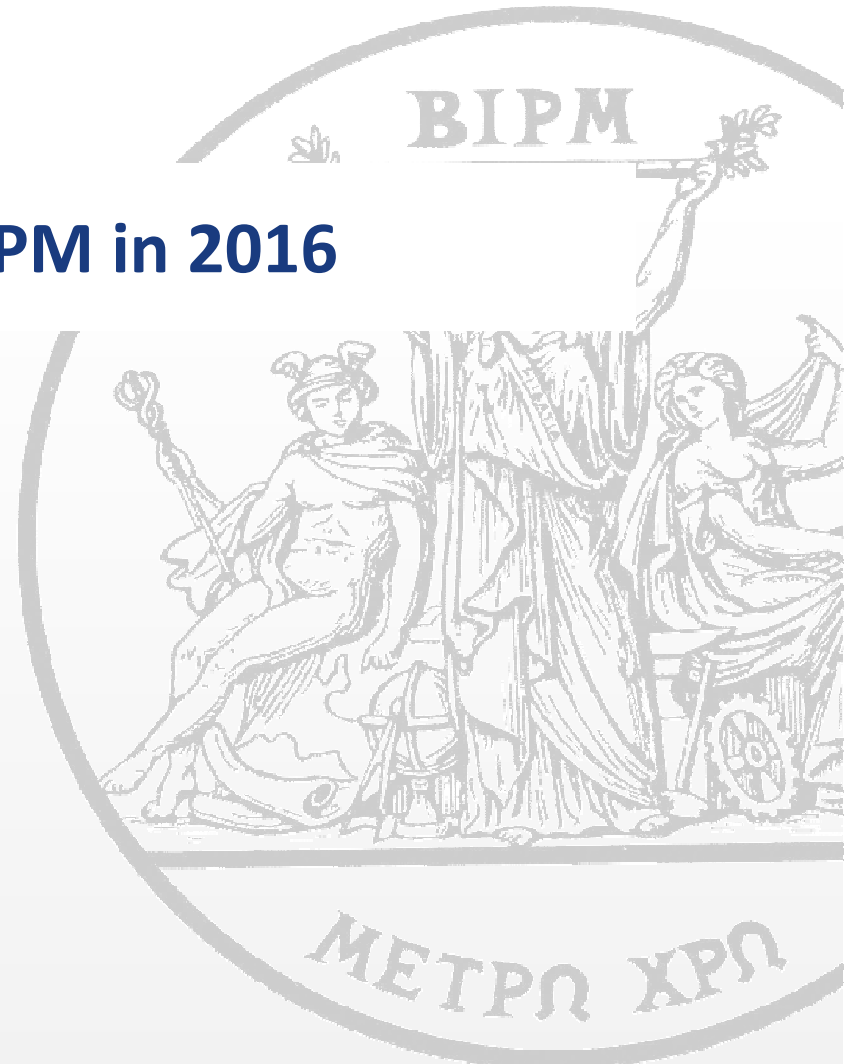


Highlights in the work of the BIPM in 2016

Dr Martin Milton
BIPM Director

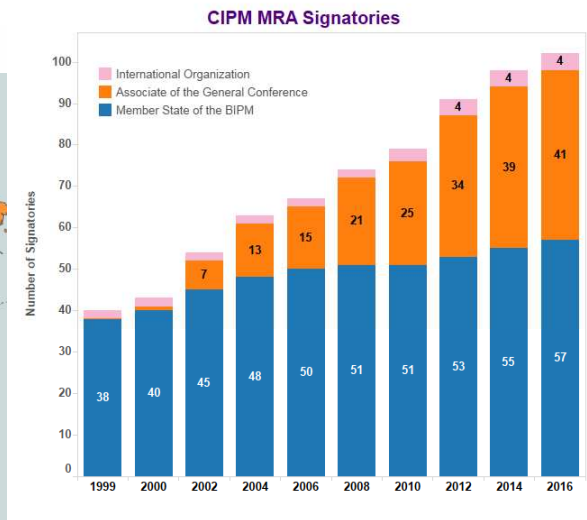
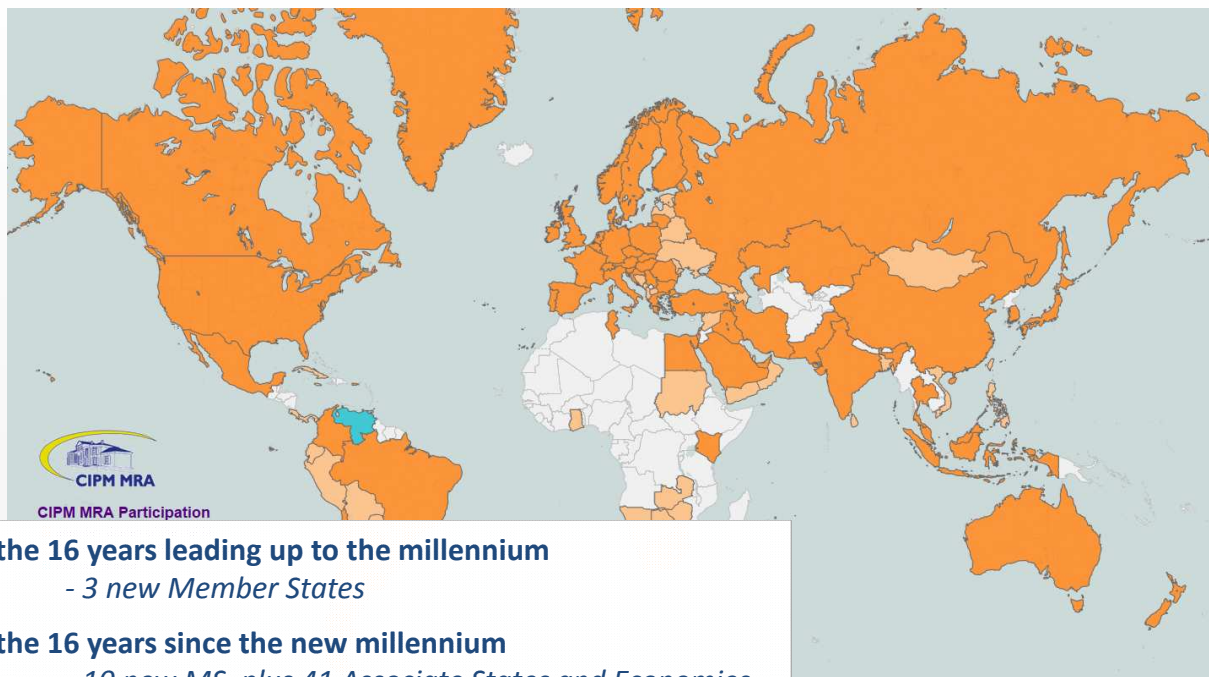
14 November 2016

Bureau
| **I**nternational des
| **P**oids et
| **M**esures



Participation in the activities of the BIPM

Currently 58 Member States and 41 Associates of the General Conference



Includes countries and economies with emerging metrology systems (CEEMS)

At the very least Associates want to be able to participate in the CIPM MRA (the reason for Associate status)

In the 16 years leading up to the millennium
 - 3 new Member States

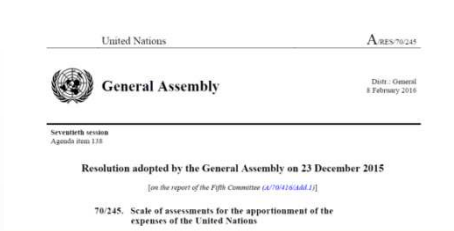
In the 16 years since the new millennium
 - 10 new MS, plus 41 Associate States and Economies

Changes in members and associates

- ◆ **Lithuania**, became a Member State on 16 April 2015 (previously an Associate since 2001),
- ◆ The **United Arab Emirates**, became a Member State on 27 April 2015, and
- ◆ **Slovenia**, became a Member State on 23 March 2016 (previously an Associate since 2003).

- ◆ There are two new Associate States:
 - **Qatar** became an Associate of the CGPM on 10 March 2016, and
 - **Sri Lanka** (previously an Associate but excluded at the end of 2014) became an Associate once again on 17 August 2016.
- ◆ No new Associates entered the “escalator”.
 - There are currently 17 Associate States on the escalator (one less than in the Notification for 2016 as Slovenia has now acceded).

New UN Scale of Assessment – BIPM Notification for 2017



- A new scale of assessment for the three years 2016-2018 was issued by the UN in February 2016,
- This requires an adjustment to the 2016 contributions and subscriptions (which had been prepared in December 2015 on the 2013-2015 UN scale).
- **Full details of the calculation of contributions and subscriptions are available in two explanatory notes available from the BIPM website.**

Explanatory note

Calculation of Member State Contributions to the BIPM Dotation

And other adjustments that may appear on the annual Notification to Member States

Calculation of the Subscriptions for Associate States and Economies of the CGPM

And other adjustments that may appear on the annual Notification to Associates

Increase in contributions and subscriptions follows plan:

Associate	Date meeting criteria	Period of increasing subscription		Step on ladder:
		Start	90% MS	
Belarus	before 2011	2013	2017	4
Costa Rica	before 2011	2013	2017	
Cuba	before 2011	2013	2017	
Ecuador	October 2011	2013	2017	
Jamaica	before 2011	2013	2017	2
Latvia	before 2011	2013	2017	
Panama	before 2011	2013	2017	1
Ukraine	before 2011	2013	2017	
Viet Nam	before 2011	2013	2017	
Albania	June 2013	2015	2019	2
Macedonia, the FYR of	October 2013	2015	2019	
Moldova, Republic of	October 2013	2015	2019	1
Estonia	November 2014	2016	2020	
Georgia	November 2014	2016	2020	
Paraguay	November 2014	2016	2020	
Peru	November 2014	2016	2020	
Republic of Philippines	March 2014	2016	2020	

- Draft versions of the Notification will be available from the website.
- Note- the matter of possible re-distribution of arrears from Venezuela has not yet been included.

BIPM-WADA Workshop



“Standards and Metrology in support of Anti-Doping Analysis” (28-29 Sept 2016)



Secretary of State for Sport,
Thierry BRAILLARD,
Préfet des Hauts-de-Seine,
Pierre SOUBELET
Chair of WADA Technical Commission
Valerie FOURNEYRON,

Workshop Recommendations

- ◆ Produce and a prioritized list of CRMs required for anti-doping analysis (WADA)
- ◆ Carry out environment scan of opportunity to utilize existing accuracy based EQAS for measurands in blood/serum (WADA)
- ◆ Raise awareness in Member States of the need for Measurement Standards (CRMs) in support of Anti-Doping Analysis (BIPM & WADA)
- ◆ Seek to make best use of expertise at NMIs, Anti-doping laboratories, Laboratory medicine reference laboratories for developing anti-doping analysis
- ◆ Produce documented examples of MU for educational/information purposes (WADA with NMI support)
- ◆ Share best practice on processes for optimizing knowledge transfer between laboratories (BIPM/NMIs with WADA)
- ◆ Work towards harmonizing LOD and LOQ calculations (WADA with NMI support)

100 participants from NMIs,
National Anti-doping and Clinical
Chemistry Laboratories



Mass Department - CCM Pilot Study

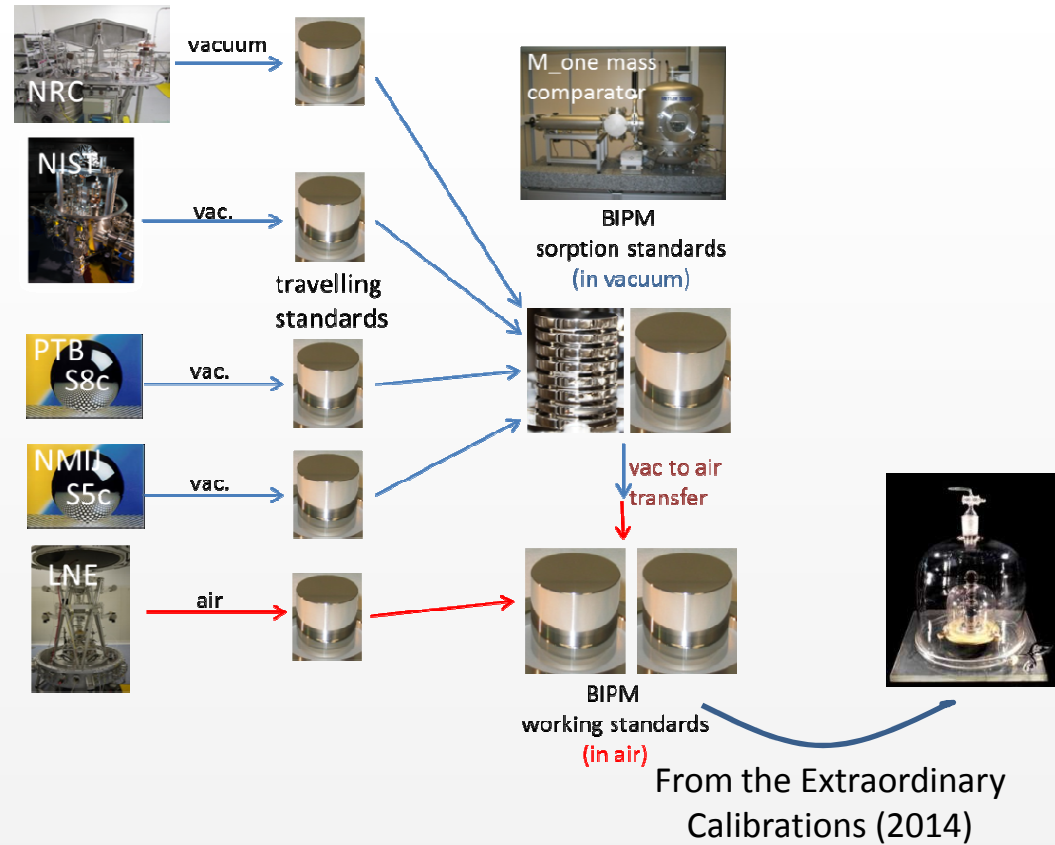
comparison of future primary realizations of the kilogram

Objectives

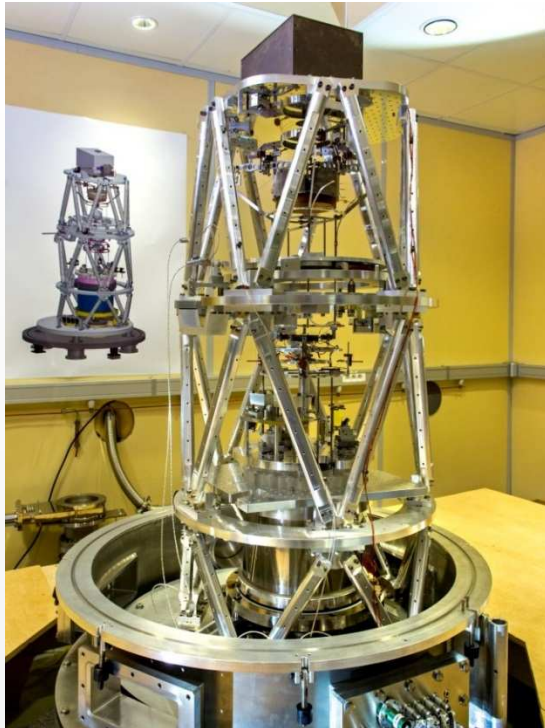
- To test the consistency of independent realizations of the kg
- To test for continuity with the present definition

Status to date

- Measurements close to completion
- Report being prepared
- Results are satisfactory - consistent with results for h
- No apparent obstacle for redefinition

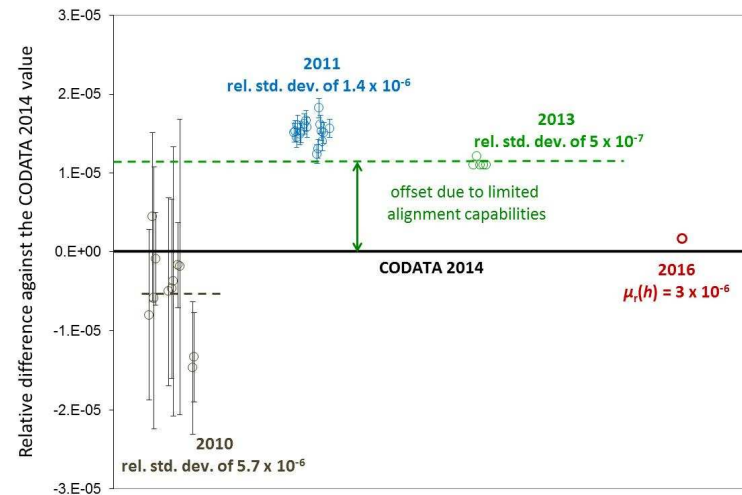


Status of the BIPM Kibble Balance (*aka* watt balance)



- new open support structure
- new interferometer
- accurately aligned magnet ($10 \mu\text{rad}$)

Evolution of measurement uncertainty

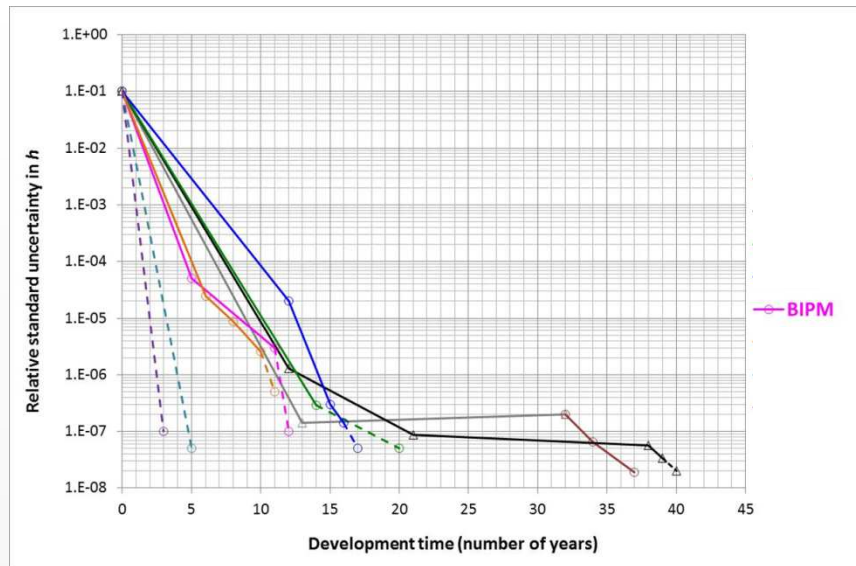


present uncertainty $\sim 3 \times 10^{-6}$

estimated uncertainty by June 2017 $\sim 1 \times 10^{-7}$

- improved alignment
- noise reduction on force measurement
- larger mass
- operation under vacuum

Evolution of uncertainties of watt balance projects



solid lines: published
dashed lines: projected

BIPM watt balance project

4 full-time staff



Dr Hao FANG

Principal Physicist
>10 years experience
(also CCM Exec. Sec.)



Dr Franck BIELSA

Physicist
8 years experience
at BIPM since 2014



Dr Shisong LI

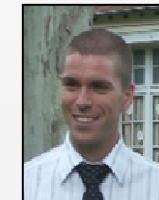
Research fellow
1 year experience (NIM, NIST)
at BIPM since 09/2016



Adrien KISS

Engineer
9 years experience

Supported by 3 staff
in the electricity team



105th CIPM Meeting – October 2016

- ◆ Decisions published on BIPM website
- ◆ Dr I. Castelazo (Mexico) elected as President of the CCL.
- ◆ Provisional election conducted for 3 places
 - Now waiting for confirmation by the « Committee for CIPM Election »



Decision CIPM/105-26

All Member States will have the right for one national laboratory charged with establishing national standards in the field to be an Observer at the applicable Consultative Committee and to send one person (only) and following their request for each meeting.

Plans for the 26th CGPM

- ◆ Week of 13 to 16 November 2018

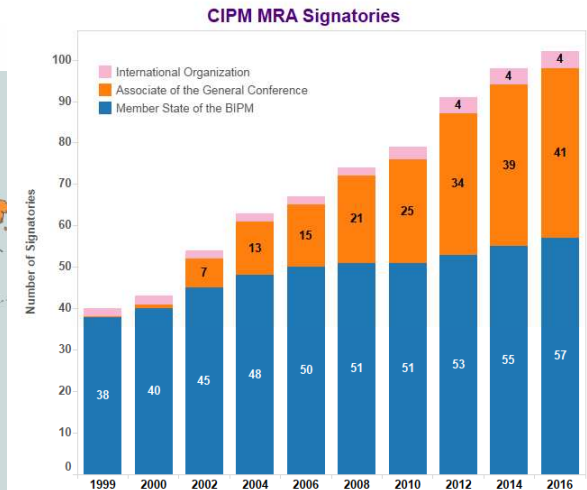
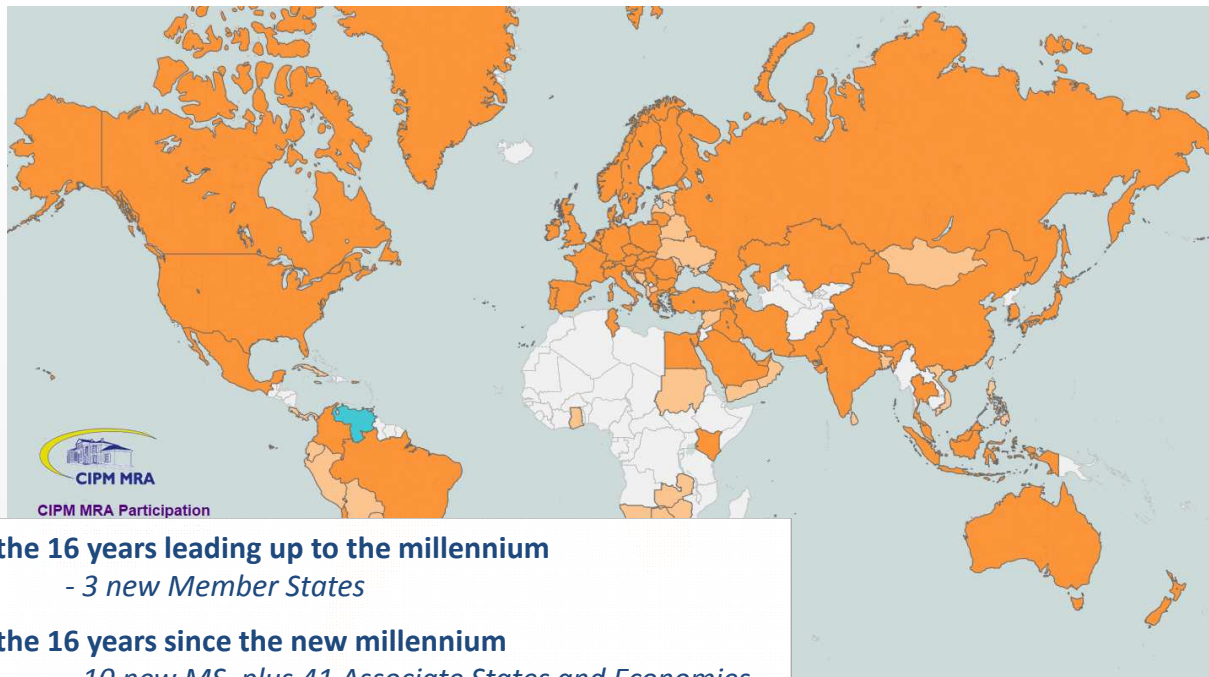
- ◆ Likely format:
 - one preparation day (at BIPM),
 - followed by a 4-day meeting (in Versailles).

- ◆ There will be a lot of effort put into planning media involvement in the decision about the revised SI.

	Morning	Afternoon
Monday	Informal dotation meeting (at the BIPM)	Lab tours
Tuesday	<ul style="list-style-type: none"> • Official opening speeches – CIPM President's and BIPM Director's reports. • BIPM finance report, BIPM pension report • New Vision, Mission and Objectives for the BIPM 	<ul style="list-style-type: none"> • Feedback on the review of the MRA • The leap second + report from WTC (2015), • Lecture on fibre-optic linked clocks. • CCTF and CCL reports,
Wednesday	<ul style="list-style-type: none"> • Discussion of member states in arrears and re-scheduling • Proposals for BIPM Work Programme (2020-2023) 	<ul style="list-style-type: none"> • Proposals for dotation (2020-2023) • Informal dotation meeting
Thursday	<ul style="list-style-type: none"> • Speaker from the World Bank + discussion of Quality Infrastructure, ILAC & ISO speakers(?). • Speaker from UNESCO + Capacity Building • Feedback on successes from the CBKT project • OIML + discussion of collaboration on CEEMS 	<ul style="list-style-type: none"> • Anti-drugs (WADA) and /or diagnostics (Abbott) • CCQM and JCTLM reports. • IAEA talk • CCRI + CCAUV + CCT(?) reports • WMO (Solar radiation) + CCPR report
Friday	<u>Open Session (including press, media etc)</u> <ul style="list-style-type: none"> • CCU, CCEM, CCT (?) and CCM reports • 3 or 4 science talks: achievements and future of the SI • Resolution No 1 « On the re-definition of the SI » 	<ul style="list-style-type: none"> • Election of CIPM • Approval of other resolutions (inc BIPM dotation)

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Capacity Building & Knowledge Transfer Activities



Three main thrusts:

Focused capacity building opportunities at the BIPM

01

Engagement with the Global QI capacity building community

02

Scientific comparisons of particular interest to Member States that are developing countries

03

The programme is open to ideas from sponsors that contribute to the objectives

Within the broad objectives, the sponsor agrees with BIPM:

- ◆ Which type of action they wish to support;
- ◆ The specific topic;
- ◆ Whether to open to Associates;
- ◆ Whether to focus on supporting particular regions.

2016 "Leaders of Tomorrow" course



NIST sponsored 11 day course

Confirmed

Aimed at new, inexperienced and potential RMO TC and WG Chairs/ Convenors.

- Will facilitate participants ability to fulfil their CIPM MRA obligations
- Benefiting all by more effective operation of the CIPM MRA processes.

Course dates:

7 – 18 November, 2016

Location:

BIPM, Sevres

Places favoured Africa and Americas

Bureau 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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> You are here: BIPM CB&KT programme > Leaders of Tomorrow

2016 "Leaders of Tomorrow" course: Outline and status

→ The "Leaders of Tomorrow" course is aimed at new, inexperienced and potential Regional Metrology Organization Technical Committee Chairs and Working Group Convenors. Training will enable participants to fulfil their CIPM MRA obligations as TC Chairs/WG Convenors, with the wider benefit of ensuring the effective operation of the CIPM MRA processes.

- **Application process:**
The application period for the course has now closed. Candidates have been selected and notified of their placement in the course.
- **Financial support:**
Support is available for selected applicants covering course participation, air fare and hotel costs.
- **Course dates:**
7-18 November 2016, at the BIPM.
- **Programme:**
 Draft programme (v4)
- **Sponsor:**
The course is fully funded by NIST.

NIST National Institute of Standards and Technology
U.S. Department of Commerce

2016 "Leaders of Tomorrow" course



Trainees

Trainee	Origin	NMI	RMO
Gibson Aguko	Kenya	KEBS	AFRIMETS
Karina Bastida	Argentina	INTI	SIM
Jariya Buajareern	Thailand	NIMT	APMP
Valnei De Cunha	Brazil	INMETRO	SIM
Efrem Kebede Ejigu	South Africa	NMISA	AFRIMETS
Raphael Galea	Canada	NRC	SIM
Nedzadeta Hodzic	Bosnia Herzegovina	IMBIH	EURAMET
Gouda Hussien	Egypt	NIS	AFRIMETS
Sibusiso Jozela	South Africa	NMISA	AFRIMETS
Omar Kanakrieh	Saudi Arabia	SASO	GULFMET
Irena Kolozinska	Ukraine	NSC "Inst. of Metr."	COOMET
Katrice Lippa	USA	NIST	SIM
Alexander Matlejoane	South Africa	NMISA	AFRIMETS
Edgar Mendez	Mexico	CENAM	SIM
Luis Chaves Santacruz	Costa Rica	LACOMET	SIM
Raul Solis	Panama	CENAMEP	SIM
David Tonui	Kenya	KEBS	AFRIMETS
Maryna Yarmalovich	Belarus	BeIGIM	COOMET

Lecturers

Speaker	Topic
Dr Wolfgang Schmid	Role of DIs in EURAMET
Dr Mariela Trujillo	Role of DIs in SIM
Dr Stuart Davidson	Specific guidelines for comparisons and CMCs in M
Dr Andrew Lewis	Specific guidelines for comparisons and CMCs in L
Dr Lucas di Lillo	Specific guidelines for comparisons and CMCs in EM (I)
Dr Luca Callegaro	Specific guidelines for comparisons and CMCs in EM (II)
Dr John Keightley	Specific guidelines for comparisons and CMCs in IR
Dr Angelique Botha	Specific guidelines for comparisons and CMCs in QM
Dr Ramiz Hamid	Specific guidelines for comparisons and CMCs in TF
Dr Gregory Strouse	Specific guidelines for comparisons and CMCs in T
Prof. Noha Khaled	RMO structure and QS: AFRIMETS
Dr Enver Sadikoglu	RMO structure and QS: EURAMET
Ing. Gabriela de la Guardia	RMO structure and QS: SIM
Dr Natalia Muravskaya	RMO structure and QS: COOMET
Eng. Omar Kanakrieh *	RMO structure and QS: GULFMET
Mr Ian Dunmill	OIML - General
Mr Poul Dixon	OIML – Certificate system
Mr Sean Mac Curtain	ISO
Mr Laurent Vinson	ILAC
Dr Mala Khan	Case study: Bangladesh
Prof. Philip N. Dearden	Hitting the target
CC Executive Secretaries	CC strategy, structure and operations
Other BIPM staff	CIPM MRA etc

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		INMETRO	SIM
		NMISA	AFRIMETS
		NRC	SIM
		IMBIH	EURAMET
		NIS	AFRIMETS
		NMISA	AFRIMETS
		SASO	GULFMET
		NSC "Inst. of Metr."	COOMET
		NIST	SIM
		NMISA	AFRIMETS
Edgar Mendez	Mexico	CENAM	SIM
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Dr Luca	
Dr Luca	
Dr John	
Dr Ange	
Dr Ram	
Dr Greg	
Prof. No	
Dr Enve	
Ing. Gal	
Dr Nata	
Eng. Or	
Mr Ian	
Mr Pou	
Mr Sean Mac Curtain	ISO
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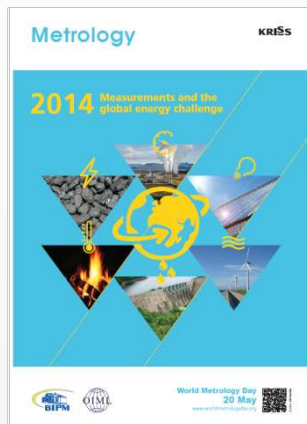


CBKT Status summary

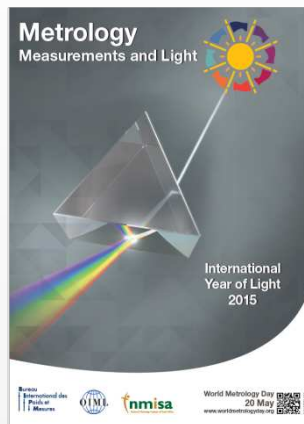


- ◆ “Leaders of tomorrow”, **7 to 18 Nov 2016**. *Confirmed – sponsors: NIST*
- ◆ “Sound beginning in the CIPM MRA”, **13 to 24 Nov 2017**. *Confirmed – sponsors: NIST*
- ◆ “Metrology for safe food and feed in developing countries” *Confirmed, sponsors: (NIM, NMISA, PTB, UME).*
- ◆ “Metrology for clean air “ *Confirmed, sponsors: PTB (seeking further participation/sponsorship)*
- ◆ “TC Workshop, Dubai” **22 to 23 Nov 2016**. *Confirmed, sponsors: GULFMET*
- ◆ “TC Leadership, BIPM”, **7 to 10 Feb 2017**. *Confirmed, sponsors: EURAMET*
- ◆ *Training in the calibration of time transfer equipment for UTC (under consideration)*

World Metrology Day joint BIPM and OIML initiative



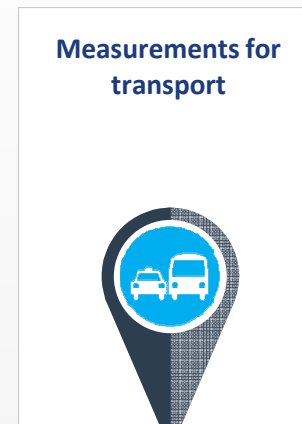
2014



2015



2016



2017



2018

Growing impact of World Metrology Day

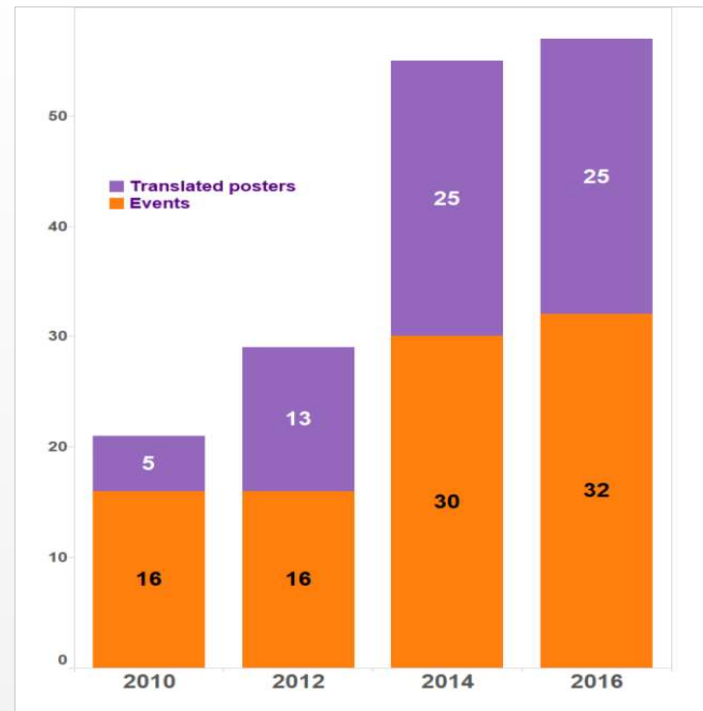


www.worldmetrologyday.org

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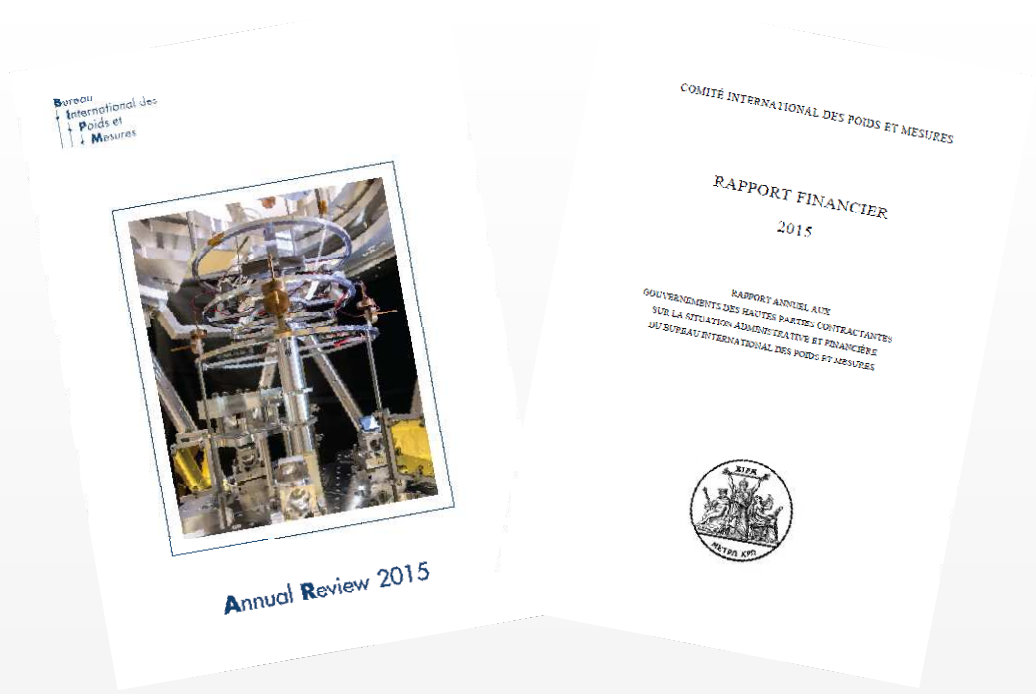
Year	Theme	PDF A4 size
2015 [Web site]	Measurements and Light	
2014 [Web site]	Measurements and the global energy challenge	
2013 [Web site]	Measurements in daily life	
2012 [Web site]	We measure for your Safety	
2011 [Web site]	Measurements in Chemistry	
2010 [Web site]	Measurements in Science and Technology	

Growth in uptake



www.bipm.org

New publications



- Project to digitize all BIPM historic meeting material is very close to completion
- Commitment to make CC papers open access where possible.

