



**SIM  
METROLOGY  
SCHOOL**

# The Sistema Interamericano de Metrología (SIM)

From Coordinated Metrology in the Americas to International Recognition Through the CIPM MRA

**SPEAKER**

**Lisa KARAM**

National Institute of Standards and Technology (NIST)

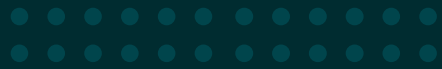
**Bogotá, Colombia | August 2024**

**NIST** | PHYSICAL  
MEASUREMENT  
LABORATORY



# Some History

## Were you there?



# In the beginning...

## Some SIM History

- 1971: Conference on Applications of Science and Technology in Latin America (Brasilia) – need for cooperation in metrology
- 1972: Consejo Inter-americano para la Educación, la Ciencia y la Cultura (Mar del Plata) – Sistema Inter-Americano de Metrologia y Calidad (SIMYC)
- 1974: OAS/NBS international workshop on industrialization and standardization (Gaithersburg) – recognized need for metrology
- 1975: OAS meeting (Buenos Aires) – special project on metrology
- **1979: SIM created** (13 Latin American countries)

SISTEMA INTERAMERICANO DE METROLOGIA

PREAMBULO

Visto, la necesidad de dar permanencia en el tiempo a las acciones de coordinación iniciada bajo el Proyecto Especial OEA "Sistema Regional de Metrología y Calibración", los representantes de diferentes instituciones de trece países latinoamericanos, inspirados en los principios establecidos en Panamá en setiembre de 1977, reunidos en la ciudad de Buenos Aires a los tres días del mes de setiembre de mil novecientos setenta y nueve, decidimos por unanimidad constituir el SISTEMA INTERAMERICANO DE METROLOGIA (SIM), declarando aprobado el Estatuto que regirá su funcionamiento.



# The Early Years

Holding pattern in the 1980s

## SIM starts rolling

- 1992/1993: Workshops; 1<sup>ST</sup> GA (Buenos Aires)
- 1994: Summit of the Americas Declaration of Principals promote technical cooperation on metrology and standards
- 1995: OAS coordinating meeting (Rio de Janeiro) to reorganize and revitalize SIM (2<sup>nd</sup> GA)
- 1995-1998: More financial support from OAS, more members, workshops (including first metrology schools), comparisons, interactions, etc.
- **1999: CIPM MRA signed**

*“Raising the standards of basic metrology in each country in the hemisphere, and promoting regional and international cooperation in metrology, based upon mutual confidence among the region's national metrology institutes”*

### SIM Presidents:

- Rafael Steimberg, INTI (Argentina), 1979-1985
- Hector Nava Jaimes, CENAM (Mexico), 1995-1998
- Mauricio Nogueira Frotas, INMETRO (Brasil), 1998-2000
- Felipe Urresta, INEN (Ecuador), 2000-2004
- Diana Lalla-Rodrigues, ABBS (Antigua y Barbuda), 2004-2006
- Humberto Brandi, INMETRO (Brasil), 2006-2010
- José Dajes, INDECOPI (Perú), 2010-2014
- Héctor Laiz, INTI (Argentina), 2014- 2018
- Claire Saundry, NIST (USA), 2018-2022
- Javier Arias, CENAMEP (PANAMA), 2023 –



# Into the New Millennium

## SIM as an RMO

### Momentum Builds

- From 2000: Metrology Working Groups (MWGs) to liaise among metrologists in each field (training, coordinating projects, comparisons, reviews, etc.)
  - Creation of the QSTF
  - Mutual recognition of standards and certificates
  - Cooperation in R&D
  - Fulfilling requirements of the CIPM MRA
- 2016: SIM moves to obtain legal entity status (based in Uruguay)
- **2017: SIM fully recognized as a legal entity**

## QUALITY SYSTEM TASK FORCE (QSTF)

Ensuring efficient and effective review of the quality systems of SIM NMIs to ensure conformance with the expectations of the CIPM MRA and to serve other quality system approval needs of SIM NMIs.

### Quality System Review Guidelines

The SIM QSTF must satisfy itself that, through its review process, the quality management system operated by the NMI or DI is effective and conforms with the requirements of the CIPM MRA, including the applicable requirements of ISO/IEC 17025, ISO 17034, etc.

The SIM QSTF requires on-site peer reviews and may request additional review be undertaken, in order that the NMI or DI may demonstrate confidence in their ability to deliver their claimed CMCs.

Quality systems that have been approved must be fully re-evaluated and re-approved within five years.

### Technical Metrology Working Groups (MWGs)

MWGs consist of active members from registered NMIs/DIs of SIM, and who are experts in the relevant technical area. Each MWG meets on a schedule which most effectively meets their requirements (some meeting several times a year, others every two years) and whenever necessary. The MWGs:

- promote the participation of all NMI members and of their DIs with technical measuring capabilities in their area;
- record, coordinate, and ensure the proper functioning of the SIM comparisons, as well as the adequate dissemination of the results thereof;
- review the calibration and measuring capabilities (CMC) of SIM members for submission to the JCRB through the President of the TC;
- review the CMCs of NMIs/DIs of other regional organizations within the framework of CIPM MRA;
- suggest and organize training activities and collaborative projects among its members.

Each MWG may establish a sub-working group to address specific issues arising in the technical field.





# Structure

## Operational Parameters

### Mission


*To support the development of the measurement capabilities and quality infrastructure in America; to foster science and innovation; and to enable Members' international recognition to underpin competitiveness, trade, consumer safety, and sustainability*

### Vision

*To be an inclusive, innovative, and internationally leading Regional Metrology Organization (RMO)*

### TEAM SIM

*Teamwork, **E**quity, **A**spiration, **M**otivation  
and  
**S**cience, **I**nnovation, Mastering **M**etrology*





# Structure

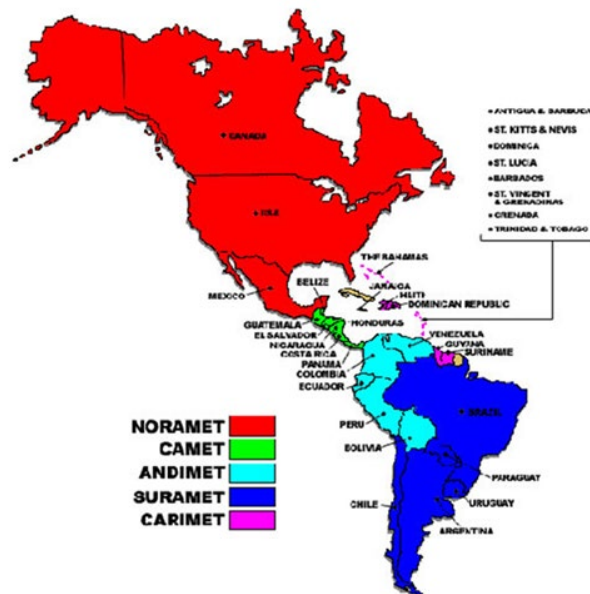
## People and partners





# Membership

- 33 Active members (NMIs)
- 15 Associate members (DIs+IAEA)
- 4 Affiliates member organizations (IAAC, COPANT, CROSQ, AEM MS)
- Pending: Suriname, Cuba



	Region	Country	NMI/Active member	DI/ Associate member
1	NORAMET	Canada	NRC	TCC
2		Mexico	CENAM	INEC, ININ
3		USA	NIST	NUWC-USRD IAEA
4	CARIMET	Antigua and Barbuda	ABBS	
5		Bahamas	BBSQ	
6		Barbados	BNSI	
7		Dominica	DBS	
8		Dominican Republic	INDOCAL	
9		Grenada	GDBS	
10		Guyana	GNBS	
11		Haiti	BHN	
12		Jamaica	BSI	
13		St. Lucia	SLBS	NADF
14		St. Kitts and Nevis	SKNBS	
15		St. Vincent and Grenadines	SVGBS	
16		Trinidad and Tobago	TTBS	
17		CAMET	Belize	BBS
18	Costa Rica		LCM	LAMETRO-ICE, ICE LMVA, RECOPE, LanammeUCR
19	El Salvador		CIM	
20	Guatemala		CENAME	
21	Honduras		CEHM	
22	Nicaragua		LANAMET	
23	Panamá		CENAMEP	
24	ANDIMET	Bolivia	IBMETRO	
25		Colombia	INM	CALAIRE
26		Ecuador	INEN	
27		Peru	INACAL	
28		Venezuela	SENCAMER	
29	SURAMET	Argentina	INTI	CNEA
30		Brazil	INMETRO	LNMRI/IRD, ON
31		Chile	INN	CCHEN*
32		Paraguay	INTN	
33		Uruguay	LATU	UTE, MIEM-LSMRI*



# Working with SIM

## Liaison Organizations

### RMOs and Others

- [APMP](#) (Asia Pacific Metrology Programme)
- [AFRIMETS](#) (Intra-African Metrology System)
- [COOMET](#) (Euro-Asian Cooperation of National Metrological Institutions)
- [EURAMET](#) (European Collaboration in Measurement Standards)
- [GULFMET](#) (Gulf Association for Metrology)
- [BIPM](#) (Bureau International des Poids et Mesures)
- [SADCMET](#) (Southern African Development Community Cooperation in Measurement Traceability)
- [PTB](#) (Physikalisch-Technische Bundesanstalt)
- [OIML](#) (International Organization of Legal Metrology)
- [QICA](#) (Quality Infrastructure Council for the Americas)
- [IAAC](#) (Inter American Accreditation Cooperation)
- [COPANT](#) (Pan American Standards Commission)
- [NSCLi](#) (National Conference of Standards Laboratories International)



# Official Documents

## Critical Information

*“There shall be only one Full member (National Metrology Institute, NMI) per country”*

- **Cooperative Arrangements**

- SIM-IAAC-COPANT: MOU among the 3 regional quality infrastructure (QI) organizations of the Americas
- SIM-OAS: Framework for cooperation between SIM and OAS (OEA) to jointly contribute to the development of metrology capabilities in the Americas

- **Bylaws, Rules of Order, Strategic Plan 2022-2032**

- **Guidance**

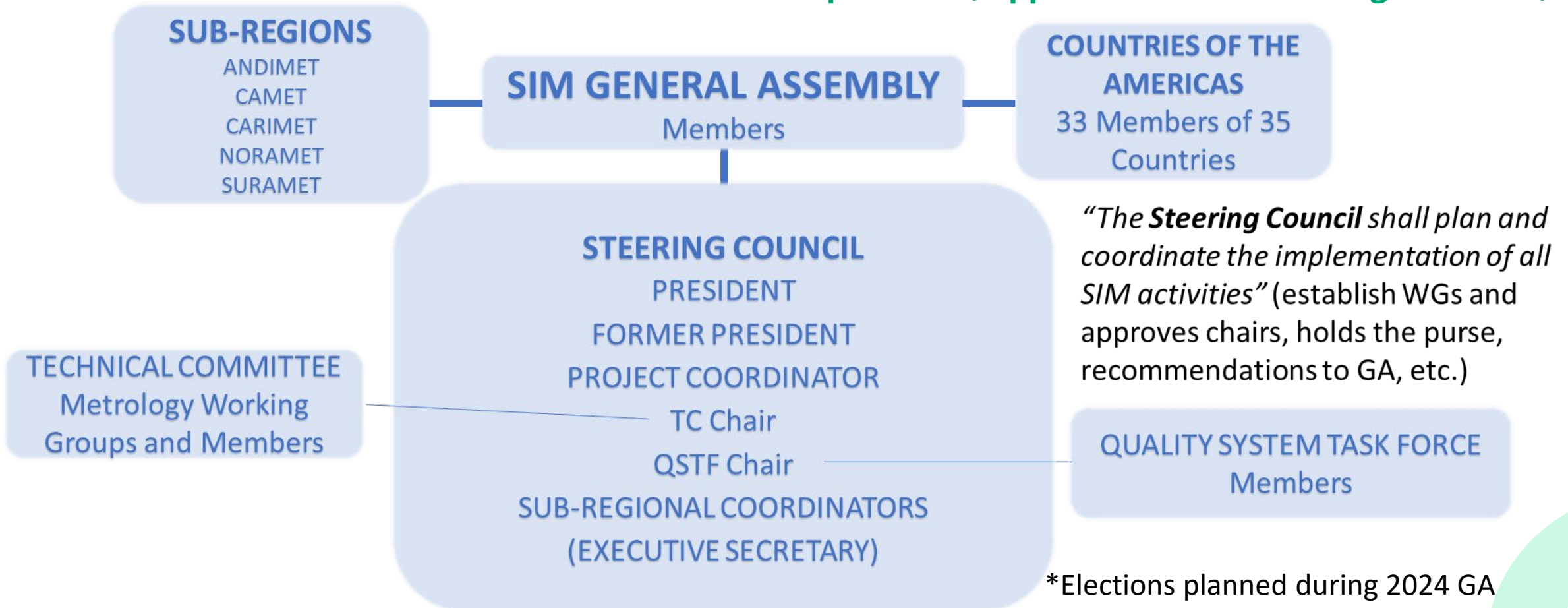
- SIM-D-01: Terms of reference for the MWGs
- SIM-D-05: Procedures for CMC review
- SIM-D-06: Electronic voting
- SIM-D-07: Procedures for SIM comparisons
- SIM-D-09: Procedures for review of QMS
- SIM-D-12: Use of the SIM logo

**Strategic GOAL I:** To advance SIM Members metrological capabilities (e.g., capacity building)  
**Strategic GOAL II:** To enhance SIM international standing as an RMO and as a pillar of the regional QI (integration in the CIPM MRA)  
**Strategic GOAL III:** To address the measurement challenges of the future (identify & plan)

<https://sim-metrologia.org/official-documents/>

# Council and Committees

*“The SIM General Assembly (GA)\* consists of one representative from each organization with SIM active membership, each having one vote” (elect SIM President and others, define policies, set rules and priorities, approve members and agreements, etc.)*



\*Elections planned during 2024 GA (Nov at CENAMEP AIP Panama)



# Council in 2024

## Leadership

- SIM President (2023-2025): Javier Arias (CENAMEP AIP, Panama)
- Deputy SIM President (2023-2024): Claire Saundry (NIST, USA)
- Project Coordinator: Luis Omar Becerra (CENAM, Mexico)
- Sub-Regional Coordinators



**President**  
**Javier Arias**  
 CENAMEP Panama



**Deputy President**  
**Claire Saundry**  
 NIST USA



**Project Coord.**  
**Luis Omar Becerra**  
 CENAM Mexico



**ANDIMET**  
**Jose Dajes**  
 INACAL Peru



**CAMET**  
**Fernando Andrés**  
 LCM Costa Rica



**CARIMET**  
**Erica Caruth**  
 TTBS Trinidad and  
 Tobago



**NORAMET**  
**James G.**  
**Kushmerick**  
 NIST USA



**SURAMET**  
**Gregory Kyriazys**  
 INMETRO Brazil

**STEERING COUNCIL**  
 PRESIDENT  
 FORMER PRESIDENT  
 PROJECT COORDINATOR  
 TC Chair  
 QSTF Chair  
 SUB-REGIONAL COORDINATORS  
 (EXECUTIVE SECRETARY)





# Council in 2024

## Technical Committee of MWGs

- TC Chair: Lucas Di Lillo (INTI, Argentina)
- Deputy: Marina Gertsvolf (NRC, Canada)
- Most MWGs parallel with corresponding Consultative Committees
- Two (Quality System and Statistics and Uncertainties) are overarching

*“The technical activities in metrology among the members of SIM are generally discussed, and future activities are planned, through the work and interaction of members of the technical committees which, in SIM, are the Metrology Working Groups (MWGs)”*



**TC Chair**  
**Lucas Di Lillo**  
**INTI Argentina**

### STEERING COUNCIL

PRESIDENT

FORMER PRESIDENT

PROJECT COORDINATOR

TC Chair

QSTF Chair

SUB-REGIONAL COORDINATORS

(EXECUTIVE SECRETARY)

# Technical Committee of Metrology Working Groups

## MWGs Coordinating with the Consultative Committees


<b>MWG 1: Electricity and Magnetism</b> Chair: Felipe Hernández, CENAM/MEXICO	<b>MWG 2: Photometry and Radiometry</b> Chair: Juan Pablo Bárbaro, INTI/ARGENTINA
<b>MWG 3: Thermometry</b> Chair: Ciro Sanchez, NMI/COLOMBIA	<b>MWG 4: Length</b> Chair: Karina Bastida, INTI/ARGENTINA
<b>MWG 5: Time and Frequency</b> Chair: Diego Luna, INTI/ARGENTINA	<b>MWG 6: Ionizing Radiation and Radioactivity</b> Chair: Lizbeth Laureano-Pérez, NIST/USA
<b>MWG 7: Mass &amp; Related Quantities</b> Chair: Sheila Preste, LATU/URUGUAY	<b>MWG 8: Chemistry</b> Chair: Melina Pérez Urquiza, CENAM/MEXICO
<b>MWG 9: Acoustics, Ultrasound and Vibration</b> Chair: Akobuije Chijioke, NIST/USA	<b>MWG 10: Flow and Volume</b> Chair: Hernán Brenta, INTI/ARGENTINA
<b>MWG 11: Legal Metrology</b> Chair: Sandra Zúñiga, LACOMET/COSTA RICA	<b>MWG 12: Quality System</b> Chair: Elizabeth Ferreira, LATU/URUGUAY
<b>MWG 13: Statistics and Uncertainty</b> Chair: Antonio Possolo, NIST/USA	<b>MWG 14: Metrology for Digital Transformation</b> Chair: Rodolfo Souza, INMETRO/BRAZIL





# Technical Committee of Metrology Working Groups

## Objectives

- **Inclusion of All Members**
    - Promote participation of all NMIs and DIs with technical measurement capabilities
    - Suggest and organize training activities and collaboration projects among its members
  - **Interlaboratory Cooperation for Metrological Rigor**
    - Promote cooperation between SIM and legal metrology organizations (e.g., the OIML)
    - Assess, promote and coordinate SIM comparisons and dissemination of their results
    - Promote cooperation between SIM and the BIPM in key and supplemental comparisons
    - Coordinate with the PDC and PC all SIM Activities
  - **Publishing and Promoting Capabilities**
    - Review CMCs of SIM members for submission to the JCRB (intraRMO review)
    - Review CMCs of NMIs/DIs of other RMOs within the framework of CIPM MRA (JCRB review)
    - Encourage the development of new services to meet Region's needs
- 

# Comparisons

## Meeting Obligations of the CIPM MRA

SIM Participants Comparisons	Total	AUV	EM	L	M	P/R	T	TF	CHEM	IR
Argentina	179	6	35	19	26	3	7	1	54	28
Bolivia	42		1	2	21		4		14	
Brazil	298	23	29	28	35	7	10	1	114	51
Canada	250	11	57	21	27	22	19	1	49	43
CARICOM	13		3	2	5		2		1	
Chile	62		4	4	30		7		17	
Colombia	70		6	5	23	1	7	1	27	
Costa Rica	54	2	14	2	25		6	1	4	
Ecuador	28		2	2	16		6		2	
Jamaica	15		1	2	10		1		1	
Mexico	299	16	25	29	97	8	8	1	102	13
Panama	28		8	3	13		3	1		
Paraguay	18		3		13		2			
Peru	68	1	4	5	25		5	1	27	
USA	504	11	89	33	79	31	22	1	131	107
Uruguay	73		18	3	18		6		26	2

*“The technical basis of the CIPM MRA is the set of results obtained over the course of time through scientific key comparisons carried out by the Consultative Committees of the CIPM, the BIPM and the RMOs”*

- Demonstrate measurement capability
- SIM-07 describes SIM implementation of CIPM-MRA-G-11
- Unique aspects in each technical area
- May not always be possible

Current valid comparisons from KCDB 23 May 24

# Calibration and Measurement Capabilities (CMCs)

## Meeting Obligations of the CIPM MRA

*“A CMC is a calibration and measurement capability available to customers under normal conditions”*

- Declared measurement capabilities
- SIM-05 describes SIM implementation of CIPM-MRA-G-13
- SIM accounts for about 25 % of all published CMCs\*
- Efforts underway to optimize CMC declarations (shining the light farther)
- A published CMC is not required to provide a service

Field	# of CMCs from SIM	Total # of CMCs in Field
Acoustics, Ultrasound, Vibration	334	1257
Electricity and Magnetism	1502	4581
Length	328	1680
Mass AND Flow and Volume	862	2954
Photometry and Radiometry	331	1558
Thermometry	350	2966
Time and Frequency	188	828
Chemistry	2358	6393
Ionizing Radiation and Radioactivity	1127	3658

SIM CMCs from KCDB 23 May 24

\*Absolute number of CMCs is irrelevant

## Council in 2024

### Quality System Task Force (QSTF)

- QSTF Chair: Sally Bruce (NIST, USA)
- Deputy: Isabelle Amen (NRC, Canada)
- Voting members are SIM members that are Member States or Associates of the **CGPM** and are signatory to **CIPM MRA**
- Multiple guidance documents on procedures, forms, review process (every 5 years), etc. available at <https://sim-metrologia.org/about-us/structure/quality-system-task-force-qstf/>

*“Ensuring efficient and effective review of the quality systems of SIM NMIs to ensure conformance with the expectations of the CIPM MRA and to serve other quality system approval needs of SIM NMIs”*



**QSTF Chair**  
**Sally Bruce**  
**NIST USA**

PRESIDENT  
FORMER PRESIDENT  
PROJECT COORDINATOR  
TC CHAIR  
QSTF CHAIR  
SUB-REGIONAL COORDINATORS  
(EXECUTIVE SECRETARY)

*NRC Canada*

*NIST USA*

*CENAM Mexico*

*BSJ Jamaica*

*CARICOM Trinidad and Tobago*

*LCM-LACOMET Costa Rica*

*CENAMEP-AIP Panama*

*INM Colombia*

*INEN Ecuador*

*INACAL Peru*

*LATU Uruguay*

*INMETRO Brazil*

*IBMETRO Bolivia*

*INTN Paraguay*

*INTI Argentina*

*UDEC Chile*

# Quality Management Systems (QMS)

## Consistent Realization of CMCs

- CMCs represent capability at a point in time
- All CMCs under review must be supported by an approved QMS
- On-going validity is supported by participation in comparisons, etc.
- An active QMS
  - Usually based on standards ISO 17025 and 17034 (and others)
  - Revision to standards may necessitate CMC reviews sooner than 5-year renewal period



Inter-American Metrology System

## *SIM QSTF: Quality System Task Force Quality Management System Reviews*



**May, 2024 – San José, Costa Rica and on-line (hybrid)**

Mid-year meeting of QSTF; 15 QMSs from SIM NMIs were reviewed and approved





## Council in 2024

### Executive Secretary

- Knower of all SIM knowledge
- Keeper of SIM official documents
- Master of SIM web presence
- Distributer of funds and keeper of the books



*The “go to” to “get done right”...*

PRESIDENT  
FORMER PRESIDENT  
PROJECT COORDINATOR  
CHAIR OF TC  
CHAIR OF QSTF  
SUB-REGIONAL COORDINATORS  
(EXECUTIVE SECRETARY)

Claudia Santo (previous chair of MWG 7 on Mass)







# Activities

## What else we do



# And What Has SIM Been Up To Lately?

## Recent Events

*Activities of a dynamic RMO within the region and around the world*



SIM TEMPERATURE AND HUMIDITY (MWG3) Meeting...



Post-Measurement Workshop – Making an Impact on Water...



12th METROLOGY FOR DIGITAL TRANSFORMATION...



SIM-NCSLI EARLY CAREER METROLOGISTS AWARD



First PAQI and QICA Exchange Meeting



SIM WEEK – INM, Colombia – May 23-26 2023



SIM joins the BIPM e-learning platform



OPEN EVENTS SIM WEEK-COLOMBIA: CELEBRATION...



OPEN EVENT SIM WEEK COLOMBIA: AWARENESS...



13th METROLOGY FOR DIGITAL TRANSFORMATION...

SIM celebration World Metrology Day 2024: [https://youtu.be/rIM\\_agrpru8](https://youtu.be/rIM_agrpru8)

# And more...



**5 - 6** SEPTEMBER  
3:00 am - 6:00 pm

**M4DT ANNUAL  
CONFERENCE- SAVE THE  
DATE**

[VIEW DETAIL](#)



**17 - 19** OCTOBER  
8:00 am - 6:00 pm

**CABUREK CIRCULAR  
ECONOMY WORKSHOP-  
PANAMA**

[VIEW DETAIL](#)



**21 - 23** NOVEMBER  
8:00 am - 6:00 pm

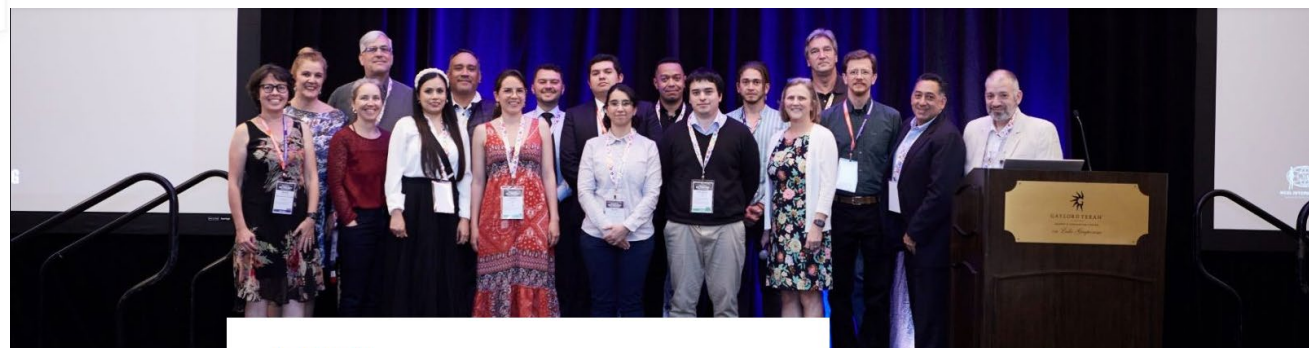


**6 - 10** NOVEMBER

**SIM WEEK - GA - INTN,  
Paraguay**

SAVE THE DATES GA: 9, 10th November

[VIEW DETAIL](#)



[HOME PAGE NEWS](#)

**BIPM Young metrologists' 2050+  
vision**

Dear young metrologists,

[Next Events](#)

Follow us at



<https://www.facebook.com/METROSIM>

## And What Is Coming...



**18 - 22** NOVEMBER  
All Day

**SIM GA 2024 : CENAMEP-  
PANAMA**

VIEW DETAIL

Keep up-to-date on the SIM website  
at <https://sim-metrologia.org/>

# Projects and Sources of Support

- SIM receives support from multiple sources
  - NIST
  - IADB
  - PTB
  - OAS
- Projects focused on development throughout region through **capacity building**
- May include training, expert exchange, secondments, comparison support, etc.





# NIST Grant

## Supporting Technical Exchange and Collaboration

- Equipment and materials for **comparisons** (recently MWGs 6, 8, 9)
- Laboratory **exchanges**
- **Covid-19 metrology projects** (UV disinfection, IR thermometry)
- Participation in **SIM events** (and associated awareness activities, such as this Metrology School 😊)
- Participation in **other RMO-organized events** (e.g., with APMP related to water in Malaysia)
- Attendance and participation in **TC meetings** during SIM week (1-2/year)



The National Institute of Standards and Technology...the US NMI





# Inter-American Development Bank (IADB)

## Supporting Digital Transformation in Latin America

- **Metrology for DT to support health services in LAC**
- **Awareness Events**
  - **ANDIMET**: INM Colombia : 23 May 2023
  - **CAMET**: CIM – El Salvador : 18 Aug 2023
  - **SURAMET**: INTN – Paraguay: 8 Nov 2023 (with SIM GA)
  - **NORAMET**: CENAM – Mexico: 20 Nov 2023
  - **CARIMET**: DBS – Dominica: 7 Dec 2023
- **Development of new DT services by NMIs (CABUREK\*)**
  - DCC, automation, **remote calibrations**, digitalization of services
  - Meetings and workshops from 2022 through 2023
- **Research projects**
  - Development of a **low-cost THB** (temperature humidity bias)
  - **Optical 3D measuring systems** - Dimensional traceability (industrial/medical)
  - Metrological evaluation of **lung ultrasound using virtual vector machine**
  - **Open platform** for time and frequency measurements



The Inter-American Development Bank finances development projects across LA and the Caribbean

\*Capacity Building in Technical and Scientific Organizations Using Regional Experiences and Knowledge

# PTB International Cooperation

## Supporting Digital Transformation and Beyond

- Technical expertise to **MWG 14**
- Financial support for development of basic metrology infrastructure to support medical testing equipment (**ventilators**)
  - Expertise support
  - Supporting development of low-cost mechanical ventilators
  - Promoting mutual acceptance of volume and flow measurements related to ventilator control
- Support to **develop and promote QI**
  - Biodiversity and climate change mitigations
  - Circular economy (QI4CE) into 2023



Latin America and the Caribbean

Regional Fund Quality Infrastructure for  
Biodiversity and Climate Protection

# PTB with SIM/COPANT/IAAC/QICA/OAS

## Success in Sustainability Through International Leverage

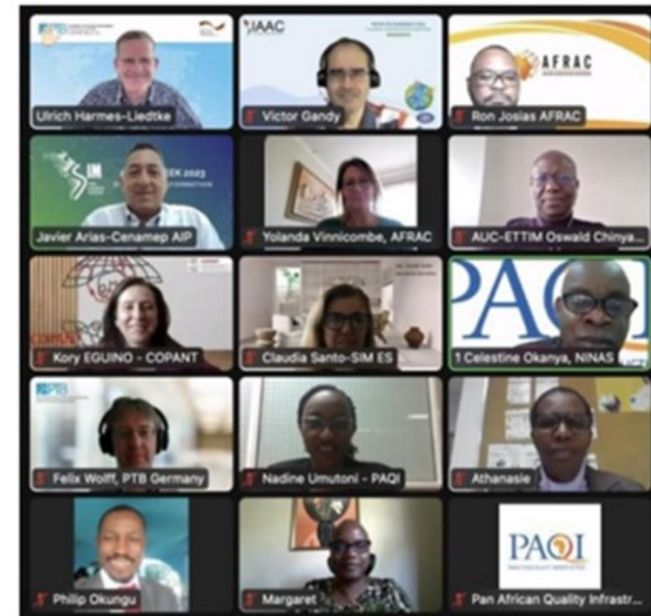
- QI for the **circular economy** (QI4CE)
- From **2020-2023** (pandemic impacted)
- National projects involving **quality infrastructure** related to plastics, construction and agri-food
  - Oct 2022 workshop (Ecuador) with nearly 50 participants from the standardization, accreditation, metrology and CE industry
  - Follow up meetings in Mar (virtual) & Oct (in Panama) 2023
- **Additional OAS support of metrology for**
  - **Sustainable Energy Technologies** and the Environment in the Western Hemisphere
  - **Energy Efficient Measurements** and Compliance in Central America and the Dominican Republic





# Accomplishments

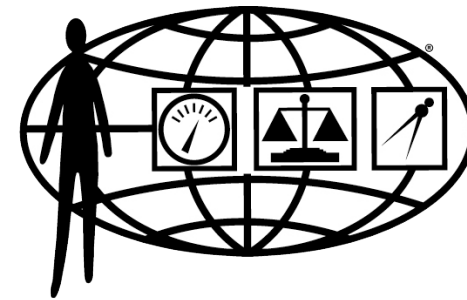
- **SIM joined e-Learning platform with BIPM (<https://e-learning.bipm.org/>) March 2023**
  - Supports development of measurement capabilities and QI
  - 17 courses from uncertainty estimations to CMC submissions
  - >800 registered users from all 6 RMOs
- **PAQI and QICA Exchange Meeting (June 2023)**
  - First exchange/collaboration meeting of pan-African and pan-American QI teams
  - Various standardization, accreditation, and metrology bodies from both regions; facilitated by PTB
  - Common needs, shared best practices, planning joint workshops



# Joint SIM-NCSLI

## Project for the Next Generation

- Project started during the pandemic, aims to have **early-career (within 5 years) metrologists** write about scientific or industrial papers
- In 2022, 4 papers from the 5 SIM sub-regions, together with the 6 winners from 2020 & 2021 contests, sent to **present at the NCSLI 2022** Conference in Grapevine, TX (Aug 2022)
- Three of the 4 early career metrologist awardees sent to **present at the NCSLI 2023** Conference in Orlando (July 2023)
- Five winners in 2024 (representing each subregion) sent to **present at the NCSLI 2024** Conference in Denver (6-12 July)\*



**NCSLI INTERNATIONAL**


*Serving the World of Measurement*



\*Congratulations to Kevin Lemassy, TTBS, runner up on NCSLI Best Paper Award!



## Key Takeaways

- Inter-American cooperation in metrology has a long history, culminating in **SIM's creation in 1979**
  - SIM promotes, supports and coordinates integration of a **reliable measurement infrastructure** in the Americas by
    - Advancing SIM Members' **metrological capabilities**
    - Enhancing SIM **international standing** as an RMO and as a pillar of the regional quality infrastructure (e.g., comparisons)
    - Addressing the **measurement challenges** of the future
  - SIM continues a dynamic program of **internationally recognized metrology** while paving the road into the future through addressing emerging technical challenges, working to transform to a more digital presence, and bringing the next generation of metrologists to fruition
- 



# A Week of Metrology

Where You'll Get More Specific Details

Mornings

Afternoons

🕒	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
8:30 - 9:15	International Metrology: Organisations, Structure, Process <b>CHINGIS KUANBAYEV</b>	MWG1/CCEM <b>LUCAS DI LILLO</b>	MWG5/CCTF <b>MARINA GERTSVOLF</b>	MWG11/Legal Metrology <b>JUAN CARLOS SÁNCHEZ</b>	MWG12/QSTF <b>ELIZABETH FERREIRA</b>
9:15 - 10:00	Traceability, Calibrations, KCs, KCDB <b>LUCAS DI LILLO</b>	MWG1/CCEM <b>LUCAS DI LILLO</b>	MWG5/CCTF <b>MARINA GERTSVOLF</b>	MWG10/Flow & volume <b>ROBERTO ARIAS</b>	MWG14/M4DT <b>EDUIN CULMA</b>
10:00 - 10:15	<b>COFFEE BREAK</b>	<b>COFFEE BREAK</b>	<b>COFFEE BREAK</b>	<b>COFFEE BREAK</b>	<b>COFFEE BREAK</b>
10:15 - 11:00	Quality infrastructure and NMI role <b>JAVIER ARIAS</b>	MWG 2/CCPR <b>CARLOS MATAMOROS</b>	MWG3/CCT <b>ANDREA PERUZZI</b>	MWG 4/CCL <b>DANIEL SAWYER</b>	MWG13/CCU <b>RICARDO SANCHEZ</b>
11:00 - 11:45	SIM Org - Structure, role, history, projects accomplishments <b>LISA KARAM</b>	MWG 2/CCPR <b>CARLOS MATAMOROS</b>	MWG3/CCT <b>ANDREA PERUZZI</b>	MWG 4/CCL <b>DANIEL SAWYER</b>	MWG13/CCU <b>RICARDO SANCHEZ</b>
11:45 - 13:15	<b>LUNCH BREAK</b>	<b>LUNCH BREAK</b>	<b>LUNCH BREAK</b>	<b>LUNCH BREAK</b>	<b>LUNCH BREAK</b>
13:15 - 14:00	MWG6/CCRI <b>LIZBETH LAUREANO PEREZ</b>	MWG7/CCM <b>CLAUDIA SANTO</b>	MWG8/CCQM <b>BRIAN CALDERON</b>	MWG9/CCAUV <b>TRIANTAFILLOS KOUKOULAS</b>	CARIMET Presentation <b>DAMIEN PRESCOD</b>
14:00 - 14:45	MWG6/CCRI <b>LIZBETH LAUREANO PEREZ</b>	MWG7/CCM <b>CLAUDIA SANTO</b>	MWG8/CCQM <b>BRIAN CALDERON</b>	MWG9/CCAUV <b>TRIANTAFILLOS KOUKOULAS</b>	Industry Presentation <b>PHYSICAL METROLOGY</b>
14:45 - 15:00	<b>COFFEE BREAK</b>	<b>COFFEE BREAK</b>	<b>COFFEE BREAK</b>	<b>COFFEE BREAK</b>	<b>COFFEE BREAK</b>
15:00 - 15:45	LAB TOUR	LAB TOUR	LAB TOUR	LAB TOUR	Industry Presentation <b>CHEMICAL METROLOGY</b>
15:45 - 16:30	LAB TOUR	LAB TOUR	LAB TOUR	LAB TOUR	Panel Discussion on Metrology Future and CLOSING <b>FERNANDO ANDRES</b>
16:30 - 16:45	<b>COFFEE BREAK</b>	<b>COFFEE BREAK</b>	<b>COFFEE BREAK</b>	<b>COFFEE BREAK</b>	<b>COFFEE BREAK</b>
16:45 - 17:30	LAB TOUR	LAB TOUR	LAB TOUR	LAB TOUR	Panel Discussion on Metrology Future and CLOSING <b>Fernando Andres</b>

# Metrology in Action

## Laboratory Tours

DAY	SCHEDULE	GROUPS					
		A	B	C	D	E	F
MONDAY	15:00 - 15:30	Power and Energy Quality	Pressure	Mass	Force	Volume	Torque
	15:35 - 16:05	Pressure	Mass	Force	Volume	Torque	Power and Energy Quality
	16:10 - 16:40	Mass	Force	Volume	Torque	Power and Energy Quality	Pressure
	16:45 - 17:15	Force	Volume	Torque	Power and Energy Quality	Pressure	Mass
TUESDAY	15:00 - 15:30	Volume	Torque	Power and Energy Quality	Pressure	Mass	Force
	15:35 - 16:05	Torque	Power and Energy Quality	Pressure	Mass	Force	Volume
	16:10 - 16:40	Hardness	Time and Frequency	Gas Flow	Density	Viscosity	Direct Current and Alternating Current
	16:45 - 17:15	Time and Frequency	Gas Flow	Density	Viscosity	Direct Current and Alternating Current	Hardness
WEDNESDAY	15:00 - 15:30	Gas Flow	Density	Viscosity	Direct Current and Alternating Current	Hardness	Time and Frequency
	15:35 - 16:05	Density	Viscosity	Direct Current and Alternating Current	Hardness	Time and Frequency	Gas Flow
	16:10 - 16:40	Viscosity	Direct Current and Alternating Current	Hardness	Time and Frequency	Gas Flow	Density
	16:45 - 17:15	Direct Current and Alternating Current	Hardness	Time and Frequency	Gas Flow	Density	Viscosity
THURSDAY	15:00 - 15:30	Chemistry	Length	Temperature and Humidity			
	15:35 - 16:05	Length	Temperature and Humidity	Chemistry			
	16:10 - 16:40	Temperature and Humidity	Chemistry	Length			

**¡Gracias!  
Thank You!  
Obrigada!  
Merci!**

**Lisa KARAM**

National Institute of Standards and Technology (NIST)

[lisa.karam@nist.gov](mailto:lisa.karam@nist.gov)



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