

DEAR FRIENDS, DEAR COLLEAGUES,

We are nearing the end of the year. It is almost like a grand finale in IMEKO. Since September, nearly every week, there has been a conference. Due to the activities, there is a growing interest in the Technical Committees, and many membership applications have arrived. IMEKO is also expanding and building external relations with APMP, SIM, EURAMET and, recently, GULFMET. Preparations are taking place to sign a Memorandum of Understanding and be in closer cooperation. IMEKO received invitations and presented at the EUROLAB and at the SIM annual event and will attend APMP in December.

This issue starts with IMEKO's TC7 Chair, Professor Eric Benoit, who received the Finkelstein Award 2022. As part of this ceremony, IMEKO President Professor Frank Härtig was given his 2021 award in person. (See more in the December Newsletter 2021 about it.)

The company Modal Shop, which delivers innovative structural vibration and acoustic sensing systems and services, introduces itself from the industrial contacts.

Meet Karl H. Ruhm, a long-time member of the IMEKO community and the delegate of the confederation's Swiss member organisation. Finally, after so much advertising, there is news about the success of the Technical Committee events.

FINKELSTEIN AWARD 2022

The Finkelstein Award 2022 has been given to Professor Eric Benoit ;

"For notable contributions to measurement internationally."



"Professor Eric Benoit graduated with a Master's degree in Physics in Instrumentation and Measurement and a Magister's degree in Physics from the Joseph Fourier University in Grenoble and obtained his PhD in Physics honours in 1993 from the same institution.

His main area of scientific research has been in measurement science, machine learning and distributed fusion systems. Building on his ongoing interest in

information technology, he is seeking out new challenges related to the development of machine learning and fusion methods, with a focus on application fields which include human-machine interaction and the Internet of Things.

His favourite challenges are those that are considered by others as 'impossible'. The Internet of Things area has provided him with a number of new projects in his favourite fields in measurement science, presently facing challenges with the measurement of weakly defined quantities in the human or biomedical spheres, such as emotion, systems complexity, human perceptions or market risks.

Prof. Benoit has performed the role of IMEKO Technical Committee (TC)7 Chair on Measurement Science, as well as editorial board engagement with the International Journal of Metrology and Measurement Systems and the International Journal Acta IMEKO. He reflects his expertise in the field in his teaching in his current post at LISTIC Polytech Annecy-Chambéry, in Annecy, France."

(Written by Professor Kenneth Grattan)

FROM PRACTICE TO SCIENCE BY KARL RUHM



Karl H. Ruhm: As a young mechanical engineer, I started in the industry with measurement and control applications in electrical power stations. I was interested in and extremely fond of the demanding messages of the cybernetic proposals of those days. Gradually, I moved forward to the control and automatization design in nuclear power stations, which of course, at that time was already realised by digital concepts and tools. I was allowed to regularly attend seminars concerning measurement and control at the Swiss Federal Institute of Technology (ETH) Zürich, seminars presented by the Institute of Measurement and Control (IMRT) together with the Swiss Society of Automatic Control (SGA). The latter was effective as the Swiss member organisation within the International Measurement Confederation (IMEKO) and the International Confederation of Automatic Control (IFAC). Thus, my developing interest in the representational interrelations between all sorts of items brought me to the modelling of the dynamic behaviour of power station objects. Several years later, I was asked to join the Institute of Measurement and Control. After serious scruples concerning a return to science after so many years of practice, I accepted the offer. This was a worthwhile decision, which I never regretted.

Practical tasks and investigations in laboratories prevailed at the beginning, but the contact with the control people strengthened my interest in theoretical concepts and tools, which could be applied beneficially in measurement requirements. On the other hand, the diverse offers and proposals of IMEKO further affected my

work, of course, though at the time only in a rather passive way. In the meantime, I had been offered to present my ideas by lecturing classes at ETH in different engineering departments: mechanical, electrical, chemical, bio-technical, and food-technical. I founded my own measurement seminar, where invited industry experts could present their newest findings.

This could have been the strategy for the future. But some day, Jean Weiler, then treasurer and delegate of Switzerland at IMEKO, wanted to resign, and I was asked to take over the position as the delegate of Switzerland. Since the 1997 IMEKO World Congress in Tampere, Finland, this has been my assignment. Recently, a second Swiss delegate, Hugo Lehmann, from the Swiss Federal Institute of Metrology (METAS), Bern, has been nominated.

Gradually the contact with IMEKO increased: General Council Sessions (GC), World Congresses (who did not enjoy the concert given by the IMEKO president Olli Aumala (organ) at the World Congress in Tampere, 1997, and the concert by the IMEKO President Leo van Biesen (saxophone) at the World Congress in Rio de Janeiro, 2006)? I participated in Technical Committee activities (TC1: Education and Training in Measurement and Instrumentation, TC7: Measurement Science, TC21: Mathematical Tools for Measurement). I then enjoyed an eight-month sabbatical leave at the San Diego University of Southern California. I chaired several sessions at conferences. Many papers have been published in different journals. Besides, I keep reviewing papers and have received several best reviewer awards: on the whole, the typical duties of an academic. I never was an IMEKO officer. After my retirement, I moved on to the Institute of Machine Tools and Manufacturing (IWF), applying scientific ideas to applicational demands.

Last but not least, I shortly want to add some remarks on the topics and ideas of my scientific activities. There is a sentence from Ludwik Finkelstein, one of the arch pillars of IMEKO, which I highly esteem: "Learned societies convert the experience of practice into organised knowledge. This is one of the principal mechanisms by which knowledge is shaped into teachable disciplines." This sentence always supports my ideas and proceedings. And in this context, I use four main tools: Mathematics, Signal and System Theory, Stochastics and Statistics, as well as Model Design. And I always try to keep holistic and interdisciplinary aspects in mind. In this regard, I keep missing a relevant textbook in our discipline, which would be worthy of a joint commitment for Technical Committee TC1 Education and Training in Measurement and Instrumentation and TC7 Measurement Science.

I strongly propose to adopt the hypothesis of the philosopher K. R. Popper of three existing worlds: world one, the real (in concreto) world; world two, the world of our consciousness; and world three, the autonomous world of abstract (in abstracto) models (representations of the real world). In consequence, I call items of interest in real-world 1 "processes" and "quantities" and their behaviour as a procedure, and I call their abstract models "systems" and "signals". Signal and System Theory does not treat processes and quantities but only the models of processes and quantities. It is a pity that most presentations and papers do not distinguish between processes and their models.

My special interest concerns the terms error and uncertainty since measurement errors are still a disregarded topic, although the Guide to the Expression of Uncertainty in Measurements (GUM) acknowledges the existence of errors. Do you know that any numeric value of a self-contained measurement error is accompanied by a

measurement uncertainty value and is treated like any self-contained signal? At the IMEKO World Congress in Busan, Republic of Korea (2012), I offered a workshop, "The Significant Role of Errors in Metrology Justification by System Theory".

Further on, I was invited to give a plenary lecture at the IMEKO World Congress, Prague, 2015, "Measurement Plus Observation A Modern Structure of Metrology", where I discussed the structures of measurement procedures and observation procedures, the dual concept of direct and indirect measurement. This, too, is based on Signal and System Theory, where observation procedures and observers are well-defined structures and items, however, normally claimed and used by the control community. But an observer is able to capture and present quantities which a normal measurement process is not able to collect directly.

One last remark: As anybody must be aware, the terminology in metrology is disastrous. The uncountable applicational fields all keep their own nomenclature, in spite of the well-meant attempts, like the International Vocabulary of Metrology (VIM). On the other side, frequent hype terms like "smart sensor" or, recently "digital twin" have come up, seemingly right from the advertising industry of consumer goods for better selling purposes. In fact, the term "model" has served all needs completely for a long time, including space-time questions.

I would like to expand the title of my little presentation and, thereby, also the sentence of Ludwik Finkelstein, quoted above, to:

From Practice to Science and Back to Practice.

(Written by Karl H. Ruhm, ruhm@ethz.ch)

INTRODUCING THE MODAL SHOP



The Modal Shop, Inc. (TMS) delivers innovative structural vibration and acoustic sensing systems and services to test laboratories and manufacturing facilities around the globe from our facility in Cincinnati, Ohio, USA. Founded over three decades ago with strong ties to PCB Piezotronics, TMS provides industry-leading precision calibration systems, a robust sound and vibration rental program, vibration shakers, non-destructive test systems, and digital sensing technologies to complement PCB's expertise in dynamic sensor design and manufacturing. Today TMS and PCB are part of Amphenol Corporation with a leading global presence in the sound and vibration industry, including as an IMEKO exhibitor and participation in TC22 (Vibration Measurement).

A sensor is only as good as its calibration, and The Modal Shop's Model 9155 Precision Calibration Workstation grew from our relationship with PCB. With high powered users of our own systems in PCB Piezotronics facilities across the globe using TMS systems each day, we've maintained a high standard of user friendly functionality, incorporating continuous improvement feedback from technicians and engineers. This, coupled with the vetting by use in our high-volume production facilities, allows us to deliver a precise, reliable, and usable calibration system.

The Modal Shop's Model 9155 precision Calibration combines an easy-to-use software interface to drive automation of calibration tasks using any of the TMS calibration exciters ranging from:

- high-frequency vibration with our industry-leading air-bearing shaker
- low-frequency vibration
- shock
- acoustic and
- dynamic pressure



The simplicity of the system allows the user to focus on the intricate details of SUT mounting and operation per existing ISO 16063 21 and/or IEC 61094-5 standards while fulfilling the procedural requirements of ISO 17025. TMS Model 9155 Calibration Workstations offer a proven track record of calibrating tens of thousands of dynamic sensors across accredited labs at both PCB and TMS facilities, as well as national metrology labs, major corporations, and third-party calibration labs around the world.

TMS further leverages calibration expertise with the Portable Vibration Calibrator (PVC) series 9100D. Widely used in industrial spaces, the compact, rugged, battery-operated unit brings sensor calibration and vibration testing to the plant floor. From onsite loop testing for validating entire monitoring channels to creating NIST traceable calibration certificates for documenting facility control requirements, the PVC tests everything from proximity probes to vibration switches to analysers, and more.



Beyond calibration systems, TMS uses decades of application experience in the sound and vibration industry to bring a full suite of structural testing solutions, including modal shakers with a through-hole armature, general vibration shakers for qualification testing of small components up to Cubesats, and the ICP® LaserTach LT2 for rotational sensing, as a few examples.

More recently, TMS has developed a line of digital sensing products, including the Digiducer USB Digital Accelerometer and a Digital ICP® USB Signal Conditioner. This technology offers a new level of flexible and portable data collection on the go by allowing a user to collect one or two channels of data with a smartphone, tablet, or laptop over a range of operating systems and software applications.

As a complete solution provider, the TMS Rental Program provides fast, short-term accessibility to these testing solutions to engineers across the industry and the globe. As a single source for varied test equipment rental, offerings range from PCB and Endevco sensors to Larson Davis Sound Level Meters to data acquisition systems and other tools from leading Test & Measurement companies.

Driven by Total Customer Satisfaction, The Modal Shop is excited to continue to be a partner helping to solve your toughest sound and vibration challenges of today and the future with our smart sensing solutions.

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IMEKO CONFERENCES AND OTHER EVENTS FROM SEPTEMBER

The 25th IMEKO TC4 International Symposium

The 25th IMEKO TC4 International Symposium was held in Brescia, Italy, September 12-14. The Symposium allowed a wide view of measurement and instrumentation's scientific and technological progress. The event took place over three days. The first day of the Symposium was held in the historical centre of Brescia, where attendees could enjoy the beauties of the historic centre, especially the wonderful San Barnaba Auditorium.

The following two days were organised at the Department of Engineering of the University of Brescia, where two parallel sessions could be accommodated. Three invited keynote speakers gave an overview of their research in three different research topics among the main interests of the IMEKO TC4 Measurement of Electrical Quantities. Giorgio Sberveglieri, from the University of Brescia, Italy, talked about "How to Evolve Chemical Sensors from a

University Laboratory to the Industrial World for Electronic Nose applications", describing the state of the art of technology and fabrication of chemical sensors for electronic nose applications. Hansjörg Scherer, from the Physikalisch-Technische Bundesanstalt Germany presented "Quantum Electronics in Metrology: Cornerstones and Topical Developments". Dr Scherer talked about the advancement at PTB in the field of quantum metrology. Dragana Popovic Renella,



SENIS AG, Switzerland, presented the talk "Advanced Hall Magnetic Sensing and Measurement in Industry and Physics Laboratories" by giving an overview of the

Hall-effect magnetic sensors from an industrial point of view.

The scientific program was completed by presenting 69 accepted papers, organised in 13 thematic oral sessions and one poster session.



The social events offered a very pleasant opportunity to meet in a friendly atmosphere and exchange ideas among scientists of different countries on research and daily-life subjects. The welcome party on Sunday, the 11th of September, was held on the Terrace of the Vittoria Hotel in the centre of Brescia and a Gala dinner on Monday, the 12th, at the Villa Fenaroli Palace Hotel.

(Written by Luca de Vito)

TC6 Digital Transformation and Metrology



IMEKO TC6 successfully organised the first iteration of the new M4Dconf.

"Hybrid conferences can work, after all." This has been a recurring statement from the audience of the first international Conference on Metrology and Digitalization - the M4Dconf. IMEKO TC6 organised their first international event and, from the start,

considered a very broad range of topics as well as a clear commitment to a hybrid format.

The success of the conference was measurable: 221 attendees from around the world, with 96 attendees in person; 44 reviewed scientific papers; 16 invited talks; 15 sessions; 6 international liaisons.

The organising team partnered with several international organisations: CIPM, OIML, EURAMET, SIM, GULFMET and EUROLAB to form the programme and set impulses in addition to the scientific papers presented. CIPM organised a session on the role of the SI in the digital age. Similarly, the OIML session illustrated the impact of digital transformation in legal metrology. EURAMET presented in their special session recent developments from collaborative research in Europe, and EUROLAB presented and discussed the needs and opportunities for laboratories from small to large ones. In addition, IMEKO TC8 organised a special session to discuss the impact of digitalisation on traceability.

These special sessions formed a complementary part of the scientific presentations in the regular sessions. The wide range of scientific topics clearly demonstrated the interdisciplinary character of digitalisation.

There was almost no keyword from digital transformation that has not been addressed in at least one of the presentations: digital twin, data model, Internet of Things (IoT), simulation, FAIR principles, blockchain, cloud, digital certificates, smart infrastructures, ontologies and many, many more.

The TC6 Members are still processing the many insights and impulses received from this M4Dconf. The talks and other information can be found on the conference platform (<https://m4dconf2022.ptb.de>). Registered conference participants also have access to video recordings and photos from the event. The outcomes and insights from the conference will be fed into the TC6 work program for 2023 and into the preparations for the IMEKO World Congress 2024. And the preparations for the second edition of the M4Dconf have already been started.

(Written by Sascha Eichstädt)

TC20 Webinar Series 2022



TC20 successfully organised free Webinars every month since June, which were the follow-up events of the India IMEKO TC 20 Green Hydrogen Conference. The series, still with the theme "Expert Talk on Green Hydrogen (GH2) Fuels", took place with speakers invited from different fields of green hydrogen. The 45 mins sessions 35 minutes of Talk and 10 mins of Q&A.)

1. High Efficiency and Clean Combustion Modes for Diesel Engines by Dr Anand Krishnasamy IIT Madras, India: 08.06.22
2. Role of National Metrology Institutes in the Transition from Natural Gas to Green Hydrogen and Biomethane, by Dr Adriaan van der Veen VSL Netherlands: 08.07.22
3. Green Hydrogen Economy for India, by Mr Shirish S Garud TERI, Delhi: 15.07.22
4. Safety Relevant Ignition Processes-Ignition by Electrical Discharges by Dr Ing. Detlev Markus PTB Braunschweig, Germany: 05.08.22
5. Quality Infrastructure in Solar PV. by Dr Saurabh Kumar PTB Consultant, India: 19.08.22

6. The Role of Hydrogen as an Energy Carrier and Fuel for the Energy Transition by Dr Karsten Wilbrand SHELL, Hamburg, Germany: 02.09.22

7. Air Quality Measurements: Particulate Matter as Source of CO_x in Atmosphere by Dr Shankar G. Aggarwal NPLI, India: 09.09.22

8. Hydrogen Combustion and Thermo-acoustic Instabilities by

Prof. Dr Wolfgang Polifke TU Munich, Germany: 16.09.2022

10. Implications of H₂ Geo-Sto, by Dr G.L. Manjunath, Energy Institute, Bengaluru, India; 30.09.2022

The series continues, with the next one on the 11th of November at 10:00 CET.

(Written by Dr Sumit Agarwal on behalf of TC20

TC3, TC5, TC16, TC22 Joint Conference



The success came at the third attempt to hold the joint IMEKO TC3-TC5-TC16-TC22 Conference in Croatia. The conference, as an in-person event, took place from the 11th to the 13th of October 2022 in Cavtat near Dubrovnik. It brought together topics of four IMEKO TCs covering the fields of mass, gravity, torque, force, hardness, pressure, vacuum and vibration, promoting fundamentals, measurement principles, traceability and uncertainties of those physical quantities. It aimed to exchange information and views among the international scientific community members, professional metrologists, measurement equipment manufacturers, engineers and students. The IPC Chairs were the Chairs of

the four TCs: Andy Knott, Renato Machado, Jay Hendricks and Gustavo Ripper, who were responsible in their respective fields for abstract selection and subsequent peer review. The NOC chairs were Davor Zvizdic and Lovorka Grgec Bermanec.

The IMEKO information officer Dirk Roeske and NOC chairs have constructed the conference website and provided and managed the platforms for uploading and peer reviewing abstracts and full papers. There were participants from 31 countries; 98% came from abroad, mainly from Europe, but also from North and South America, Africa and Asia. The conference included 4 Plenary lectures, 60 oral presentations in three parallel sessions and 45 posters.

Jay Hendricks TC16 Chair and Plenary lecturer, presented NIST Photonic Realization of the Pascal and Methods of Photonic Thermometry with "NIST on a Chip" Program

"BECAUSE IT ALL STARTS IN A VACUUM" 60 YEARS

1643 Manometer →
 1874 McLeod Gauge →
 1950 Bayard Alpert Gauge →
 1960 Integrated Circuit →
 2007 "modern" Smart Phone →
 2021 Quantum Vacuum Standards →?

NIST National Institute of Standards and Technology
 U.S. Department of Commerce

NIST on a Chip Devices

Vacuum UHV and XIV
 Chip-scale Atomic Clock, Wavelength References
 Temperature Photonic Thermometer
 Voltage AC and DC Josephson Junction Arrays
 Pressure -Fixed Length Optical Cavity
 Smart Mirror Laser, RF, & μwave Power
 Emergency Response Dosimetry

IMEKO-Oct. 2022 Dr. Jay H. Hendricks, NIST 56

Six companies were present as exhibitors. The peer-reviewed and presented scientific work will be deposited in the Conference proceedings and shortly available at the IMEKO repository. Besides the condensed programme in three parallel tracks, the conference participants had time to visit Dubrovnik and spend precious informal time together.



(Written by Lovorka Grgec Bermanec and Davor Zvizdic)

IMEKO TC11 & TC24 Joint Hybrid Conference

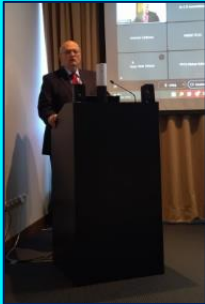
For the first time, IMEKO TC11 (Measurement in Testing, Inspection and Certification) and TC24 (Chemical Measurements) organised a joint conference in collaboration with EUROLAB. The conference was held from the 17th to the 19th of October 2022 in the beautiful setting of Cavtat (Dubrovnik, Croatia). The themes proposed were "Measurement for a Better life" and "Chemical Measurements Towards a Sustainable Future".

On the 16th of October, before the official start of the conference, the workshop on 'ILAC G8:09/2019 Guidelines on Decision Rules and Statements of Conformity' was organised to present guidance about this important topic for accreditation. The invited speaker was Dr Ana Čop, IMEKO TC24 member.

The Joint Conference officially started on the 17th of October, and during the three days,

had four keynote lectures held by eminent speakers in the field of Measurements and Instrumentation:

- Laura Martin, EUROLAB Secretary General, presenting "The Lab of the Future Towards Better Efficiency and Traceability."
- Zeynep Yildizeli, B2EU Consulting, presenting "Opportunities from EU Funding Programs."
- Prof. Mira Petrović, ICRA Catalan Institute for Water Research, presenting "Multiresidue Analysis of Pharmaceuticals in Water Samples."
- Prof. Krno Miličević, Faculty of Electrical Engineering, Computing and Informatics, Osijek, presenting "Blockchain for the Digital Transformations of Metrology".



A large number of participants (both in person and virtually) from 21 countries made the conference a success. Round tables, numerous discussions after the presentations, and great interaction during the breaks ensured excellent

networking between the participants. After all, this is one of the most important indicators of the conference's success. The social program included a guided walking tour of the Dubrovnik Old Town and an entertaining conference dinner.

Accepted and presented full papers will be submitted for inclusion in Scopus after the event. Also, selected authors will have the opportunity to submit an extended version of their papers to 'Measurement: Sensors' (Elsevier) or to 'Acta IMEKO'. Elsevier offers a 100% APC waiver for all papers accepted in the Special Issue in 'Measurement: Sensors'. All extended papers submitted to the two journals will undergo the standard peer-review process.

The organising committee did a great job, leading to the success of the conference:



- Mladen Jakovčić, President of the Croatian Metrology Society (HMD) and local organiser
- Álvaro Silva Ribeiro, TC11 Chair
- Tatjana Tomić, TC24 Chair
- Marija Čundeva-Blajer, TC11 Scientific Secretary
- Leonardo Iannucci, TC24 Scientific Secretary

The Organizing Committee would like to acknowledge thankfully:

- The organising partner: EUROLAB, the European Federation of National Associations of Measurement, Testing and Analytical Laboratories, especially Laura Martin and Martina Razzaboni
- Co-organisers: Ruđer Bošković Institute and Nikola Tesla Innovation Center
- Sponsor: Lotrič Metrology, Slovenia,

and especially the "invisible heroes": the numerous reviewers whose work significantly raised the scientific level of the conference and the IMEKO Secretariat for successfully promoting the conference.



We invite you all to continue to follow the work of IMEKO and EUROLAB and to participate in future conferences and events.

(Written by the Organising Committee)

THE GENERAL COUNCIL SESSIONS 2023

The date and place are now set for the General Council Sessions in 2023. It will be held in Budapest, Hungary, on Friday the 8th of September in the afternoon and Saturday the 9th of September the whole day.

The event will be organised in hybrid mode. The Advisory Board and Supervisory Committee meeting will take place shortly before this date, online.

UPCOMING TC EVENTS

TC25 Quantum Metrology and the Expanding Role of the National Metrology Institute

IMEKO TC25 - Quantum Measurement and Quantum Information will be holding a working meeting and hosting a session in conjunction with the Conference on Precision Electromagnetic Measurements in Wellington, New Zealand, the week of December 11, 2022. The session, described below, will highlight talks from a number of TC25 members.

Quantum Metrology and the Expanding Role of the National Metrology Institute

Advances in quantum technology are changing the face of international metrology. New levels of control and manipulation of light and matter are enabling a new generation of high-precision standards - both within the laboratories of the national metrology institutes (NMIs) and in the form of miniaturised, intrinsically accurate and quantum-referenced sensors. The ability to deploy precision metrology devices at the point of use challenges our long-standing concepts of traceability, measurement assurance and the role of the NMI.

This session will cover quantum metrology - both how metrology is enhanced by quantum mechanics and the metrology needed to develop quantum technologies - and will include presentations from various countries and regions on their quantum programs and strategies.

This session will include the following talks:

Introduction to IMEKO TC25 Quantum Measurement and Quantum Information,

and topics being explored in this panel
Barbara Goldstein, NIST.

Quantum Metrology: Jay Hendricks, NIST

Quantum-Enhanced Metrology: Marco Genovese, INRIM

Metrology for Quantum Technology - the Knowns and Unknowns

- Nicolas Spethmann, PTB
- Guilherme Temperao, Pontifical Catholic University of Rio de Janeiro, Brazil.

Quantum National Programs and Strategies, and the Expanding Role of the NMI: Alexander Tzalenchuk, NPL

Overview : Alexander Tzalenchuk, NPL

Korea: Professor Yonuk Chong, Department of NanoEngineering, Sungkyunkwan University

United Kingdom: Tim Prior, Quantum Programme Manager, NPL

United States: Jim Kushmerick, the Director of the Physical Measurement Laboratory, NIST

European Union: Nicolas Spethmann, and Marco Genovese

New Zealand: David Hutchinson, the Director of the Dodd-Walls Centre

Panel Discussion

(Written by Barbara Goldstein)

2023 CCM & IMEKO TC16 7th International Conference on Pressure and Vacuum Metrology

Announcing the 7th CCM International Conference on Pressure and Vacuum Metrology in conjunction with the 7th International Conference IMEKO TC16 will take place from May 15-18, 2023, in the Washington DC region.

The CCM International Conference on Pressure and Vacuum Metrology is the world's leading conference on measurement-related issues in the pressure and vacuum field.



It is to review research and developing work on the highest quality primary standards and the dissemination of traceability to the most exacting and demanding users in the range from 10^{-9} Pa to 10^{10} Pa.

The International Conference IMEKO TC16 on pressure measurement focuses on the more practical aspects of pressure and vacuum measurement mainly for industrial sectors like the process and semiconductor industry, photovoltaic, coating, metallurgy, packaging, pharmaceutical, and others but also for research applications.

The CCM-PVWG (Consultative Committee on Mass (CCM) Working Group on Pressure and Vacuum) holds an international meeting every 6 years to discuss issues relating to pressure and vacuum metrology. The meeting was last held in Perera, Colombia, in 2017. For questions about this conference, please email: jacob.ricker@nist.gov

TC4 International symposium, Academia meets Industry 2023

“Dear Colleagues and Friends,



On behalf of the Organizing Committee, it is a great pleasure to invite you to the 26th IMEKO TC4 International Symposium and 24th International Workshop on ADC and

DAC Modelling and Testing (IWADC) that will be held in Pordenone, Italy, on September 20-21, 2023.

For the first time, this International Symposium will be organised in parallel with the industry-driven World Magnetic Conference at the international trade show COILTECH Italy.

<https://conferences.imeko.org/event/3/>

We are pleased to welcome Keynote Speakers from CSEM (Swiss Center for Electronics and Microtechnology) and SENIS in Switzerland, PTB (Physikalische-Technische Bundesanstalt) in Germany and the Imperial College London, England.

We are also happy to inform you that we invited the UK Magnetics Society and CERN, the European Organization for Nuclear Research, to organise Special Sessions, and there will be many other interesting sessions, topics and social events.

The Call for Abstracts is open now!

Please follow the Author's Instructions: <https://conferences.imeko.org/event/3/page/6-author-instruction>

If you would like to propose and organise a Special Session, please let us know as soon as possible.

We look forward to meeting you all in Pordenone in September 2023!"

(Written by the Organising Committee)

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