

**DEAR FRIENDS, DEAR COLLEAGUES,**

All good things come to an end, and so did the IMEKO World Congress 2024. It was a much-anticipated event that turned out to have moved the Metrology Community in a much larger quantity than expected. Those who participated could feel the enriching effect of meeting in person. Old friends, new friends, colleagues, famous persons, and newcomers, plenty of opportunities to share scientific knowledge, personal experiences, a good laugh and some breathtaking moments. Thank you All for being there and making it an unforgettable week. Thank you also, Organising Team Volunteers of PTB, for giving your best and making this a successful event in all its aspects.

This issue is entirely dedicated to the recent IMEKO events, starting with the Technical Board and General Council Sessions, which went together with the new officers' election this year. IMEKO has a new President now. Besides this latest IMEKO news, we turn to the World Congress Hamburg.

**THE NEWLY ELECTED IMEKO PRESIDENT, PROFESSOR PAOLO CARBONE**

Ladies and Gentlemen,  
Distinguished colleagues

Let me start by thanking all who made it possible for me to stand before you today in this capacity of IMEKO President.

IMEKO, with its 42 member organisations and participating scientists, is a lively and very active federation, as we all witnessed over the last few days here in Hamburg.

With its 25 TCs, Committees, governing bodies (AB, TB, GC), and officers, we have the privilege of advancing knowledge in the area of metrology and instrumentation and measurement technology by putting together the strengths of countries, research institutions, metrological institutes, academia and companies.

Over the last few years, our activities have grown significantly, mainly due to the hard work of all volunteers, past presidents, TCs, AB, and GC, and by the strong contribution of the Secretary-General and the IMEKO Secretariat.

It is my intention to continue pursuing the direction taken to ensure that IMEKO strengthens its role as the reference organisation for people making measurements.

The great success of the IMEKO World Congress is an example, and I want to thank Prof. Haertig and all German colleagues who contributed to this success.

Some important issues that we will need to address:

- Making IMEKO a dynamic and responsive organisation to the needs of the changing world in which we live and work.
- Supporting its Technical Committees (TCs), which are at the core of IMEKO, to operate at the forefront of science and industry.
- Ensuring that IMEKO is well recognised as an effective, global organisation by engaging scientists and engineers from across the world in its activities.
- Enabling IMEKO to have a real outreach to serve and support its breadth of stakeholders by helping them understand and improve the state-of-the-art in MIM.
- Ensuring that IMEKO excels in its publication and web presence Through its journals, publishing the best, high-impact work globally in the field of MIM.

In this journey, collaboration will be my compass, and diversity will be our strength. We will foster an environment where young scientists flourish and ideas are valued.

As your President, I pledge to advocate for science and education and to be a voice for our community.

Thank you for giving me the opportunity to serve you as a President. It is an awesome responsibility.

I will do my best to honour this role.

I look forward to working with all of you in the years ahead. Together, we will build on the strong foundation of IMEKO's new milestones in the service of knowledge and humanity.

Thank you, and let the work begin.

*Written by Professor Paolo Carbone,  
IMEKO President*

## THE GENERAL COUNCIL SESSIONS 2024



The General Council Sessions (GC) 2024 took place on 24-25 August in Hamburg, Germany, right before the IMEKO World Congress. It was a very well-attended event, with 31 Member Organisation delegates present and almost all the Technical Committees well represented during the Technical Board meeting. Besides the fruitful discussions and the presentation of insightful reports, important decisions were taken.

IMEKO welcomed a new member organisation on board, the National Metrology Centre (NMC), Singapore, represented at the GC by Dr Gregory Goh and Dr Cui Shan.

Besides the new member organisation, since last year's GC, 58 applications have arrived at the Secretariat and were approved by the Technical Board to join the Technical Committees.

## NEWLY ELECTED IMEKO OFFICERS

IMEKO officers' election is a tradition that coincides with our triannual World Congresses.

IMEKO thanks those who served last term and also those who continue in their current position.

Here are the newly elected IMEKO Officers. We wish you all a lot of success, and thank you for your service!



Editor-in-Chief of Acta IMEKO:

Prof. Francesco Lamonaca



Advisory President:

Prof. Frank Härtig has served IMEKO for the last six years as President-Elect, Chairperson of the Technical Board and President. He is also a delegate to the GC



Publication Officer:

Prof. Kenneth Grattan. He is also a delegate to the GC, a member of TC7 Measurement Science and TC17 Measurement in Robotics.



Secretary-General:

Mr Zoltan Zelenka has been reelected as Secretary-General. He is a member of TC3 Measurement of Force, Mass, Torque, and Gravity, TC6 Digitalisation, and TC8 Traceability.



Vice President in charge of the next World Congress, Rimini, Italy, 2027:

Prof. Pasquale Daponte He is an Honorary member of the Advisory Board. An active member of TC4, Measurement of Electrical Quantities.



Treasurer:

Prof. Daniel Kytyr: He is also the Chairperson of TC15, dedicated to Experimental Mechanics.



Information Officer,

Dr Leonard Klaus, He is the Scientific Secretary of TC22 (His detailed introduction follows.)

## NEWLY ELECTED IMEKO OFFICERS



Advisory Board Member:  
Prof. Masatoshi Ishikawa.  
He served for nine years in  
IMEKO as President-Elect  
President and Advisory  
President.



Advisory Board Member:  
Dr Jay Hendricks  
He is the Chairperson of  
TC16, Pressure and  
Vacuum Measurement.



Advisory Board Secretary:  
Dr. Alessandro Germak,  
Member of TC3, Measure-  
ment of Force, Mass,  
Torque, and Gravity TC5,  
Hardness Measurement,  
and delegate to the GC.



Technical Board Member:  
Prof. Alexander Shestakov,  
Member of TC21,  
Mathematical Tools for  
Measurements and a  
delegate to the GC.



Advisory Board Member:  
Prof. Pedro Silva Girão  
Member of TC1, Education  
and Training in Measure-  
ment and Instrumentation,  
and TC19 Environmental  
Measurements.



Technical Board Member,  
Dr. Malcolm McEwen,  
Member of TC13, Measu-  
rements in Biology and  
Medicine, and delegate to  
the GC.



Advisory Board member:  
Prof. Shigeru Takayama



Supervisory Committee  
Member:  
Dr Zsolt János Viharos  
He is the Chairperson of  
TC10, Measurement for  
Diagnostics, Optimization  
& Control, and the delegate  
to the GC.



## INTRODUCTION OF NEW OFFICERS



Dr Beatrice Rodiek,  
Supervisory Committee  
Member

Dr Beatrice Rodiek started at the (PTB) Physikalisch Technische Bundesanstalt almost 10 years ago.

In 2019, she became group leader of the single-photon metrology group at LENA (a cooperation between PTB and the Technical University of Braunschweig). Two years later, she started an internal PTB trainee programme, during which she worked in various areas of PTB and was seconded to the National Institute

of Standards and Technology (NIST) in Gaithersburg.

Through the programme, Dr Beatrice Rodiek was introduced to mass metrology. She became head of the "Mass Standards" working group at PTB after completing the programme in 2023.

Digitalisation topics, such as the implementation of the digital calibration certificate (DCC), are important to her, and she has been involved in various projects. Beatrice Rodiek has been a member of IMEKO TC3 "Measurement of Force, Mass, Torque, and Gravity" and has been an elected member of the IMEKO Supervisory Board since August 2024.



Dr Tzvetelin Gueorguiev,  
Supervisory Committee  
Member.

Tzvetelin Gueorguiev has taught metrology, quality control, quality management systems, auditing management systems, and related courses at the University

of Ruse 'Angel Kanchev' in Bulgaria since 2003. He is also the coordinator of the bachelor's degree course in "Quality Management and Metrology" and the master's degree course in "Quality Management" and a mentor of PhD students in the doctoral programme "Metrology and Metrological Assurance".

He has been a member of the Union of Metrologists in Bulgaria since 2004.

In November 2019, he became a member of the Management Board of this professional organisation.

In January 2023, Tzvetelin Gueorguiev became a member of TC1, Education and Training in Measurement and Instrumentation. In August 2024, a TC14 member, Measurement of Geometrical Quantities.

He has rich international experience and has been involved in multiple projects, lectures, and conferences in more than 20 countries. His scientific research results encompass 7 keynote/invited speeches at international conferences, a monograph, more than 110 publications in journals and conference proceedings, and worldwide citations of his works.



My name is Leonard Klaus. I am the new Information Officer of IMEKO and will therefore be responsible for the website of IMEKO. Besides my work for IMEKO, I am employed at the Physikalisch-Technische Bundesanstalt (PTB), the German National Metrology Institute.

After graduating with an engineering degree in Industrial Information Technologies from Ostfalia University of Applied Sciences in Wolfsburg, Germany, I joined PTB. I have always been interested not only in mechanical but also in electronic and information technology topics. My degree programmes covered all those areas, and fortunately, this was also the case when I started working as a research engineer at PTB on the topic of impact force calibration. The mix of design, experimental work, and data analysis is a really interesting combination.

I was given the opportunity to stay at PTB as a PhD student, which I am very grateful for.

The dynamic measurement of mechanical quantities remained my field of work, this time focussing on dynamic torque calibrations carried out within a European EMRP project. I really enjoyed the international cooperation between the various participants. I was able to continue this work after receiving a doctorate in mechanical engineering from the University of Hanover before becoming head of the Impact Dynamics group at PTB.

During my time there, I worked for one year at PTB's Presidential Staff. There, I got an impression of the larger topics outside my direct field of work, their internal and external promotion and the management of such an institution.

After some time, I moved into leading PTB's vibration group and took over some of the topics of the old working group. Since then, I have been a convenor for EURAMET TC-AUV and a member of IMEKO TC22. Within TC22, I was elected as the Scientific Secretary and, at the same time, I became the IMEKO Information Officer.

I am very much looking forward to these new and exciting roles for IMEKO.

## PARTNERS PRESENT AT THE GC



IMEKO global partner organisations operating internationally in the metrology field have been invited to the GC. These were: GULFMET, represented by its President Mrs Amina Al-Bastaki, operating across the Gulf states.

EUROLAB, represented by President Paolo Moscatti of Italy;

The Asia Pacific Metrology Programme APMP, represented by Dr Gregory Goh, Intra-Africa Metrology System,

AFRIMETS, representing the breadth of African states in the field by Dr Jessie Pillay; and finally, the

European Metrology Organisation, EURAMET, represented by Ms Maguelonne Chambon. Global cooperation is seen as a key way to increase the impact that IMEKO makes.

## A\*STAR'S NATIONAL METROLOGY CENTER (NMC) SINGAPORE JOINS IMEKO



IMEKO recently welcomed and celebrated the National Metrology Centre (NMC) Singapore, joining the confederations as a Member Organisation on 25 August in Hamburg, Germany. The Institute was represented at the GC by its Executive Director, Dr Gregory Goh, and Dr Cui Shan.

## GENERAL COUNCIL SESSIONS HIGHLIGHTS

The format for the General Council meeting has been well established over many years; the first day was focused on the work of the Technical Committees and was chaired by the President-Elect, Professor Paolo Carbone of Italy. The aim is to review, on an annual basis, the work of each of the Committees, appoint new members and present an overview of the activities planned (by way of conferences and symposia, for example) in the subsequent years. This year, 58 new members have joined the various TCs from across the globe for IMEKO TC membership. A highlight of the meeting was that several selected Committees, representing the breadth of IMEKO, each gave a short presentation on their activity and challenges. These were TC9, a long-established committee on Flow Measurement (and which hosts the highly regarded FLOMEKO Conference, bringing in experts from across the world); TC15, on Experimental Mechanics; TC20, Measurements of Energy and Related Quantities and the more recently established TC23 Metrology, on Food and Nutrition.

This is a 'snapshot' of the extensiveness of IMEKO's activities, which has expanded in recent years in its focus from that of the more 'traditional' areas of metrology.

IMEKO had set up in the previous years several Working Groups (WGs) (with membership across the TCs and which met several times over the year by Zoom) to look at a number of key topics and to make recommendations to improve IMEKO and the way it works for the members.

These WGs' report included an IMEKO wide Survey on the membership and reported on the results and recommendations from the members on the better functioning of IMEKO; one WG on the operation of the TCs themselves providing a protocol for the best approach to Chairing a TC (to help new Chairs better to fulfil their role) and one on the operation of the Technical Board itself; and with a protocol for IMEKO Officers. A WG on best practices in the running of TC events, which produced a 'Guide to Sponsorship'; a WG on IMEKO's very successful publishing activity and how to enhance that; a WG on digitalisation coordinated by TC6 (the specialist TC in Digitalisation) as IMEKO is part of the initiative of the "Joint Statement of Intent on Digitalisation" among many organisations with BIPM. Finally, a WG on IMEKO Branding presented guidelines to ensure consistent branding of IMEKO events across its breadth of activities.

*Based on the reports of Prof Kenneth Grattan*

## IMEKO PUBLISHING ACTIVITIES



Professor Ken Grattan, the Publication Officer, presented reports on the portfolio of what is now 5 IMEKO journals: Acta IMEKO; Measurement Journal; Measurement Sensors; Measurement Food and the newly launched (in 2024) Measurement Energy, where the Editor is Prof Yong Yan. The reports showed the breadth of impact of the journals;

Some 50,000 authors are estimated to be connected to IMEKO activities globally through IMEKO's publications annually. Publishing activity at IMEKO has gone with major improvements in several areas seen over the last year. Highlights from the year for the now five IMEKO journals include:

- **Measurement:** (New 2023 CiteScore: 10.2 (+13.33%) and IF >5.0). Submissions strongly increased in 2023 to 9,507; we have already seen 35% growth in submissions YTD as of June 2024.
- **Measurement Sensors:** CiteScore: increased to 3.1 (up by +244% from 0.9). Submissions have risen sharply since launch, mainly through the encouragement of multiple thematic special issues, reaching 1,106 in 2023. Published papers: 326 in 2023 (equalling 2021's post-COVID peak). The Journal welcomes Dr Luca de Vito as a new Co-Editor-in-Chief to handle the increased workload.
- **Measurement Food:** First CiteScore: 3.1. Submissions have spiked since Scopus indexation, increasing from 92 in 2022 to 399 in 2023. The rejection rate has had to increase alongside this growth.

Activities during the year include updated aims and scope statements published in early June 2024; Elsevier's marketing campaign to promote this is underway through banner ads on all relevant journals' homepages and social media channels. Co-Editor-in-Chief Mr Joris Van Loco (Chair of IMEKO TC23) joined Dr Antje Hebestreit in 2024 and will take over as sole EiC in January 2025, when she steps down. The Journal urgently needs to appoint more board members from Europe and the US to cover key topical areas; IMEKO's assistance here would be greatly appreciated.

- **Measurement Energy:** Launched in January 2024, it is the newest Journal. Submissions as of June 2024: 63. Published papers as of June 2024: [Measurement Energy](#). Two special issues are already in progress and open to submissions. DOAJ indexing: application will take place when the Journal reaches 10 published articles.
- **Acta IMEKO:** The new Acta IMEKO website and submission system are online: [Acta IMEKO](#). This Journal is now indexed in Scopus, Web of Science, and DOAJ. The Acta IMEKO LaTeX template is ready and works also with OverLeaf. It will be available on the Acta IMEKO website soon. The number of citations increased (Source Scimago): 2020: 188, 2021: 233, 2022: 357, 2023: 412. The number of reviewers also increased: More than 40 new reviewers were added to the system. The publication time is reduced. The desk rejection policy and adding new reviewers have reduced publication time. (Resolution 68.014)

All the journals reported increased impact (measured through the Scopus Cite Score of the Web of Science Impact Factor).

Planning with Elsevier is underway for a new journal, Measurement Digitalisation, which will likely launch in the next 12 months.



**NEW MEMBERS OF THE TECHNICAL COMMITTEES**

TC1: Tetyana Gordiyenko; Ukraine,  
TC2: Mario Giardini; UK,  
 Marco Ruggeri; USA,  
 Tuan Guo; China,  
 Gaozhi Xiao; Canada,  
 Stefano Cattini; Italy,  
 Annamaria Cucinotta; Italy,  
 Yuan Liu; China,  
 Heyan Wang; China,  
TC3: Andrea Prato; Italy,  
 Beatrice Rodiek; Germany,  
TC4: Carlos Roberto Hall Barbosa; Brazil,  
TC5: Louise (Ami) Ahure Powell; USA,  
 Andrea Prato; Italy,  
TC6: Alexander Reissert; Germany,  
 Siegfried Hackel; Germany,  
 Vukan Ogrizović; Serbia,  
 Li Li; China,  
 Serhii Kursin; Ukraine,  
TC7: Ihor Pototskyi; Ukraine,  
 Huixu Song; China,  
TC8: Marco Di Luzio; Italy,  
TC9: Dr Venugopal Arumuru; India,  
 Denys Serediuk; Ukraine,  
TC10: Li Li; China,  
 Ruqiang Yan; China,  
TC11: Fu Xiao; China,  
TC12: Xiaojuan Feng; China,  
 Essam El-Din Mahmoud Mohamed Ibrahim;  
 Egypt,

TC13: Grazia Iadarola; Italy,  
 Dan Kytir; Czech Republic,  
 Malcolm McEwen; Canada,  
 Tao Peng; China,  
TC14: Huixu Song; China,  
 Günther Poszvek; Austria,  
 Tzvetelin Gueorguiev; Bulgaria,  
TC15: Afdhal; Indonesia,  
 Vladimir Milovanovic; Serbia,  
 Dvoynishnikov Sergey; Russia,  
TC19: Zhao Chao; China,  
TC20: Andrea Mariscotti; Italy,  
 Brandon Rotavera; USA,  
 Lijuan Wang; UK,  
 Tuan Guo; China,  
 Wenbiao Zhang; China,  
 Pinakeswar Mahanta; India  
TC21: Xiangchao Zhang; China,  
 João A. Sousa; Portugal,  
 Alvaro Silva Ribeiro; Portugal,  
TC22: Michael Mains; USA,  
 Daniela Virovska; Bulgaria,  
 Leonard Klaus; Germany,  
TC23: Soraya Sandoval Riquelme; Chile,  
TC24: Alleni T. Junsay; Philippines,  
 Francesca Durbiano; Italy,  
 Valnei Smarcaro da Cunha; Brazil,  
 Thiago de Oliveira Araujo; Brazil,  
 Pavel Gurikov; Germany,  
TC25: Kai Wei; China

**NEW OFFICERS OF THE TECHNICAL COMMITTEES**

TC2: Vice Chair: Maik Rosenberg; Germany,  
 Scientific Secretary: Armando Albertazzi;  
 Brazil,  
TC5: Chair Cihan Kuzu; Turkey,  
 Scientific Secretary: Renato Reis Machado;  
 Brazil,  
TC7: Chair: João A. Sousa; Portugal,  
 Scientific Secretary: Francesco Crenna; Italy,  
TC8: Vice Chair: Thomas Wiedenhofer;  
 Germany,  
 Scientific Secretary: Sergio Oliveira; Brazil,  
TC15: Scientific Secretary:  
 Zvonimir Tomičević; Croatia,

TC18: Chair: Jun Izawa; Japan,  
TC20: Scientific Secretary:  
 Ms Zeynep Serinyel; France,  
TC21: Chair: Prof. Alistair B. Forbes; UK,  
 Vice Chair: Gregory Kyriazis; Brazil,  
 Vice Chair: Katsuhiko Shirono; Japan,  
 Scientific Secretary: Alen Bošnjaković;  
 Bosnia and Herzegovina,  
TC22: Chair: Akobuije Chijioko; USA,  
 Vice Chair: Hideaki Nozato, Japan,  
 Vice Chair: Gustavo Ripper; Brazil,  
 Scientific Secretary: Leonard Klaus;  
 Germany,

## REMINISCING ON THE WORLD CONGRESS

Looking back at the recent IMEKO World Congress, some participants were kind enough to share their impressions. Thank you very much for it!



Prof. Tilo Pfeiffer, Germany

"Regarding the IMEKO Congress in Hamburg, I am still impressed by the event, which was very successful in every respect. The event was perfectly organised by the PTB and was always very helpful and supported by the PTB's friendly staff. I have to think back a long time to remember an IMEKO Congress with more than 1000 participants, such excellent keynote speeches, well-attended technical sessions and a broad industrial exhibition that matched the event's main topics very well."



Dr Cui Shan; NMC Singapore

"The IMEKO 2024 World Congress was remarkably well-organised, featuring three focused technical themes: digitisation, quantum technologies, and sustainability. I was thoroughly impressed by the quality of research presented by our global metrology community. The World Congress served as an excellent platform for forming new collaborations and expanding our horizons in potential future research directions."



Mr Julian Haller; Sartorius, Germany

"The IMEKO2024 was an amazing event with lots of interesting talks and posters, interesting exhibitors and very good networking opportunities. I especially liked the spatial layout of the venue - due to the extensive event over several levels, you always met old and new acquaintances, and it was very easy to get into conversation.

In terms of content, it was obvious that digitalisation is becoming more and more important - I am already looking forward to further developments in the future and to be able to be part of it."



Dr Richard Green, NRC, Canada

"As a first-time attendee of an IMEKO conference, I was impressed not only by the scientific program, which was enriching and filled with great colleagues, new friends, and fruitful discussion but also with the organisation of the conference. From the decision to host in the beautiful city of Hamburg, the venue, events and refreshments, and even the paper submission and review process. If this is the standard for all IMEKO conferences, I clearly have been missing something special. I'm not sure there have been many other conference sessions anywhere combining a talk from a Nobel prize winner with musical interludes of instrumental Beatles covers. I felt very fortunate to be in attendance and am looking forward to the next conference in Rimini."



Mrs Kay Tancock; Elsevier, UK

It was a real pleasure as the publisher of the Elsevier-IMEKO portfolio of journals to attend the IMEKO 2024 XXIV World Congress in Hamburg and have the chance to meet so many interesting people. I thoroughly enjoyed discussing the journals with authors, readers, and people who were also completely new to the publications. Attending conferences like this is a great chance to immerse oneself in a scientific field and its community, which is so valuable and stimulating for a publisher. And I even had the opportunity to meet many of the Editors of the journals in one place, in real life, a rare treat! Thank you for hosting me so warmly and for all the fascinating conversations. See you in Rimini!



Dr Beatrice Rodiek; PTB,  
Germany

"For me, the IMEKO World Congress 2024 was a perfect opportunity to get in touch with people worldwide and great exhibitors. It was packed with a wide range of interesting presentations and workshops and rounded off with a variety of social events. All in all, I can say that it was a really nice and entertaining event with many highlights."



Dr Tzvetelin Georgiev,  
University of Ruse, Bulgaria

"Over the year, I have attended numerous international conferences in my professional domain. The IMEKO World Congress 2024 is by far the most impressive one I have ever attended. The pleasure of sharing experience, ideas, and inspiration with proven professionals and researchers is immense."

My satisfaction is great, and I am also grateful to the keynote speakers and Nobel Prize winners who balanced long years of experience with new trends in metrology, adding a touch of humour. The next IMEKO World Congress 2027 in Rimini will definitely be a focus event in my calendar."



Prof. Li Li; HIT, China

"Hello, everyone, I am Li Li from the Harbin Institute of Technology in China. I am honoured to have joined IMEKO as a TC member in July this year. I then hurriedly started applying for a visa to Germany, eagerly anticipating my first trip to the World Congress. Due to cultural differences, I couldn't help but feel some tension and anxiety when I set off, unsure if I could handle the various challenges that may arise. Upon reflection, I realised that I was overthinking."

I spent a very colourful week in Hamburg, listening to interesting presentations, attending TC meetings and giving an introductory presentation."

I also visited PTB and participated in various social activities organised by the committee. During these activities, I had friendly exchanges with scholars from different countries, such as Germany, Hungary, France, Italy, Spain, and Thailand. My feeling is that although we come from different countries and have different cultures, our aspirations for technological innovation and the common development of humanity are the same. Metrology undoubtedly plays a crucial foundational role in all processes."

Thank you to the organising committee of the IMEKO World Congress for selecting a beautiful city and designing rich and colourful events. The aesthetic of the organising committee left a deep impression on me. The blue, white, and black conference logo design is really beautiful. Finally, thank you, IMEKO, and thank you to those friends who have helped me and accepted me with smiles. See you in Italy in 2027!"



Mr. Mayckol Morales; INM,  
Colombia

"This was my first IMEKO event, and on the first congress day Monday, when a keynote speaker showed a historical picture of the 26th CGPM with the name of Colombia in the picture, I shared the picture with my colleagues with the legend "La importancia de estar", which can be translated as "The importance of being there" and is the phrase that best describes my experience at the IMEKO 2024."

By being there, I could join old friends and partners, discover people who are working on projects related to my own, and find that someone has already solved a problem that I have and that you solved someone else's problem. It was an experience full of discoveries, and it's already giving fruits in cooperation and in measurement improvements."



Mr Miguel Burg Demay; CERTI, Brazil

"It was very pleasant to learn about the present and the future of metrology and SI in a digital world. Furthermore, it was a great opportunity to exchange experiences, make contacts and learn a lot. I look forward to meeting you in Rimini.

(CERTI is a Brazilian R&D centre where several solutions for the industry have been developed. For instance, digital twins are used to monitor the integrity of O&G subsea assets. In this context, the uncertainty of digital models plays a vital role, and it is a research field where metrology can be enormously significant.)"



Dr Malcolm McEwen; NRC, Canada:

"What is an IMEKO World Congress? That was my question as I arrived in Hamburg in late August. Here was a city rich in history and architecture, basking in some beautiful weather with amazing botanical gardens right next to the conference centre - there were plenty of other things to do if the meeting sessions did not live up to expectations.

There was no need for such scepticism! From registration on Sunday evening to the lab tours of PTB on the last day, the organisation and content were top-class. With keynotes by Nobel-prize winners, a range of very interesting sessions, technical exhibits and posters, and plenty of opportunities for engaging in discussions with colleagues, it was actually a struggle to get out of the conference centre!

A highlight was certainly the screening of "The Last Artifact", followed by the Q&A with co-director Jaime Jacobsen. To see "metrology at the movies" was something special; the quality of the presentation truly matching the quality of the amazing science behind the story.

But it was the breadth of measurement science on show that was perhaps the best thing - where else could you go from the digital revolution to the preservation of statues, from climate monitoring to next-generation clocks, all in the course of a day?

A good conference sends you back to your lab energised and full of new ideas, and on that basis, the 2024 IMEKO WC definitely exceeded expectations. In Olympic terms, it was a gold medal performance!

I'm already looking forward to the 2027 WC in Rimini, but I'm glad I'm not part of the team tasked with matching what was achieved in Hamburg!"



Ms Wynfred Kimuya; KEBS Kenya

"The IMEKO 2024 conference was an enlightening and truly enriching experience. It brought together experts from all areas of metrology, showcasing the breadth and depth of ongoing metrological research. I was impressed by the quality and diversity of research papers presented across various tracks, highlighting the critical advancements in the field.

I had the distinct honour of participating in the WIMER panel, where I had the opportunity to engage with and be inspired by trailblazing women leading research in Metrology and Energy. Their insights and achievements were truly motivating.

The Helmholtz Award ceremony was another highlight; it celebrated innovative, award-winning projects that are pushing the boundaries of research. It was a privilege to witness these accomplishments firsthand.

The industrial visit added an extra dimension to the event; the industries were carefully selected, and the participants were provided with valuable insights that aligned with our professional interests.

Overall, IMEKO 2024 was an outstanding experience, and I eagerly look forward to the next IMEKO conference!"



## AN OVERWHELMING EXPERIENCE, WRITTEN BY DR ANNETTE RÖTTGER

The IMEKO World Congress was an invitation for the world of measurement technology to gather for scientific exchange in Hamburg in August 2024.

More than 1000 people came together to discuss the challenges facing metrology as a result of the diverse and rapid changes taking place around the world. National and international metrology and legal metrology organisations, calibration laboratories, accreditation bodies and industry are being driven not only by the transformation coming by digitalisation but also by the technological changes brought about by the energy transition, the responsible use of artificial intelligence, the new possibilities offered by quantum technologies and the need for action on climate change.



*Outer Alster Lakes*

*(The pictures of this article are courtesy of Dr Stefan Röttger)*

IMEKO took place at the Hamburg Congress Centre, just opposite Planten un Blomen, not far from the Inner Alster. The sun shone all week, and it was only on Friday, during the bus transfer to Braunschweig, that Hamburg's proverbial "Schietwetter" caught up with us. Those who strolled through the park or sat on the banks of the Alster quickly succumbed to the city's charms, so it was no surprise to see the happy and relaxed faces of the participants everywhere.



*Planten un Blomen, Statepark Hamburg*

The IMEKO World Congress was held in recognition of the 17 Sustainable Development Goals (SDGs) of the UN, and as the pursuit of diversity and inclusion is indispensable for realising the vision of the SDGs, this topic was addressed by an intensive workshop at IMEKO, too. I had the chance to participate in the WIMER session and was touched by the different views and experiences that brought us together.

One part of the WIMER session was a panel discussion moderated by Dr. Dorothea Knopf and Co-Moderator Dr. Solmaz Nadiri. The core of the discussion was "Sustainability through Precision: Women Leading Metrology and Energy".

After some personal statements and a self-introduction of the participants of the panel, which were Ms Winfred Kimuya, Dr Cui Shan, Prof Lovorka Grgec-Bermanec, Dr Annette Röttger and Dr Marina Romanchikova, the discussion got more vivid also involving questions from the audience.

One core question was what "sustainability" meant for us: It's not an easy question. The interesting thing is that I have always thought of progress in linear terms.

We are experiencing a technological evolution that is leading us to a different, hopefully better, future. This is certainly true for the big issues of digitalisation, AI, renewable energy, quantum technology or personalised medicine.

However, sustainability requires a different way of thinking, not a linear one, but a circular one. A functioning circular economy that maintains the current level of technology would, therefore, be a huge step forward.

It takes a strong team to overcome such challenges. Which brings us to the next question: What makes a team strong? The consensus on the panel was: diversity. Diversity of many characteristics, not just gender, but age, education, religion, experience and much more. My wish is that one day, this kind of diversity will be so normal that the question of gender equality will no longer be relevant. But it will probably take some time, otherwise the WIMER session would not be a topic at IMEKO.



*In the picture from the left, organiser Ms Dorothea Fabeck, co-moderator Dr Solmaz Nadiri, Ms Winifred Kimuya, Dr Cui Shan, Dr Annette Röttger, moderator Dr Dorothea Knopf, Prof Lovorka Grgec-Bermanec, Dr Marina Romanchikova, and Ms Carla-Cristina López-Canchola.*

Speaking from experience, I can only encourage anyone to put together a heterogeneous team to solve problems. Only with different perspectives can a team be more than the amplification of one voice. It has to be said that this is sometimes exhausting but always rewarding.

Another point of discussion in the panel was the opportunity to act as a mentor for young people, not least to get them interested in metrology.

Although our experiences differed in the details due to the different education and research systems, one experience was common: to make young people successful, a solid relationship of trust between mentee and mentor and the ability of the mentor to listen is required. Careers often mean different things to different people. So, it remains the mentor's privilege to point out doors, even to open doors, but it is the mentee's job to decide which ones they want to go through.

In the end, our discussion brought us back to the themes of IMEKO. How can we make our field attractive to young people? Is the subject sufficiently present in the education system? Are we willing and able to take our issues to social media to reach young talents?

No small challenge for our generation in metrology: because I can proudly say that I am older than the internet - not to mention social media!

I really enjoyed the discussion on the WIMER panel. It was inspiring, surprising, and sometimes just funny. When I think about it, there was a very diverse team sitting there, different in age, nationality, profession, experience and identity. We still don't have a solution to all the challenges, but we've worked well on them. We'll just do the rest at the next meeting!

Coming back to the highlights of IMEKO, I would like to mention our SI system, our foundation on which we stand firmly. The SI - for all times, for all people. In his opening speech, Wynand Louw, President of the CIPM, gave an impressive account of the history of the system of units. Joachim Ullrich, former President of the PTB and of the DPG (German Physical Society), reported on new trends in metrology, and

Cornelia Denz, current President of the Physikalisch-Technische Bundesanstalt, not only linked metrology to the history of the Hanseatic city of Hamburg but also addressed the need of modern society for a reliable, trustworthy quality infrastructure. This fitted in perfectly with the reception at Hamburg City Hall and the speech by Melanie Leonhard, Minister for Economy and Innovation.



*In the picture, Dr Annette Röttger and Prof Frank Härtig*

Many people should be mentioned who contributed to the success of the Congress: the organisation team of PTB, the TC Chairs of IMEKO, the great contributions of the Nobel Prize winners Stefan Hell and Klaus von Klitzing and the glamorous awarding of this year's Helmholtz Prize to the physics group of Prof. Dr Peter Baum from the University of Konstanz (precision measurements in basic research) and to an interdisciplinary physics/medicine team from Leibniz University Hannover (led by Prof. Dr Bernhard Roth) and the University of Rostock (led by Prof. Dr Steffen Emmert) for their innovations in optical biopsy in skin cancer diagnostics.

All supporters were thanked by IMEKO President Prof. Frank Härtig, whose charming moderation made the Congress a great success.



*In the picture, from the left, Mr Heiko Klawitter, Dr Jens Simon, Ms Jamie Jacobsen, Prof Frank Härtig*

There was also a consensus at the cinema event: Anyone who has not seen the film "The Last Artefact" should do so. Because metrology is not only the basis of everything we measure in science and technology, it can also be as exciting as a thriller! Jaime Jacobsen has succeeded in telling our story and was enthusiastically received at IMEKO.



*In the picture, Mr Heiko Klawitter, Dr Annette Röttger and Dr Stefan Röttger*

Who could resist being photographed on the red carpet with the star of the film, well protected by his attentive bodyguard? We certainly couldn't. Here, you can see the silicon sphere in the hands of the PTB couple Röttger under the watchful eyes of the bodyguard on duty at the IMEKO.



Thanks to this ingenious photo session, we not only enjoyed a great film night with popcorn but also took home a lasting memory of this event.

Now that the IMEKO World Congress in Hamburg has come to an end, we look forward with great anticipation to the next World Congress of IMEKO in 2027. The presidency has passed from Frank Härtig to Paolo Carbone, who will welcome IMEKO members to Rimini in 2027. The Zelenkas will be on hand with advice and support to make this a great success. Zoltan Zelenka as General Secretary, and his wife Kristine, who as Secretary of IMEKO, not only keeps track of all the appointments but also takes care of the newsletter, the members and the TCs.



*In the picture from the left, Prof Tilo Pfeifer, Mr Zoltan Zelenka, Kristine Zelenka, and Dr Annette Röttger*

After the official end of the Congress, participants had the opportunity to explore special destinations in Hamburg as part of the Technical Visits. There was such a wide range on offer that it was difficult to choose: Airbus Hamburg, Deutsches Elektronen-Synchrotron, Calibration Directorate North, EMH - Energie Messtechnik GmbH, HHLA - Hamburger Hafen und Logistik AG, XFEL - European X-Ray Free-Electron Laser Facility GmbH and ZAL - Center of Applied Aeronautical Research.

We chose Airbus for family reasons because I feel close to the company where my late father had headed a department in Bremen for many years.

So, it was quite an emotional moment to drive over to the Hamburg site and suddenly see the VFW 614 on the open-air museum square. The plane he loved to work on decades ago. An eventful visit, crowned by a presentation of the latest ideas on sustainability in aviation. Airbus is also active in Horizon Europe as part of the European Clean Aviation Partnership, as are EURAMET and many European metrology institutes such as PTB in the Partnership on Metrology. Both partnerships are concerned with hydrogen, with the aim of developing a sustainable future. It might help to be aware of each other's strengths!



I experienced the end of the Congress as a visit to our PTB, with many sightseeing offers and lectures in the lecture hall, which could hardly have been more exciting and impressive: "Time and Frequency: Development of New Clocks" by Prof. Tanja Mehlstäubler, "Quantum Technology and Quantum Computing" by Prof. Christian Ospelkaus and "Atomic Clocks as a Tool for the Search for New Physics" by Prof. Andrey Surzhykov. This shows how profitable and successful the networking of PTB with LUH and TU Braunschweig is. A strong team in Lower Saxony shows that success is possible when university and governmental research are brought together.

The IMEKO in Hamburg was an overwhelming experience. Are you prepared to join the next World Congress in Rimini?



## PORTRAIT DRAWING ROBOT AT THE WORLD CONGRESS



*In the picture, Prof Frank Härtig and Dr Zsolt Viharos and Piktor-o-Bot*

HUN-REN SZTAKI's portrait drawing robot has also visited the IMEKO World Congress. The Piktor-o-Bot machine was exhibited during the event, and visitors could have their portraits drawn.

"A drawing took an average of 4 minutes; there were over 200 drawings made in the time available. This is quite a performance! Thank you all for this opportunity and collaboration." *(Dr Zsolt Viharos)*

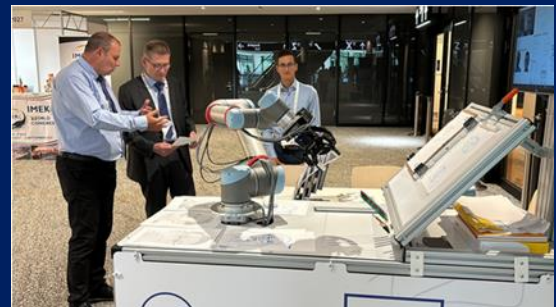


Piktor-o-Bot is the drawing robot of the HUN-REN Institute for Computer Science and Control (HUN-REN SZTAKI). It can draw anyone and anything, using its sensors to perceive its environment. It is designed to draw portraits. The

subject of the portrait stands in front of the robot's camera, and the robot draws a picture of the person based on the photo taken with its camera. Piktor-o-Bot takes a photo of the subject and transforms it into lines using an AI-driven algorithm.

The aim is to enhance the most relevant contours drawn by the robot arm attached to the table. This is a collaborative robotic arm, which means it is designed to work in the immediate environment of humans, so drawing is entirely safe - even without a cage or bars enclosing the robot.

The purpose is to show how machine vision works and makes sense of what it sees. The only thing that robots can interpret is what is translated into their language of computing - in the case of Piktor-o-Bot, this is done with lines. It should be stressed that the human face is a highly complex structure, much more so than a graphic logo or an object with sharp contours. Although HUN-REN SZTAKI's researchers basically designed Piktor-o-Bot to draw faces, it can reproduce practically anything. The collaborative robotic arm takes the marker prepared and uses it to carefully draw the contours the algorithm determines from the photograph, pressing it perpendicular to the drawing board with constant force.



*In the picture Dr Zsolt Viharos, Prof. Frank Härtig, and Mr Mátyás Hajós*

Wish to know more? Here is a video where Zsolt János Viharos, senior researcher of HUN-REN SZTAKI, explains the robot's functions:

<https://www.youtube.com/watch?v=fIYZ8b2mwGk>

*(Written by Péter Smejkal HUN REN team)*

**PROFESSOR BENOITE LEFORT AND PROFESSOR KARL-HANS LAERMANN HAS PASSED AWAY**



Measurements of Energy and Related Quantities, from IMEKO TC20 and WIMER - Women in Metrology and Energy Research are profoundly saddened by the sudden passing of our esteemed collaborator, active member, and dear colleague, Professor Benoîte Lefort, from the University of Bourgogne and ISAT in France.

Professor Lefort was a renowned expert in combustion chemistry, spectroscopy, and kinetics. Her excellent work on shock tube-based high-temperature chemical kinetics and flame measurements earned widespread recognition and respect within the scientific community.

Beyond her scientific achievements, she was cherished for her kindness, humility, and warm and friendly nature. Her constant smile and approachable demeanour endeared her to students, colleagues, and collaborators alike, impacting everyone who had the privilege of knowing her.

Her passing is an immeasurable loss to our community, and her absence will be deeply felt.

Professor Lefort will be remembered not only as a brilliant scientist but also as a wonderful human being who touched the lives of many. Her legacy will live on through her contributions to science and the lasting memories she leaves behind. She will be greatly missed, and we will always hold her fondly in our hearts.



IMEKO, its TC15, dedicated to Experimental Mechanics, the University of Wuppertal mourns the loss of Professor Emeritus Karl-Hans Laermann. He was one of the first professors in the field of civil engineering to be appointed to the comprehensive university, which was founded in 1972. Even after his retirement in 1995, he remained present and highly valued.

Prof. Karl-Hans Laermann held the professorship for Structural Analysis, headed the Laboratory for Experimental Stress Analysis and Measurement Technology and trained numerous civil engineers. His colleagues and students not only appreciated his outstanding expertise but also his pleasant personality and his great, constructive commitment to the faculty and the university.

Prof Laermann's academic career began with a degree in civil engineering at RWTH Aachen University. As a graduate engineer, he worked for several construction companies before gaining his doctorate in 1963. In 1966, he habilitated with a thesis on "Stress-optical methods for solving elasticity theory problems in civil engineering". In 1971, he was appointed Scientific Councillor and Professor in Aachen and in 1974, Professor of Structural Analysis in Wuppertal.

Prof. Laermann has received several awards for his significant contributions to science, including honorary doctorates from Košice University of Technology, Tianjin University, Otto von Guericke University Magdeburg and Prague University of Technology.

The European Association for Experimental Mechanics honoured his contributions to experimental mechanics with the "Award of Merit". He was also elected as a "Corresponding Member" of the Class of Physical Sciences of the "Accademia delle Scienze dell'Istituto di Bologna"; its members also include Albert Einstein, Marie Curie and Luigi Galvani. In 1996, the President of the Bundestag, Rita Süßmuth, awarded him the Grand Cross of Merit with Star.

Prof Laermann also rendered outstanding services to science policy. For 24 years, from 1974 to 1998, he was part of the FDP parliamentary group in the Bundestag, where he was involved in research and technology issues and as a member of the Committee on Education, Science and Research. In 1994, he served in Helmut Kohl's cabinet as Federal Minister of Education and Science. Karl-Hans Laermann's life was characterised by science and politics, and he left his mark on politics and science.