



# IMEKO

International Measurement Confederation

**Measurement for Diagnostics, Optimization and Control**

Technical  
Committee  
**TC10**



SZTAKI



CENTRE OF  
EXCELLENCE **EPIC**  
Production Informatics and Control

## **19<sup>th</sup> IMEKO TC10 Conference**

**“MACRO meets NANO in Measurement for  
Diagnostics, Optimization and Control”  
Delft, The Netherlands on September 21-22,  
2023**



**Closing and Awards Ceremony**  
**Dr. Zsolt János VIHAROS**

Senior research fellow, Institute for Computer Science and Control

Vice Dean for Science of the John von Neumann University

President of the Hungarian Member Organisation (MO) of IMEKO

**Chairperson, IMEKO TC10 on Measurement for Diagnostics, Optimization and Control**

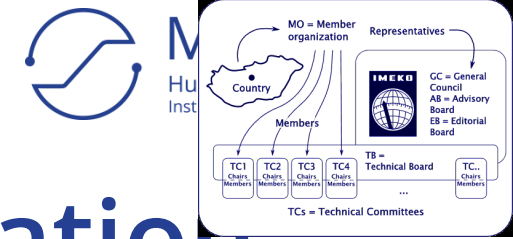


Seeing beyond



# About IMEKO

## International Measurement Confederation



- **TC1** Education and Training in Measurement and Instrumentation (established in: 1967)
- **TC2** Photonics (established in 1962)
- **TC3** Measurement of Force, Mass and Torque (1967-1998: Measurement of Force and Mass)
- **TC4** Measurement of Electrical Quantities (established in 1984)
- **TC5** Hardness Measurement (established in 1973)
- **TC6** Digitalization (until 2020: Vocabulary Committee)
- **TC7** Measurement Science (1975-1993: Measurement Theory)
- **TC8** Traceability in Metrology (established in 1972)
- **TC9** Flow Measurement (established in 1976)
- **TC10** Measurement for Diagnostics, Optimization & Control (established in 1976)
- **TC11** Measurement in Testing, Inspection and Certification
- **TC12** Temperature and Thermal Measurements (established in 1979)
- **TC13** Measurements in Biology and Medicine (established in 1980)
- **TC14** Measurement of Geometrical Quantities (established in 1980)
- **TC15** Experimental Mechanics (established in 1984)
- **TC16** Pressure and Vacuum Measurement (established in 1986)
- **TC17** Measurement in Robotics (established in 1987)
- **TC18** Measurement of Human Functions (established in 1998)
- **TC19** Environmental Measurements (established in 1999)
- **TC20** Measurements of Energy and Related Quantities (1999 - 2010: Measurement Techniques for the Construction Industry, 2010 - 2015: Energy Measurement)
- **TC21** Mathematical Tools for Measurements (established in 2004)
- **TC22** Vibration Measurement (established in 2005)
- **TC23** Metrology in Food and Nutrition (established in 2006)
- **TC24** Chemical Measurements (established in 2008)
- **TC25** Quantum Measurements and Quantum Information (established in 2021)



# 19<sup>th</sup> IMEKO TC10 Conference: “MACRO meets NANO in Measurement for Diagnostics, Optimization and Control”

## INVITATION

The International Measurement Confederation IMEKO, Technical Committee 10 on Measurement for Diagnostics, Optimization and Control (<https://www.imeko.org/index.php/tc10-homepage>) kindly invites you to attend the

**19<sup>th</sup> IMEKO TC10 Conference: “MACRO meets NANO in Measurement for Diagnostics, Optimization and Control”**

**Delft, The Netherlands on September 21-22, 2023.**

The Conference is a forum for **advancing knowledge and exchange ideas** on methods, principles, instruments, technologies and IT tools, standards, industrial applications, conformity assessment, quality management and measurement challenges **on Diagnostics, Optimization and Control** as well as **their diffusion across the scientific community. Participants have an excellent opportunity to meet** top specialists from industry and academia all over the world and to enhance their international cooperation. The programme will feature scientists and experts as **leading keynote speakers** for selected presentations on the conference’s main topics.

# IMEKO TC10 History (19 Conferences + 17/23 World Congresses) SZTAKI

## IMEKO TC10 Events

### TC 10 Conference2023 Delft The Netherlands

Name	Year	Place	Country
<a href="#">TC10 Conference 2022</a>	2022	Warsaw	POLAND
<a href="#">TC10 Conference 2020 (ONLINE)</a>	2020	Dubrovnik	CROATIA
<a href="#">TC10 Conference 2019</a>	2019	Berlin	GERMANY
<a href="#">TC10 Workshop on Technical Diagnostics 2017</a>	2017	Budapest	HUNGARY
<a href="#">TC10 Workshop on Technical Diagnostics 2016</a>	2016	Milano	ITALY
<a href="#">TC10 Workshop on Technical Diagnostics 2014</a>	2014	Warsaw	POLAND
<a href="#">TC10 Workshop 2013</a>	2013	Florence	ITALY
<a href="#">TC10 Workshop 2010</a>	2010	Krakow	POLAND
<a href="#">TC10 International Workshop on Technical Diagnostics 2008</a>	2008	Budapest	HUNGARY
<a href="#">TC10 Conference 2005</a>	2005	Budapest	HUNGARY
<a href="#">TC10 Symposium 2001</a>	2001	Compiègne	FRANCE
<a href="#">TC10 Symposium 1999</a>	1999	Wroclaw	POLAND
<a href="#">TC10 Workshop 1995</a>	1995	Trondheim	NORWAY
<a href="#">TC10 Symposium 1992</a>	1992	Dresden	GERMANY
<a href="#">TC10 Workshop 1991</a>	1991	Warsaw	POLAND
<a href="#">TC10 Symposium 1990</a>	1990	Helsinki	FINLAND
<a href="#">TC10 Conference 1989</a>	1989	Prague	CZECHOSLOVAKIA
<a href="#">TC10 Workshop 1988</a>	1988	Budapest	HUNGARY
<a href="#">TC10 Conference 1987</a>	1987	Paderborn	F. R. GERMANY
<a href="#">TC10 Conference 1986</a>	1986	Dubrovnik	YUGOSLAVIA
<a href="#">TC10 Conference 1981</a>	1981	London	UNITED KINGDOM
<a href="#">2-day Meeting of TC10 1980</a>	1980	Nienwagen	THE NETHERLANDS
<a href="#">TC10 Conference 1979</a>	1979	Karlovy Vary	CZECHOSLOVAKIA

## IMEKO World Congresses

<a href="#">I IMEKO World Congress</a>	1958	Budapest	HUNGARY
<a href="#">II IMEKO World Congress</a>	1961	Budapest	HUNGARY
<a href="#">III IMEKO World Congress</a>	1964	Stockholm	SWEDEN
<a href="#">IV IMEKO World Congress</a>	1967	Warsaw	POLAND
<a href="#">V IMEKO World Congress</a>	1970	Versailles	FRANCE
<a href="#">VI IMEKO World Congress</a>	1973	Dresden	GERMAN D. R.
<a href="#">VII IMEKO World Congress</a>	1976	London	UNITED KINGDOM
<a href="#">VIII IMEKO World Congress</a>	1979	Moscow	SOVIET UNION
<a href="#">IX IMEKO World Congress</a>	1982	Berlin (West)	F. R. GERMANY
<a href="#">X IMEKO World Congress</a>	1985	Prague	CZECHOSLOVAKIA
<a href="#">XI IMEKO World Congress</a>	1988	Houston/Texas	USA
<a href="#">XII IMEKO World Congress</a>	1991	Beijing	P. R. CHINA
<a href="#">XIII IMEKO World Congress</a>	1994	Torino	ITALY
<a href="#">XIV IMEKO World Congress</a>	1997	Tampere	FINLAND
<a href="#">XV IMEKO World Congress</a>	1999	Osaka	JAPAN
<a href="#">XVI IMEKO World Congress</a>	2000	Vienna	AUSTRIA
<a href="#">XVII IMEKO World Congress</a>	2003	Dubrovnik	CROATIA
<a href="#">XVIII IMEKO World Congress</a>	2006	Rio de Janeiro	BRAZIL
<a href="#">XIX IMEKO World Congress</a>	2009	Lisbon	PORTUGAL
<a href="#">XX IMEKO World Congress</a>	2012	Busan	REPUBLIC of KOREA
<a href="#">XXI IMEKO World Congress</a>	2015	Prague	CZECH REPUBLIC
<a href="#">XXII IMEKO World Congress</a>	2018	Belfast	UNITED KINGDOM
<a href="#">XXIII IMEKO World Congress</a>	2021	Yokohama	JAPAN
<a href="#">XXIV IMEKO World Congress</a>	2024	Hamburg	GERMANY

## 19th IMEKO TC10 Conference: “MACRO meets NANO in Measurement for Diagnostics, Optimization and Control”

### SPONSORS



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**PI**





## 19th IMEKO TC10 Conference: “MACRO meets NANO in Measurement for Diagnostics, Optimization and Control”

### INVITED KEYNOTE LECTURERS

#### *Keynote speaker*

#### **Dr. Richard Quintanilha**

Optical System Engineer, Corporate Research & Technology Carl Zeiss AG, Carl-Zeiss-Straße 22, 73447 Oberkochen, Germany

Dr. Richard Quintanilha received his PhD degree in physics from the University of Grenoble, France in 2005, for his research in spectroscopic scatterometry carried out within Crolles 2 Alliance and CEA\LETI. He joined the National Institute for Standard and Technology (NIST), The USA, Gaithersburg, MD in 2006 where he worked in the development and research of an UV transmission microscope and a deep UV reflective microscope for standards and metrology mainly dedicated to microelectronic industry process control (CD measurement, defectivity, etc.). He joined ASML Research Netherlands B.V. Veldhoven, The Netherlands in 2010 in the Sensors, Metrology and Computational Modeling (SMC) group where his work was focused on metrology for future technology nodes. He joined in 2018 ZEISS-SMT in Oberkochen, Germany. His work was focused on metrology for EUV mirror characterization. Since 2022, He works in ZEISS AG Corporate Research and Technology as an Optical System Engineer.

#### Lecture: *Carl ZEISS and Metrologies*

General introduction to ZEISS group and its different Segments with a special place for the Semiconductor Manufacturing Technology Segment. The talk will focus on manufacturing and associated metrology requirements challenges through some examples coming from different segments of the company. A more detail presentation of the DUV-EUV optics manufacturing and metrology is discussed.

## 19th IMEKO TC10 Conference: “MACRO meets NANO in Measurement for Diagnostics, Optimization and Control”

#### *Keynote speaker*

#### **Poul Erik Hansen**

Principal scientist at Principal scientist, Danich National Metrology Institute, Kogle Alle 5, DK-2970 Hørsholm, Denmark

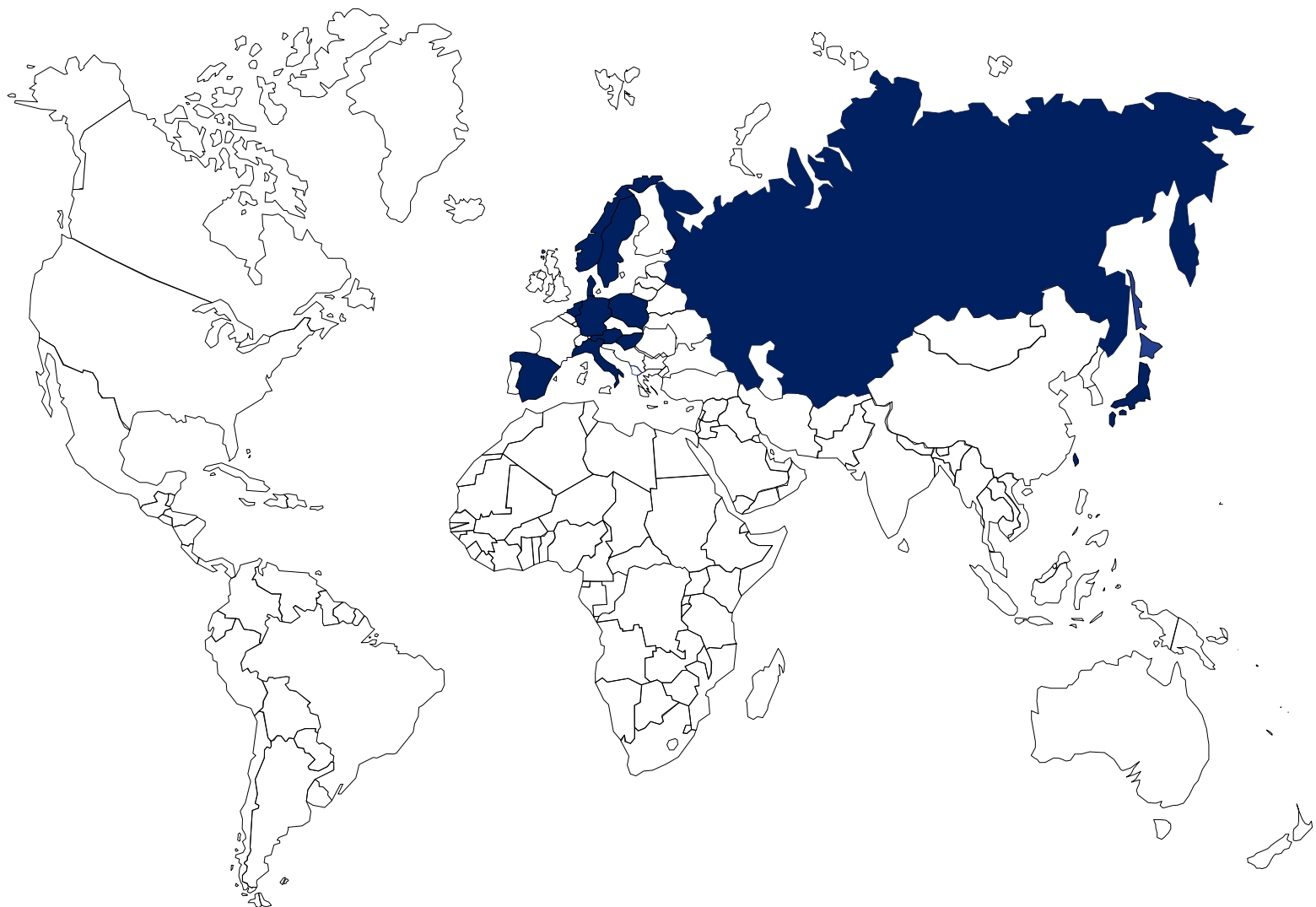
Poul-Erik Hansen got his Ph.D. in Physics in 1998 at Aalborg University, Denmark. Since 2006 he has worked as a research scientist at Danish Fundamental Metrology in the field of surface metrology, scatterometry as well as ellipsometry and confocal microscopy. He also has an expertise in advanced mathematical modeling of the light matter interaction. Poul-Erik is a leader of several Danish projects on optical Metrology and scattering of nanosized objects and has authored more than 60 papers in international peer reviewed journals.

#### Lecture: *Traceability and uncertainty in optical measurements*

The talk is meant to provide users of metrology and the general public with a simple yet comprehensive overview on the subject. It targets those who are not familiar with the topic and who require an introduction, as well as those who are involved in metrology at various levels but who want to know more about the subject or simply gain specific information. Metrology is the science of measurements and covers three main activities. 1) The definition of internationally accepted units of measurement, 2) The realization of units of measurement by scientific methods and 3) The establishment of traceability chains by determining and documenting the value and accuracy of a measurement and disseminating that knowledge. This talk focuses on the third aspect and we will show examples of current work to establish an internationally recognized traceability chain for optical microscopy, reflectometry, scatterometry and ellipsometry at the micrometre and nanometre scale. To do this we need measurement institutes/companies that can provide high quality measurement, fabrication institutes/ companies that can manufacture high quality physical samples and a protocol for how each participant should measure and analyse the samples to obtain the required measurand and uncertainty. All the data will then be compared and checked for internal conformity and if available conformity with reference measurement from an established traceability chain.

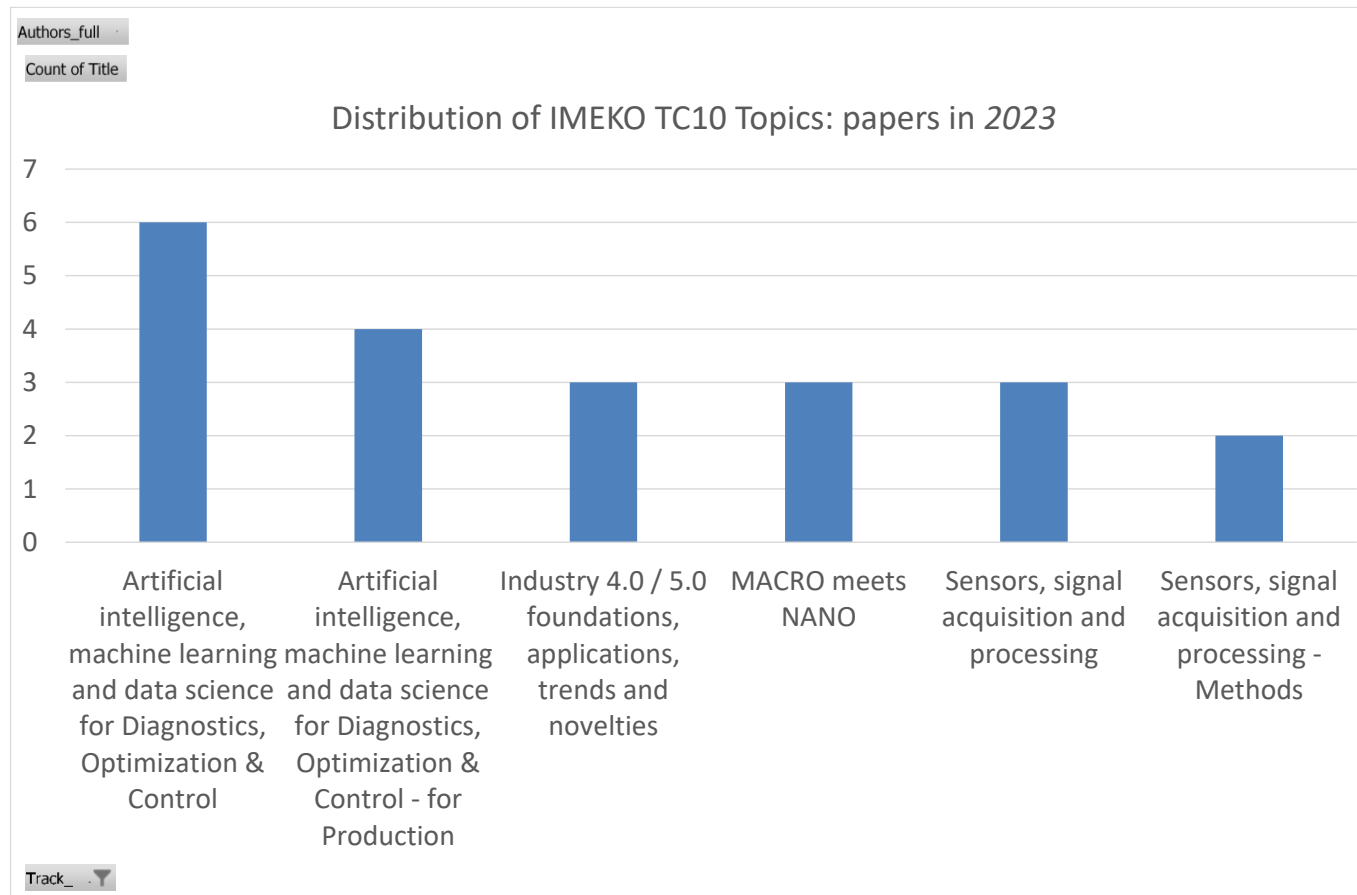
The talk also will address measurement techniques such as optical microscopy, spectroscopic scatterometry, spectroscopic ellipsometry and reflectometry as well as data processing and the measurement uncertainty.

## Authors (from 13 countries)



# Key scientific topics - 2023 (21 published papers)

- **T5 - Artificial intelligence, machine learning and data science for Diagnostics, Optimization & Control**
- **T2 - Sensors, signal acquisition and processing for Diagnostics, Optimization & Control**
- **T6 - Industry 4.0 foundations, applications, trends and novelties**
- **MACRO meets NANO**



→ **Increase impact**

→ **Collaboration potential**

→ **Follow others' results**





# IMEKO

International Measurement Confederation

**Measurement for Diagnostics, Optimization and Control**

Technical  
Committee  
**TC10**

Past: 2 + 1  
**Membership** candidate discussions

**Present: 2 new members**

***Assignment for ALL:  
looking for new members***

Name	Position	Country
<a href="#">Dr. Zsolt Janos Viharos</a>	TC10 Chairperson	HUNGARY
<a href="#">Prof. Lorenzo Ciani</a>	TC10 Vice Chairperson	ITALY
<a href="#">Dr. Piotr Bilski</a>	TC10 Scientific Secretary	POLAND
<a href="#">Prof. Álvaro Silva Ribeiro</a>		PORTUGAL
<a href="#">Prof. Marcantonio Catelani</a>	Honorary member	ITALY
<a href="#">Prof. Laszlo Monostori</a>		HUNGARY
<a href="#">Prof. Artur Lopes Ribeiro</a>		PORTUGAL
<a href="#">Yakov Ben-Haim</a>		ISRAEL
<a href="#">Prof. Eduard Egusquiza</a>		SPAIN
<a href="#">Prof. B. K. N. Rao</a>		UNITED KINGDOM
<a href="#">Prof. He Zhengjia</a>		CHINA
<a href="#">Prof. Romauld Zielonko</a>		POLAND
<a href="#">Dr. Eng. Yukio Hiranaka</a>		JAPAN
<a href="#">Dr. Justinas Janulevicius</a>		LITHUANIA
<a href="#">Dr. Lauryna Siaudinyte</a>		NETHERLANDS
<a href="#">Prof. Helena Geirinhas Ramos</a>		PORTUGAL
<a href="#">Dr. Oleg Bushuev</a>		RUSSIA
<a href="#">Prof. Ephraim Suhir</a>		USA
<a href="#">Prof. Diego Galar</a>		SWEDEN
<a href="#">Dr. Oleksandr I. Shevchenko</a>		UKRAINE
<a href="#">Mr Balázs Scherer</a>		HUNGARY
<a href="#">Prof. Giulio D'Emilia</a>		ITALY
<a href="#">Prof. Dr. Ing. David Delaux</a>		FRANCE
<a href="#">Dr. Marco Carratù</a>		ITALY
<a href="#">Dr. Gábor Nick</a>		HUNGARY
<a href="#">Gabriele Patrizi</a>		ITALY
<a href="#">Prof. Chao-Ching Ho</a>		TAIWAN
<a href="#">Ádám Szaller</a>		HUNGARY



## Contacts

Prof. Marcantonio Catelani (Honorary member)	ITALY
Prof. Álvaro Silva Ribeiro	PORTUGAL
Prof. Laszlo Monostori	HUNGARY
Prof. Artur Lopes Ribeiro	PORTUGAL
Prof. Yakov Ben-Haim	ISRAEL
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Dr. Eng. Yukio Hiranaka	JAPAN
Dr. Justinas Janulevicius	LITHUANIA
Dr. Lauryna Siaudinyte	THE NETHERLANDS



## Contacts

(Invited, Member of IMEKO TC10)

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Dr. Oleg Bushuev	RUSSIA
Prof. Ephraim Suhir	USA
Prof. Diego Galar	SWEDEN
Dr. Oleksandr I. Shevchenko	UKRAINE
Mr Balázs Scherer	HUNGARY
Prof. Giulio D'Emilia	ITALY
Prof. Dr. Ing. David Delaux	FRANCE
Dr. Marco Carratù	ITALY
Dr. Gábor Nick	HUNGARY
Dr. Gabriele Patrizi	ITALY

# Thank you for the excellent operative organization!

- 150+ emails
- 20+ online meetings
- 40+ calls
- 50+ messages
- ...



Dr. Lauryna Siaudinytė



Judit Stefkó  
Congress Ltd.

- Outcomes

1. Proceedings of the conference

- NOT Open Access

2. Proceedings on the IMEKO website

- Open Access
- **With DOI !**
- Indexed in many databases

3. Special issue(s)

- Case-based
- Full review - risky

IMEKO TC10 Conference on MAC x +

imekotc10-2023.sztaki.hu/index.php

Proman 1.0 - EMI P... NAPELEM\_GROWAT... Neptun.Net PE\_OW... Zsolt János Dr. Viha... Fájlok - SZTAKI Nex... EPIC new - Google... Boards | Trello TC10 MemberQues... Adatelemzési képzé...

**IMEKO** International Measurement Confederation **TC10** Technical Committee **Measurement for Diagnostics, Optimization and Control**

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**Conference on MACRO meets NANO in Measurement for Diagnostics, Optimization and Control**  
Delft, The Netherlands on September 21-22, 2023

**INVITATION**

The International Measurement Confederation IMEKO, Technical Committee 10 on Measurement for Diagnostics, Optimization and Control (<https://www.imeko.org/index.php/tc10-homepage>) kindly invites you to attend the 19th IMEKO TC10 Conference: "MACRO meets NANO in Measurement for Diagnostics, Optimization and Control" to be held in Delft, The Netherlands on September 21-22, 2023.

The Conference is a forum for advancing knowledge and exchange ideas on methods, principles, instruments, technologies and IT tools, standards, industrial applications, conformity assessment, quality management and measurement challenges on Diagnostics, Optimization and Control as well as their diffusion across the scientific community. Participants have an excellent opportunity to meet top specialists from industry and academia all over the world and to enhance their international co-operation. The programme will feature scientists and experts as leading keynote speakers for selected presentations on the main topics of the Conference.

**CALL FOR PAPERS**

Authors are kindly invited to submit extended abstracts in the appointed scientific topics, three to four pages long in A4 format. The abstract should report original research results of theoretical or applied nature and should explain the significance of the contribution to the research field. The abstracts will be reviewed by the International Programme Committee. Electronic abstracts must be in Adobe Acrobat (pdf) and should be sent according to the procedure described on <https://www.imekotc10-2023.sztaki.hu/>. Proceedings identifier: ISBN: 978-92-990090-4-8.

**SPECIAL ISSUE**

Selected papers of the conference will be invited to the Measurement, Measurement Sensors and Acta IMEKO Special Issues. All submitted papers will undergo a regular peer review process. The manuscript MUST be significantly extended beyond the IMEKO TC10 conference paper.

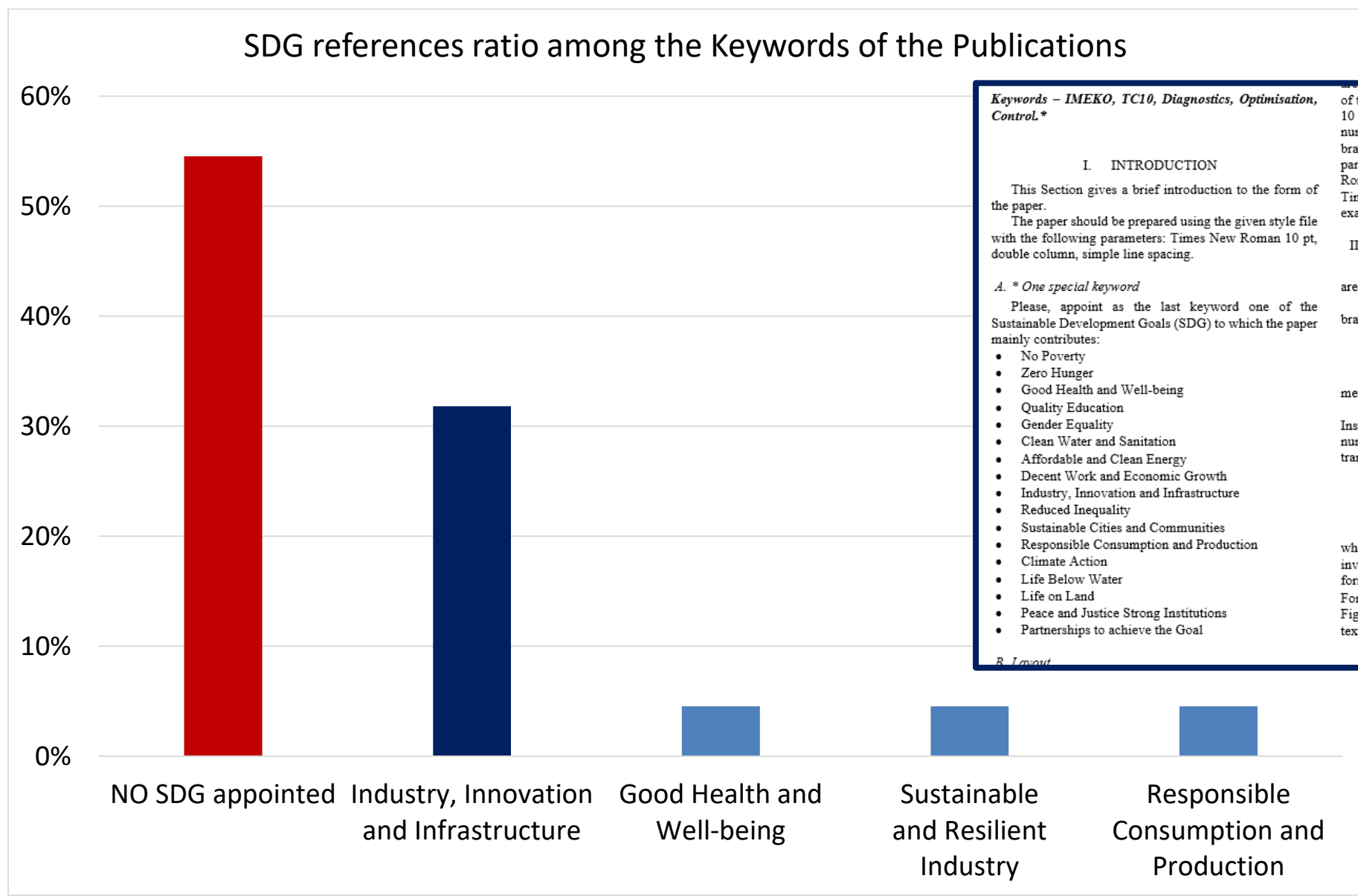
**SCIENTIFIC TOPICS**

- Basic principles and development trends in Measurement for Diagnostics, Optimization & Control
- Sensors, signal acquisition and processing
- Failure & fault detection and prognosis
- Artificial intelligence, machine learning and data science for Diagnostics, Optimization & Control
- Industry 4.0 / 5.0 foundations, applications, trends and novelties

**IMEKO**



# Keywords vs. SDG (Sustainable Development Goals)





# IMEKO

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Technical Committee  
**TC10**

**Measurement for Diagnostics, Optimization and Control**



**2023.09.21 Thursday**

[Hotel Arsenaal, Delft \(Korte Geer 1, Delft\)](#)

9:00 - 9:30	REGISTRATION - Hotel Arsenaal
9:30 - 10:00	<b>Welcome, Conference Openning - Hotel Arsenaal</b>
10:00 - 10:45	<b>Invited Key Lecturer: Dr. Richard Quintanilha</b> Optical System Engineer Corporate Research & Technology; Carl Zeiss AG Carl ZEISS and Metrologies
10:45 - 11:00	COFFEE BREAK - Hotel Arsenaal
<b>Scientific session</b>	<b>Session chair: Dr. Zsolt János Viharos - Artificial intelligence, machine learning and data science for Diagnostics, Optimization &amp; Control - for Production</b>
11:00 - 11:20	Chao-Ching Ho, Chun-Han Liu, Ming-Chieh Kao: Multi-task Learning Based on Deep Convolutional Neural Networks for Surface Defect Detection of Metal Gaskets
11:20 - 11:40	Dennis Grunert, Hellmich, Jan Hendrik, Henrik Heymann, Maik Frye, Robert H Schmitt: Machine Learning Management Model for Production
11:40 - 12:00	Eszter Kocsis, Attila Lukács, István Szalai: Investigation of atmospheric pressure plasma treatment on PCB surface finishes
12:00 - 12:20	Leonhard Czarnetzki, David Karnok, Viola Gallina, Johannes Breitschopf, Gashi Milot, Matthias Karner, Catherine Laflamme: Improving the Planning Quality in Practice with Artificial Intelligence
12:20 - 13:20	LUNCH - Hotel Arsenaal

Scientific session	Session chair: Prof. Lorenzo Ciani - Artificial intelligence, machine learning and data science for Diagnostics, Optimization & Control
13:20 - 13:40	Marco Carratù, Vincenzo Gallo, Antonio Pietrosanto, Gabriele Patrizi, Alessandro Bartolini, Lorenzo Ciani, Marcantonio Catelani: A deep learning method for current anomaly detection
13:40 - 14:00	Bartosz Połok, Piotr Bilski: Analysis of the Faults in Ratchet Mechanisms in the Presence of Noise
14:00 - 14:20	Roland Nagy, István Szalai: Development of machine learning assisted suspension vibration data-based road quality classification system
14:20 - 14:40	Yuko Hiranaka, Hidenori Katsumura, Koichi Tsujino, Masashi Nakagawa: Anomaly Score for Multiple Operating Modes of Rotating Machines by Using Conditional Variational Auto-Encoder
14:40 - 15:00	Marco Carratù, Vincenzo Gallo, Valter Laino, Consolatina Liguori: Use of Artificial Intelligence in optical microscope imaging
15:00 - 15:20	Alexander Shestakov, Dmitry Galyshev, Olga Ibryaeva, Victoria Ereemeeva, Vladimir Sinitsin: Detection of Broken Bar Fault in Induction Motor Using Higher-Order Harmonics Analysis
15:20 - 15:50	COFFEE BREAK - Hotel Arsenaal
15:50 - 17:00	<b>All Participants - IMEKO TC10 Meeting</b>
19:00 -	<b>Gala Dinner in <u><a href="#">Delfts Brouwhuis</a></u></b> Hippolytusbuurt 43; 2611HM Delft; 06-43255788



# IMEKO

International Measurement Confederation

Technical Committee  
**TC10**

**Measurement for Diagnostics, Optimization and Control**



**2023.09.22 Friday**

[Hotel Arsenaal](#), Delft (Korte Geer 1, Delft)

Scientific session	Session chair: Prof. Piotr Bilski - Sensors, signal acquisition and processing
9:00 - 9:20	Gabriele Patrizi, Marco Carratù, Lorenzo Ciani, Paolo Sommella, Roberto Singuaroli, Marcantonio Catelani, Antonio Pietrosanto: Dynamic characterization of MEMS-based Inertial Unit under combined vibration stresses
9:20 - 9:40	Zsolt Tóth, Eszter Kocsis, Attila Lukács, István Szalai: No-clean flux residues detection with impedance measurements
9:40 - 10:00	Giulio D'Emilia, Luciano Chiominto, Antonella Gaspari, Emanuela Natale, Andrea Prato, Alessandro Schiavi: A contribution to trustworthiness of data from digital MEMS accelerometers for smart mobility
10:00 - 10:20	Raissa Schiavoni, Antonio Masciullo, Andrea Cataldo: Skin monitoring and diagnostics: towards a wearable low-cost system
10:20 - 10:40	Alexander Shestakov, Olga Ibryaeva, Victoria Ereemeeva, Vladimir Sinitsin: The Detection of Rotor Bar Faults in Induction Motors Using the Recursive Matrix Pencil Method
10:40 - 11:10	COFFEE BREAK - Hotel Arsenaal
Scientific session	Session chair: Prof. Giulio D'Emilia - Industry 4.0 / 5.0 foundations, applications, trends and novelties
11:10 - 11:30	Botond Kádár, Eduardo Colangelo, Gábor Nick, László Fükő, Ádám Szaller: Flexible Manufacturing Concept at Bosch: A low-cost implementation of an Industry 4.0 concept
11:30 - 11:50	Ferenc Kása, Péter Wolf, Tamás Gyulai, Zsolt János Viharos: Learning Factories towards Industry 5.0: Evolutionary or Revolutionary?
11:50 - 12:10	Marc Vila Forteza, Ajit Kumar Verma, Diego Galar Pascual, Uday Kumar: RELIABILITY PREDICTION OF CENTRIFUGAL PUMPS IN DIGITIZED OIL & GAS ENVIRONMENT
12:10 - 13:00	LUNCH - Hotel Arsenaal

<b>13:00 - 13:40</b>	<b>Invited Key Lecturer: Poul Erik Hansen</b> Principal scientist Danish National Metrology Institute Traceability and uncertainty in optical measurements
Scientific session	Session chair: Dr. Lauryna Siaudinytė: MACRO meets NANO
13:40 - 14:00	Atul Tiwari, Sebastian Heidenreich, Victor Soltwisch: Bayesian approach for determining the optical constants of layered systems using EUV reflectometry: The effect of different priors
14:00 - 14:20	Poul-Erik Hansen, Lauryna Siaudinyte, Thomas Siefke: In situ calibration of numerical aperture effects in optical microscopes
14:20 - 14:40	Thomas Siefke, Astrid Tranum Rømer, Lauryna Siaudinytė, Poul-Erik Hansen: Fine details of structural deviations in reference samples for scatterometry
14:40 - 15:10	COFFEE BREAK - Hotel Arsenaal
<b>15:10 - 16:00</b>	<b>Closing and Award Ceremony - Hotel Arsenaal</b>











THE ROOM FOR OUR TC10 Conference is the Blue Room:



### DREAM OF ADVENTURES UNDER THE HISTORIC BEAMED CEILING

Hotel Arsenaal Delft offers 63 hotel rooms, including two suites, superior rooms and comfort rooms. Every room breathes authenticity, reminding us of the rich history of the city of Delft. Thanks to the sixteenth century construction, all rooms have an authentic, unique and romantic character. The beds and facilities are similar in all rooms, but may vary in size and view. Hotel Arsenaal is a non-smoking hotel. It is therefore not allowed to smoke in the rooms.





2023.09.21, Delft, The Netherlands, IMEKO TC10 Meeting







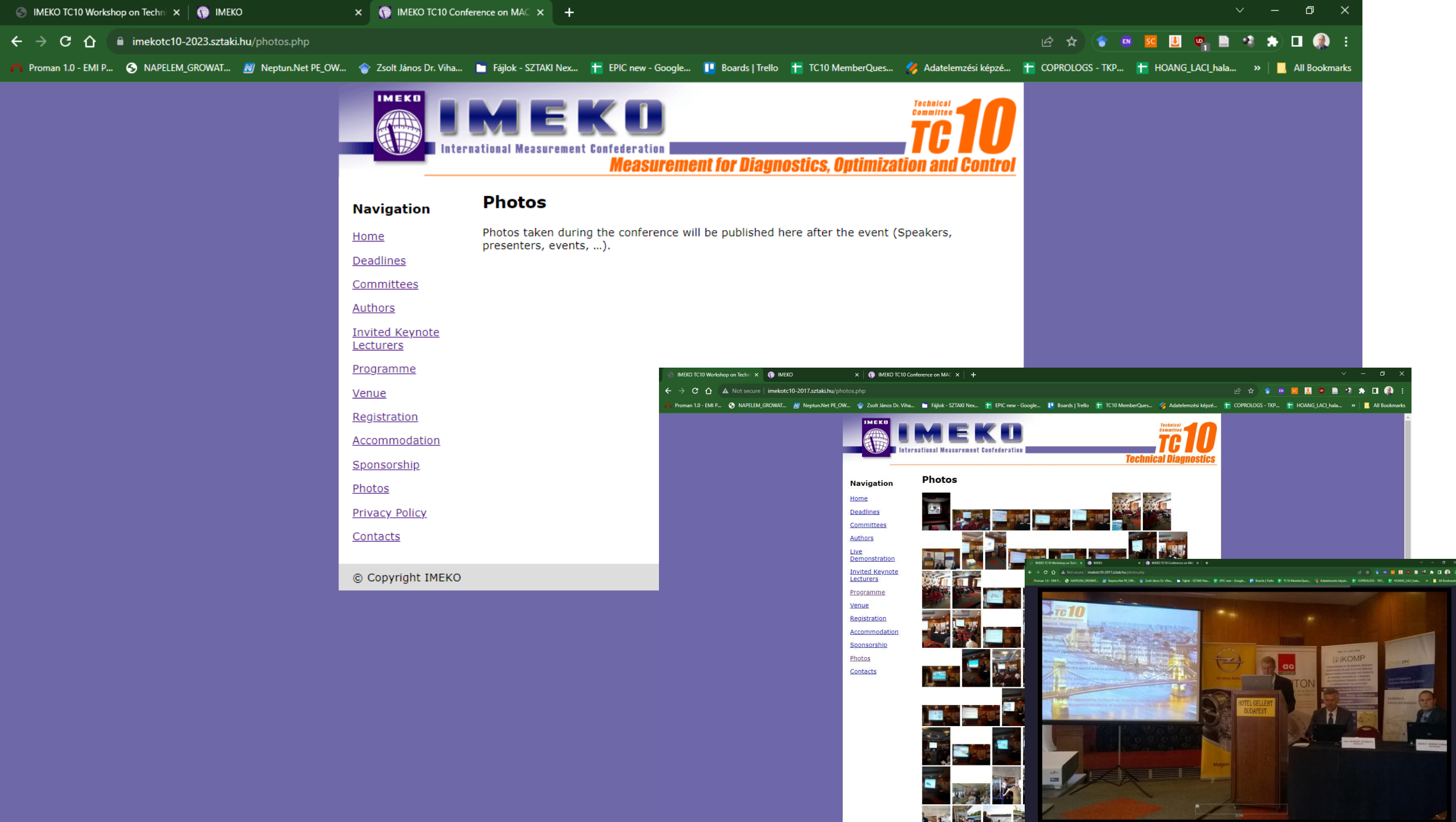














## Workshop awards

- An award will be given for the **Best Scientific Paper & Presentation of the Conference.**
- An award will be given for the **Best Scientific Paper & Presentation by a Woman on the Conference.**
- To encourage the attendance of young researchers, an award will be given for the **Best Paper Authored and Presented by a Young Researcher.**



# International Measurement Confederation

## Certificate of Award for the Best Scientific Paper & Presentation Presented by a Woman

In recognition of professional excellence, the paper titled

**Investigation of atmospheric pressure plasma treatment on PCB surface finishes**

presented at the

19<sup>th</sup> IMEKO TC10 Conference: “MACRO meets NANO in Measurement for Diagnostics, Optimization and Control” to be held in Delft, The Netherlands on September 21-22, 2023.

The author(s) of this paper,

**Eszter Kocsis, Attila Lukács, István Szalai**

are hereby congratulated and recognised for the excellent research work reported in the paper and presentation.

Dr. Zsolt János Viharos  
Chairperson of IMEKO TC10 on  
Measurement for Diagnostics, Optimization  
and Control

# International Measurement Confederation



## Certificate of Award for the Best Scientific Paper & Presentation Presented by a Young Scientists

In recognition of professional excellence, the paper titled

**Dynamic characterization of MEMS-based Inertial Unit under combined vibration stresses**

presented at the

19<sup>th</sup> IMEKO TC10 Conference: “MACRO meets NANO in Measurement for Diagnostics, Optimization and Control” to be held in Delft, The Netherlands on September 21-22, 2023.

The author(s) of this paper,

**Gabriele Patrizi, Marco Carratù, Lorenzo Ciani, Paolo Sommella, Roberto Singuaroli, Marcantonio Catelani, Antonio Pietrosanto**

are hereby congratulated and recognised for the excellent research work reported in the paper and presentation.

Dr. Zsolt János Viharos  
Chairperson of IMEKO TC10 on  
Measurement for Diagnostics, Optimization  
and Control

# International Measurement Confederation



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19<sup>th</sup> IMEKO TC10 Conference: “MACRO meets NANO in Measurement for Diagnostics, Optimization and Control” to be held in Delft, The Netherlands on September 21-22, 2023.

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**Chao-Ching Ho, Chun-Han Liu, Ming-Fu Chen, Ming-Chieh Kao**

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and Control

# Key, actual challenges

- On TC level
  - **Internationalization**
    - 41 IMEKO member „country” vs. 8-10 „TC10 active member country”
      - The TC10 topic is everywhere → finding the active, motivated people in additional IMEKO countries
        - **Missing:** Albania, **Austria**, Belgium, Bosnia and Herzegovina, Brazil, Bulgaria, Canada, **China**, Congo, Croatia, Czech Republic, Finland, **Germany**, Greece, India, Kazakhstan, Kenya, Korea, Romania, Rwanda, Russia, Serbia, Slovakia, Slovenia, South Afrika, Spain, Switzerland, Thailand, Türkiye, Uganda, Ukraine, United Arab Emirates, **United Kingdom**, **USA**
        - BUT: The Netherlands...Taiwan...
    - Finding successors for **Inactive members**
    - **How to share the work** among TC10 leaders
    - **Conference host country:** having **more papers/participants by the host**
    - Various **difficulties with the new conferencing system** (support needed)
    - Lack of **joint scientific projects**
  - On IMEKO level
    - TC Functioning WG – to continue





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26–29 August 2024 | Hamburg, Germany



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Seeing beyond

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