



# 27th meeting of the CGPM (Nov 2022)



## Seven resolutions adopted

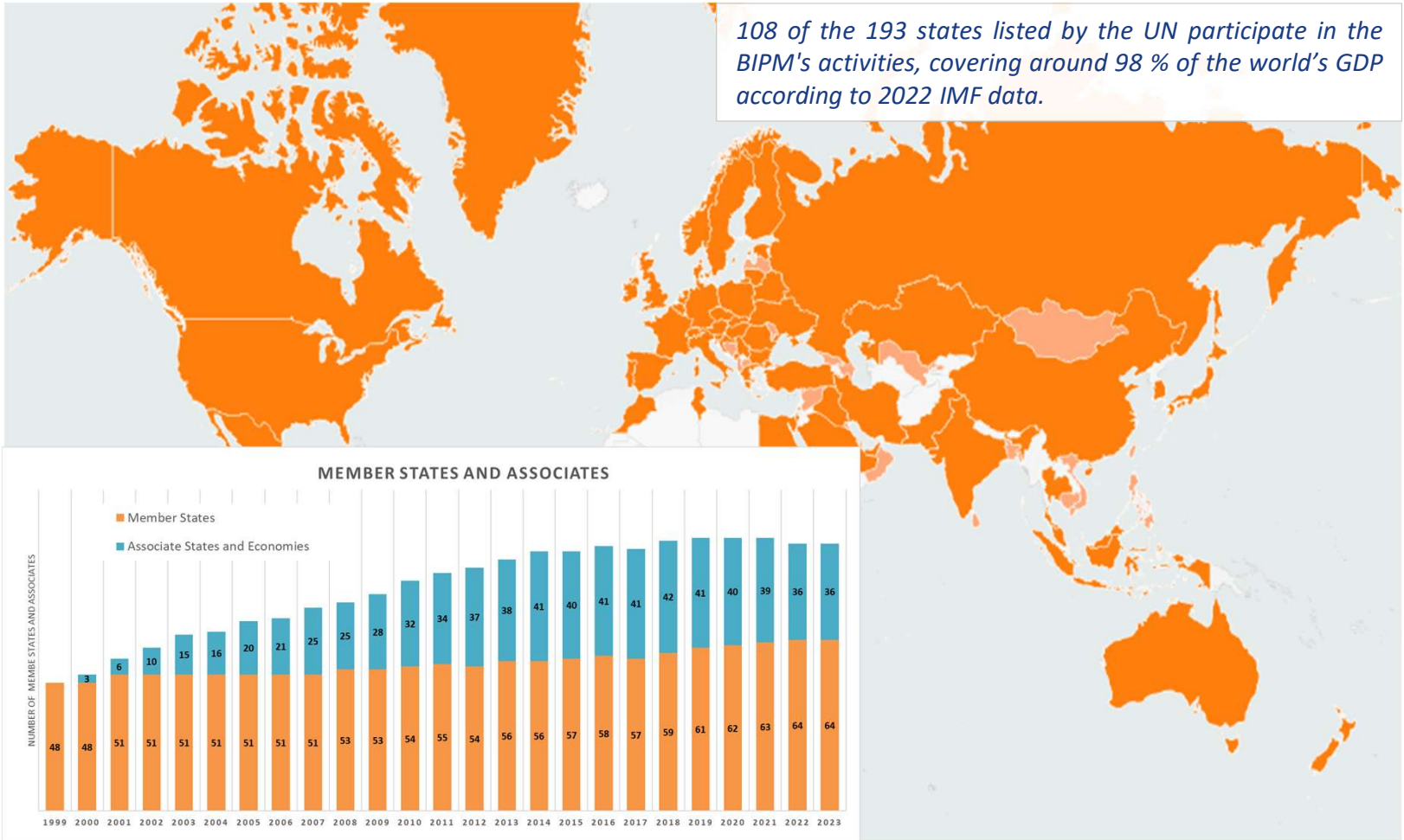
1. On the report prepared by the CIPM on the *“Evolving Needs in Metrology”*
2. On the *global digital transformation and the SI*
3. On the extension of the range of SI prefixes
4. On the use and future development of UTC
5. On the future redefinition of the second
6. On the universal adherence to the Metre Convention
7. On the dotation of the International Bureau of Weights and Measures for the years 2024 to 2027

# The “Universality” Project (Resolution 6)

to further strengthening the role of the International Bureau of Weights and Measures (BIPM) and to facilitate wider participation in its activities, thus achieving lasting and universal adherence to the Metre Convention,

# Member States and Associates (October 2023)

- 64 Member States and
- 36 Associates of the CGPM  
*(States and Economies)*



## NEW MEMBER STATES:

- Morocco (May 2019)
- Ecuador (August 2019)
- Belarus (January 2020)
- Estonia (January 2021)
- Costa Rica (September 2022)

## NEW ASSOCIATES:

- Cambodia (January 2021)
- Zimbabwe (February 2022 reinstatement; *excluded in Jan 2021*)

## EXCLUDED ASSOCIATES:

- Cuba (January 2022)
- Sudan (January 2022)

## WITHDRAWN ASSOCIATE:

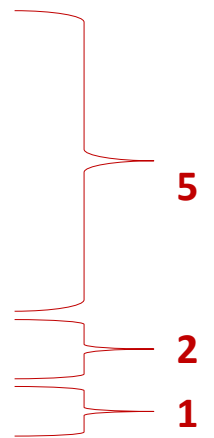
- Seychelles (January 2022)

# The 'encouragement' criteria in practice (2023)

**RESOLUTION 4 of the 24<sup>th</sup> CGPM (2011):**  
 Associates who have been encouraged to become Member States

#	Associate State	Date meeting criteria	Period of increasing subscription	
			Start	90% MS
1	Latvia	2011	2013	2017
2	Panama	2011	2013	2017
3	Viet Nam	2011	2013	2017
4	Peru	2014	2016	2020
5	Philippines	2014	2016	2020
6	Azerbaijan	2020	2022	2026
7	Luxembourg	2021	2023	2027
8	Sri Lanka	2023	2025	2029

Step on ladder:



# CIPM MRA participation *(September 2023)*



## 252 Institutes participating in the CIPM MRA

The CIPM MRA has been signed by the representatives of:

- 64 Member States
- 36 Associates of the CGPM, and
- 4 international organizations (ESA, IAEA, JRC, WMO)

*and covers a further 151 institutes designated by the signatory bodies*

**1 814 comparisons**

1157 KCs, 676 SCs

**25 809 CMCs**

Peer-reviewed declarations

# 85 UN Member States are not Member States or Associate States

60 States participate in an RMO



25 States do not participate in an RMO

## 11 States on UN Scale $\geq 0.02$

**AFRIMETS members (3)** *Cote d'Ivoire, Nigeria, Algeria*  
**SIM members (3)** *Guatemala, Dominican Republic\*, Venezuela\**  
**APMP members (2)** *Brunei, Jordan*  
**COOMET member (1)** *Cuba\**  
**EURAMET member (1)** *Cyprus*  
**GULFMET member (1)** *Bahrain*

## 3 States on UN Scale $\geq 0.02$

**European States (1)** *Iceland*  
**Asian State (2)** *Turkmenistan, Lebanon*

## 49 States on UN Scale $< 0.02$

**AFRIMETS members (34)** *Angola, Benin, Burkina Faso, Burundi, Cameroon\*, Cabo Verde, Central African Republic, Chad, Comoros, Congo Brazzaville, Dem. Rep. of Congo, Equatorial Guinea, Eswatini, Gabon, Gambia, Guinea, Guinea-Bissau, Lesotho, Liberia, Libya, Madagascar, Malawi, Mali, Mauritania, Mozambique, Niger, Rwanda, Senegal, Sierra Leone, Seychelles\*, South Sudan, Sudan\*, Togo, Uganda*

**APMP members (6)** *DPR Korea\*, Kiribati, Fiji, Myanmar, Nepal, Papua New Guinea (inc. 3 Pacific Islands Forum members: Fiji, Kiribati, Papua New Guinea)*

**SIM members (5)** *Bahamas, El Salvador, Haiti, Honduras, Nicaragua (incl. 2 CARICOM members: Bahamas, Haiti)*

**COOMET members (3)** *Armenia, Kyrgyzstan, Tajikistan*

**GULFMET (1)** *Yemen\**



## 22 States on UN Scale $< 0.02$

**African States (4)** *Djibouti, Eritrea, São Tomé and Príncipe, Somalia*  
**Pacific Islands Forum members (9)** *Marshall Islands, Micronesia, Nauru, Palau, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu*  
**Asian States (5)** *Afghanistan, Bhutan, Laos, Maldives, Timor-Leste*  
**European microstates (4)** *Andorra, Liechtenstein, Monaco, San Marino*

# Universal Adherence

- What do we mean by “**universal adherence**”?
  - All UN states use the SI (and UTC), implement the concept of traceability and follow the decisions of the CGPM
- **Universal adherence** does not require a national metrology institute in each country and/or signing the CIPM MRA and registering CMCs
- **Universal adherence** is not about the money, as the 85 UN Member States not participating in activities of the BIPM make up just 2% of world GDP
- Renegotiation of the Metre Convention is not practical!
- Proposed solutions must be balanced and acceptable to existing Member States



# Affiliate Status

Presented as a proposal at the NMI Directors' Meeting in October 2023:

- Facilitation of access to information and to the BIPM Headquarters activities on a cost-neutral basis (for existing members and the future affiliates).
- States of the **60 existing RMO members** will have a simplified pathway to the affiliate status.
- The **25 States not participating in an RMO** can directly apply for the affiliate status, but at the same time will be strongly encouraged to participate in an RMO.

# Benefits for Future Affiliates



## Visibility:

- Participate in the international metric system and be listed on the BIPM website as a State having Affiliate status at the BIPM
- Participate in World Metrology Day activities **(in collaboration with RMOs)**

## Knowledge and Information:

- Access to webpage material and e-learning courses
- Participation in open online events, including open sessions of the CGPM
- Participation in open in-person events at own costs
- Annual newsletter for Affiliates **(in collaboration with RMOs)**

## Tailor-made Capacity Building:

- Depending on external funding
- E-learning/ in-person training addressing the needs of affiliates **(in collaboration with RMOs)**

# Benefits for existing Member States/Associates



- **Enhanced visibility** of the Metre Convention
- **Economic benefits** in trade due to a harmonized system
- **Strengthened Communication** with states with less developed metrology infrastructures
- **Strengthened regional structures**

# Next steps

Presented at the 2023  
Director's workshop

- *Invited input from States present*

Consult with the RMOs  
and the JCRB in 2024

Ask the RMOs to assist  
consulting with potential  
Affiliates already active in  
their RMO

Seek to undertake formal  
consultation with  
Member State  
representatives as of  
March 2024

With the ILC, prepare an  
info pack for prospective  
Affiliates that we will start  
to distribute together  
with the RMOs

Present an update at the  
150<sup>th</sup> anniversary  
celebration in 2025

Refine and Draft  
Resolution for the 28<sup>th</sup>  
CGPM in 2026



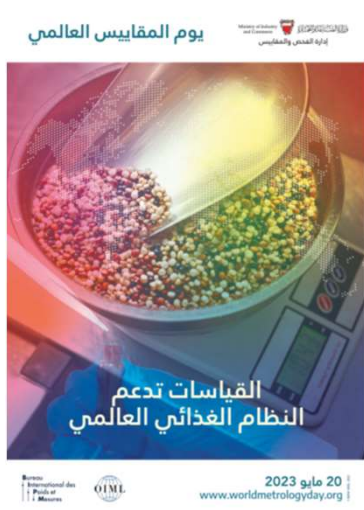
# World Metrology Day 2023

Partner RMO is SIM

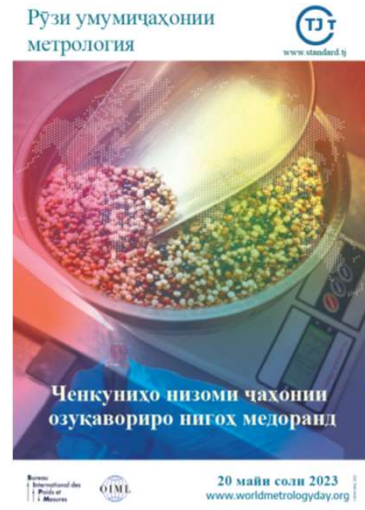
<https://www.worldmetrologyday.org/index.html>



# World Metrology Day 2023



Bahrain



Tajikistan



Nigeria



Haiti

Examples of non-members participating in  
World Metrology Day 2023

# World Metrology Day - a UNESCO initiative



- Proposal for UNESCO to proclaim “World Metrology Day” on 20 May every year has been submitted to the UNESCO Executive Committee (by the Permanent Delegation of Kazakhstan, supported by 43 UNESCO Member States).
- Ratification expected by the 42nd session of the UNESCO General Conference in **November 2023**

## UNESCO Member States in support:

**21 Member States (out of 64):** *Belarus, Brazil, Bulgaria, China, Hungary, Indonesia, Iran, Malaysia, Morocco, Pakistan, Poland, Republic of Korea, Russian Federation, Saudi Arabia, Serbia, Singapore, South Africa, Switzerland, Tunisia, Turkey, United Arab Emirates*

**12 Associates of the CGPM (out of 36):** *Albania, Azerbaijan, Bangladesh, Ethiopia, Ghana, Mauritius, Moldova, Mongolia, Sri Lanka, Syria, Uzbekistan, Viet Nam*

**10 States out of 85 UN Member States/non-members:** *Cameroon, Dominican Republic, Gabon, Jordan, Kyrgyzstan, Lebanon, Liberia, Myanmar, Palau, Turkmenistan*

# Evolving needs in Metrology (Resolution 1)

## encourages the CIPM

- to develop a long-term vision for an international measurement system that will remain relevant and adequately address new metrological challenges,
- to establish inter-disciplinary (“horizontal”) groups that will address these new challenges and will be complementary to the existing quantity-based (“vertical”) structure of its Consultative Committees,
- to mark the 150th anniversary (on 20 May 2025) of the signing of the Metre Convention by outlining a new vision for the BIPM that builds on the CIPM report on the “Evolving Needs in Metrology” and is based on a review of the achievements of the BIPM and the future requirements for its work,
- to consult widely on its proposal for a new vision for the BIPM to be presented at the 28th meeting of the CGPM (2026),



# CIPM Strategy

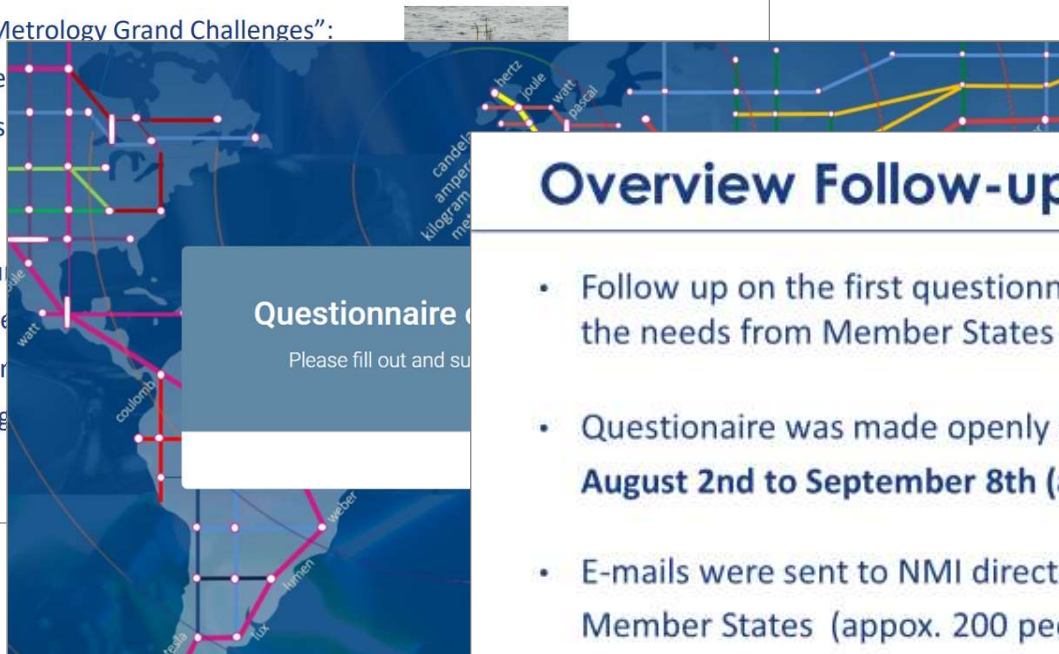
## 21<sup>st</sup> Century Metrology Grand Challenges

The CIPM identified five “Metrology Grand Challenges”:

- Climate change and e
- Health & life sciences
- Food safety
- Energy
- Advanced manufactu

Next to cross-cutting challenge

- Digital Transformation
- “New” metrology (e.g.



## Overview Follow-up Questionnaire

- Follow up on the first questionnaire (April 2023) to prioritize the needs from Member States on the future role of CIPM
- Questionnaire was made openly available from **August 2nd to September 8th (approx. 5 weeks)**
- E-mails were sent to NMI directors, State Representatives of Member States (approx. 200 people)



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Thank you for your participation!

# Young Metrologists Vision 2050+

## RMO Coordinators

**AFRIMET**



*Alphonsus KIPKEMBOI  
(Kenya)*

**AFRIMET**



*Pritesh JIVAN  
(South Africa)*

**APMP**



*Oijai ONGRAI  
(Thailand)*

**APMP**



*Yin Hsien FUNG  
(New Zealand)*

**COOMET**



*Nikita ZVIAGIN  
(Russian Federation)*

**COOMET**



*Gulaikhan SUYEUBAYEVA  
(Kazakhstan)*

**EURAME**



*Peter PAVLASEK  
(Slovakia)*

**GULFME**



*Rayan ALYOUSEFI  
(Saudi Arabia)*

**GULFME**



*Moza Khalfan  
ALMEMARI (UAE)*

**SIM**



*Rodrigo COSTA-FELIX  
(Brazil)*

**SIM**



*Fernando José Andrés  
MONGE (Costa Rica)*

# Timeline

- **AFRIMETS:** early December 2023 (TBC)
- **APMP:** first quarter of 2024 (TBC)
- **COOMET:** week from 12-16 February 2024 (exact date and time TBC)
- **EURAMET:** first quarter of 2024 (TBC)
- **GULFMET:** will be defined (TBC: Dec2023, Jan2024)
- **SIM:** 16<sup>th</sup> November 2023 from 14:00-16:00 (UTC).

CIPM  
Strategy  
2030+



Young  
metrologists'  
vision 2050+  
presentation

**Step 1:**  
Preparatory  
WS  
(online)

**Step 2:** Launch of questionnaires

**Step 3:** Online virtual workshops in  
each RMO

RMO internal activities

**Step 4:** Consolidation  
WS (in-person)

**Step 5:**  
Delivery

RMOs  
nominate  
Coordinators  
46th JCRB  
(03/2023)

March 2023

June 2023

June 2024

Oct 2024

20 May  
2025

150th anniversary  
of the signing of  
the Metre  
Convention

- **AFRIMETS:** contacting/encouraging NMIs/DIs (Web - TBC)
- **APMP:** organizing events (recruiting volunteers to promote etc.) to encourage YM (<https://www.apmpweb.org/portal/article/index/cid/16/id/1037.html>)
- **COOMET:** Questions and prompts were translated. Encouraging NMIs/Dis through internal channels
- **EURAMET:** Encouraging NMIs/DIs through internal channels.
- **GULFMET:** a session alongside of GULFMET GA - November 15, 2023, from 11:00-12:45 (Riyadh time)
- **SIM:** <https://sim-metrologia.org/2023/10/03/young-metrologists-2050-vision/>

The screenshot shows the SIM website with a navigation menu: Home, News, About SIM, Official Documents, Projects, Capacity Building, Publications, Only Members, Contact. The main content area features a large group photo of young metrologists standing on a stage. Below the photo is a news article titled "BIPM Young metrologists' 2050+ vision" with a sub-header "HOME PAGE NEWS". The article text reads: "Dear young metrologists, As future leaders in metrology, we are inviting you to participate in this foresighting exercise to seek your vision of what metrology will look like in the future. Foresighting helps us to identify emerging trends and technologies, and to anticipate new challenges and opportunities. The results of this exercise will complement the CIPM Strategy 2030+." It also mentions that a questionnaire was developed to start the process. To the right of the article is a "Next Events" section listing "SIM WEEK 2022", "Photometry Short Course (26 - 29 April 2022)", and "Learn more about SIM".

The screenshot shows a questionnaire titled "Questionnaire Young metrologists' 2050+ vision (June 2023 - June 2024)". It includes a "Background" section with the following text: "As a young metrologist, you are the future of metrology and your contributions to create the visions for 2050+ is of vital importance to shape the future of metrology. Please take this opportunity to engage with your peers, share your knowledge, and let's together create a collective vision by bringing different views of young metrologists' that are inclusive, innovative and sustainable." It also states: "The 27th meeting of the CGPM (2022) mandated the CIPM to develop a long-term vision for an international measurement system - CIPM Strategy 2030+. This involves extensive consultation at NMI, RMO level and with other stakeholders. The CIPM President is asking young metrologists to complement this strategy with visionary ideas for future opportunities and challenges for metrology over slightly longer timescale. The outcomes of this second exercise will of course be more speculative and less subject to the filters of current infrastructural or other limitations."

<https://form.jotform.com/BIPM/young-metrologists-2050-vision>

More than 20 responses from SIM member NMIs and DIs

<https://sim-metrologia.org/2023/10/03/young-metrologists-2050-vision/>

# „Horizontal Groups“



## Sectorial Task Group on Climate and Environment

- Workshop with WMO 26-30 September, 2022: report available
- First time in 2023: Participation in COP 28 as observer

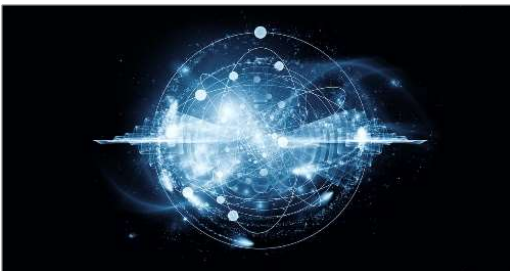


## Forum on Metrology and Digitalization

Kickoff meeting: 21 November 2023

## Forum on Metrology and Digitalization

- Kick-off Meeting: 21 November, 2022
- Workshop on FAIR Data: 05/06 March, 2024
- First Forum Meeting: 07/08 March, 2024



## Quantum Technologies

- First workshop: 22/23 March, 2024

# The Joint Statement

"On the digital transformation in the international scientific and quality infrastructure"

## Digital Transformation

Joint Statement of Intent *On the digital transformation in the international scientific and quality infrastructure*

### Joint Statement of Intent

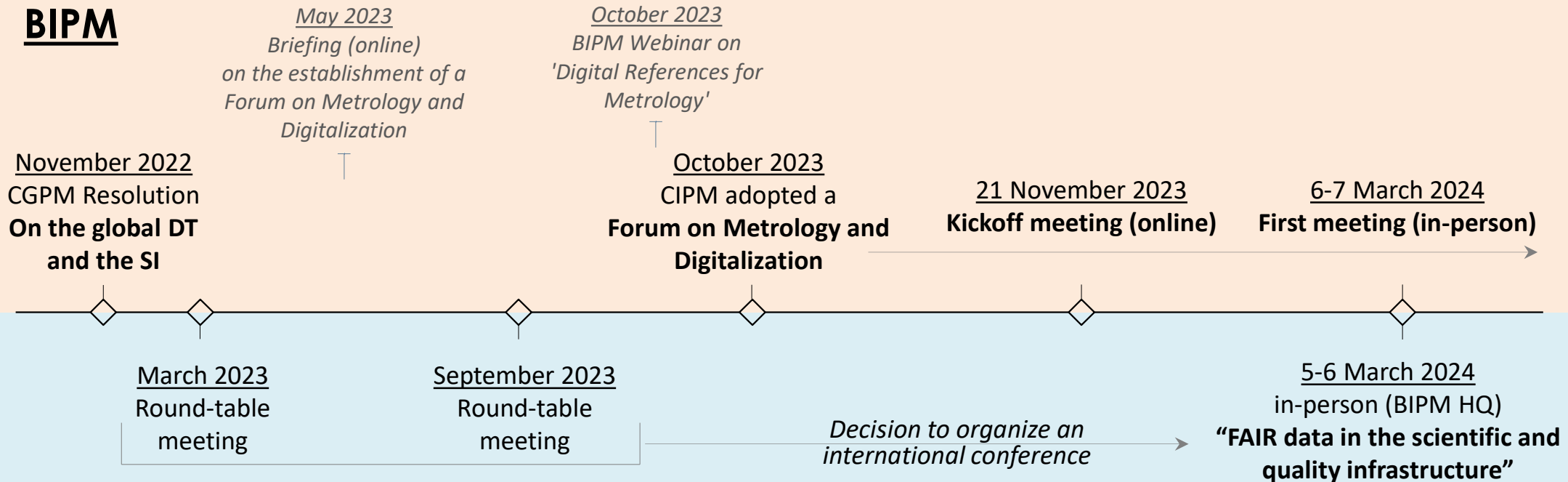
On the digital transformation in the international scientific and quality infrastructure

We the undersigned undertake to support in a way appropriate to each organisation the development, implementation, and promotion of the SI Digital Framework as part of a wider digital transformation of the international scientific and quality infrastructure.



# Digital Transformation

## BIPM



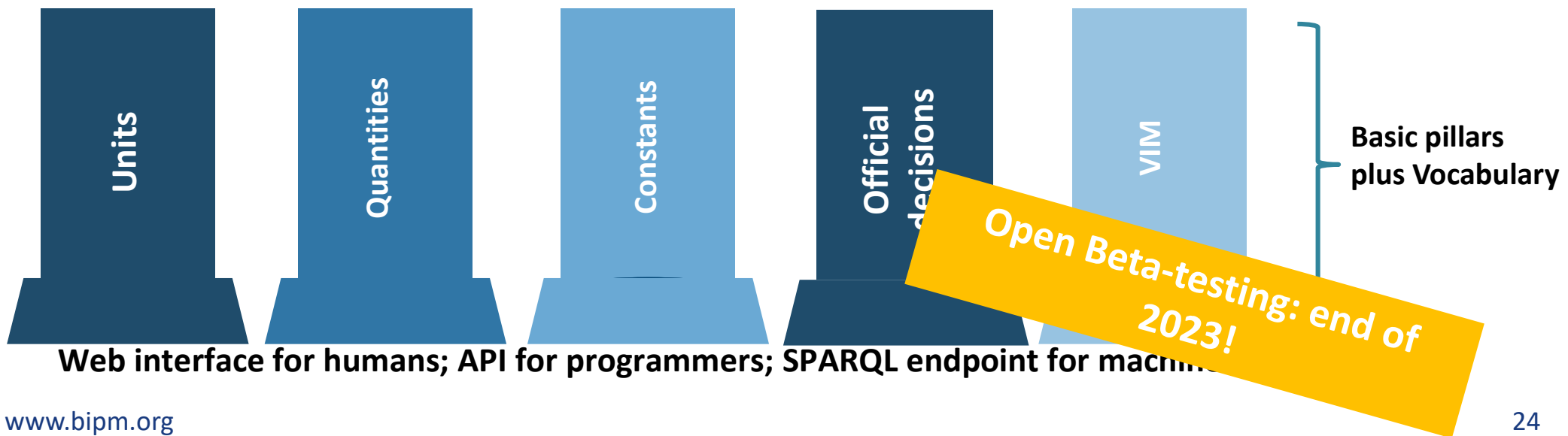
## Joint Statement

*The organizing committee includes a representative from each of the signatory bodies.*

# SI Reference Point – beta-testing from October



- [si-digital-framework.org/SI](https://si-digital-framework.org/SI)
- [si-digital-framework.org/constant](https://si-digital-framework.org/constant)
- [si-digital-framework.org/quantity](https://si-digital-framework.org/quantity)





# 20<sup>th</sup> May 1875

The Metre Convention was signed in Paris by 17 nations on **20 May 1875** “to assure the international unification and perfection of the metric system”



# 20<sup>th</sup> May 2025

Save the dates ..

Mon 19<sup>th</sup> May

to

Friday 22<sup>nd</sup> May

2025

Paris.

## We are planning a number of events in Paris in the week of 20<sup>th</sup> May 2025.

- To celebrate the achievements of 150 years of metrology by the BIPM since the signature of the Metre Convention.
- To present a new vision and strategy for the BIPM for 2030 and beyond developed by the CIPM.
- To promote metrology to the widest possible global audience.

# Update on Capacity Building



# CBKT statistics since 2016 (as of October 2023)

## 58 CBKT initiatives

- **29** projects in-person at the BIPM and regions
- **29** projects online (*13 of them repeated to cover all time zones*)
- **60 +** lecturers from NMIs/DIs and IOs have been involved in delivery of the CBKT activities

## 3544 participation

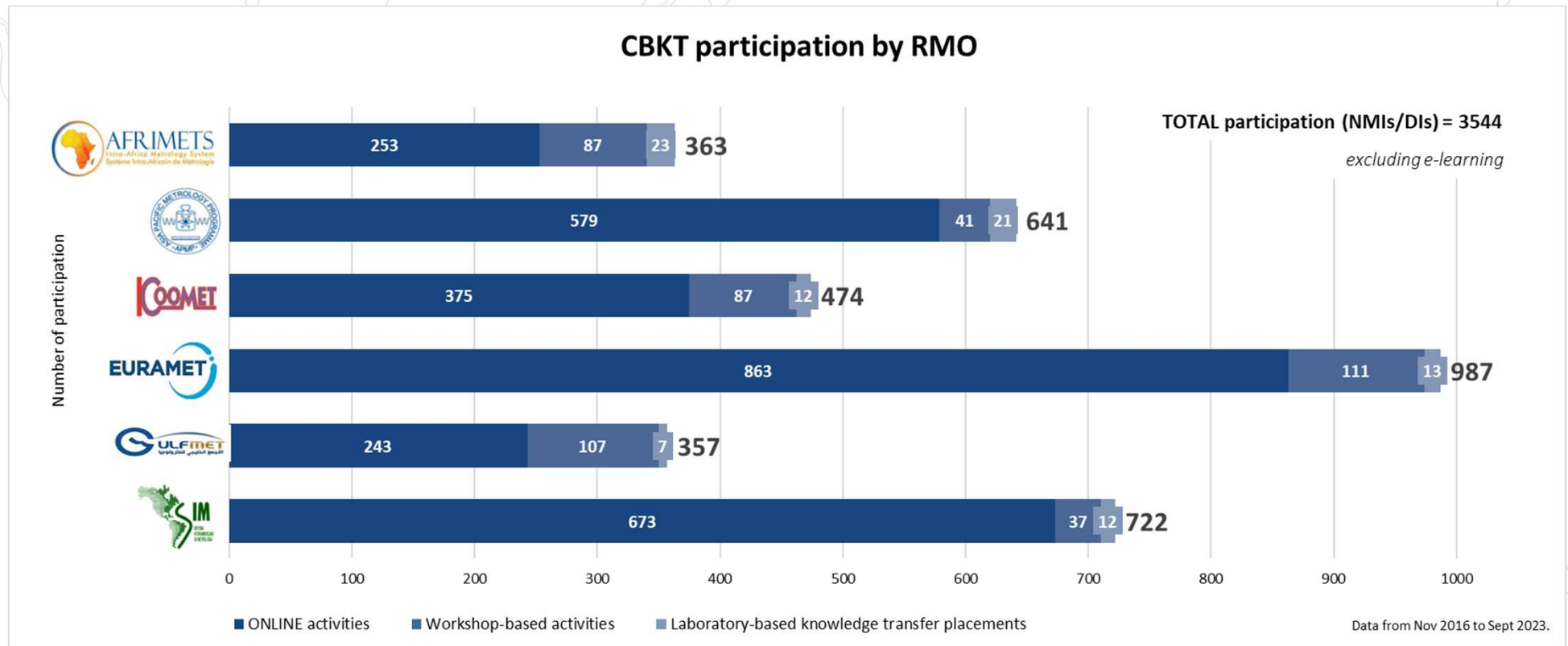
- **558** in-person participation from NMIs/DIs
  - **2986** online participation
- Additionally:**
- **604** Accreditation community
  - **950** registered users in e-learning

### Thanks for support from:

- |                      |                       |                         |                |
|----------------------|-----------------------|-------------------------|----------------|
| - METAS, Switzerland | - NMISA, South Africa | - SCL, Hong Kong, China | Plus           |
| - NIM, China         | - NPL, United Kingdom | - TÜBITAK UME, Türkiye  | - All the RMOs |
| - NIST, USA          | - PTB, Germany        | - IEEE, USA             |                |

# CBKT Participation by RMO

Collaboration with all six RMOs



# BIPM/RMO forum:

## *Supporting RMO Secretariats*

### This initiative:

- **meets the BIPM long-term strategy (2024-2029):**  
*“To explore, with the RMOs, the concept of an integrated mentoring tool”*
- **assists in the implementation of Resolution 6 (27th CGPM)**  
*“On universal adherence to the Metre Convention”*

### **21 Participants from 6 RMOs**

*RMO Secretariats and those who assist the RMO in various interactions with the BIPM.*

**27 to 29 September 2023**

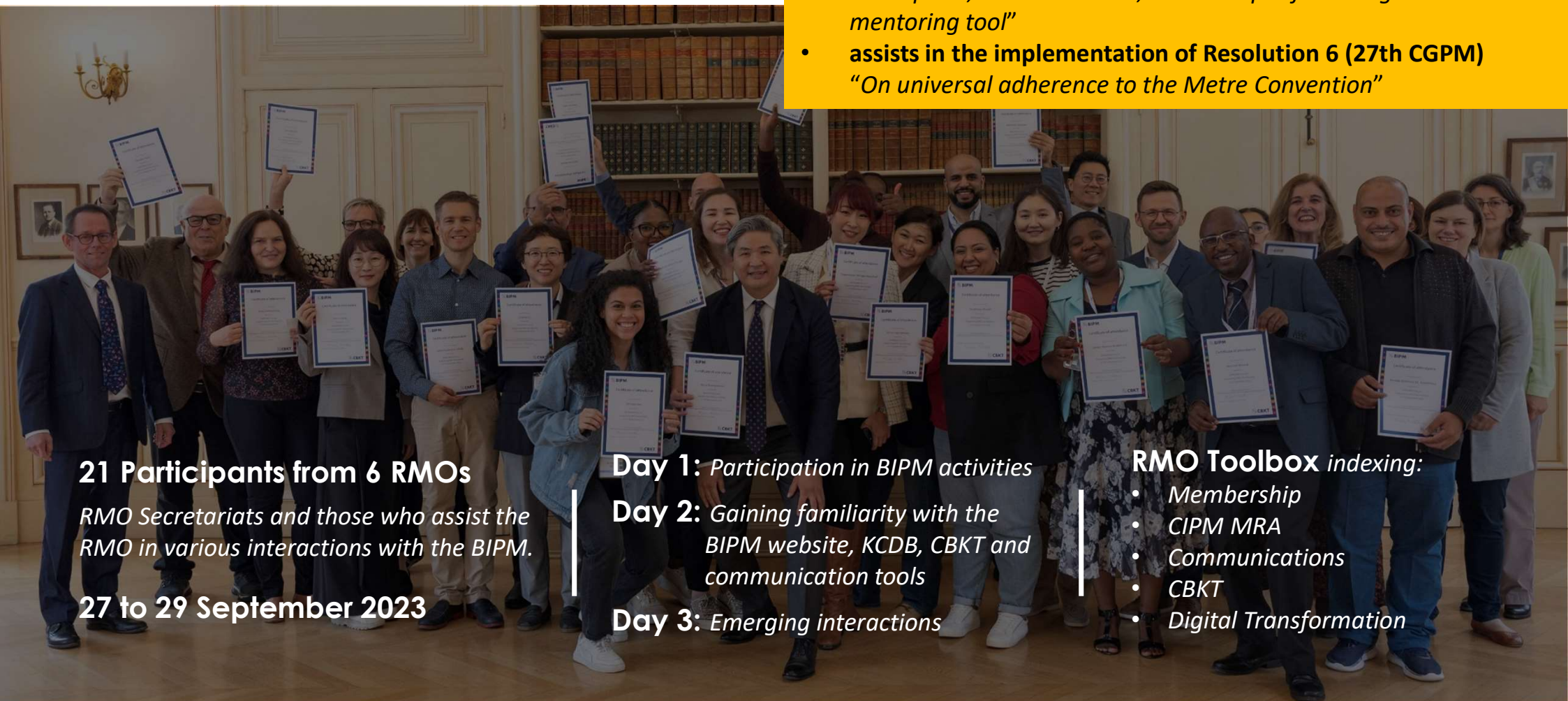
**Day 1:** *Participation in BIPM activities*

**Day 2:** *Gaining familiarity with the BIPM website, KCDB, CBKT and communication tools*

**Day 3:** *Emerging interactions*

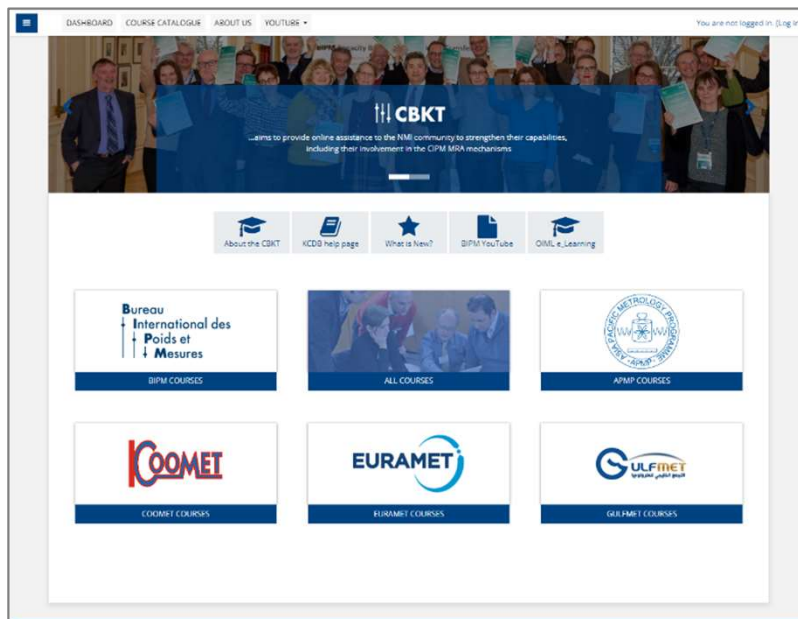
### **RMO Toolbox indexing:**

- *Membership*
- *CIPM MRA*
- *Communications*
- *CBKT*
- *Digital Transformation*



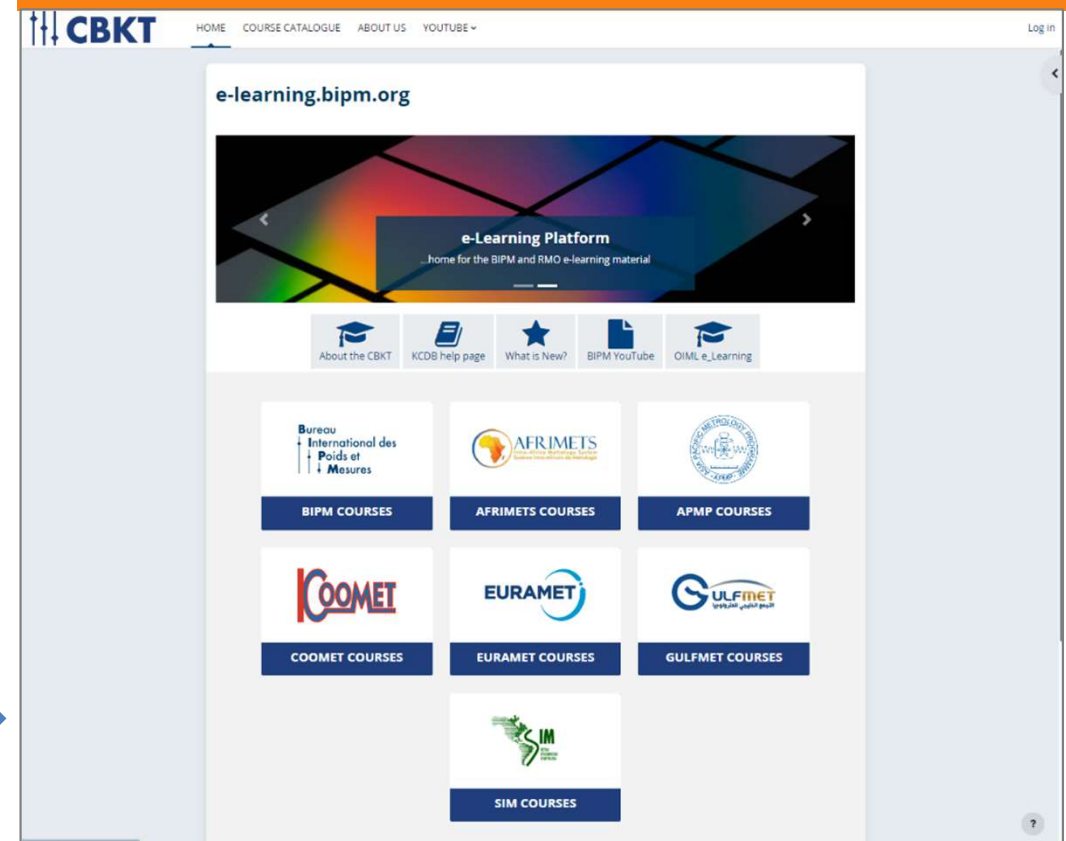
# e-learning platform

Version – 3.9 (LTS) – April 2021



Security improved, new navigation, additional functions, accessibility improved

Upgrade – 4.1 (LTS) – Launched in August 2023

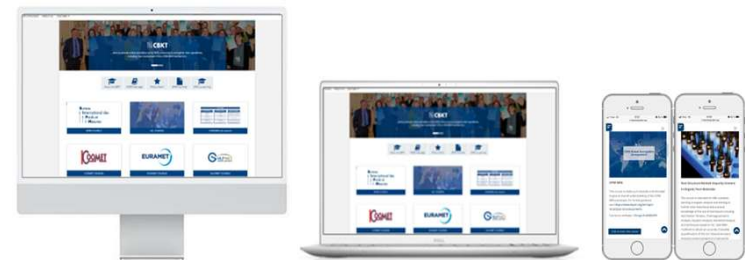
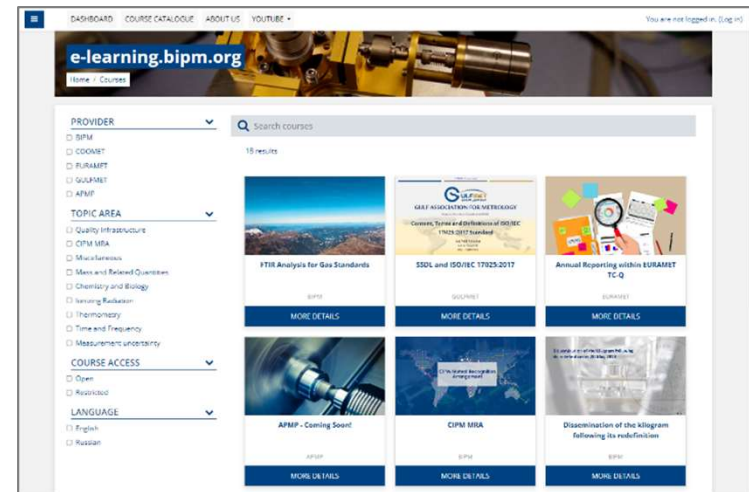


www.bipm.org

# e-learning platform

A “training platform” operated by the BIPM, hosts BIPM and RMO e-learning material

- 950 users in the platform
- 6 RMOs have joined the initiative: AFRIMETS, APMP, COOMET, EURAMET, GULFMET, SIM
- 19 courses from BIPM and participating RMOs are available today
- Self-registration system
- Accessible around the clock and on any device



<https://e-learning.bipm.org/>



# BIPM/OIML brochure

**BIPM**

**OIML**

## National Metrology Systems

The framework for States to participate in the globalization of trade and services that depend on measurement-based requirements

www.bipm.org      www.oiml.org

**BIPM** **OIML**

### The role of government in a National Metrology System

National Metrology System (NMS) overview

A national metrology system comprises:

1. The realization, the public and private, that serves as the metrological infrastructure for the realization of the units of measurement, through the use of a national metrological infrastructure.
2. The realization of the legal and technical framework that enables the realization of the units of measurement.
3. The realization of the technical and scientific infrastructure that enables the realization of the units of measurement.

It is important to have a strategy and a vision for the NMS that takes into account the role of the government, the role of the private sector, the role of the public sector, the role of the metrology community, and the role of the metrology infrastructure.

www.bipm.org      www.oiml.org

**BIPM** **OIML**

### Policy implementation options for governments

When governments make strategic choices on the structure and use of national metrology systems, they are aware of the need to consider the measurement-based requirements of the international metrology system. The implementation of national metrology systems is a complex task that requires the involvement of various stakeholders, including government agencies, the private sector, and the metrology community.

www.bipm.org      www.oiml.org

**BIPM** **OIML**

### International aspects of National Metrology Systems

The need for international recognition and compatibility between national and international metrological requirements.

International metrology organizations

www.bipm.org      www.oiml.org

**BIPM** **OIML**

### Legislating for metrology

General considerations when developing a law on metrology

www.bipm.org      www.oiml.org

**BIPM** **OIML**

### Assessing metrology needs that support national priorities

The purpose of this brochure is to support measurement-related activities in a country's economy, the realization of a national metrology system, and the globalization of trade and services that depend on measurement-based requirements.

www.bipm.org      www.oiml.org

**BIPM** **OIML**

### Developing a metrology system for the future

Responding to a changing world

www.bipm.org      www.oiml.org

E-Learning course will follow in 2024

Thank you

