

Report from the BIPM... to the EURAMET GA

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BIPM

22 May 2019

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





About the BIPM



20 May 2019 - World Metrology Day

The new definitions of the SI base units
have now come into effect!

Metrology area:

- Acoustics, Ultrasound and Vibration
- Chemistry and Biology
- Electricity and Magnetism
- Ionizing Radiation
- Length
- Mass and related quantities
- Photometry and Radiometry
- Thermometry
- Time and Frequency
- Units

The International System of Units (SI)

Introduction

Definition of the SI

SI base units

SI prefixes

The 2018 revision of the SI

How to realize the SI units

SI Brochure

History

→ The recommended practical system of units of measurement is the International System of Units (*Système International d'Unités*), with the international abbreviation **SI**.



The SI is defined by the **SI Brochure**, which is published by the BIPM.

In a landmark decision, the BIPM's Member States voted on 16 November 2018 to revise the SI, changing the world's definition of the kilogram, the ampere, the kelvin and the mole.

This decision, made at the 26th meeting of the General Conference on Weights and Measures (CGPM), means that from 20 May 2019 all SI units are defined in terms of constants that describe the natural world. This will assure the future stability of the SI and open the opportunity for the use of new technologies, including quantum technologies, to implement the definitions.

The seven defining constants of the SI are:

- the caesium hyperfine frequency $\Delta\nu_{\text{Cs}}$;
- the speed of light in vacuum c ;
- the Planck constant h ;
- the elementary charge e ;
- the Boltzmann constant k ;
- the Avogadro constant N_{A} ; and
- the luminous efficacy of a defined visible radiation K_{cd} .

The SI was previously defined in terms of seven base units and derived units defined as products of powers of the base units. The seven base units were chosen for historical reasons, and were, by convention, regarded as dimensionally independent: the metre, the kilogram, the second, the ampere, the kelvin, the mole, and the candela. This role for the base units continues in the present SI even though the SI itself is now defined in terms of the defining constants above.



SI Brochure: The International System of Units (SI)

9th edition (2019)

Appendix 1

Appendix 2


Appendix 3

Appendix 4

Previous editions

→ We are pleased to present the 9th edition of the SI Brochure (2019), which defines and presents the *Système International d'Unités*, the SI (known in English as the International System of Units).

- **Complete brochure**  (French and English)

- Concise summary 

- Text in English 

- Text in French 

- Appendix 1: Decisions of the CGPM and the CIPM
- Appendix 2: Practical realization of the definition of some important units
- Appendix 3: Units for photochemical and photobiological quantities
- Appendix 4: Historical notes on the development of the SI and its base units

Le
Système
international
d'unités
The
International
System of
Units



The International System of Units - making measurements fundamentally better

Some small changes that come into effect for laboratories working at the highest levels in the mass and electricity communities.

for electricity:

https://www.bipm.org/utis/common/pdf/CC/CEM/ccem_guidelines_revisedSI.pdf

for mass:

https://www.bipm.org/utis/common/pdf/CC/CCM/BIPM_Note-on-kilogram-redefinition.pdf

→ The 20th May 2019 marks a particularly special celebration of World Metrology Day because it is the day chosen for the implementation of the changes agreed to the definitions of the SI base units. These landmark changes were decided at the 26th meeting of the General Conference on Weights and Measures (CGPM), which took place in Versailles in November 2018.

From 20 May 2019 the International System of Units (SI) embraces one of the most significant changes since its establishment - the definitions of four units (the kilogram, the ampere, the kelvin and the mole) are also linked to physical constants, which ensure their stability and universality. For more information on the impact redefinition has on the realization of the units see <https://www.bipm.org/utis/common/pdf/SI-statement.pdf>.

The world-wide promotional activities surrounding the meeting of the CGPM last November were very successful; we hope that the efforts to generate awareness about the implementation of the decisions will be similarly effective. Many examples of initiatives under way around the world are available from the World Metrology Day resource website (<http://www.worldmetrologyday.org/>).

Whilst the motivation for the changes to the definitions has been to provide new opportunities to increase access to accurate measurements there are some small changes that come into effect today that will concern laboratories working at the highest levels in the mass and electricity communities. Information about these changes is available from:

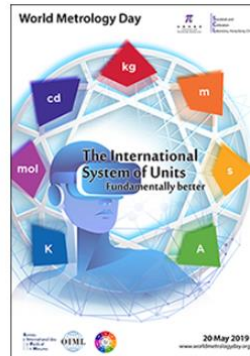
https://www.bipm.org/utis/common/pdf/CC/CEM/ccem_guidelines_revisedSI.pdf

for electricity, and

https://www.bipm.org/utis/common/pdf/CC/CCM/BIPM_Note-on-kilogram-redefinition.pdf

for mass.

We wish success to all activities around the world on World Metrology Day that are raising awareness of how the SI is "Fundamentally Better".



Select a topic:

- ☒ BIPM highlights
- ☒ BIPM CBKT programme
- ☒ CIPM MRA
- ☒ Committees
- ☒ Member States and Associates
- ☒ Metrology events
- ☒ Publications
- ☒ Revision of the SI
- ☒ Staff and recruitments

Read more...



Information for users about the redefinition of the SI

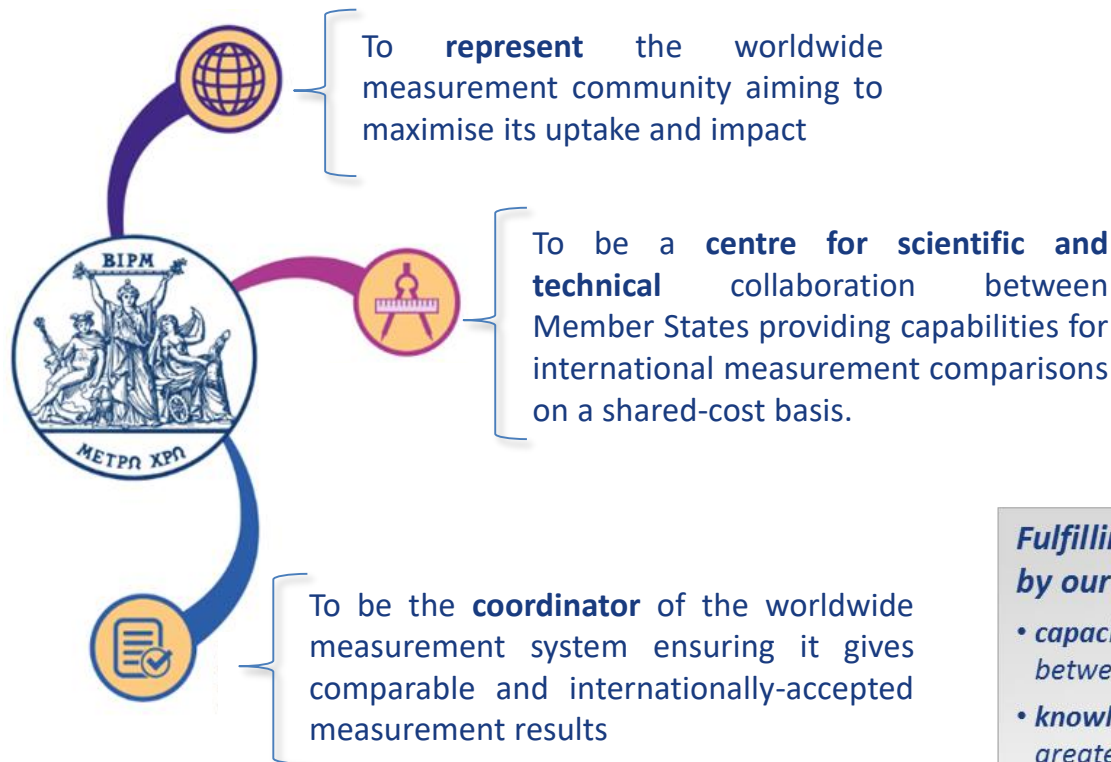
Updated May 20, 2019

The International System of Units, the SI, which is based on the **second**, the **metre**, the **kilogram**, the **ampere**, the **kelvin**, the **mole** and the **candela** (the base units), has been revised to update the definitions of four of these units. In November 2018 revised definitions of the **kilogram**, **ampere**, **kelvin** and **mole** were approved by the General Conference on Weights and Measures (CGPM), the international body responsible for the global comparability of measurements, with the adoption of Resolution 1 (2018)¹. The revised definitions came into force on 20 May 2019.

The revised definitions are based on seven physical constants (for example the speed of light, the Planck constant and the Avogadro constant) and are therefore inherently stable. The quantities have been chosen so that the revised definitions will not need to be modified to accommodate future improvements in the technologies used to realize them. The revision of the SI in this way was foreseen in Resolutions of the CGPM adopted in 2011 and 2014. Additional requirements contained in these Resolutions have ensured a smooth transition to the four revised definitions. Most users will not notice the change. A new edition of the SI Brochure² provides essential information for users, including, in its Appendix 2, guidance on the practical realization of the units³.

The objectives of the BIPM

Approved by Resolution 3 of the 26th CGPM



Fulfilling our mission and objectives is underpinned by our work in:

- **capacity building**, which aims to achieve a global balance between the metrology capabilities in Member States.
- **knowledge transfer**, which ensures that our work has the greatest impact.

Results of the election of the CIPM

→ On 16 November 2018, the CGPM conducted an election for all 18 seats on the CIPM.

Twelve current members stood and were re-elected:

- Dr F. Bulygin (Russian Federation),
- Dr I. Castelazo (Mexico),
- Dr Y. Duan (People's Republic of China),
- Dr H. Laiz (Argentina),
- Dr T. Liew (Singapore),
- Dr W. Louw (South Africa),
- Dr M.L. Rastello (Italy),
- Dr P. Richard (Switzerland),
- Dr G. Rietveld (Netherlands),
- Dr M. Sené (United Kingdom),
- Dr T. Usuda (Japan),
- Prof. J. Ullrich (Germany).

In addition, the following six new members were elected and will start their term at the next session of the CIPM, scheduled for March 2019:

- Dr D. del Campo Maldonado (Spain),
- Dr N. Dimarcq (France),
- Dr P. Neyezhnikov (Ukraine),
- Dr J. Olthoff (United States of America),
- Dr S.-R. Park (Republic of Korea), and
- Dr A. Steele (Canada).

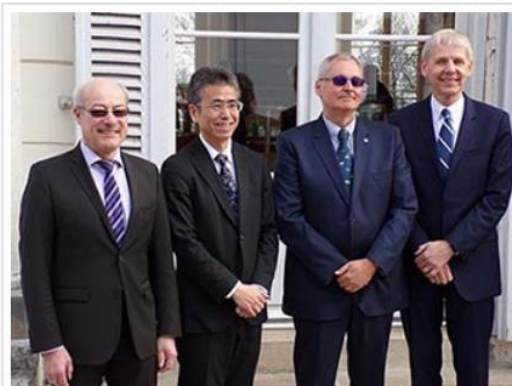
The next session will also mark the retirement of six CIPM members who did not stand for re-election:

- Dr M. Buzoianu (Romania),
- Mr L. Erard (France),
- Dr B. Inglis (Australia),
- Dr D.-I. Kang (Republic of Korea),
- Dr W. May (United States of America), and
- Dr J. McLaren (Canada).

Election of the CIPM bureau

→ During the first session of its 108th meeting (20-21 March 2019) the CIPM elected the following to form the bureau of the Committee:

- President - Dr W. Louw (South Africa)
- Secretary - Dr T. Usuda (Japan)
- Vice-Presidents - Prof. J. Ullrich (Germany) and Dr J. Olthoff (United States of America)



The CIPM bureau (left to right): Prof. J. Ullrich, Dr T. Usuda, Dr W. Louw and Dr J. Olthoff.



The six new CIPM members (left to right): Dr S.-R. Park, Dr D. del Campo Maldonado, Dr A. Steele, Dr J. Olthoff, Prof. P. Neyezhmakov and Dr N. Dimarcq.

The 108th meeting was the first to be held following the 26th meeting of the CGPM (November 2018), at which all 18 CIPM members were elected. Six of those elected participated in the CIPM for the first time:

- Dr D. del Campo Maldonado (Spain)
- Dr N. Dimarcq (France)
- Prof. P. Neyezhmakov (Ukraine)
- Dr J. Olthoff (United States of America)
- Dr S.-R. Park (Republic of Korea)
- Dr A. Steele (Canada).

Current CIPM:

→ CIPM bureau members:

		Election to the CIPM bureau (or first election)	Most recent (re)election to the CIPM by the CGPM	First election to the CIPM by the CGPM (or provisional election by the CIPM)	
↘ President	Dr W. Louw (South Africa)	20 March 2019	2018	15 May 2013	☑
↘ Secretary	Dr T. Usuda (Japan)	20 March 2019	2018	1 July 2012	☑
↘ Vice-President	Prof. J. Ullrich (Germany)	9 March 2015	2018	15 May 2013	☑
↘ Vice-President	Dr J. Olthoff (United States of America)	20 March 2019	2018	2018	☑

→ Other CIPM members:

		Most recent (re)election to the CIPM by the CGPM	First election to the CIPM by the CGPM (or provisional election by the CIPM)	
↘	Dr F. Bulygin (Russian Federation)	2018	2014	☑
↘	Dr I. Castelazo (Mexico)	2018	2014	☑
↘	Dr D. del Campo Maldonado (Spain)	2018	2018	☑
↘	Dr Y. Duan (People's Republic of China)	2018	8 March 2010	☑
↘	Dr N. Dimarcq (France)	2018	2018	☑
↘	Dr H. Laiz (Argentina)	2018	7 Dec. 2016	☑
↘	Dr T. Liew (Singapore)	2018	2014	☑
↘	Prof. P. Neyezhmakov (Ukraine)	2018	2018	☑
↘	Dr S.-R. Park (Republic of Korea)	2018	2018	☑
↘	Dr M.L. Rastello (Italy)	2018	7 Dec. 2016	☑
↘	Dr P. Richard (Switzerland)	2018	2014	☑
↘	Dr G. Rietveld (Netherlands)	2018	2014	☑
↘	Dr M. Sené (United Kingdom)	2018	7 Dec. 2016	☑
↘	Dr A. Steele (Canada)	2018	2018	☑
↘ ex officio	Dr M.J.T. Milton (United Kingdom), Director of the BIPM			☑

The CIPM appoints new Presidents of the CCQM and CCTF

→ The CIPM appointed two new Consultative Committee (CC) Presidents at Session I of its 108th meeting (March 2019).

Dr Sang-Ryoul Park, President of the Korea Research Institute of Standards and Science (KRISS), Republic of Korea, was appointed as President of the Consultative Committee for Amount of Substance: Metrology in Chemistry and Biology (CCQM) for a four-year term. Dr Park succeeds Dr Willie May, who has stepped down from the role that he had held since 2011.

Dr Noël Dimarcq, Deputy Director of the Observatoire de la Côte d'Azur, France, was appointed as the President of the Consultative Committee for Time and Frequency (CCTF) for a four-year term. Dr Dimarcq succeeds Mr Luc Énard, who had been CCTF President since 2007.

Both Dr Park and Dr Dimarcq were elected to the CIPM at the 26th meeting of the CGPM in November 2018. They took their seats at the CIPM for the first time in March 2019.

Member States and Associates

As of 14 November 2018, there are:

- 59 Member States
- 42 Associates of the CGPM (States and Economies)

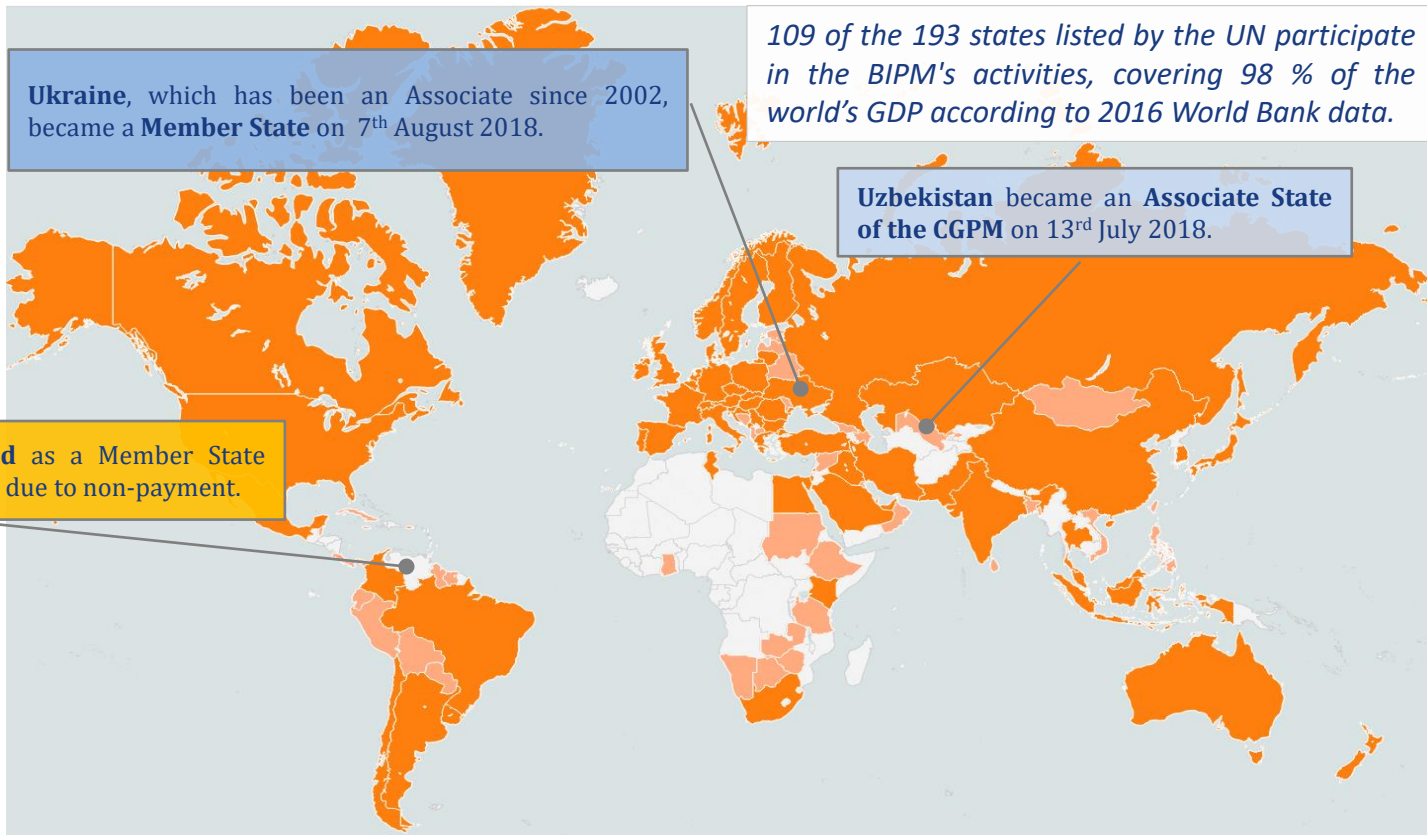
Venezuela is excluded as a Member State on 14th November 2018 due to non-payment.

Ukraine, which has been an Associate since 2002, became a **Member State** on 7th August 2018.

109 of the 193 states listed by the UN participate in the BIPM's activities, covering 98 % of the world's GDP according to 2016 World Bank data.

Uzbekistan became an **Associate State of the CGPM** on 13rd July 2018.

** The official term is "State Parties to the Metre Convention"; the term "Member States" is its synonym and used for easy reference.*

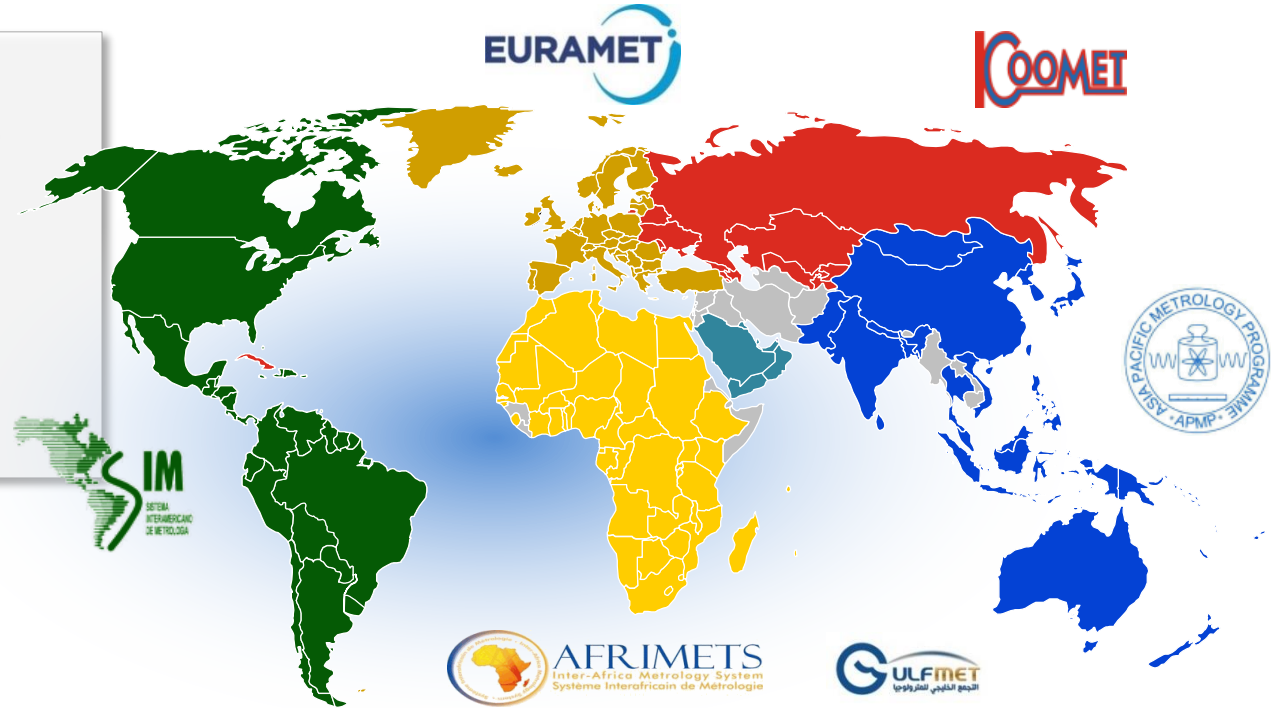


CIPM MRA participation today

Participation

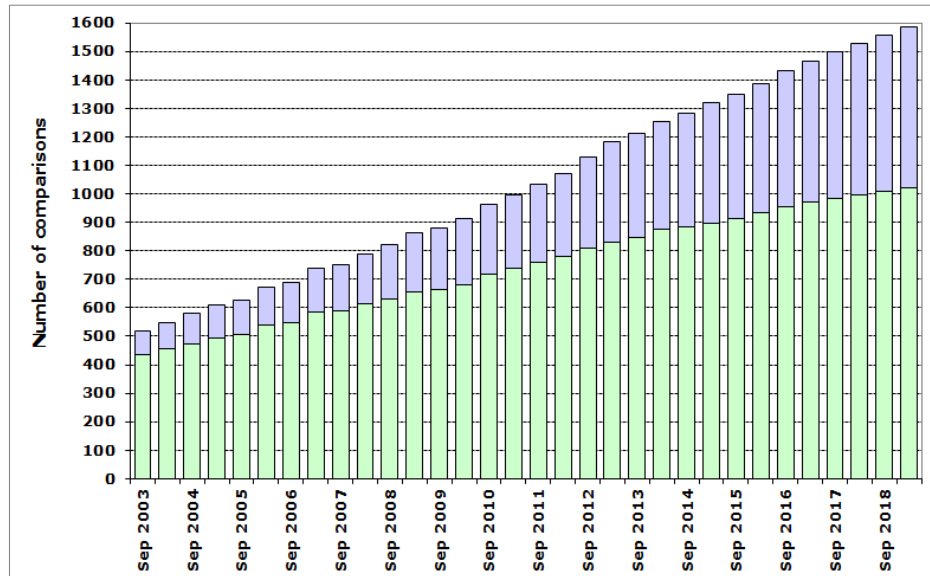
- **101 National Metrology Institutes**
 - 59 Member States
 - 42 Associates
- **4 International organizations**
(ESA, IAEA, JRC, WMO)
- **plus 156 Designated Institutes**

Total: 261 Institutes

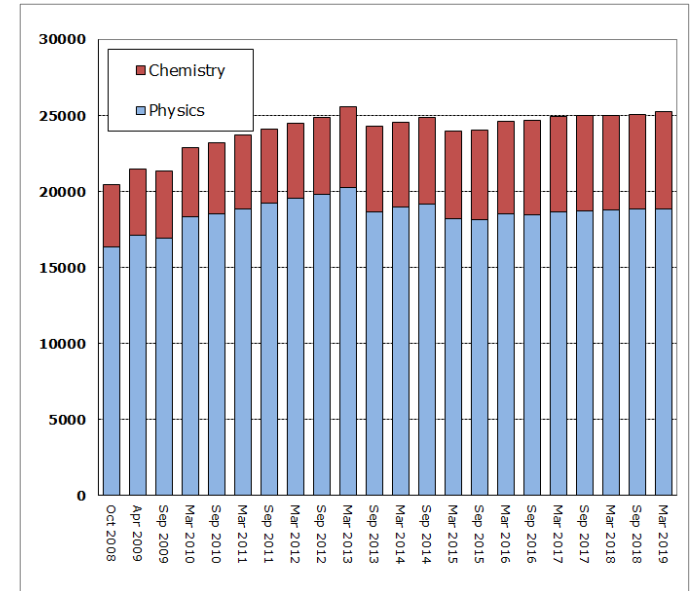


KCDB figures *(March 2019)*

1588 comparisons :
1022 key, 566 supplementary comparisons

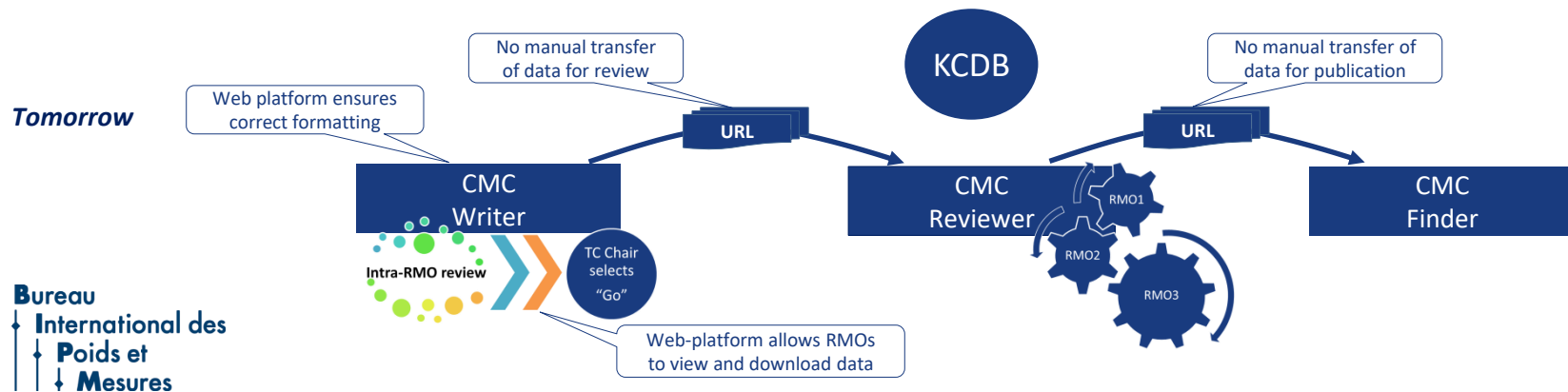
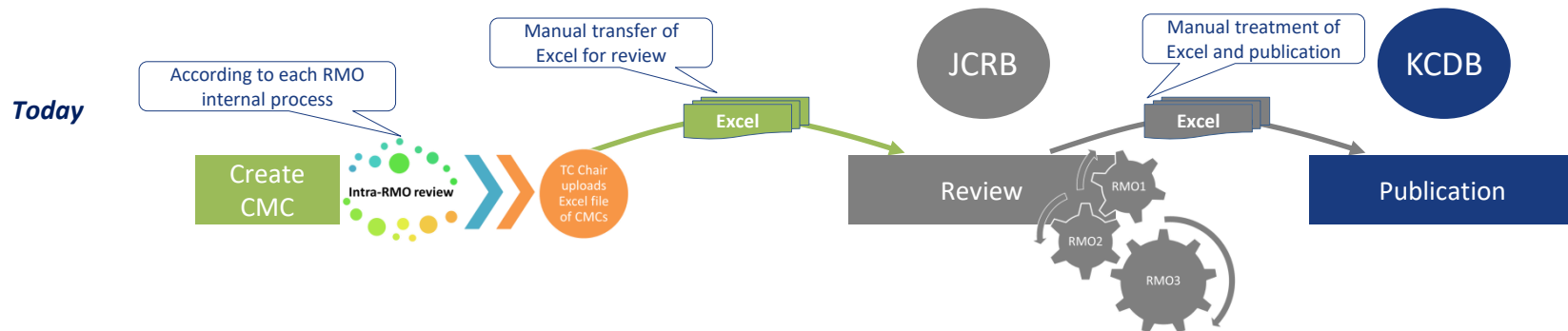


Total: 25 268 CMCs



CIPM MRA review and outcomes

KCDB 2.0 – *General concept*



KCDB 2.0 α -demonstration

← to BIPM.org

 CIPM MRA PARTICIPANTS

→ Login



All data listed in the KCDB have been reviewed and approved within the CIPM Mutual Recognition Arrangement



CMCS

COMPARISONS

NEWS

STATISTICS

Comparison search

KCDB

What is the KCDB

Help with searching

Help on CMC edition, review and management

FAQs

CIPM MRA

Participants

About the CIPM MRA

JCRB

Policy documents

CLASSIFICATION OF SERVICES

Acoustics, Ultrasound and Vibration

Chemistry and Biology

Electricity and Magnetism

Ionizing Radiation

Mass and related quantities

Photometry and Radiometry

Thermometry

Time and Frequency

RMOs and NMIs

Topic
NMIs to be encouraged to share comparisons piloting etc? [R1c]
CMCs to reflect services available to customers under normal conditions and shall not be artificially subdivided. [R3d]
Use of uncertainty equations and matrices to reduce the number of CMCs [R3c]
NMIs advised to use % of services covered as metric (not number of CMCs) [R3e]
RMO to encourage developed NMIs to become mentors [R5c]
RMOs to encourage and assist developing NMIs to both participate in and pilot comparisons [R5b]

Recommendation 3 - (On constraining the proliferation of CMCs):

- a. The results of KCs and SCs should be interpreted as widely as reasonably applicable to indicate coverage of CMCs.
- b. The use of CMCs to cover as many services as is technically justified should be encouraged, so that CMCs become representative rather than comprehensive. It should be emphasized that the goal is for NMIs to develop services and that CMCs are tools for describing the capabilities maintained to underpin the delivery of those services. The NMI Qs should document the relationship between services and CMCs. The CCs should work towards better consistency in the expression of CMCs (e.g. units, uncertainty ranges) .**
- c. The CCs and NMIs are encouraged to use uncertainty equations and matrices to reduce the number of CMCs where possible.
- d. CMCs shall reflect the services available to customers under normal conditions, in accord with the MRA, and shall not be artificially subdivided.
- e. NMIs should be advised to use the percentage of coverage of their services by CMCs as a metric of success rather than the number of CMCs (The number of CMCs alone should not be considered a metric of the success of an NMI).

CIPM ad hoc Working Group

on Implementing the Recommendations from the Review of the CIPM MRA

Action 2/03/2017: We recommend the following interpretation of terms:

- The term '*how far the light shines*' - is taken to refer to the use of comparisons as the evidence base supporting CMC claims.
- The term '*broad scope CMCs*' - is taken to refer to the possibility of NMIs summarising their capabilities with the smaller number of CMCs each with a broader scope.
- That the issue of what CMCs should/ or should not cover be articulated around the question of whether the CCs' service category lists are sufficiently detailed to cover the services delivered by the NMIs/DI participating in the CIPM MRA.
- That it is understood that some RMOs are considering the importance of NMI/DI services where recognition is required at regional level only.
- That the term '*flexible scope*' has a specialised meaning in accreditation, and is not applicable to the discussion on broad scope CMCs.

Action 5/03/2018: It is recommended that in future all parties should refer to what has so far been called the '*risk based approach*' as an '*efficient and effective*' review.

Broad scope = Representative CMCs



Use of the CIPM MRA logo and
certificates statement

CIPM MRA-D-02
Version 3.3

The following words have been added to Section 2 as a footnote

A CMC is deemed to cover services that meet all of the following criteria:

- Use the same instrument type/measurement method as that identified in the CMC, noting that more than one instrument type/measurement method can be listed in one CMC,
- Fall within the range covered by the CMC,
- Have measurement uncertainty no less than the uncertainty quoted in the CMC, with appropriate treatment, documented in the quality system, for any methods/instruments listed that are derived, i.e. involve further steps in the metrological traceability chain.

<https://www.bipm.org/utils/common/documents/CIPM-MRA/CIPM-MRA-D-02.pdf>

Joint BIPM, OIML, ILAC and ISO declaration



Joint declaration on metrological traceability

The Joint Declaration was refreshed and resigned in **November 2018**, having been first reviewed by the four parties and agreed at the Quadripartite meeting of March 2018. The revised text was circulated and agreed by the CIPM

Changes to the joint BIPM, OIML, ILAC and ISO declaration

The refresh of the Joint BIPM, OIML, ILAC and ISO declaration was suggested by ISO WG44 during the revision of ISO/IEC 17025, who wanted to reference the Joint Declaration in the revised standard. The Quadripartite meeting agreed that there would be no substantive changes but the document should be reordered.

The following changes were made:

- The order was reversed such that the description of the four signatory bodies came after, rather than before, the recommendations
- The descriptions of the organizations were generalized in as much as data that changes frequently would not be explicitly quoted (e. g the exact number of members of the originations)
- The OIML-CS system was introduced and the now redundant OIML Basic Certificate System and OIML MAA deleted.
- Some small parts of the text were “polished”.

'Single metrology' concept
Under development

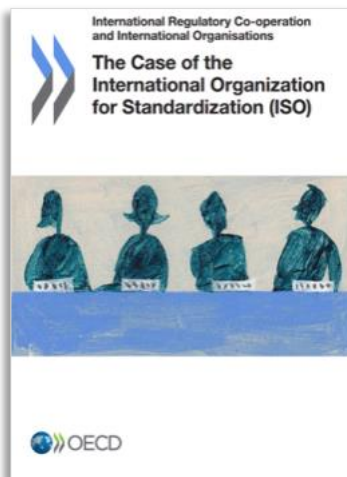
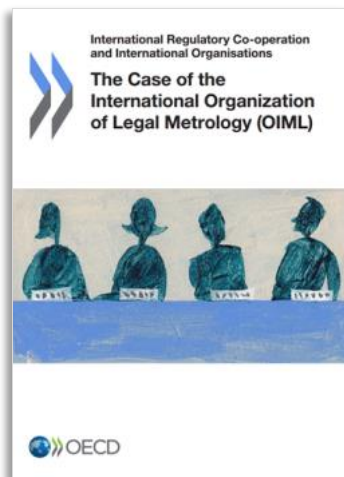
V6



BIPM LIAISONS

OECD case studies (2017-2019)

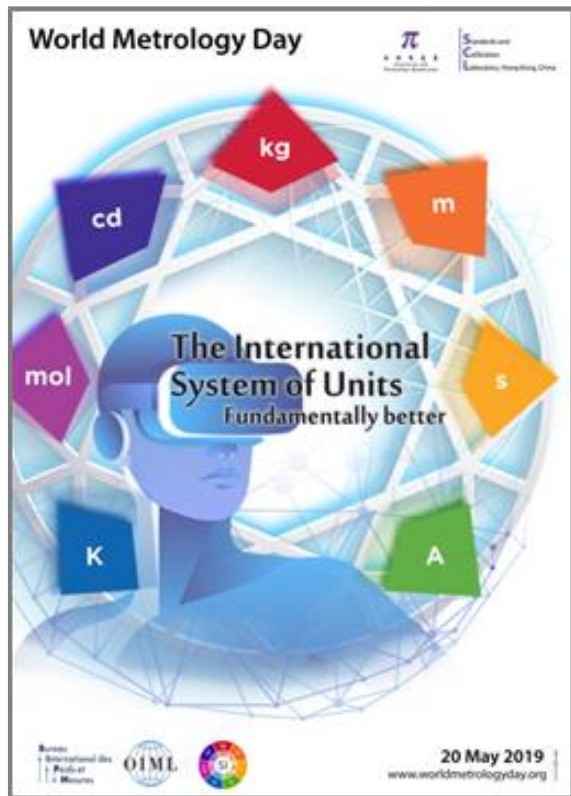
BIPM, WTO, ASTM International



The Case of the International Bureau of Weights and Measures (BIPM)



World Metrology Day 2019



The theme of World Metrology Day in 2019 is ***“The International System of Units - Fundamentally better”***

Information on national WMD activities is posted on the website:
<http://www.worldmetrologyday.org>

The 2019 poster was designed by the
Standards and Calibration Laboratory,
Hong Kong, China.



RMO poster history:

2013: EURAMET

2014: APMP

2015: AFRIMETS

2016: COOMET - VNIIMs

2017: SIM –INM Colombia

2018: EURAMET

2019: APMP

2020: AFRIMETS

2021: GULFMET

CIPM and the JCRB news

Please visit

- for CIPM: [https://www.bipm.org/en/committees/cipm/meeting/108\(I\).html](https://www.bipm.org/en/committees/cipm/meeting/108(I).html)
- for JCRB: <https://www.bipm.org/en/committees/jc/jcrb/meeting/40.html>

CIPM (March 2019) decisions

Decision CIPM/108-05

The CIPM supported the establishment of a Joint Task Group at an operational level to further improve the cooperation between the BIPM and the International Organization of Legal Metrology (OIML), following the proposal made by the President of the International Committee of Legal Metrology (CICLM). Dr T. Liew was appointed to act as CIPM liaison to the Task Group.

CIPM (March 2019) decisions

Decision CIPM/108-09

The CIPM thanked the Presidents of the Consultative Committees for their work and their excellent reports to the 26th meeting of the CGPM. It decided to reappoint the Presidents of the following Consultative Committees for four-year terms:

- Consultative Committee for Acoustics, Ultrasound and Vibration (CCAUV): Dr T. Usuda.
- Consultative Committee for Electricity and Magnetism (CCEM): Dr G. Rietveld.
- Consultative Committee for Length (CCL): Dr I. Castelazo.
- Consultative Committee for Mass and Related Quantities (CCM): Dr P. Richard.
- Consultative Committee for Photometry and Radiometry (CCPR): Dr M.L. Rastello.
- Consultative Committee for Ionizing Radiation (CCRI): Dr W. Louw.
- Consultative Committee for Thermometry (CCT): Dr Y. Duan.
- Consultative Committee for Units (CCU): Prof. J. Ullrich.

CIPM (March 2019) decisions

Decision CIPM/108-19

In response to discussions held before the adoption of Resolution 3 “On the objectives of the BIPM” at the 26th meeting of the CGPM, the CIPM established a CIPM Task Group to propose terms of reference for a Working Group of Member State representatives. It appointed Dr W. Louw as its convener, assisted by Drs P. Richard and A. Steele. Drs F. Bulygin, I. Castelazo, N. Dimarcq, H. Laiz, T. Liew, Prof. J. Ullrich and the Director of the BIPM were appointed as the members.

It charged the Director of the BIPM to provide the Task Group with appropriate background information, in a concise format, as soon as possible.

It requested the Task Group:

- to identify the main issue(s),
- to determine if any of those issue(s) can be addressed by the CIPM,
- to propose terms of reference for a Working Group of Member State representatives - for agreement by the CIPM prior to circulation, and
- to establish a timeline consistent with the meeting of Member State representatives to be held in October 2019.

9th Executive Secretary of the JCRB

→ Dr Sten **BERGSTRAND**

JCRB Executive Secretary; on secondment from RISE

▼ Contact details

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Tel.:	+33 1 45 07 62 94



40th JCRB outcomes (March 2019)

Action 40/1: The JCRB decides that the informal QMS meeting after the 40th JCRB be open to all JCRB members and that minutes be taken for any recommended actions for the next JCRB. Any future QMS discussion meetings will take place before the JCRB as further preparation for the formal QS items as an integral part of the plenary agenda. Action 40/2 In order to support the restructuring of the CIPM MRA document suite, the JCRB Delegate from each RMO will assign a person to support the review of the drafts by 31 March 2019.

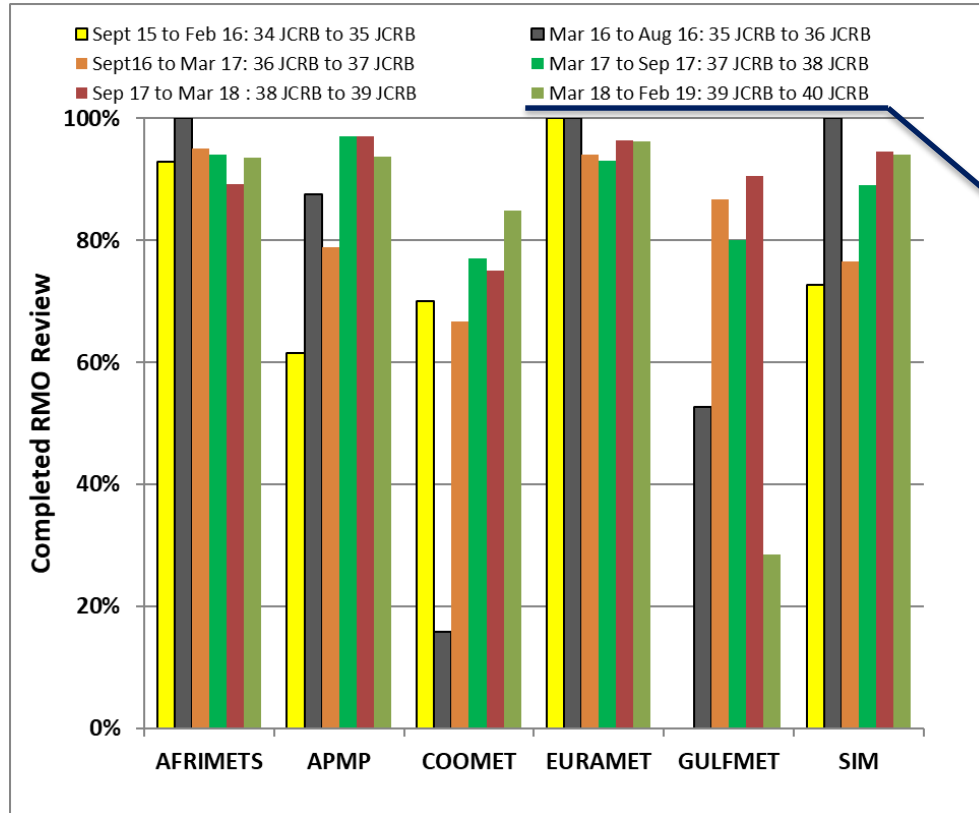
Action 40/2: In order to support the restructuring of the CIPM MRA document suite, the JCRB Delegate from each RMO will assign a person to support the review of the drafts by 31 March 2019.

Action 40/4: BIPM to review existing JCRB documents for guidance relating to CIPM MRA participants that wish to cease their involvement in the CIPM MRA, and to prepare a summary and a proposal (if necessary) to be presented to the 41st JCRB.

40th JCRB outcomes (March 2019)

Recommendation 40/1: The JCRB agrees that the Hybrid Comparison scheme proposed by APMP may be used as an example of “Other available knowledge and experience” in Section 3 of CIPM MRA D-04, which underpins CMCs. It was noted that the use of Hybrid Comparisons is not an alternative to participation in key or supplementary comparisons when accessible. It was also noted that it is not intended to include Hybrid Comparisons within Appendix B of the KCDB. This agreement is to be sent to the CIPM for approval in order to expedite communication to the Consultative Committees.

Inter-RMO review performance: adherence to deadlines



37 sets since JCRB 39:

22 sets for review and voting

10 sets for voting only

5 sets for reviewing only

- AFRIMETS: 93 %
- APMP: 94 %
- COOMET: 85 %
- EURAMET: 96 %
- GULFMET: 29 %
- SIM: 94 %

Less than 100 % complete due to loss of right to review

- No response to review request
- Respond yes, no review
- Did not vote on final approval

CMC, working group issues: CMC submissions without QMS evidence

Action 35/09: The RMOs to remind TC and WG chairs of the requirement stated in CIPM MRA-D-04 to submit, at the beginning of the inter-RMO review, the confirmation that the QMS evidence supports the CMC set, and to consider how this will be embedded in the update to the KCDB/JCRB IT suite.

CMC sets submitted **with** confirmation of QMS evidence at time of post:

- 38th JCRB to 39th JCRB : 63 %
- 39th JCRB to 40th JCRB : 81 %

39th JCRB – 40th JCRB, sets submitted **with** QMS evidence

Green: TC/WG chair submitted all sets w/QMS

Pink: TC/WG chair submitted all sets w/o QMS

Although QM uses fast track procedure and always checks QS confirmation before it, the confirmations should be submitted with the submissions, in order to have them together on the CMC-portal.

	AFRIMETS	APMP	COOMET	EURAMET	SIM	total
AUV	1 of 1	1 of 1		1 of 2		3 of 4
EM				0 of 1		0 of 1
L		3 of 3	0 of 1	1 of 1	1 of 1	5 of 6
M	2 of 2	3 of 3	3 of 3	8 of 8	3 of 3	19 of 19
PR		1 of 1	2 of 2	2 of 3		5 of 6
QM		0 of 1*	0 of 1*	1 of 1	0 of 1*	1 of 4
RI		1 of 1	1 of 1		3 of 3	5 of 5
T	3 of 3	1 of 1		1 of 1		5 of 5
TF		0 of 1		1 of 3		1 of 4
total	6 of 6	10 of 12	6 of 8	15 of 20	7 of 8	44 of 54

CBKT FIGURES:

Over 75 % of Member States and Associates have participated in the CBKT Programme
(as trainees, lecturers and sponsors)

18 CBKT projects

- 14 Completed
- 4 Ongoing

366 people

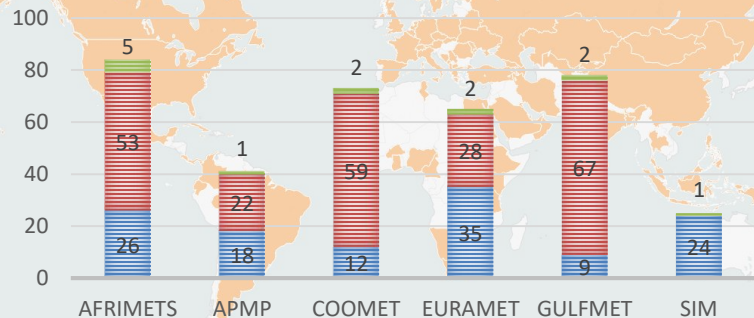
from 84 countries have benefited

56 invited lecturers

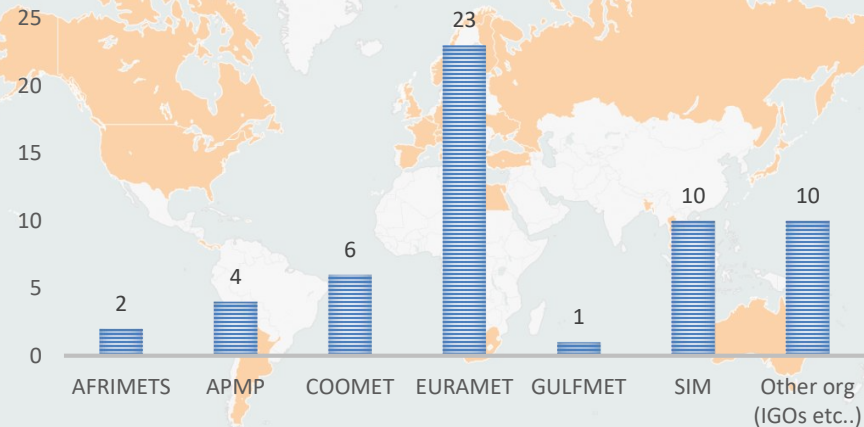
from 27 countries supported to deliver the projects

CBKT PARTICIPATION

■ At the BIPM ■ At the RMO ■ Placement



INVITED LECTURERS



DIRECT OUTCOME: *Leaders of tomorrow courses...*

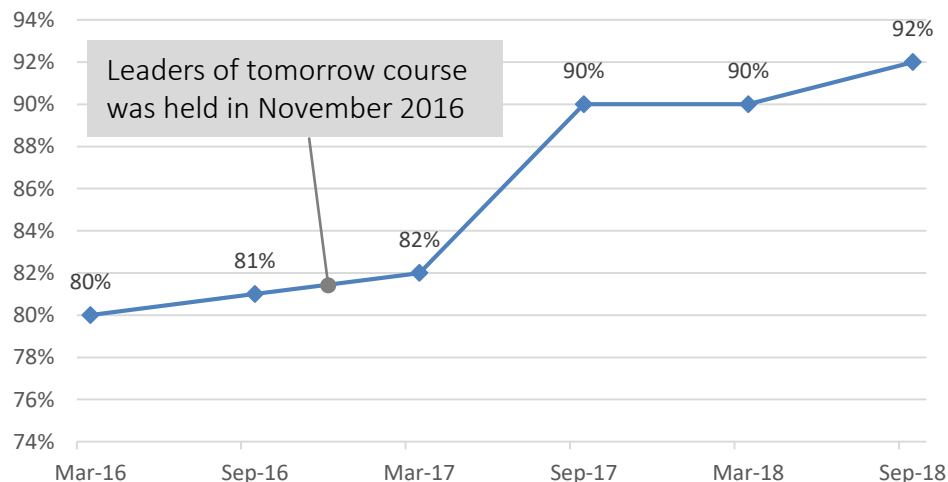
Balancing the load

- **14 new** RMO TC/WG Chairs
- **12 existing** RMO TC/WG Chairs benefited from the CBKT programme

Increasing efficiency

- **10 % increase** in CMC review performance

CMC review performance: adherence to deadlines



DIRECT OUTCOME: *Sound beginning course...*

"Right first time" CMC publication in the KCDB by 4 Associates joined after 2010.

The course was held in November 2017!

- **Zimbabwe (joined in 2012):**
13 CMCs in Thermometry - published in July 2018

- **Namibia (joined in 2012)**
7 CMCs in Mass - published in Sept 2018

- **Zambia (joined in 2010)**
11 CMCs in Thermometry – published in November 2018

- **Azerbaijan (joined in 2015)**
1 CMC in Viscosity - published in July 2018

Cc Andy Henson; Johanne

i You forwarded this m

Good day Chingis, Andy and Johanne

I hope you are well and your family in Paris. I am happy to advise that after completing the training course , "Sound Beginning in the CIPM MRA" I have managed to submit our QMS for approval to our RMO, Afrimets and it has been aproved. We prepared our CMCs for the temperature Laboratory and the are now on the stage of Inter RMO review stage. We hope to have our CMC published soon.

Thank you for the opportunity for the training course,

Regards,

B Chibaya
Head of Temperature Metrology
SIRDC-NMI Zimbabwe
+263772107300

- **Botswana (joined in 2012)**
3 CMCs in Thermometry – published in April 2018

2019 EURAMET-BIPM Training Course on Organisation and Piloting of Intercomparisons in Ionizing Radiation

➤ EURAMET-BIPM Training course

➔ The EURAMET-BIPM Training Course 'Organisation and Piloting of Intercomparisons in Ionizing Radiation' aims to prepare metrologists from the field of ionizing radiation to organise and pilot comparisons in the areas of dosimetry, radioactivity and neutron measurements. By helping to improve the skills of experts, as well as NMIs/DIs, the purpose of this course is to contribute towards sharing the load of piloting comparisons between more NMIs/DIs in EURAMET, and worldwide.

- **Target audience:**

The course is primarily aimed at those in NMIs or DIs who plan to pilot or take part in future comparisons in ionizing radiation metrology.

The deadline for registration is 1 June 2019. For more information, please visit the EURAMET dedicated webpage.

- **Programme highlights:**

Agenda 

- **Lecturers:**

Lecturers will be from worldwide leading metrology institutions in the field of Ionizing Radiation (BIPM, NPL, PTB, VSL, JRC, SSM, IJS) and EURAMET.

- **Training dates:**

9 - 11 October 2019, at NPL, Teddington, (United Kingdom)



Joint initiative with
involvement of
three lecturers
from the BIPM

Slots are available
for other RMOs!

Core CBKT initiatives 2020-2023

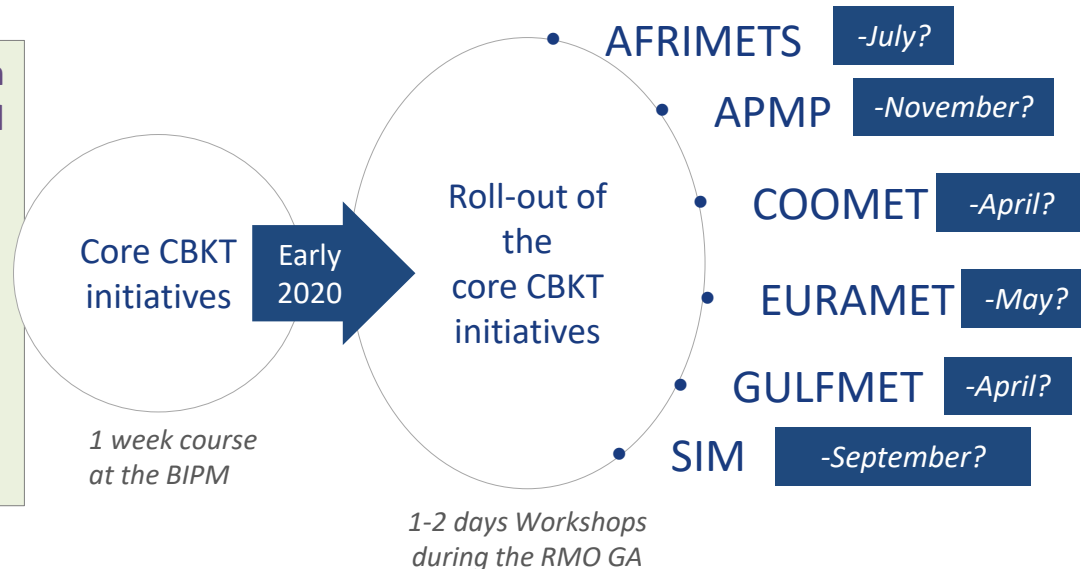
Please plan your activities!

Work Programme of the BIPM for the four years 2020-2023

The CIPM MRA support activities* have been currently identified as core financed and address the following topics:

- Participation in the BIPM activities
- Sound beginning
- Balancing the workload
- Future leaders

**Funded (or partly funded) by the BIPM dotation*

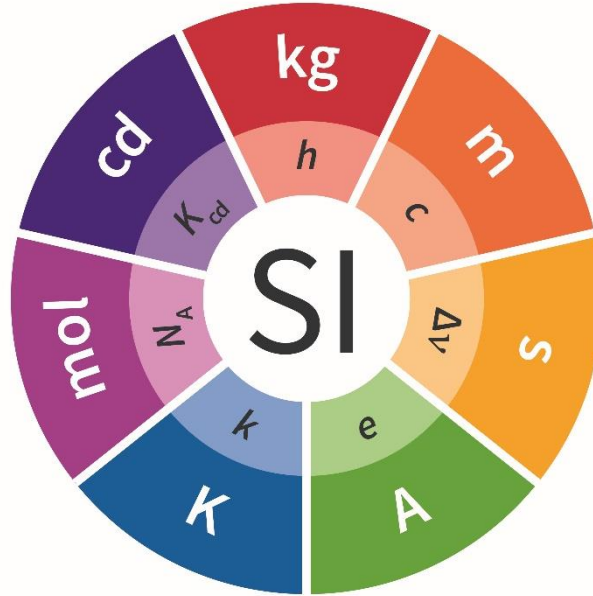


Upcoming meetings and events at the BIPM

From 3 to 7 June 2019	<i>27th meeting of the CCRI and related meetings</i>
From 24 to 29 June 2019	<i>JCGM Working Group 2: VIM</i>
From 16 to 20 September 2019	<i>24th meeting of the CCPR and related meetings</i>
From 23 to 27 September 2019	<i>12th meeting of the CCAUV and related meetings</i>
From 8 to 9 October 2019	<i>24th meeting of the CCU</i>
10 October 2019	<i>BIPM Workshop ATFT: the ultimate frontier for remote comparison methods</i>
From 25 to 29 November 2019	<i>JCGM Working Group 2: VIM</i>
From 2 to 3 December 2019	<i>Meeting of JCTLM Members and Stakeholders</i>
From 3 to 6 December 2019	<i>JCGM Working Group 1: GUM</i>
4 December 2019	<i>Meeting of the JCTLM-WG-TEP</i>
4 December 2019	<i>Meeting of the JCTLM-DBWG</i>
From 5 to 6 December 2019	<i>21st meeting of the JCTLM Executive Committee</i>

Thank you.

andy.henson@bipm.org



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