

PROGRAMME

19th INTERNATIONAL METROLOGY CONGRESS

CIM2019

24
26 SEPT
PARIS
FRANCE

SHARE
MEASUREMENT
INTELLIGENCE

Data Analytics



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CIM2019



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Jenny HULLY
Daniel JULLIEN
Congress Co-Chairs

The CIM is the only event of its kind in Europe, and has proven to be a tremendous hit with the entire profession. It incorporates:

- a conference on the latest developments in technology and measurement processes, where 900 participants come together from 45 countries, now organised in partnership with the new Measurement World exhibition,
- a meeting place for manufacturers, experts and scientists, where the whole European metrology research community gets together every other year
- a networking space for everyone involved: manufacturers and service providers, official bodies, end-users from all kind of industry, university staff, researchers, etc
- a showcase for the technological skills and opportunities available to industry through expertise in measurements and industrial processes.

Metrology and measurement are two sectors with dynamic evolutions due to the developments associated with Industry 4.0: intelligent instrumentation and sensors, data use and security, collaborative robotics, AI, etc.

Come along to learn about and “Share Measurement Intelligence” relating to industrial metrology at CIM 2019!



Jérôme LETU-MONTOIS
Director of the Measurement World exhibition

I'm delighted that our latest exhibition, Measurement World, has been organised in collaboration with the CFM. This partnership has allowed us to combine both the International Metrology Congress 2019, and a Metrology Village in this new event reuniting the major players in the sector.

We worked in close collaboration with the grass roots of the profession, to create a biennial event for all the community.

Measurement forms the backbone of the exhibition, being its primary focus, but MeasurementWorld is also aimed at professionals in the optics, vision, testing and analysis sectors. We also decided, right from the first event, to register this exhibition on the international events calendar so that it very quickly becomes an unmissable get-together. By creating Measurement World we have attracted attention from numerous national and international corporate partners.

I'm convinced that the partnership between the exhibition and the International Metrology Congress will allow us to present a comprehensive technology offer and provide our visitors with very high-level conferences and workshops, all in a high-quality environment that is conducive to discussions, networking and business.

Welcome, and enjoy your visit!

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Mr BOSSE - PTB (Germany)

Mr CALLEGARO - INRIM (Italy)

Mrs CARE - CETIAT (France)

Mrs CHAMBON - LNE (France)

Mr COOREVITS - Arts et Métiers Paris Tech (France)

Mrs DEL CAMPO - CEM (Spain)

Mrs DIAS - IPQ (Portugal)

Mr FREJAFON - INERIS (France)

Mrs GODINHO - IPQ (Portugal)

Mr GOURNAY - BIPM

Mr GUERDAT - Montres Rolex (Switzerland)

Mr GUETTLER - PTB (Germany)

Mr HENNEBELLE - University of Burgundy (France)

Mr HIMBERT - LCM LNE-CNAM (France)

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Mr KUECK - PTB (Germany)

Mr LARQUIER - BEA Métrologie (France)

Mr LE LONG - PSA Groupe (France)

Mrs LOESCHNER - FOOD DTU (Denmark)

Mr MASOERO - University of Turin (Italy)

Mr MATAMOROS - CENAM (Mexico)

Mrs MEDINA - CEM (Spain)

Mr MENDEZ - CENAM (Mexico)

Mr MERLONE - INRIM (Italy)

Mr MILOSEVIC - VINCA (Serbia)

Mrs MILOTA - BEV (Austria)

Mr NAYKKI - Finish Environment Institute (Finland)

Mrs PETRY - SPF ECONOMIE (Belgium)

Mr PERNOT - CNRS (France)

Mr PIQUEMAL - LNE (France)

Mr RIETVELD - VSL / Netherlands

Mr ROBINSON - NPL (United Kingdom)

Mrs SALVETAT - Ifremer (France)

Mrs SEGA - INRIM (Italy)

Mr KUECK - PTB (Germany)

Mr SCHAEFFTER - PTB (Germany)

Mr SCHOEFS - University of Nantes (France)

Mr SMID - CMI (Czech republic)

Mrs SPOHR - IPQ (Portugal)

Mr STOLL-MALKE - PTB (Germany)

Mr VILLAMANAN - University of Valladolid (Spain)

Mr WHIBBERLEY - NPL (United Kingdom)

■ CONTACT

Collège Français de Métrologie

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THURSDAY 26	WELCOME	S14 Thermal Measurements in Industry		POSTER		S17 Standards in Thermal Measurements	CLOSING	DRINK
		S15 IOT and Calibration challenges		<ul style="list-style-type: none"> • Industry 4.0 • Training • Mechanical Quantities • Radiation • Time / Frequency 		S18 Photonics		
		 Training and careers for industry 4.0		S16 Nanometrology		 Additive Manufacturing: measure and control challenges		



TUESDAY 24 SEPTEMBER

9:00

CONGRESS OPENING

S1 PROCESSING METROLOGICAL DATA

Chairman: Sascha EICHSTADT - PTB (Germany)

9:30

KEYNOTE TALK

Future metrology: are you ready for the digital age?

Mr EICHSTADT - PTB / Germany

9:55

The european metrology cloud: impact of data protection and free flow of data regulation

Mr THIEL - PTB / Germany

10:20

A new approach to software requirements

Mr. TURNER - CECIP / Belgium

10:45

Calibration 4.0 - Information system for use of digital calibration certificates

Mr. SOUSA, Mr. RIBEIRO - IPQ / Portugal

11:15 ☕ 11:45

S2 INNOVATIVE ELECTRICAL INSTRUMENTATION

Chairwoman: Maguelonne CHAMBON - LNE (France)

9:30

Practical precision electrical impedance measurement for the 21st Century

Mr POWER - NSAI / Ireland & All

9:55

Study of non-invasive instruments for the measurement of pulsed X-Ray tube high voltage

Mr AGAZAR - LNE / France & All

10:20

A universal compact ultra-stable sine-wave generator for metrology purposes

Mr KUCERA, Mr KOVAC - CMI / Czech Republic

10:45

EMPIR european project for validation of vector array SAR measurement systems

Mr. ALLAL - LNE / France

11:15 ☕ 11:45

TUESDAY 24 SEPTEMBER

MEASUREMENT FOR CLIMATE CHANGE

9:30

Measuring climate change with great accuracy is mandatory to understand where we stand and where we go. Metrologists working with climatologists and meteorologists can play a key role in improving the monitoring capabilities of the essential climate variables.

- How do we measure climate change?
- Why metrologists can help in understanding climate change?

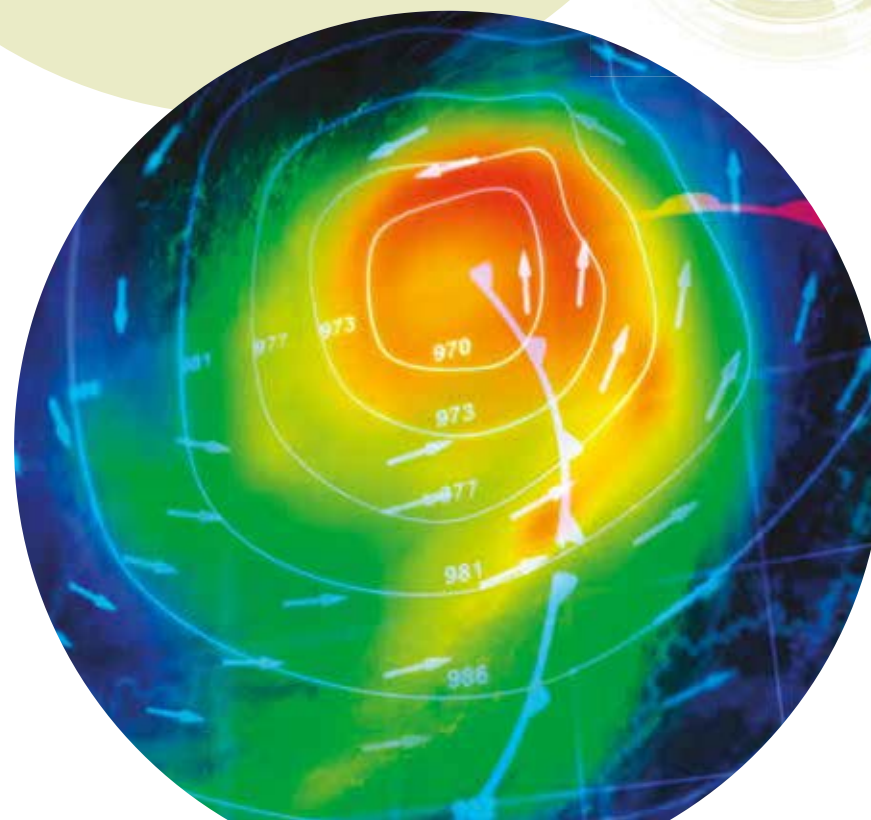
Presenter: Mr MERLONE - INRIM / Italy

With: Mr BRUNET - Rovira University / Spain, Mr. ERIKSSON - Vaisala / France,

Mrs FISICARO - LNE / France, Mrs JOUSSAUME - CNRS / France,

11:15

Mrs WOOLIAMs - NPL / United Kingdom



S3 DIMENSIONAL METROLOGY

Chairman: François HENNEBELLE - University of Burgundy (France)



- 11:45** CERN dimensional metrology service activity in the field of particle physics research
Mr CHERIF - CERN / Switzerland
- 12:05** Deep learning and 3D optical metrology improve complex feature detection and ranking
Mrs CALVEZ - Alicona / France
- 12:25** Computed tomography metrology: an accuracy contemplation
Mr ZEPP - Yxlon International / Germany
- 12:45** Investigation of non-linearities of capacitive displacement sensors for industrial application
Mr DAUL - PTB / Germany & All

13:15 14:00

**S4 QUALITY AND ACCREDITATION**



Chairman: Alain GUERDAT - Rolex (Switzerland)

- 11:45** ISO/IEC 17025:2017 considers reference data as equipment : so what ?
Mr PIERSON - LABOPRF / France
- 12:05** Calibration and measurement capability (CMC) and customer technical qualification
Mrs FISCHER BECKERT - Universidade de Santa Catarina/ Brazil
- 12:25** How to optimise your calibration-setup with a technology refresh
Mr ELBERT, Mrs PIC - WIKA / Germany
- 12:45** A case study on the establishment of a national quality infrastructure in South Korea
Mr YOO - KRISS / South Korea

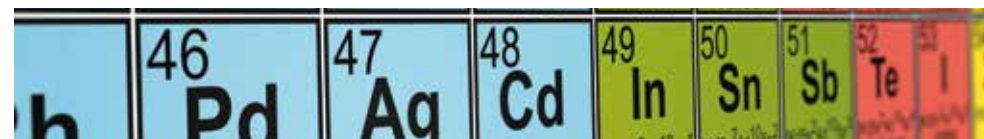
13:15 14:00

S5 SUSTAINABLE ENVIRONMENT





Chairmen: Teemu NAYKKI - Finnish Environment Institute (Finland), David BENHAMOU - CT2M (France)

- 11:45** **KEYNOTE TALK**
The European metrology network for climate and ocean observation
Mrs WOOLLIAMS - NPL / United Kingdom 
- 12:05** Metrological needs for natural steroids and xenobiotics measurements in water and blood
Mr MIRMONT - LNE / France & All
- 12:25** Use of FTIR spectroscopy for the measurement of CO2 carbon stable isotope ratios
Mr SEGA - INRIM / Italy 
- 12:45** It started to rain - INCIPIT a new project on non-catching rain instruments calibration
Mrs DOBRE - SMD / Belgium

13:15 14:00

**S6 CHEMICAL ANALYSIS**

Chairman: Bernd GUETTLER - PTB (Germany)

- 14:00** Hydrogen quality for transport revision of ISO 14687 and gas analysis according to ISO 1087
Mr BACQUART - NPL / United Kingdom & All 
- 14:15** Standardised methods for the analysis of amines, terpenes and ammonia in biomethane
Mrs CUCCIA - RICE GRTgaz / France & All 
- 14:30** Metrology for biomethane conformity assessment: measure trace gas impurities in biomethane
Mrs LI, Mr PERSIJN, Mr VAN DER VEEN, Mrs DE KROM, Mrs MEUZELAAR - VSL / THE NETHERLANDS 
- 14:45** Problems of metrological assurance of gas analysis using IR spectroscopy
Mr KONOPELKO, Mr BELOBORODOV, Mr RUMIANTSEV, Mr CHUBCHENKO - VNIIM / Russia
- 15:00** Dynamic calibration method for reactive gases
Mr RAJAMAKI - MIKES / Finland 

57 METROLOGY FOR HEALTH CARE

Chairwomen: Michela SEGA - INRIM (Italy), Sophie VASLIN-REIMANN - LNE (France)

15:45 KEYNOTE TALK

Advances in imaging supporting drug discovery

Mr WEST - GSK / United Kingdom

16:00 Metrological references for health care based on entropy

Mr PENDRILL - RISE / Sweden, Mrs QUAGLIA - LGC / United Kingdom,
Mr CANO - Modus Outcomes / United Kingdom, Mrs MELIN - RISE / Sweden

16:15 Standardisation of clinically relevant biomarkers

Mrs BŒUF, Mr DELATOUR - LNE / France, Mr HUGGETT, Mrs QUAGLIA - LGC / United Kingdom,
Mrs SWART - PTB / Germany

16:30 Unravelling the contribution of biological variability vs measurement uncertainty in MSI

Mr DEXTER - NPL / United Kingdom & All

16:45 Metrological characterisation of a device dedicated to inhalation study

Mr HAMDAR, Mr GAIE-LEVREL, Mrs MACE, Mrs VASLIN-REIMANN - LNE / France

17:00 Traceability in laboratory medicine: a european metrology network

Mr AUERBACH, Mr STOSCH, Mr GUETTLER - PTB / Germany



58 ENERGY MIX

Chairman: Marco Carlo MASOERO - Politecnico di Torino (Italy)

15:45 Measurement uncertainties of electrochemical impedance spectra of Li-ion battery cells

Mrs HEINE, Mr EBERHARDT, Mr FUNCK, Mr SEITZ - PTB / Germany

16:05 Fictive power source for calibrations in railway systems

Mrs ISTRATE, Mr FORTUNE - LNE / France

16:25 Uncertainties in PV modules performance measurements in indoor and outdoor conditions

Mrs PERRIN - CEA-LITEN / France

16:45 New photovoltaic technologies: metrology for PV energy rating

Mr DUBARD - LNE / France

17:05 Improved method for hi-resolution night aerial lighting maps production and analysis

Mr CHASSEIGNE, Mr DUBARD, Mr PIERRARD, Mr HAY - LNE / France



SMART SENSORS FOR PRODUCTION OPTIMISATION

15:45 A new generation of sensors is emerging in readiness for the factory of the future. They are faster, more precise and capable of communicating and interacting directly with the machines. Some are installed directly inside the machines or onboard vehicles, while others remain independent of the machines. As a new world of measurement emerges, just how smart are these new sensors?

- What kind of measurements for smart sensors?
- What are the impacts of last technology evolution and the normative point of view?
- How to calibrate a smart sensor?

Presenter: Mr CORLETO - STIL / France

With: Mr AVRIN - LNE / France,

Mr BUKKAPATNAM - University of Texas / USA,

Mr CARTALAS - JRI / France,

Mr LUBCKE - Endress & Hauser / Switzerland,

Mr ZIPRANI - Marposs / Italy

17:30



17:30



COCKTAIL

POSTERS - 13:45 to 15:15

DIMENSIONAL

- Method for controlling complex surfaces and associated uncertainties
Mr HABIBI - ENSAM, Mr ABDELOUAHHAB, Mr JALID - ENSET / Morocco
- Comparison of thread effective diameter measurement by using conventional methods and CMMs
Mr YUKSEL, Mr KILINC, Mr SONMEZ, Mrs ON AKTAN - Roketsan/ Turkey
- Position calibration of turn tables by using laser interferometers
Mr YUKSEL, Mr KILINC, Mr SONMEZ, Mrs ON AKTAN - Roketsan / Turkey
- 3D scanning to offload the traditional CMM, an ROI analysis
Mr LONGUEMARE - Ametek - Creaform / France
- 360° scanning of vegetable fibers with focus variation microscope
Mr VARGAS CEPEDA, Mr CORTES RODRIGUEZ, Mrs ARAQUE SALAZAR - University of Colombia / Colombia
- Investigation in optimisation of accuracy with non-contact systems by influencing factors
Mr MATHARU, Mr SADLER, Mr GASHI, Mr TOMAN - Coventry University / United Kingdom
- 3D measurement as an integral part of manufacturing processes
Mr LEMOINE - Metrologic Group / France
- Calibration of Articulating Arms per ASME B89.4.22
Mr JOHNSON - TRESICAL / USA
- Investigation of non-linearities of capacitive displacement sensors for industrial applications
Mr DAUL - PTB / Germany & All
- Task-specific uncertainties budget of curvic using analytical methods
Mr GASHI, Mr TOMAN, Mr MATHARU - Coventry University / United Kingdom
- Diameter measurement and uncertainty evaluation using three-spheres reciprocity method
Mr CHEN - ITRI / Taiwan
- Interferometric calibration bench for lengths up to 60 m
Mr SOKOLOV - VNIIFRI / Russia



POSTERS - 13:45 to 15:15



TRACEABILITY / QUALITY

- European Interlaboratory comparison in mass calibration
Mrs HEGRON - CT2M / France
- Challenges of achieving accreditation to ISO 6789-2:2017
Mr GYPPS - TRESICAL / United Kingdom
- Understand how calibration can minimise business risk whilst improving yield and quality
Mr FORSYTH - KEYSIGHT TECHNOLOGIES / United Kingdom
- Risk and opportunity management: an approach for the mechanical testing field
Mr JAMAL-EDDINE - L2EC / France
- Inter-laboratory comparison on the calibration of photometric and radiometric measurements
Mr SONMEZ, Mr KILINC, Mr YUKSEL, Mrs ON AKTAN - Roketsan / Turkey

POSTERS - 13:45 to 15:15

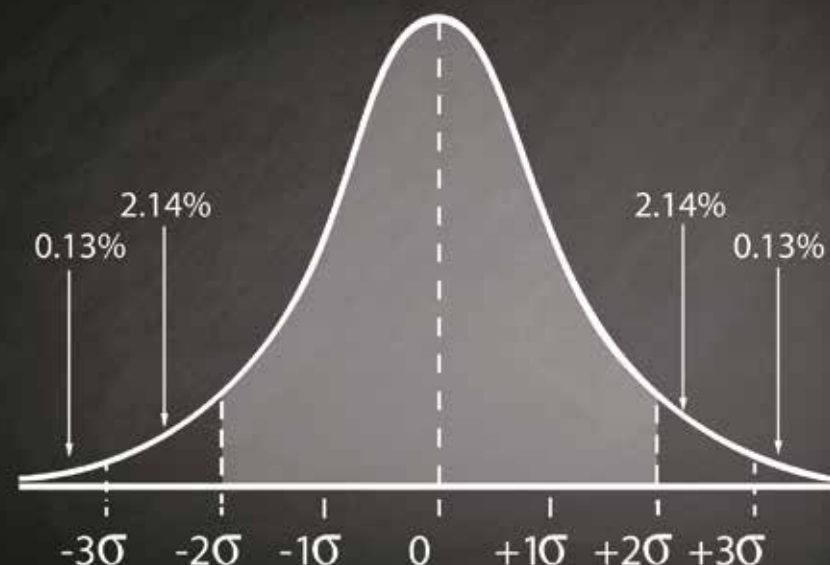
ELECTRICITY

- Automated multiple decade ratios precision divider for generation of low DC voltages
Mr GALLIANA, Mr CERRI, Mr CORONA - INRIM / Italy
- A versatile electrical impedance calibration laboratory based on digital impedance bridges
Mr ELMHOLDT CHRISTENSEN - TRESKAL / Denmark
- Measurement setup to characterize electrical standards
Mr CAPRA - INRIM / Italy & All
- New reference systems for the calibration of high voltage impulses at LNE
Mr AGAZAR, Mrs SAADEDDINE - LNE / France
- Influence of crimped connections in temperature rise verification
Mr ROCCATO - INRIM / Italy & All
- Piezoelectricity measurements of hybrid films functionalised with ZnO nanostructures
Mrs DURACCIO, Mrs FIORAVANTI - CNR, M. CAPRA, M. FILIPPO - INRIM, Mr MALUCELLI - University of Turin / Italie
- Traceability features of the electric power unit in Ukraine
Mr VELYCHKO, Mr KARPENKO - Ukrmetrteststandard / Ukraine
- Inter-laboratory comparison on the calibration of a multimeter
Mr BENHAMOU - CT2M / France
- Exploration of a special alternative generator for small power wind turbines
Mr BOURAS - Badji Mokhtar-Annaba University / Algeria



POSTERS - 13:45 to 15:15

Normal Curve



UNCERTAINTIES

- Choosing parameters for R&R and their impacts on measurement capability
Mrs COURTOIS - DELTAMU / France
- Inter-laboratory comparison on tensile testing of solid composite rocket propellants
Mr GUREL, Mr YUKSEL - ROKETSAN / Turkey
- Uncertainty calculations and calibration of metal hardness testing equipment
Mr GUREL, Mr YUKSEL - ROKETSAN / Turkey
- The drift in the estimation of the measurement uncertainty
Mr COQUET - ACEI / France

S9 MECHANICAL QUANTITIES

Chairmen: Nabil ANWER - ENS Cachan, Thierry COOREVITS - Arts et Métiers Paris Tech (France)

- 9:00** Dynamic calibration of a secondary reference pressure transducers in gaz
Mr SARRAF - ARTS ET METIERS PARIS TECH / France
- 9:20** Traceable calibration of dynamic pressure transducers for motor pressure range
Mr SALMINEN - MIKES, Mr HOGSTROM, Mr HAMALAINEN, Mrs SAXHOLM - VTT / Finland
- 9:40** Reinventing airborne sound detection
Mr SOMMERHUBER - XARION LASER ACOUSTICS / Austria
- 10:00** Robustness studies of viscoelastic fluids with oscillation-type density meters
Mr PEREIRA - IPQ / Portugal & All
- 10:20** Quantitative fractography for failure analysis and material characterization
Mr PONSON - TORTOISE / France



11:00 ☕ 11:30

S10 SI, WHAT'S NEXT?

Chairmen: Pierre GOURNAY - BIPM, JT JANSSEN - NPL (United Kingdom)

- 9:00** **KEYNOTE TALK**
Light and photon: quantum technology and applications for the future
Mrs RASTELLO - INRIM / Italy
- 9:20** On Supporting Capacitance Measurements by the BIPM
Mr MORENO, Mr GOURNAY - BIPM / France
- 9:40** The mise-en-pratique of the new definition of the kelvin: what happens next?
Mr SADLI, Mr SPARASCI, Mr PITRE - LNE-LCM-CNAM / France
- 10:00** A μ Kibble balance for direct realisation of small-scale masses and forces
Mr ROBINSON, Mr DAVIDSON, Mrs WEBSTER - NPL / United Kingdom
- 10:20** Superconducting microwave cavity quantum pressure standard in the range 200 Pa to 20 kPa
Mr GAMBETTE, Mr PITRE, Mr PLIMMER - LNE-LCM-CNAM / France, Mr RIPE, Mr GAVIOSO - INRIM / Italy
- 10:40** Progress towards SPRIGT from 5 K to 25 K with pressures up to 60 kPa
Mrs GAO - Chinese Academy of Sciences / China & All

11:00 ☕ 11:30

NEW ISO/CEI 17025: FIRST FEEDBACKS

9:00 In November 2017, ISO and the IEC published a comprehensive revision of the accreditation standard 17025 "General requirements for the competence of testing and calibration laboratories".

Now that we have passed the halfway mark of this period, the time has come to review the first feedback on the practical application of this standard.

- What have we learned from the launch of the new 17025?
- The transition to the new 17025 - an easy task?
- What are the first feedbacks?

Presenter: Mrs COMBE - EA, Mr LABORDE - COFRAC / France
With: Mr ESPANOL - QTI / Spain, Mr LAUNEY - LNE / France,
Mr MAMODALLY - COFRAC / France, Mr OSBORNE - A2LA / USA,
Mr PECCHIONI - Police Technique et Scientifique / France,
Mr THOMPSON - UKAS / United Kingdom

11:00



SHARE MEASUREMENT INTELLIGENCE

Chairman: Thomas GRENON - LNE (France)

11:35 — 12:50

Data, representation, models and knowledge: augmenting measurements
Mr CHINESTA - Arts et Métiers ParisTech (France)

From smart measurements to intelligent assets management for the intelligent enterprise
Mr GEOFFROY - SAP (France)

Regulatory issues raised by emerging technologies like artificial intelligence
Mr FRUGIER - French Federation of Mechanical Engineering Industries (France)

EURAMET coordinates research
in measurement science across Europe



S11 SCIENCE WITH IMPACT

Chairwoman: Maria-Luisa RASTELLO - INRIM (Italy),
Maguelonne CHAMBON - LNE (France)

13:45 The TiFOON project: time and frequency over optical networks
Mr KRONJAEGER - NPL / United Kingdom

14:00 Representation of the quantity radon activity concentration
for traceable calibrations
Mr BECK - BFS / Germany

14:15 Certified reference materials for breath alcohol control -
the ALCOREF project
Mrs LALERE, Mrs VASLIN-REIMANN - LNE / France

14:30 Primary reference in terms of air kerma for ionizing radiation fields produced by a LINAC
Mr BORDY - CEA-LNHB / France

14:45 Metrology for drug delivery 2 : a new joint research project
for metrology in healthcare
Mr OGHEARD - CETIAT / France

The EURAMET logo indicates that the work described in the paper is linked to an EMRP or EMPIR project.



S12 UNCERTAINTIES: TOOLBOX

Chairman: Alexandre ALLARD - LNE (France)



- 15:30** Risk calculations for conformity assessment in practice
Mr ALLARD, Mr FISCHER - LNE / France, Mr HARRIS, Mr SMITH - NPL / United Kingdom,
Mr PENDRILL - RISE / Sweden
- 15:50** From GUM to GUM SI evaluation of the calibration line
Mrs YARDIN, Mrs EBRARD - LNE / France
- 16:10** Bayesian approach to uncertainty evaluation: is it always working?
Mrs SALICONE, Mr FERRERO, Mr JETTI - Polytechnical University of Milan / Italy
- 16:30** Towards a new perspective for the GUM
Mr FISCHER - LNE / France
- 16:50** Evaluate and quantify the drift of a measuring instrument
Mrs COURTOIS, Mr POU, Mr DUBOIS - Delta Mu, Mr LEBLOND - PSA Groupe / France
- 17:10** Role of measurement uncertainty in conformity assessment
Mr PUYDARRIEUX - Orano / France & All

S13 INNOVATIONS IN FLOW

Chairwoman: Isabelle CARE - CETIAT (France)



- 15:30** Calibration of Doppler current profilers in velocity
Mr LE MENN - SHOM, Mr MORVAN - ENSEEIHT / France
- 15:50** Development of a dynamic gravimetric calibration method for liquid water flow metering
Mr OGHEARD - CETIAT / France
- 16:10** On-field LNG flow rate measurement by using Laser Doppler Velocimetry standard
Mr MAURY - CESAME EXADEBIT / France
- 16:30** Measuring flowrate of fans by embedded sensor
Mrs CARE, Mr GUEDEL - CETIAT / France
- 16:50** Evaluation of the influence of the gas type on the calibration results for a thermal mass
Mrs ABBAS, Mr MOUCHEL - TRESICAL / France
- 17:10** Numerical and experimental investigations on cylindrical critical flow Venturi nozzle CFVN
Mr LAMBERT, Mr MAURY - CESAME EXADEBIT / France

**MEASUREMENT CHAIN SECURITY AND TRACEABILITY**

- 15:30** A traceability chain based on data-driven approaches cannot exist without cryptographic solutions for storage and communication of data, so that the information being shared with partners and customers is not misused or manipulated. Recent advances in cryptography, public key infrastructures and distributed ledger technologies, such as blockchain, may provide possible solutions.
- Why traceability of datas is so important?
 - Which solutions for ensuring traceability of datas?

Presenter: Mr EICHSTADT - PTB / Germany

With: Mr ABAZ - Thales / France, Mr AHLE - FIWARE / Germany,

Mr BENOIST - ARXUM / France, Mr JAEGER - Rohde & Schwarz / Germany,
Mr MOREL - Akeo Plus / France, Mr WIEDENHOEFER - PTB / Germany**17:30**

POSTERS - 13:45 to 15:15

TEMPERATURE

- Overview of measurements capabilities in radiation thermometry at CEM
Mrs MARTIN-HERNANDEZ - CEM / Spain
- Improvement of emissivity measurements on low emissivity insulation materials 
Mr HAMEURY - LNE / France & All
- Calibration of radiation thermometers and infrared cameras in real measurement conditions
Mrs HOTS - Lviv Polytechnic National University / Ukraine & All
- A new set-up for the calibration of wood moisture meters
Mr FESTER, Mr NIELSEN - Danish Technological Institute / Denmark
- Humidity calibration automation
Mr FENOTTI, Mr VASTY — TRESICAL / Italy
- New calibration facility developed at LNE-CETIAT
Mr GEORGIN, Mr BERNARD, Mr REBAUD, Mr SALEM - CETIAT / France
- Interlaboratory comparison on thermal conductivity measurements by GHP at LNE and VINCA 
Mr HAY - LNE-LCM-CNAM / France & All
- Wall radiation quantification on temperature measurements in climatic chambers 
Mr FAVREAU - CETIAT / France
- A new EMPIR Project “Met For TC” for developing traceable measurement capabilities for monitoring thermocouple performance 
Mrs ARIFOVIC - TUBITAK UME / Turkey & All
- A data processing software tool for double-wavelength thermometry 
Mr BILGIC, Mr NASIBLI - TUBITAK UME / Turkey
- Results of intercomparison of radiation temperature scales between UME and SASO 
Mr NASIBLI, Mrs PEHLIVAN - TUBITAK UME / Turkey, Mr ALDAWOOD, Mr ALFALEH - SASO / Saudi Arabia
- Influence of low temperature annealing on Nickel RTDs designed for heat flux sensing
Mrs BEGOT - University of Franche-Comté / France
- Improvement of thermal enclosures for pressure measurements in primary thermometers
Mr COPPA - INRIM / Italy

ENVIRONMENT

- Quantify sediment plumes generated by dredging operations at sea: metrological approach
Mr ROCHE, Mr DEGRENEDELE, Mrs DOBRE - FPS Economy / Belgium
- Verification of Sr-90 determination in marine animals
Mr VISETPOTJANAKIT, Mr NAKKAEV - Office of Atoms for Peace / Thailand

POSTERS - 13:45 to 15:15

BIO / HEALTH

- Optical Phantom Development for Skin Measurement
Mrs ZHANG - NATIONAL METROLOGY CENTRE - A*STAR / Singapour & All
- Uncertainty and limit of detection in biosensors from immunoassays
Mr LAVIN - Polytechnical University of Madrid / Spain & All
- Reference materials to address metrological challenges in life sciences and diagnostics
Mrs KEPIRO - NPL / United Kingdom
- The contribution of metrological management in Moroccan institutions of blood donation
Mr EL BEKKAYE - Centre Régional de Transfusion Sanguine / Morocco
- Comparison of temperature dynamics of various thermal cyclers calibration methods
Mrs SPAN, Mr. HENDRIKX - CYCLERTest, Mr. VERBLAKT - Geno-tronics / The Netherlands
- Metrological performance of thermal cyclers: characterisation
Mrs FERNANDES - LNE / France
- Understand and monitor the scope of accreditation thanks to ISO 9001
Mr BOZONNET - IP / France
- Use of fuzzy logic in estimating and controlling the parameters of a system
Mr HASSINI - University of Mostaganem, Mrs HAMZAOU - DSP Mostaganem / Algeria
- Development of a new ‘6 axis’ force connected sensor
Mr BUISSON - RB CONSULTANT, Mr DECATOIRE, Mr LACOUTURE, Mr LEFORT - University of Poitiers, Mr ABDI - W Technologies / France



CHEMISTRY

- Evaluation of homogeneity in certified reference materials (CRM)
Mr COSTA - IPQ / Portugal
- Preparation of hydrogen chloride in hydrogen standard gas mixtures for hydrogen purity requirements 
Mr ROJO, Mr SANTAMARIA - CEM / Spain
- Influence of storage time of pulp and paper industry wastewaters in AOX determination
Mrs SOARES, Mrs MARQUES, Mrs RODRIGUES - Forest and Paper Research Institute / Portugal
- Recent progress in chemical capabilities in INM determined by european metrology programs 
Mrs BUZOIANU - NMI, Mr RADU, Mr IONESCU - NMI / Romania

WEDNESDAY 25 SEPTEMBER

POSTERS - 13:45 to 15:15

FLOW

- Installation for the high accuracy flow meter calibration with the weighting method
Mr RADANOV, Mr ILIC, Mr JANKOVIC - University of Belgrade - Directorate of Measures and Precious Metals / Serbia
- Calibration of flowmeters using gauging method and comparison to Coriolis flowmeters
Mr MOUCHEL, Mrs ABBAS - TRESICAL / France



NANOMETROLOGY

- nPSize: a project to improve the traceability chain of nanoparticle size measurements
Mr FELTIN - LNE / France, Mr HODOROABA - BAM / Germany
- Robust accurate and traceable determination of number concentration of Au nanoparticles by UV-Vis spectroscopy
Mr SCHOFIELD - NPL / United Kingdom & All
- Implementation of a metrological UHV-STM
Mr OSTERMANN, Mr BUSCH, Mr FLUGGE, Mr KOENDERS, Mr POPADIC - PTB / Germany
- Advanced material metrology: scanning atomic force and electron microscopy
Mr GRANT - Hitachi High Technologies / United Kingdom



GALA DINNER

WEDNESDAY 25 SEPT



The Collège Français de Métrologie and Hexagon Manufacturing Intelligence will be pleased to welcome you for the

GALA DINNER OF CIM 2019

► **Cruise on the Seine**
Upon registration



S14 THERMAL MEASUREMENTS IN INDUSTRY

Chairwoman : Florence SALVETAT - IFREMÉR (France)

9:00 EMPIR Hi-TRACE project: facilities for measuring thermophysical properties up to 3000 °C

Mr HAY - LNE /France & All

9:25 Implementation of phosphor-based surface thermometry in industrial manufacturing

Mr TABANDEH, Mr BELTRAMINO, Mr FERNICOLA - INRIM / Italy

9:50 High temperature fixed points for in-situ verification of radiation thermometers

Mrs FLEURENCE, Mr FAILLEAU, Mr BEAUMONT, Mr HAY - LNE / France

10:15 Assuring measurement traceability to ATE systems for MEMS temperature sensors testing

Mr SMORGON, Mr FERNICOLA - INRIM, Mr TAMBURINI, Mr CATTO, Mr STRAIOTTO - SPEA / Italy

10:40 Thermo-mechanical characterization of distributed sensing systems by optical fibres

Mr FAILLEAU - LNE / France & All

11:00 ☕ 11:30

S15 IOT AND CALIBRATION CHALLENGES

Chairman: Daniel JULLIEN - Digiplant Consulting (France)

9:00 KEYNOTE TALK

Measurements for autonomous vehicles

Mr ABADIE - PSA Groupe / France

9:20 Communication and validation of smart data in IoT-networks

Mr WIEDENHOEFER, Mr HUTZSCHENREUTER, Mr HACKEL, Mr HARTIG - PTB / Germany

9:40 Sensors connected to the service of manufacturers : reliability and safety?

Mr MOREAU - JRI / France

10:00 Wireless calibration for Industry 4.0

Mr BENITEZ - ETALONS / Mexico

10:20 Sensors with digital output: a metrological challenge

Mr MENDE, Mr BEGOFF - SPEKTRA / Germany

10:40 Methods for dynamic calibration and augmentation of digital acceleration MEMS sensors

Mr SEEGER, Mr BRUNS, Mr EICHSTAEDT - PTB / Germany

11:00 ☕ 11:30



TRAINING AND CAREERS FOR INDUSTRY 4.0?

9:00 Today, companies are finding it difficult to meet their needs in terms of technical skills on the labour market or amongst their existing personnel. What is generally true about technical subjects is particularly true about metrology, as activities change very quickly and find it hard to keep pace with technological developments. Machines are changing at a faster pace than people.

- How to form future technologists?
- Which kind of skills for metrologists?
- How to keep up with the evolution of technologies?

Presenter: Mr LARQUIER - BEA Métrologie / France

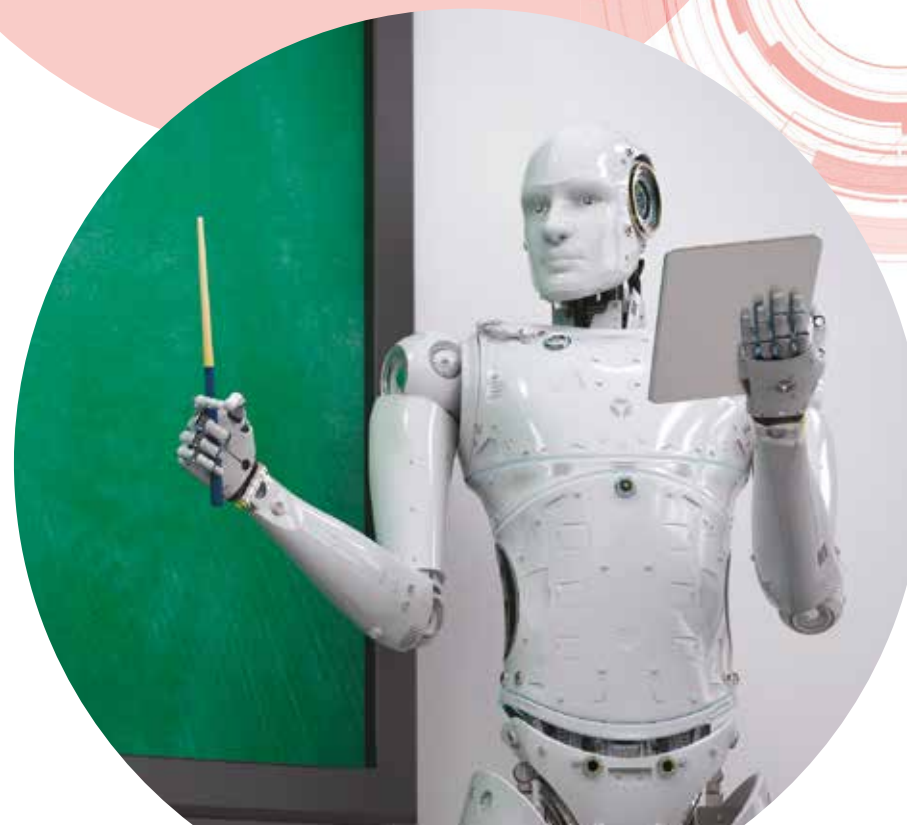
With: Mr BARBIER - CETIM / France, Mrs BEAUGRAND - Trescal / France,

Mr COOREVITS - Arts et Métiers Paris Tech / France,

Mrs ESCOFFIER - Ariane Group / France, Mr GULKA - NCSLI / USA,

Mrs LOFTUS - NPL / United Kingdom, Mr MARCONNET - IUT Saint-Etienne / France

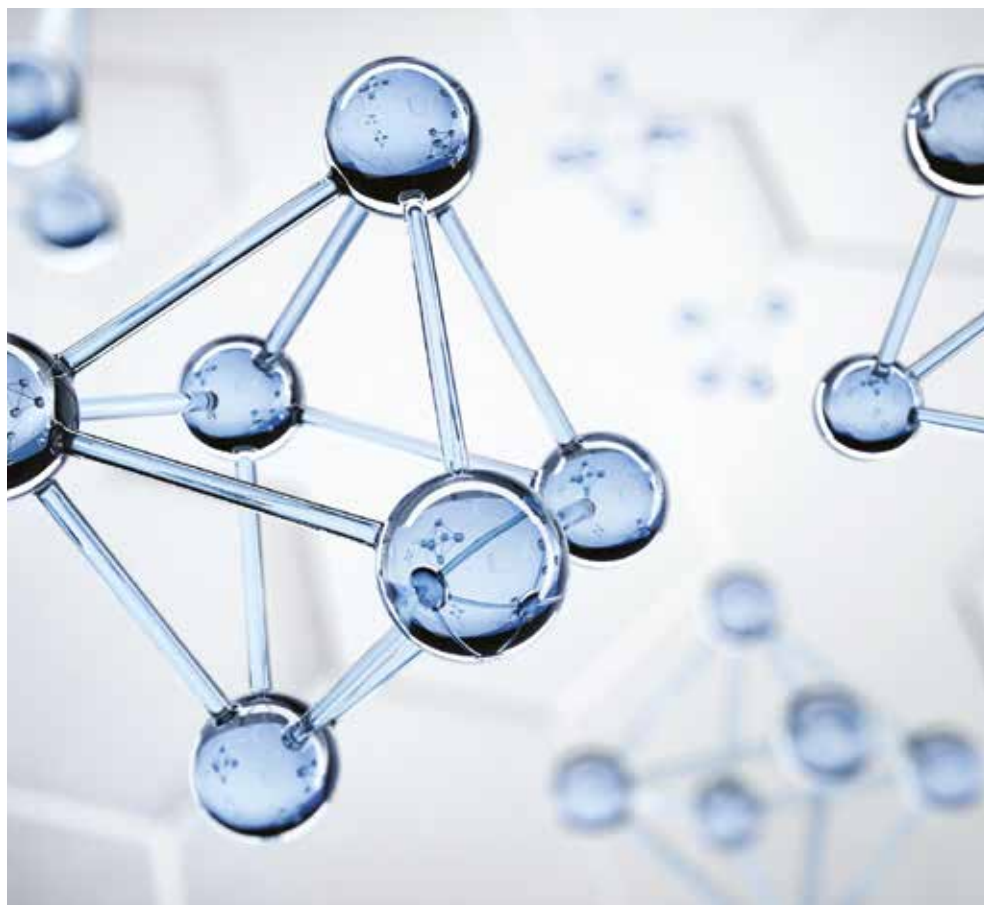
11:00



S16 NANOMETROLOGY

Chairman: Emeric FREJAFON - INERIS (France)

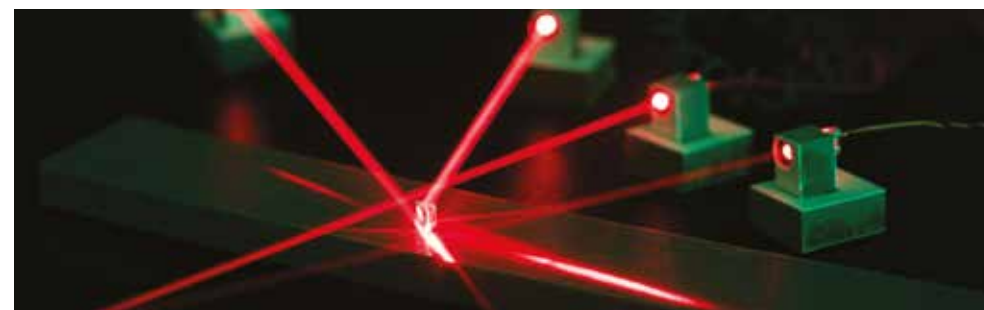
- 11:30** French traceability chain for dimensional measurements at nanometre scale
Mr DUCOURTIEUX - LNE / France & All
- 11:50** Hybrid metrology combining AFM and SEM for measuring nanoparticle dimensions
Mr CROUZIER - LNE / France & All
- 12:10** Characterisation by SEM of the nano fraction of additives in commercial products
Mr DEVOILLE, Mr FELTIN - LNE / France
- 12:30** Asymmetric flow field-flow fractionation: study of the parameters governing particle retention behavior
Mr DE CARSLADE DU PONT - LNE / France & All



S17 STANDARDS IN THERMAL MEASUREMENTS

Chairman: Pete LOFTUS — NCSLI (United-Kingdom)

- 13:45** Toward a metrological reference facility for specific heat measurements
Mr RAZOUK, Mr HAY, Mr BEAUMONT - LNE / France
- 14:05** Response time measurement of chilled mirror hygrometers at LNE-CETIAT
Mr GEORGIN - CETIAT / France
- 14:35** Realization of ITS90 temperatures with small batches of fixed point cells
Mrs DOBRE, Mr DE BOECK - FPS Economy / Belgium
- 15:00** Improving fixed-point cells by modifying furnace heater shape
Mr LOWE, Mrs WRIGHT - NPL / United Kingdom, Mr LILLER - Thermo Gauge Instruments / USA



S18 PHOTONICS

Chairman: Stefan KUECK - PTB (Germany)

- 13:45** Calibration of near infrared photovoltaic detectors using wavelength tunable light source
Mrs MAHAM - Aalto University / Finland
- 14:05** Development of an optical power meter using radiation pressure measurements
Mr SILVESTRI, Mr PINOT - LNE-LCM-CNAM / France
- 14:25** Rapid photoresponse imaging of optoelectronic devices using compressed sensing
Mr KOUTSOURAKIS, Mr THOMPSON, Mr BLAKESLEY - NPL / United Kingdom
- 14:45** Selforganisation of surfaces and the new SI: on the way to make calibration of microscopes
Mr BUSCH, Mr DAUL, Mr KOENDERS, Mrs WEINERT, Mrs XU - PTB / Germany
- 15:05** Determining the shape of curved reflective surfaces using Monte-Carlo simulations
Mr LANEVSKI - University of Aalto / Finland & All



ADDITIVE MANUFACTURING: MEASUREMENT AND CONTROL CHALLENGES

13:45 Additive manufacturing is playing an increasing role in many industries, allowing to design very complex shapes, not accessible by conventional means. But the complexity raises the question of the control of these shapes. Computerised tomography appears to be the most suitable solution, but is this really the case? Metrologists may have a word to say...

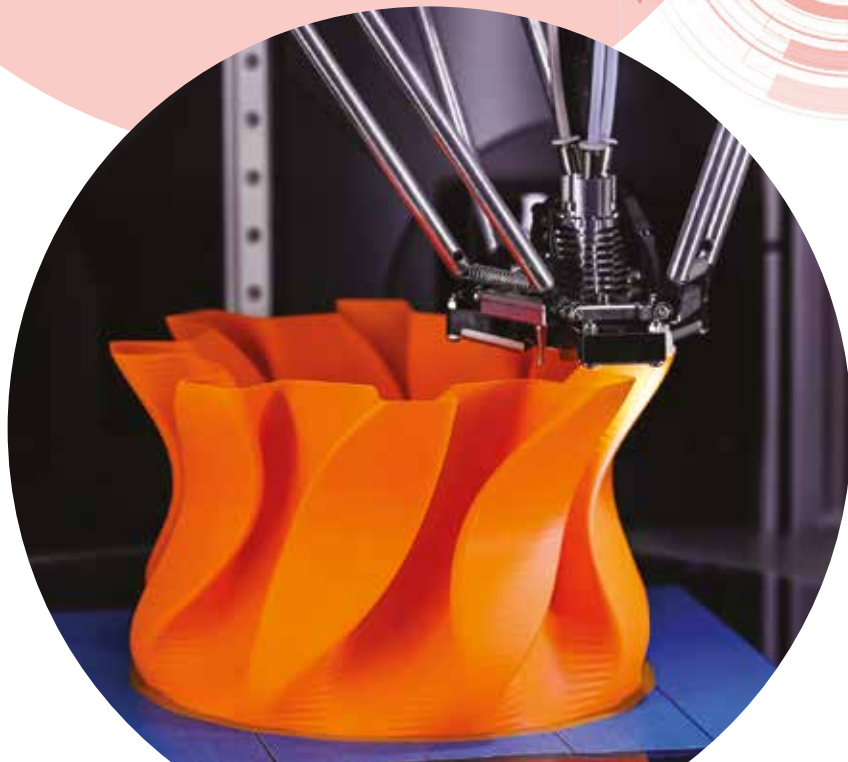
- Additive manufacturing everywhere, everytime?
- Computed tomography, the only way to measure 3D printed objects?
- What metrologists do have to say about computerised tomography?

Presenter: Mr BARBIER - CETIM / France

With: Mr GOSTIAUX - Vallourec / France, Mrs LEBORGNE - CETIM / France,

Mr LE GOUPIL - CEA Tech / France, M. THIBAUT - Carl Zeiss / France,

15:45 Mr WILLIAMS - Cranfield University / United Kingdom



CLOSING SESSION

15:50 **16:45**

Talk of Mrs Sabrina KRIEF

National Museum of Natural History (France)

Professor of the Museum / Primatologist and Director of Sebitoli Chimpanzee Project

Prospects and slideshow of best moments.

Mrs DOBRE - SPF Economie (Belgium),

Mr FILTZ - LNE (France), Mr JANSSEN - NPL (United Kingdom)

CLOSING DRINK



POSTERS - 11:15 to 12:45



INDUSTRY 4.0

- Autonomous vehicle for remote sensing
Mr LAURONT - INNOVIDEA / France
- Semantic web and ontologies for data provenance and curation
Mr BROWN - NPL / United Kingdom
- Determination of the coefficient of expansion of a carbon tube and its assembly
Mrs EL ASMAI, Mr HENNEBELLE, Mr FONTAINE - University of burgundy, Mr COOREVITS - Arts Et Metiers Paris Tech / France
- Improving reliability of power plant equipment due to measurement information redundancy
Mrs SAPOZHNIKOVA - VNIIM, Mrs BAKSHEYEVA - University of Aerospace Instrumentation, Mr TAYMANOV - VNIIM / Russia
- Close loop control machining systems needs accurate in-line dimensional metrology
Mr SCIASCIA - CETIM / France
- Achieving precision measurements under non-standard environmental conditions
Mr TUTSCH - TU Braunschweig / Germany, Mr SUMIN - TU Braunschweig / Ukrain
- How do we ensure the robustness of the links between specification and evaluation
Mr GIRAUD - GEODESIGN, Mr AUGER - CA-Consulting / France
- An online platform for sociocognitive metrology: the BEAR assessment system software
Mr FISHER, Mr WILSON - University of Berkeley / USA
- The role of magnetic sensors in the hybridisation and electrification of vehicles
Mr KRAMB, Mr SLATTER - SENSITEC / Germany
- Metrological maintenance of measuring systems in the Industry 4.0 era
Mr TAYMANOV, Mrs SAPOZHNIKOVA - VNIIM / Russia

POSTERS - 11:15 to 12:45

MECHANICS QUANTITIES

- Precision of the residual stress determined by x-ray diffraction: summary and limits
Mr MUELLER - Bochum University of applied sciences / Germany
- News on the calibration of non automatic weighing instruments
Mrs MEDINA - CEM / Spain
- Comparison by primary means on seismometer sensitivity following ISO 16063-11 standard
Mrs BARTOLI - LNE, Mr LARSONNIER - CEA / France, Mr BRUNS, Mr KLAUS - PTB / Germany
- Method for the realisation of small differential pressures between 1 Pa and 1 kPa
Mr SANDER - TESTO INDUSTRIAL SERVICES / Germany
- Establishing new types of LS2P microphones as reference standards
Mr MENDE - SPEKTRA / Germany
- Development of a primary dynamic calibration method for pressure sensors
Mr MENDE - SPEKTRA / Germany
- Recent improvements of INRIM static system for pressures generation from 2 mPa to 1 kPa
Mrs ASTRUA, Mr MARI, Mr PASQUALIN - INRIM / Italy
- The minimum weight according to regulation
Mr GIRAULT - METTLER TOLEDO / France
- Development of a generator of periodic pressure disturbances
Mr DIAZ TEY, Mr PADILLA VIQUEZ, Mr GOVAERE VICARIELLI - University of Costa Rica / Costa Rica
- Calibration of pressure balances and modelling piston-cylinders effective areas
Mr OTAL, Mrs YARDIN - LNE / France
- Calibrations techniques for differential pressure measurement
Mr BENTOUATI - LNE / France
- Shape and size corrections in magnetic susceptibility measurements of weights
Mr SZUMIATA - RADWAG WAGI ELEKTRONICZNE / Poland
- Improvement of dynamic pressure standard for calibration of dynamic pressure transducers
Mr DURGUT, Mr TURK, Mr YILMAZ, Mr HAMARAT - TUBITAK UME, Mr BAGCI - TUBITAK UME / Turkey
- On the calibration procedure in the mass-volume in microfluidics
Mrs ROSENDAHL-AVELINO - National Institute of Metrology, Quality and Technology / Brazil
- New design of automat mass comparator with $d=1\text{mg}$ to calibrate the masse below 1mg
Mr SOLECKI - RADWAG BALANCES & SCALES / Poland
- Metrology as support for predictive maintenance in concrete industry
Mrs BAVELARD - CERIB / France
- Micro structural and spectrophotometric analysis system for metal welding processes
Mrs FAGA - CNR, Mr CAPRA, Mr FILIPPO - INRIM, Mr LAI - IRIS / Italy



THURSDAY 26 SEPTEMBER

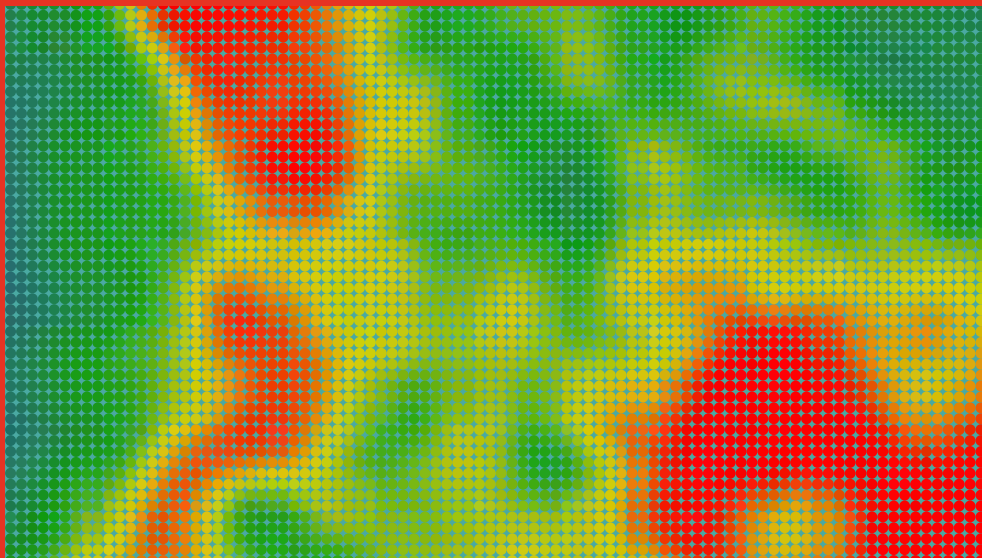
POSTERS - 11:15 to 12:45

TRAINING FORMATION

- Distance learning system in the field of gas analysis
Mr BELOBORODOV, Mr KONOPELKO - VNIIM / Russia
- Laboratory measurement activities in a first-year engineering technology class
Mr FUEHNE - Purdue Polytechnic Columbus / USA

RADIATION/PHOTONICS

- Influences of sensor protective coating on laser energy calibration results
Mr KILINC, Mr SONMEZ, Mr YUKSEL, Mrs ON AKTAN - Roketsan / Turkey
- New neutron source calibration service at the Laboratoire National Henri Becquerel
Mr THIAM - CEA-LNHB / France
- New approach to application of the spectrophotometric system for determining the optical properties of turbid liquids
Mr ZARUBICA - Analysis / Serbia



TIME/FREQUENCY

- Use of a standard microwave satellite simulator for TWSTFT earth station characterization
Mr ACHKAR - LNE-SYRTE, Mr HUANG - Paris Observatory, Telecommunication Laboratories / France & Taiwan
- CLONETS: pan-european ultra-precise time and frequency dissemination over optical fibre
Mrs BOOKJANS, Mr POTTIE, Mr TUCKEY - LNE-SYRTE / France



FAITES VOTRE TRANSITION MÉTROLOGIQUE

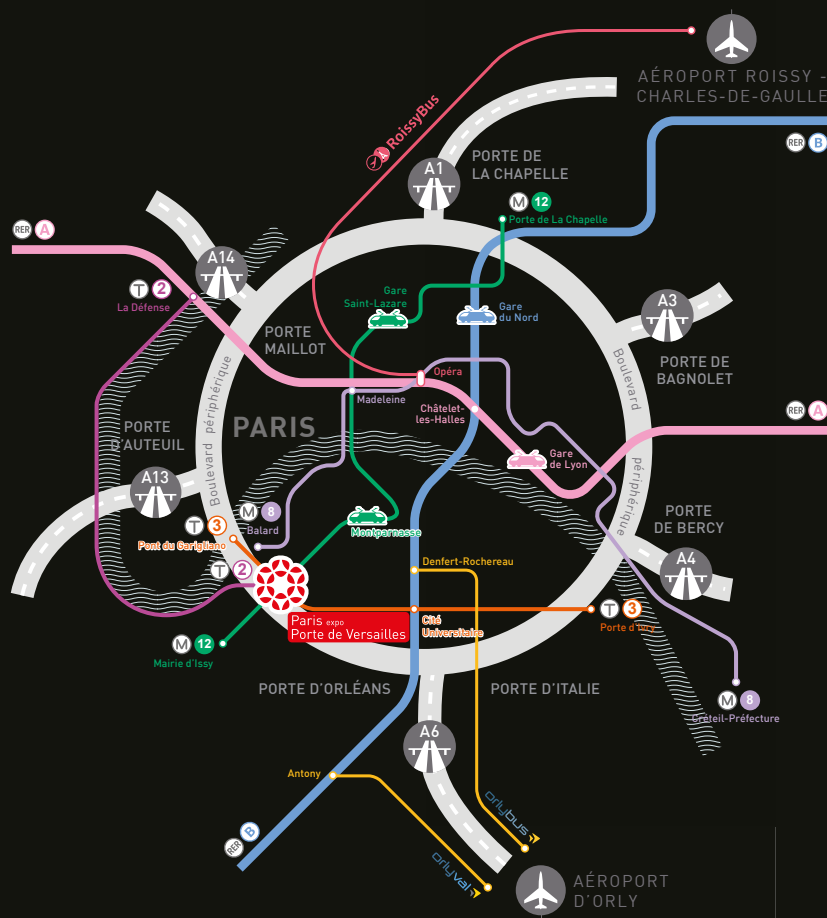


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SESSIONS I'm interested by the following sessions or Round tables

TUESDAY 24 SEPTEMBER
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WEDNESDAY 25 SEPTEMBER
☐ 9 ☐ 10 ☐ 11 ☐ 12 ☐ 13

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