

# **EURAMET CB activities**

**17th EURAMET General Assembly**

**Tallinn, Estonia  
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Vice-Chairperson (GA)

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BOD-WGCB Convenor

# CB background



Many EURAMET institutes represent the **cutting edge of global measurement expertise**

**However, some others** are in the **earlier development stages** and are **less research- and more service-oriented** or are small entities which have to keep up with their stakeholders' needs despite **very limited resources**.

EURAMET's intention is to **support EURAMET NMIs/DIs with emerging metrology systems or measurement fields**.

In addition to that, **certain knowledge** (e.g. international quality infrastructure, CIPM MRA related, operation of a TC or piloting an interlaboratory comparison) **is needed by institutes from the whole EURAMET landscape**.

One of **EURAMET's strategic objectives** is the “**High value delivered to members and associates**” with the goal to:

- move to a fit-for-purpose and truly coordinated metrology infrastructure in Europe with appropriate use of joint infrastructures and coordinated services
- assist members in achieving metrological capability where needed, and to provide reliable cross-border services where not
- help bridge the gap between emerging and well-developed members, thus developing a balanced and integrated metrology system

# EURAMET Strategy 2030 Objectives



## EURAMET Strategy 2030 Objectives

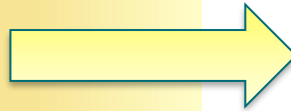
Engaging Stakeholders for Mutual Benefit

Supporting Joint Research and Development

Advancing Europe's Quality Infrastructure

Collaborating with European Policy Makers and Governments

Delivering High Value to Members and Associates



## EURAMET CB Strategy Objectives

- **Support building the human and institutional capacity** of member NMIs and DIs
- Reinforce member **NMI/DI research capabilities**
- Support EURAMET NMIs/DIs for **more effective participation in CIPM MRA processes & mechanisms**
- Support **integration** of all EURAMET members **into EURAMET structures and activities**
- **Achieve sustainability of CB activities** over the long-term through securing appropriate financial and human resources
- **Cooperation with other organisations** on CB matters

# Impact of CB & EMRP/EMPIR

## Widening the JRP community

- Countries joined at EMPIR stage: Ireland, Greece, Serbia, Bulgaria, Croatia – new participants in JRP projects,
- New countries coordinating JRPs: Slovenia, Bosnia & Herzegovina, Portugal, Croatia, Ireland
- NMIs from non EMPIR countries (never participating in a JRP before) joining as external partners: Lithuania, North Macedonia, Montenegro, Moldova

## Sharing the load

- Emerging institutes started hosting training courses (DMDM, MBM, IMBiH, DPM)
- New institutes started piloting intercomparisons within last 10 years: DMDM, BIM, EIM, HMI, HMI/FSB-LPM, HMI/FSB-LPMD, IMBiH, VINS.

## NMI/DI development

- New measurement services and facilities in NMI/DIs
- Many CMCs in preparation, some claims already submitted, some already approved

- **Europe-wide participation (36 countries)**
- **Cooperation** with the **BIPM, COOMET, APMP**
- **EURAMET CB Strategy** prepared

**Success stories:** <https://www.euramet.org/knowledge-transfer/focus-topic-capacity-building/>

# BoD Working Group for Capacity Building (BOD-WGCB)



Giving **strategic advice** on CB activities

Annual meeting 2023: 4-6 October. BoM, North Macedonia, Skopje

25 Members (**all EURAMET members welcome to join!**)

DPM (AL), BEV (AT), IMBiH (BA), SMD (BE), BIM (BG), EIM (GR), FSB-LPM (HR), METROSERT (EE), BoM (MK), PTB (DE), MIKES-VTT (FI), NSAI/NML (IE), FMTC (LI), LATMB - LNMC (LV), INM (MD), MBM (ME), GUM (PL), IPQ (PT), DMDM (RS), SMU (SK), MIRS (SI), CEM (ES), METAS (CH), TUBITAK UME (TR), NPL (UK)

## **Observers**

WELMEC  
COOMET  
APMP

## **BoD-WGCB Convenor**

Paul Hetherington, NSAI

## **BOD-WGCB Guardian**

Miruna Dobre, EURAMET Vice-Chairperson (GA)

# CB Instruments: yesterday, today and tomorrow



	Duration	2019	2020	2021	2022	2023
Training courses and workshops	3d	+	+	+	+	+
Mentoring Scheme Award (MSA)	3w	-	+	+	+	-
RMG – researcher mobility grants	3m	+	+	+	+	-
Small collaborative projects	1.5 y	-	+	+	-	-
Research Potential Projects (new)	3y	-	-	-	+	+
E-Learning platform	-	-	+	+	+	+
Collaboration with EMNs	-		+	+	+	+

Research

- Good complementarity of instruments (e.g. of various duration)
- Certain preferences for each of them (by group of NMI/DIs)
- No need to introduce new ones

(according to CB Survey 2022)

Not all of these instruments would be available every year, please check the detailed instrument page or contact the [CB Officer](#) for more information

# Annual overview: October 2021 – December 2022



Training courses	E-Learning courses	RMG adverts	Mentoring Scheme Awards	RPT SRTs
EURAMET training course on resistance standards	Annual Reporting within EURAMET TC-Q	<b>19ENG01-RMG1: Research in photovoltaic metrology</b>	MSA_001_2022_ENEA_STUK_IR	<b>Towards a true 8-digit digitiser</b>
Preparatory Workshop: 2022 RPT Call	Estimation of Measurement Uncertainty in Chemical Analysis	19ENG03-RMG1: Research in impurity assessment of hydrogen	MSA-002-2022_POLATOM-LNHB IR	<b>Improving the realisation of the kelvin by multiple fixed-point radiation thermometry</b>
EURAMET - COOMET training course on small volume comparisons	LC-MS Method Validation	19ENG07-RMG2: Research in large coordinate metrology	MSA_003_2022_UME PTB_JAWS	<b>Establishing traceability for medical measuring devices through optical absorbance liquid filters</b>
	Small Volume Comparisons	<b>19RPT01-RMG1: Research in Josephson Voltage Standards</b>	MSA_004_2022_JV_PTB humid	<b>Traceability for indentation measurements in Brinell-Vickers-Knoop hardness</b>
	Good practice in evaluating measurement uncertainty	<b>19RPT02-RMG2: Research in influence of temperature on mass measurements</b>	MSA_005_2022_CETIAT-CMI-Flow	<b>Development of RF and microwave metrology capability II</b>
	Raman spectroscopy of graphene masterclass	<b>20FUN01-RMG1: Research in optical clocks 1</b>	MSA_006_2022_... CETIAT-NSAI	<b>Novel metrological capabilities - Measuring impact of biofilms on solar panel efficiency</b>
		<b>20FUN01-RMG2: Research in optical clocks 2</b>		Determination of tritium content in solid samples
		<b>20FUN01-RMG3: Research in optical clocks 3</b>		
		<b>20FUN02-RMG1: Research in optical microscopes</b>		
	Additional courses: Work in progress	<b>21GRD01-RMG1: Research in self-assembling materials nanofabrication and opto-electrical characterization</b>	New tool, very much appreciated by participants	
		<b>21GRD07-RMG1: Research in characterisation of microplastics</b>		



2023



2024?



# Annual overview: action plan 2023



Training courses	E-Learning courses	RMG adverts	Mentoring Scheme Awards	RPT SRTs
Summer School of Thermal metrology (reduced scope)	Gloss measurement			Research Potential call – 2 M€ budget planned
Basic mass	IR comparisons			
Basic dimensional	T comparisons			
Dynamic measurements	QMS-related			
Neutron activation	DCC generation			

Full range of activities expected again in 2024, financed through CBC (CSA on Capacity Building)



# Annual overview: action plan 2023



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Basic dimensional	T comparisons			
Dynamic measurements	QMS-related			
Neutron activation	DCC generation			
	Several others...			

- 1. Encourage JRPs to create materials within the JRPs
- 2. Workforce needed for moodlisation of existing materials

Some MSAs might be possible in 2023

Full range of activities expected again in 2024, financed through CBC (CSA on Capacity Building)

# EURAMET Summer School of Temperature and humidity measurements, 11 – 15 September 2023



Ljubljana - Faculty of Electrical Engineering (MIRS /UL- FE /LMK),  
Tržaška cesta 25, 1000 Ljubljana, Slovenia

For metrologists new to the field of temperature and humidity measurement (in NMIs or DIs who have less than two years of experience) - an introductory overview of current international metrology standards, followed by a more detailed insight in the thermal metrology disciplines with many practical exercises.

Lecturers - world leading thermometry experts from NMIs and DIs from EURAMET and the wider metrology community; PTB (D), NPL (UK), LNE-LCM/CNAM (F), CEM (ES), INRIM (I), NRC (CA), LNE-CETIAT (F), MIRS/UL-FE/LMK (SI), SDM (BE) and the BIPM.

## Registration:

- EURAMET NMIs and DIs by end of April
  - Colleagues from other RMOs will be invited afterwards
- (participation fee of 100 € for the whole event is foreseen)

# Research potential projects 2014 - 2023

14RPT01	ACQ-PRO	<a href="#">Towards the propagation of ac quantum voltage standards</a>	Javier Díaz de Aguilar, CEM	completed
14RPT02	AWICaI	<a href="#">Traceable calibration of automatic weighing instruments operating in the dynamic mode</a>	Matej Grum, MIRS	completed
14RPT03	ENVCRM	<a href="#">Matrix reference materials for environmental analysis</a>	Alper Isleyen, UME	completed
14RPT04	Absorb	<a href="#">Absorbed dose in water and air</a>	Jean Marc Bordy, LNE-LNHB	completed
14RPT05	Eura-Thermal	<a href="#">Developing traceable capabilities in thermal metrology</a>	Jean-Remy Filtz, LNE	completed
15RPT01	RFMicrowave	<a href="#">Development of RF and microwave metrology capability</a>	Murat Celep, UME	completed
15RPT02	UNAC-LOW	<a href="#">Underwater acoustic calibration standards for frequencies below 1 kHz</a>	Alper Biber, MRC MI-UAL	completed
15RPT04	TracePQM	<a href="#">Traceability routes for electrical power quality measurements</a>	Věra Nováková Zachovalová, CMI	completed
15RPT03	HUMEA	<a href="#">Expansion of European research capabilities in humidity measurement</a>	Nedžadeta Mutapčić, IMBIH	completed
16RPT01	ChemMet-Cap	<a href="#">Development of scientific and technical capabilities in the field of chemical analysis</a>	Paola Fisicaro, LNE	completed
16RPT02	ALCOREF	<a href="#">Certified forensic alcohol reference materials</a>	Rosemarie Philipp, BAM	completed
16RPT03	inTENSE	<a href="#">Developing research capabilities for traceable intraocular pressure measurements</a>	Dominik Prazak, CMI	completed
17RPT02	rhoLiq	<a href="#">Establishing traceability for liquid density measurements</a>	Andreia Furtado, IPQ	in progress
17RPT03	DIG-AC	<a href="#">A digital traceability chain for AC voltage and current</a>	Damir Ilic, FER	in progress
17RPT04	VersICaL	<a href="#">A versatile electrical impedance calibration laboratory based on digital impedance bridges</a>	Oliver Power, NSAI	completed
17RPT01	DOSEtrace	<a href="#">Research capabilities for radiation protection dosimeters</a>	Amra Šabeta, IMBIH	completed
18RPT02	adOSSIG	<a href="#">Developing an infrastructure for improved and harmonised metrological checks of blood-pressure measurements in Europe</a>	Václav Sedlák, CMI	in progress
18RPT03	MetForTC	<a href="#">Traceable measurement capabilities for monitoring thermocouple performance</a>	Narcisa Arifovic, UME	in progress
18RPT01	ProbeTrace	<a href="#">Traceability for contact probe and stylus instrument measurements</a>	Murat Aksulu, UME	in progress
19RPT01	QuantumPower	<a href="#">Quantum traceability for AC power standards</a>	Helge Malmbeek, JV	in progress
19RPT02	RealMass	<a href="#">Improvement of the realisation of the mass scale</a>	Jaroslav Zuda, CMI	in progress
22RPT02	True8DIGIT	<a href="#">Towards a true 8-digit digitiser</a>	Oliver Power, NSAI	in progress
22RPT03	MultiFixRad	<a href="#">Improving the realisation of the kelvin by multiple fixed-point radiation thermometry</a>	Age Andreas Falnes Olsen, JV	in progress
22RPT01	Tracind BVK-H	<a href="#">Traceability for indentation measurements in Brinell-Vickers-Knoop hardness</a>	Cihan Kuzu, UME	in progress
22RPT04	RFMicrowave2	<a href="#">Development of RF and microwave metrology capability II</a>	Martin Hudlicka, CMI	in progress

Five potential SRTs for 2023 call

# CB activities in the future



EURAMET is launching a **Coordination and Support Action** (budget 1 M€) to support **Capacity Building activities** from the **Partnership**. The project consortium/coordinator will:

- organize the range of CB activities and to “cascade” the funding to the final beneficiaries
- take care of all processes in line with EU requirements: launching of calls (for RMG, training,...), independent evaluation of proposals, reviews of proposals, etc...
- report on the impact of the action
- work with EURAMET’s Bodies and utilize existing mechanisms for identification and planning of actions

**Call in 2023, realisation in 2024 and later**

TC CBC Scope has been prepared

Orientation paper drafted, not yet published

# E-Learning: development steps and current status




- Started in 2020
- Prototype in SharePoint developed in 2021
- Change of concept – joining BIPM platform in September 2021
- Arrangement with BIPM signed in January 2022
- Platform in operation
- Consolidation of the development team
- Next contributions (discussed at Advisory board on 30 September)
- Training course for Moodle course creators (by BIPM), 26 September
- Invitation to all running projects, if they want to publish some training materials
- Preparation of training courses for course creators from EURAMET (by Sec)
- Testing the processes before finalising the QMS documents
- Demonstration
- E-Learning development strategy



← → ↻ 🏠 <https://e-learning.bipm.org> 90% ★ 📖 📌


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**CBKT**


...aims to provide online assistance to the NMI community to strengthen their capabilities, including their involvement in the CIPM MRA mechanisms




About the CBKT




KCDB help page




What is New?




BIPM YouTube




OIML e\_Learning




BIPM COURSES




ALL COURSES




APMP COURSES



COOMET COURSES




EURAMET COURSES



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TOPIC AREA ▾

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- ☐ CIPM MRA
- ☐ Miscellaneous
- ☐ Mass and Related Quantities
- ☐ Chemistry and Biology
- ☐ Ionizing Radiation
- ☐ Thermometry
- ☐ Time and Frequency
- ☐ Measurement uncertainty

🔍 Search courses


6 results



Annual Reporting within EURAMET TC-Q

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MORE DETAILS



Estimation of Measurement Uncertainty in Chemical Analysis University of Tartu

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MORE DETAILS



Good practice in evaluating measurement uncertainty; EMPIR Project EMUE 17NRM05

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MORE DETAILS



LC-MS Method Validation University of Tartu

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Raman spectroscopy of graphene masterclass

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MORE DETAILS



Small Volume Comparisons

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MORE DETAILS

G17.04.03 CB 17th EURAMET GA, Tallinn, Estonia, 31 May, 2023

# E-Learning: development

- Started in 2020
- Prototype in SharePoint development
- Change of concept – joining BIPM
- Arrangement with BIPM signed
- Platform in operation
- Consolidation of the
- Next contributions (discuss)
- Training course for Moodle course creators
- Invitation to all running projects
- Preparation of training courses
- Testing the processes before
- Demonstration
- E-Learning development strategy

- Course for newcoming TC-chairs
- Operation of a EURAMET TC
- Course for new EURAMET members and associates
- TC-Q Initial presentation - TC-Q WG
- TC-Q QMS Review - TC-Q WG
- Basic course on Moodle for course creators – Sec
- **Conversion of EURAMET BIPM course on thermometry comparisons – work in progress**
- **Conversion of EURAMET BIPM course on ionising radiation comparisons – work in progress**
- DCC development guidance
- Materials prepared within 17IND11 Hi-TRACE
- Materials prepared within 20SCP01 Smart PhoRa
- Materials prepared within 16ENG02 PV-Enerate
- **Materials prepared within 19NRM04 ISO GScope project (Raman spectrometry)**
- Materials prepared within 20IND01 MetroCycleEU (recycling of technology critical elements)
- Materials to be prepared within SCP TRAMM (magnetic measurements)
- ...



Thank you for your attention

Questions?

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