr Philippe Richard



**B**ureau  
♦ **I**nternational des  
♦ **P**oids et  
♦ **M**esures

49<sup>th</sup> CIML, Auckland  
November 2014

# Content

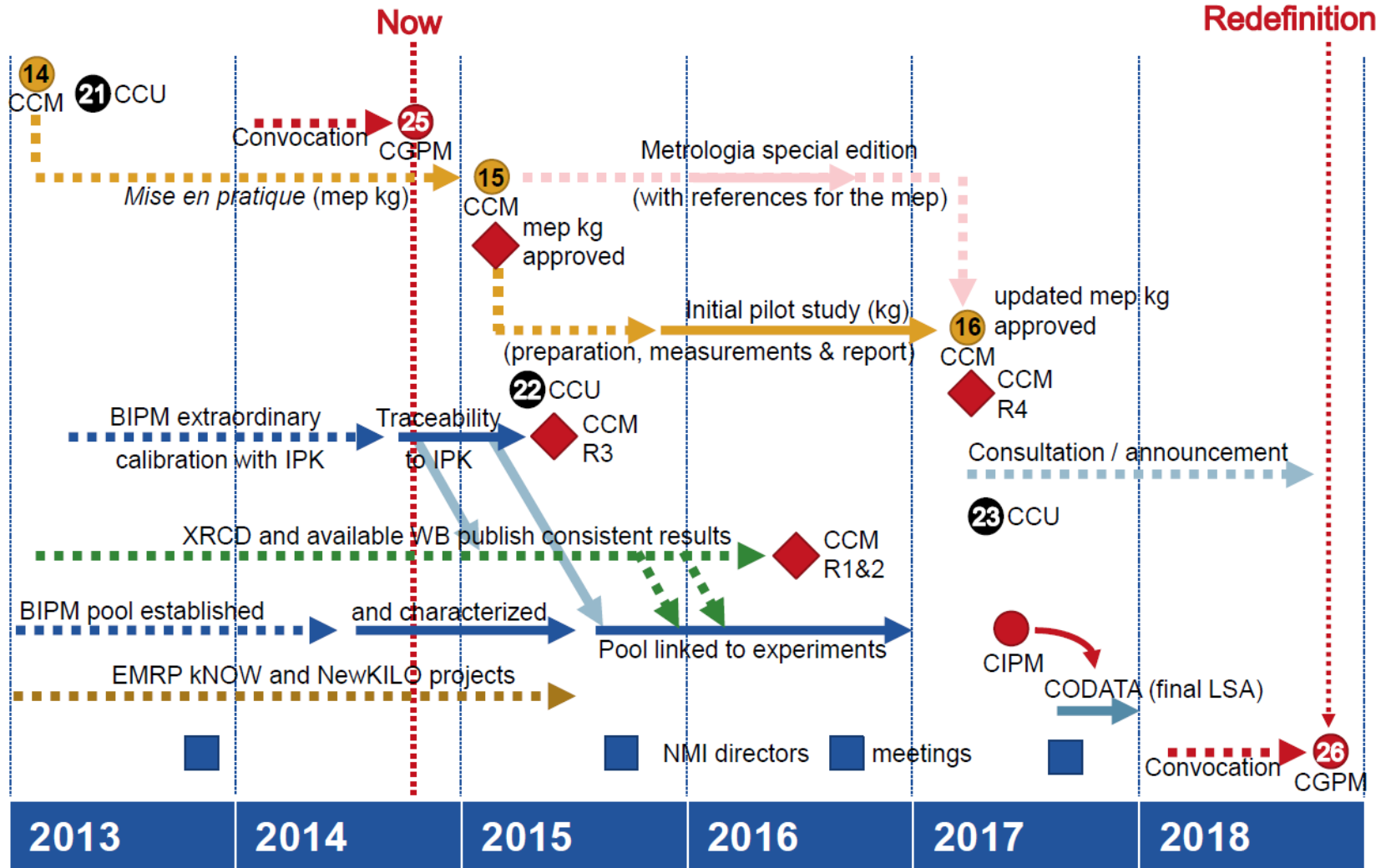
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- ◆ Towards a new SI
- ◆ *25th Conférence Générale des Poids et Mesures*
- ◆ Members and Associates
- ◆ Summary
  - World Metrology Day
  - New BIPM website
  - Meetings for 2015

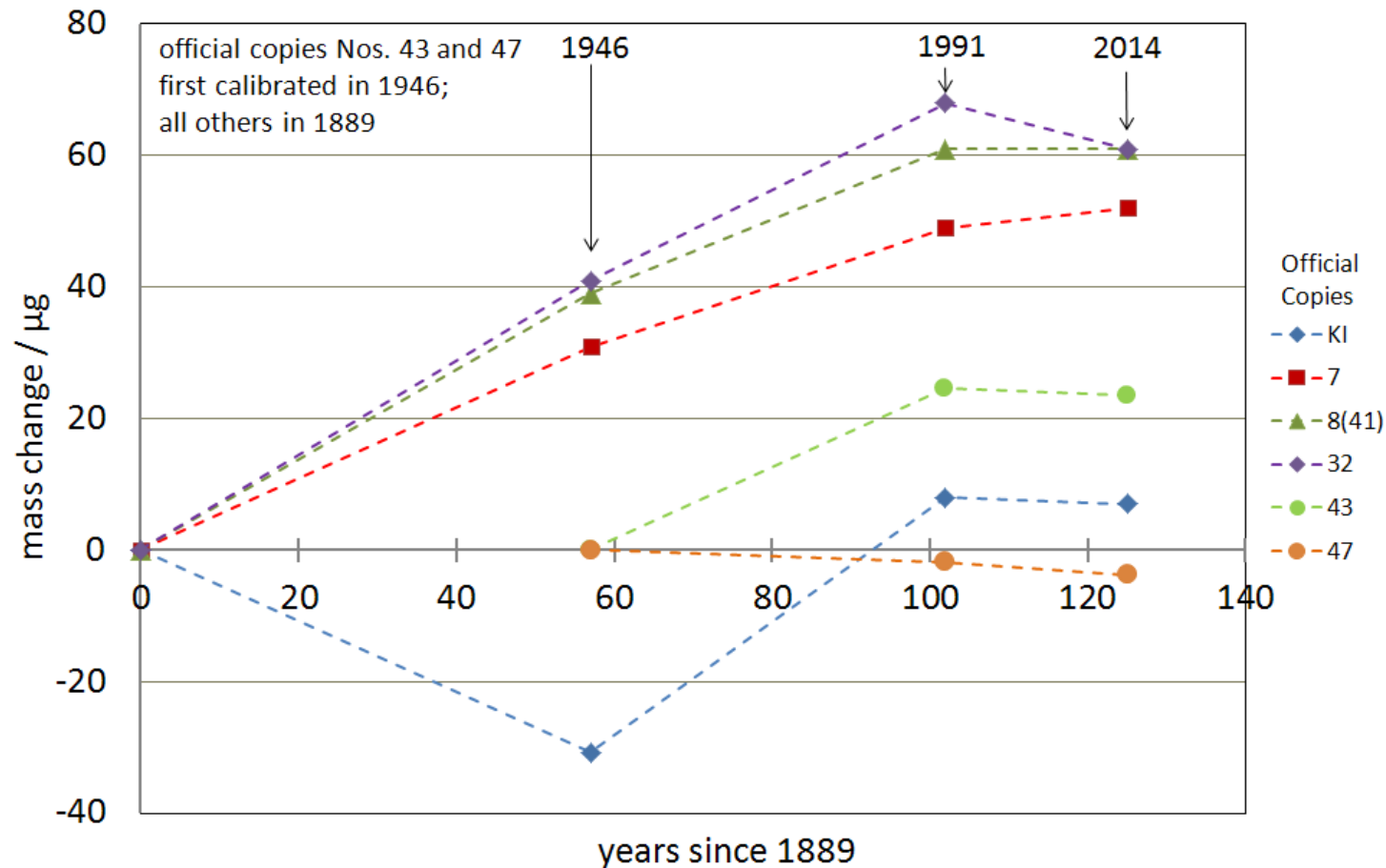
# Towards a new SI



# The CCM roadmap towards a redefinition



# “Extraordinary Calibrations” with the International Prototype of the Kilogram and official copies



average change wrt to IPK:  $-1 \mu\text{g}$

standard deviation:  $3 \mu\text{g}$

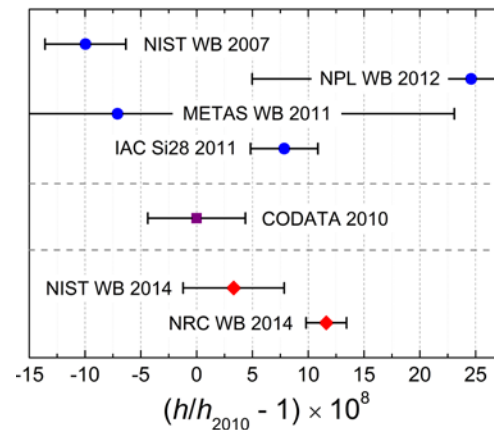
IPK and six official copies form a very consistent set of mass standards

# Towards a new SI

New data published in the latest edition of *Metrologia*.

## CCM criteria

At least 3 experiments, using  
2 different methods with  
 $u_r < 50$  ppb,  
at least one with  $u_r < 20$  ppb.

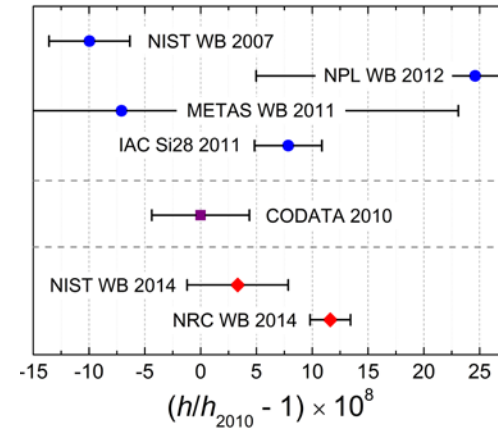


# Towards a new SI

New data published in the latest edition of *Metrologia*.

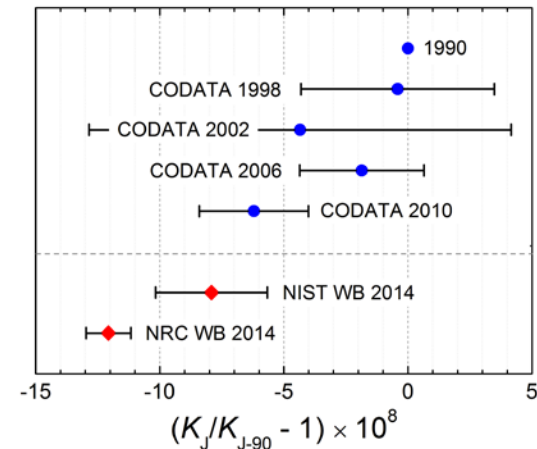
## CCM criteria

At least 3 experiments, using  
2 different methods with  
 $u_r < 50$  ppb,  
at least one with  $u_r < 20$  ppb.



## CCEM - consequences

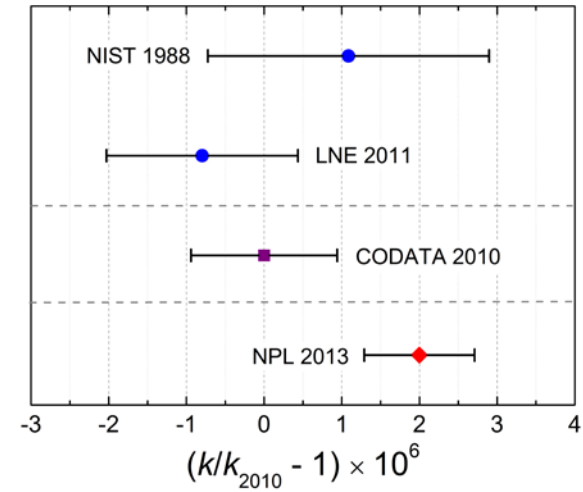
There will be consequences  
for  $K_J$  at the level of 0.1ppm.



# Towards a new SI

## CCT criteria

Value of  $k$  with  $u_r < 1$  ppm  
based on two “fundamentally  
different” methods with  
 $u_r < 3$  ppm.

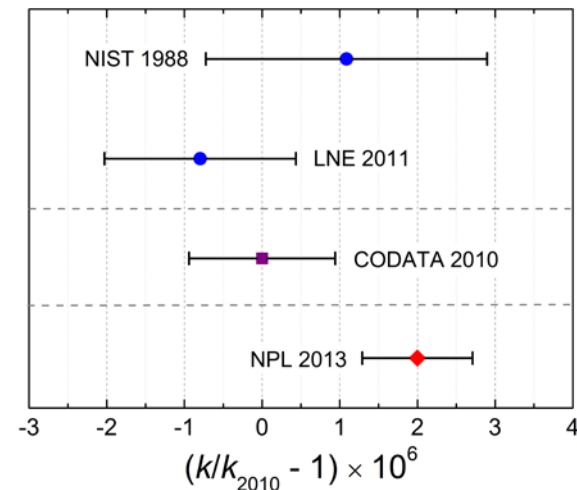




# Towards a new SI

## CCT criteria

Value of  $k$  with  $u_r < 1$  ppm  
based on two “fundamentally  
different” methods with  $u_r < 3$   
ppm.



A very active area

61 references  
75% since 2011

# *25th Conférence Générale des Poids et Mesures*



# 25th Conférence Générale des Poids et Mesures

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- ◆ The General Conference on Weights and Measures (CGPM) is made up of delegates of the governments of the Member States with observers from the Associates of the CGPM.
- ◆ Will meet in Versailles from 18- 20 November 2014
- ◆ Will address six resolutions:
  - A. On the future revision of the International System of Units, the SI
  - B. On the election of the International Committee for Weights and Measures
  - C. On the Pension and Provident Fund of the BIPM
  - D. Dotation of the BIPM for the years 2016 to 2019
  - E. On the importance of the CIPM Mutual Recognition Arrangement

# Proposals for the BIPM Work Programme (2016-19)

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The [BIPM Work programme](#) will be discussed by the Member States at the CGPM:

- ◆ Completed Financial Statements for 2013 fully audited by our external auditor (KPMG Ltd)
  - Long-term financial plan has been revised
- ◆ Published a Long-term Strategy (for 2020, and beyond)
- ◆ Proposed a Work Programme for 2016-2019 on the BIPM website (end April) for comment.
  - a limited number of comments have been received
- ◆ Developed and costed a proposal for a “BIPM Visitor Programme”

# Proposal for a “BIPM Visitor Programme 2016-2019”

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- ◆ For the first time, the BIPM is proposing a “Visitor Programme”
- ◆ It will support:
  - **Opportunities for staff from NMIs in Member States with emerging metrology infrastructure to visit BIPM for 2 or 3 months**
  - Workshops, Seminars and etc...
  - Comparison relevant to the Millennium Development Goals
- ◆ Implemented in collaboration with the RMOs
- ◆ Complementary to existing opportunities or “visiting scientists”
- ◆ Will depend on support from Member States at the 25<sup>th</sup> CGPM.

# Impact of the proposed “BIPM Visitor Programme 2016-2019”

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- ◆ The **world-wide metrology infrastructure** will benefit from access to an enlarged pool of scientific and technical staff leading to the work being shared on a more equitable cost-shared basis world-wide.
- ◆ **NMIs that are developing their metrology infrastructure** will benefit from sending staff to the BIPM on secondment.
  - When these visitors return to their NMIs they will take with them the benefits of exposure to the operation of the world-wide metrology system experienced during their time at the BIPM.
- ◆ **The RMOs** will participate in the process of identifying the highest priority candidates to take part in the programme.
  - They will benefit from the stronger contribution that those individuals will be able to make to the RMO’s activities.
- ◆ Membership of the Metre Convention will have a more tangible benefit to those Associate States that have been formally encouraged to join.

# New Election Process for the CIPM

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**In preparation for the 25th CGPM (November 2014), the CIPM have developed a new election process:**

- ◆ All 18 members of the CIPM will be elected at the CGPM in November.
- ◆ All documentation reviewed by the CIPM and submitted to the CIPM “Ad hoc Working Group” who will confirm the “slate” of candidates put forward for the election.
- ◆ The “old” CIPM will hand over to the “new” CIPM at the March 2015 meeting to maintain continuity.

# Members and Associates





## Members and Associates

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International des  
Poids et  
Mesures**

– the intergovernmental organization through which Member States act together on matters related to measurement science and measurement standards.

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MEASUREMENT UNITS
SERVICES
PUBLICATIONS
MEETINGS

> You are here: BIPM > Member States

## As of 21 July 2014, there are **56 Member States** of the BIPM, and **41 Associate States** and Economies of the General Conference:

### Member States

As of 21 July 2014, there are 56 Member States of the BIPM, and 41 Associates of the General Conference.

➔ **Member States:**

Argentina Australia Austria Belgium Brazil Bulgaria Canada Chile China Colombia Croatia Czech Republic Denmark Dominican Republic Egypt Finland France Germany Greece	Hungary India Indonesia Iran (Islamic Republic of) <u>Iraq</u> Ireland Israel Italy Japan Kazakhstan Kenya Malaysia Mexico Netherlands New Zealand Norway Pakistan Poland Portugal	Republic of Korea Romania Russian Federation Saudi Arabia Serbia Singapore Slovakia South Africa Spain Sweden Switzerland Thailand Tunisia Turkey United Kingdom United States of America Uruguay Venezuela (Bolivarian Republic of)
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Since 20 August 2013, Iraq is a Member State.

#### Summary

- ✦ Notice of Contributions
- ✦ The original signatories
- ✦ Procedure for a State to become a Member of the BIPM

#### Governance

- ✦ BIPM Compendium
- ✦ Procedure for a State to become a Member of the BIPM
- ✦ Notice of Contributions
- ✦ Annual report (and other CIPM publications)

#### Hub for Member States:

- ✦ Directors of NMIs of Member States
- ✦ Representatives of States Parties

Metrology area:
AUV
EM
L
M
PR
QM
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# Members and Associates

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Associates

As of 21 July 2014, there are 56 Member States of the BIPM, and 41 Associates of the General Conference.

→ Associates of the CGPM:

Albania

Bangladesh

Belarus

Bolivia (Plurinational State of)

Bosnia and Herzegovina

Botswana

CARICOM

Chinese Taipei

Costa Rica

Cuba

Ecuador

Estonia

Former Yugoslav Republic of Macedonia

Georgia

Ghana

Hong Kong (China)

Jamaica

Latvia

Lithuania

Luxembourg

Malta

Mauritius

Mongolia

Montenegro

Namibia

Oman

Panama

Paraguay

Peru

Philippines

Republic of Moldova

Seychelles

Slovenia

Sri Lanka

Sudan

Syrian Arab Republic

Ukraine

Viet Nam

Yemen

Zambia

Zimbabwe

Since 26 June 2014, Sudan is an Associate of the CGPM.

Since 29 January 2014, Luxembourg is an Associate of the CGPM.

Since 21 July 2014, Yemen is an Associate of the CGPM.

Governance

BIPM Compendium

Procedure for a State to become a Member of the BIPM

Procedure for a State or Economy to become an Associate of the General Conference

Notice of subscriptions

Related articles

Services available to Associate States and Economies

The CIPM MRA

Participants in the CIPM MRA

List of Member States

Hub for Associates:

Directors of NMIs of Associates

Metrology area:

AUV

EM

L

M

PR

QM

RI

T

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U

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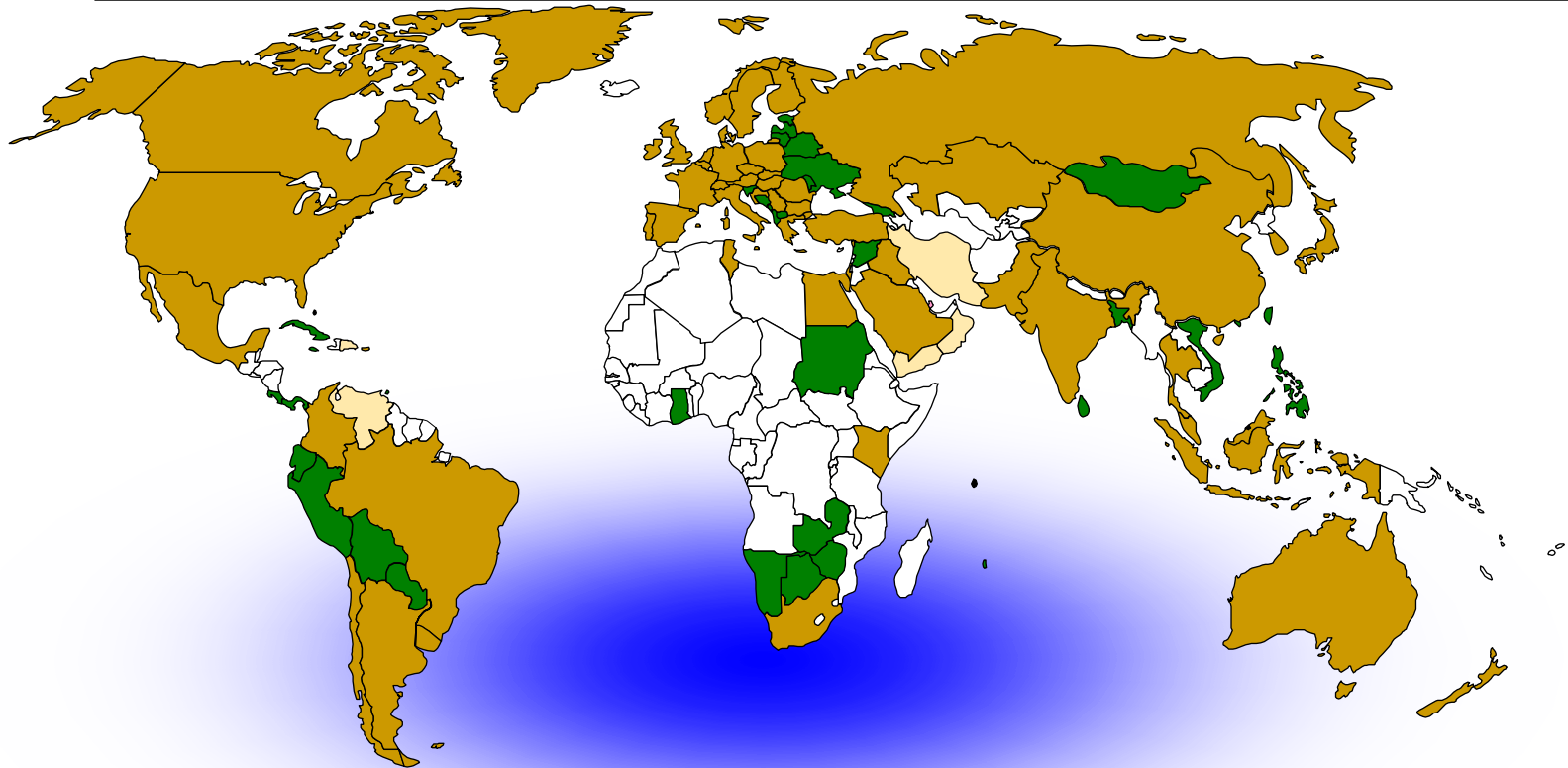
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# CIPM MRA Participation

The CIPM MRA has been signed by the representatives of **95 institutes** – from **53 Member States**, **38 Associates of the CGPM**, and **4 international organizations** – and covers a further **150 institutes** designated by the signatory bodies.



## New signatory of the CIPM MRA:

- ◆ MASM (Mongolia) - on 23 October 2013
- ◆ SSMO (Sudan) - on 26 June 2014

- Member participating in the CIPM MRA
- Associate participating in the CIPM MRA
- Members/Associates not yet signed the CIPM MRA

# World Metrology Day

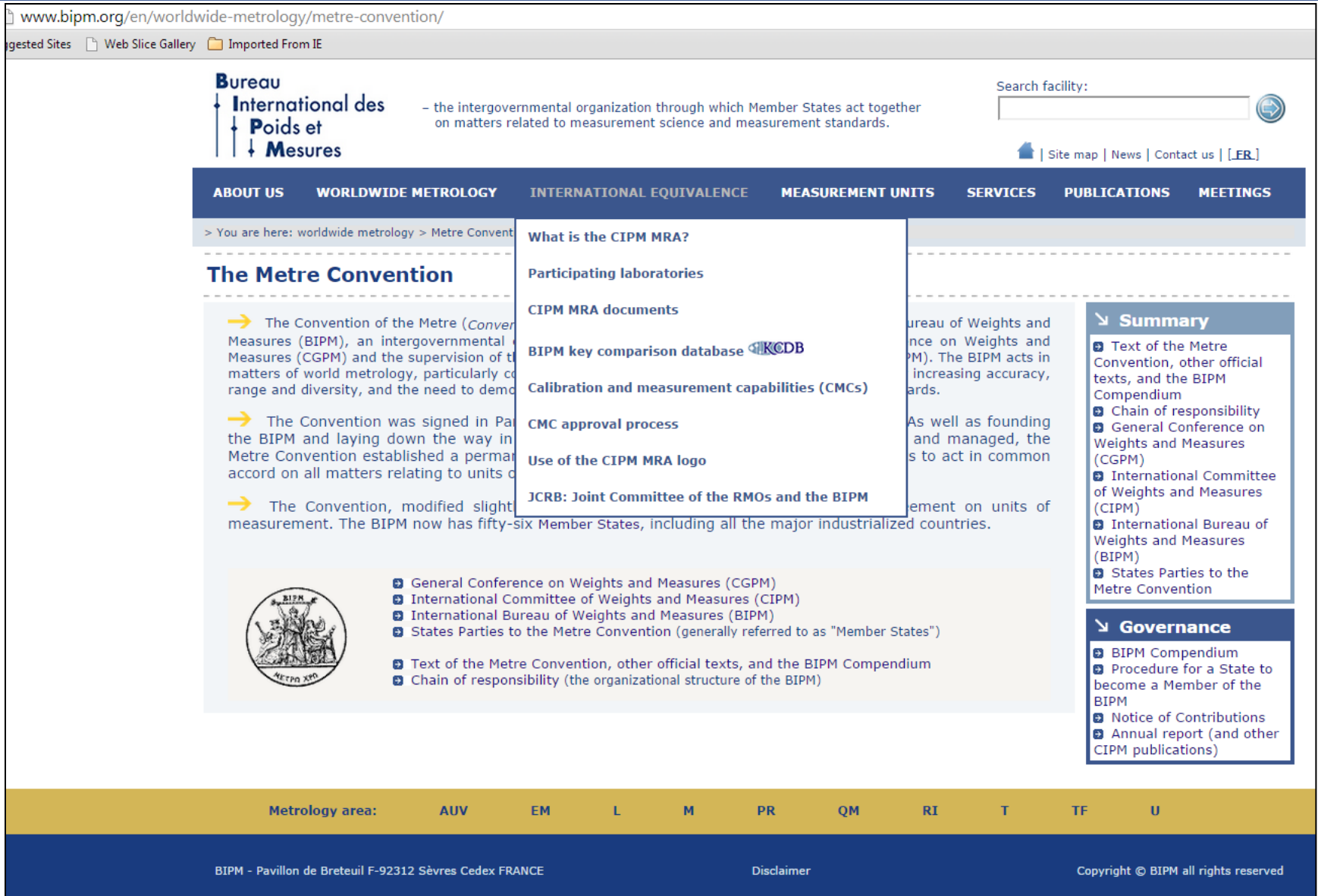


- ◆ Events recorded on the website in 26 countries.
- ◆ Poster translated into 24 languages.
- ◆ A new record set according to all metrics: distinct visits, pages viewed, hits and volume

- ◆ Theme for World Metrology day 2015: **Measurements and Light**
- ◆ Will complement the UN “Year of Light”

Argentina Azerbaijan Australia Belgium Brazil Colombia Egypt Ethiopia Gambia Germany IMEKO  
India Italy Mexico Mongolia Norway Palestine Poland Russian Federation Saint Lucia Saudi Arabia Senegal  
Singapore Spain Sri Lanka Tunisia Turkey United Kingdom United States

# Evolution of the BIPM website





# Evolution of the BIPM website

www.bipm.org/en/cipm-mra/cipm-mra-documents/

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> You are here: international equivalence: the CIPM MRA > CIPM MRA documents

## CIPM MRA documents

Policy documents **Guidance on CMCs** Guidance on comparisons Complementary info. Us

	Title
✓	Calibration and Measurement Capabilities in the context of the CIPM MRA
✓	Additional instructions and templates for CMC excel files:   General   AUV   EM   PR   QM   RI   TF
✓	<b>Links to RMO Guidelines on Quality Systems and CMCs:</b>   AFRIMETS   APMP   COOMET   EURAMET   SIM
✓	For the classification of services in the various fields, see:  AUV   EM   L   M   PR   QM   RI   T   TF
✓	Traceability in the CIPM MRA
✓	JCRB guidelines for the monitoring and reporting of the operation of quality systems by
✓	Guidelines for the review of CMCs and the monitoring and reporting of the operation of international intergovernmental organizations who are signatories of the CIPM MRA
✓	Recommendations for on-site visits by peers and selection criteria for on-site visit peer r
✓	Uncertainty contributions of the device under calibration or measurement
✓	Subcontracting of measurements under the CIPM MRA

**Time and Frequency Metrology**

- Committee structure
- Strategic plan
- What time is it?
- Timescales
- Unit of time (second)
-  International comparisons
-  Calibration and measurement capabilities (CMCs)
- Recommended values of standard frequencies
- BIPM technical work
- BIPM calibrations: Time transfer equipment
- BIPM technical publications
- BIPM Annual Report on Time Activities
- FTP server of the BIPM Time Department
- IERS Conventions Center
- BIPM liaison and coordination work
- BIPM contact

Metrology area: AUV EM L M PR QM RI T **TF** U

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# Evolution of the BIPM website

www.bipm.org/en/worldwide-metrology/regional/apmp.html

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> You are here: worldwide metrology > RMOs > Asia Pacific Metrology Programme

## Asia Pacific Metrology Programme (APMP)


Version française



APMP website: <http://www.apmpweb.org/>

Official representative to the JCRB: Dr Peter Fisk

APMP Presidency and Technical Chairpersons



- Calibration and measurement capabilities (CMCs) declared through APMP
- Measurement comparisons organized by APMP

For up-to-date information about APMP please refer to the APMP website.

Summary

- AFRIMETS
- APMP
- SIM
- EURAMET
- COOMET
- Procedure for approval of the entry of a new RMO to the JCRB

Relations with the BIPM:

- Member State
- Associate

APMP: Full Members Associate Members

State/Economy:	Organization:	Participates in the CIPM MRA?
Australia	National Measurement Institute, Australia (NMIA)	YES
	Australian Radiation Protection and Nuclear Safety Agency (ARPANSA)	YES
	Australian Nuclear Science and Technology Organisation (ANSTO)	YES
Bangladesh	Bangladesh National Metrology Laboratory (NML-BSTI)	YES
	Designated Reference Institute for Chemical Measurements (DRICM)	YES
China	National Institute of Metrology (NIM)	YES
Chinese Taipei	Center for Measurement Standards/Industrial Technology Research Institute (CMS/ITRI)	YES
	Institute of Nuclear Energy Research (INER)	YES
	Chunghwa Telecom Co., Ltd.(Chunghwa T)	YES
DPR of Korea		

# Meetings in 2015

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- ◆ Feb 2015 – “new” CIPM, JCRB
- ◆ June/July 2015 BIPM Workshops on
  - The New Guide to the Expression of Uncertainty (GUM)
  - Carbon Metrology
- ◆ October 2015 - NMI Director's Meeting (to review the MRA)
- ◆ Also during 2015
  - CCM
  - CCRI
  - CCQM
  - CCTF
  - CCL
  - CCAUV



Thank you.

<http://www.bipm.org>

[Martin.Milton@bipm.org](mailto:Martin.Milton@bipm.org)

