16th PROGRAMME

CONGRÈS INTERNATIONAL DE MÉTROLOGIE
INTERNATIONAL CONGRESS OF
METROLOGY

7 | 8 | 9 | 10 | OCTOBER | 2013
PARIS | FRANCE

www.metrologie2013.com | info@cfmetrologie.com
The Congress is 30 years old: it is mature, based on a long experience but still looking for new topics.

Its aims are multiple:
- Explore the evolution of measurement techniques and their implications for Industry, R&D and society,
- The added value of measurement as a tool for quality of products and processes,
- The participation in the development of innovative technologies.

Its content is large:
- 180 presentations in oral or poster sessions,
- 6 round-tables focused on industrial challenges,
- An exhibition showcasing innovations and solutions,
- Technical site visits exploring industrial best practice.

The news for 2013 are:
- A special introduction about trades in measurement field,
- 2 workshops dealing with European research programmes.

One public or different audiences for the Congress?

More than 1,000 participants are coming from 50 countries:
- Users of measurement technology in industry, research and academia
- Manufacturers of measurement equipment and instrumentation
- Quality managers and decision makers
- Academics and researchers.

A simultaneous translation is provided for all talks. This event is therefore the unique opportunity for communication and exchanges between all members of the same family!
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Jose VEAU - EDF (France)

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Mr PIQUEMEL - Club Nano (France)
Mrs SALVETAT - Ifremer (France)
Mrs THOMAS - BIPM
Mr TWERENBOLD - METAS (Switzerland)
Mr WUNDERLI - METAS (Switzerland)
Mr ZVIZIDIC - FSB (Croatia)

METROLOGY 2013 and enova PARIS, same place, same dates, same objectives: to encourage meetings.
16th INTERNATIONAL CONGRESS OF METROLOGY

MONDAY

S1, what's new?  S4 Optical radiation
S2 Industrial flow measurement  S5 Force and Pressure
S3 Medical biology: mastering your analysis  S6 Mathematical tools
Workshop TREND

POSTER
- Flow
- Health
- Statistics
- Mechanical quantities
- Food processing

S7 Dosimetry and Radiotherapy
S8 Advanced coordinate metrology
Measurement and traceability in food processing

COCKTAIL

TUESDAY

S10 Risk management in medicine
S11 Surface texture and Form
Measurement fuelling low carbon technologies
Workshop HiTeMS

POSTER
- Environment
- Chemistry
- Energy
- Dimensional
- Training

S13 METROLOGY AT THE HEART OF INNOVATION

S14 Energy challenges
S15 Environmental awareness
The metrological requirements specific to high-tech fields

GALA

WEDNESDAY

S17 Electrical metrology
S18 Achieving traceability
Metrology challenges for nanotechnologies

POSTER
- Temperature
- Electricity
- Time / Frequency
- Management
- Optics and Soft metrology

S19 Nanotechnology

S21 Soft metrology
S22 Temperature: some like it hot
Risk management and product conformity

THURSDAY

S23 Energy challenges
S24 Environmental awareness
The metrological requirements specific to high-tech fields

CLOSING SESSION

Drinking

PEUGEOT visit 3D measure, surface form, engine and mechanical test

CEA visit ZOE atomic pile, radioactivity measurement, radiobiology and environmental toxicology

LNE visit Electrical, thermal and optical measurement

SI, what's new? Optical radiation
Industrial flow measurement
Medical biology: mastering your analysis
Risk management in medicine
Surface texture and Form
Measurement fuelling low carbon technologies
Electrical metrology
Achieving traceability
Metrology challenges for nanotechnologies
Industrial competitiveness has become a crucial issue. Reducing cost, improving performance, reducing the risk and guaranteeing the quality of products are part of the obligations of any company or organisation.

The measurement trades, technician or engineer, are at the heart of this action. Indeed, no risk management without performing measures. No operational excellence without the most perfect possible knowledge of real needs and skills of manufacturing and measurement processes.

Examples and testimonies will illustrate the contribution of measurement in improving the competitiveness and its strategic positioning in the dynamics of companies:

- How to make a career in the fields of measurement?
- Has the sector interesting opportunities?
- Is it more varied and innovative than a career in production or design? …
**S2 INDUSTRIAL FLOW MEASUREMENT**

Chairman: Isabelle CARE - CETIAT / France  •  David BENAMOU - CT2M / France

9:00  Numerical analysis of the discharge coefficient with disturbers for flow metering accuracy
Mr LARIKI, Mr AIT AMRANE - University of Khemis-Miliana, Mr YOUCEF - University of Oran / Algeria

9:25  Measurement of air flow induct by velocity measurements
Mrs CARE - CETIAT, Mr BONTHOUX, Mr FONTAINE - INRS / France

9:50  Evaluation of vortex flowmeters by Exera
Mr DAVID, Mrs CARE - CETIAT, Mr VEAU - EDF / France

10:15 CFD and metrology in flow metering: RCS flow measurement with elbow taps and its uncertainty
Mr DENEUX, Mr ARENAS - EDF / France

10:40  Estimation of the uncertainty in the conveyance of a dam valves
Mr BLANQUART, Mrs BORNE, Mrs GRIMALDI, Mr FAURE - CNR / France

**S6 MATHEMATICALS TOOLS**

Chairman: Mouna MAKHLOUF - LCAE / Tunisia

11:35  Novel mathematical and statistical approaches to uncertainty evaluation: introducing a new EMRP research project
Mr BAR, Mr ELSTER - PTB / Germany, Mrs MATTHEWS - NPL / UK, Mr PENDRILL - SP / Sweden, Mr WRIGHT - NPL / UK

11:55  Uncertainty evaluation by means of joint possibility distributions
Mr FERRERI, Mrs SALICONE, Mr PIRIOU - University of Milano / Italy

12:15  Specification and acceptance limits in uncertainty in a shop floor measurement process, in PSA Peugeot Citroën powertrain plants: an industrial witnessing
Mr HUREL - PSA Peugeot Citroën / France

12:35  Evaluation of measurement uncertainty for time-dependant quantities
Mr EICHSTADT, Mrs ARENDACKA, Mr LINK, Mr ELSTER - PTB / Germany

**MEDICAL BIOLOGY: MASTERING YOUR ANALYSIS**

In France, the evolution of the regulations requires the medical laboratories to be accredited for all its activities of analysis before 2016. This approach requires a control of the methods of analysis, the implementation of a management of the test and measure equipments, an estimation of the uncertainties associated with the testing results. Moreover, it will be interesting to open the discussion beyond French borders and to examine the requirements that meet the medical laboratories in other countries.

Debates about key questions:
- What can be the contribution of metrology in this approach?
- Which methods used in other areas of testing apply or are adaptable?
- Should we consider new approaches and methodologies?
- How to qualify thermocyclers and centrifuges?

Animation: Mr CLAUDEL - CETIAT / France

With: Mr AVELLAN - Analys / France, Mr MacDONALD - PTB / Germany, Mrs MEHAY - Cofrac / France

Mr PEYRET - AES Chemunex / France, Mrs VASLIN - REIMANN - LNE / France
The micro- and nanoelectronic world is experiencing steady changes in tackling the new challenges in terms of miniaturization, power consumption, power density and processing speed.

New types of inorganic materials are being used in the semiconductor industry. There is now a critical need for metrology to provide traceable and quantitative chemical composition measurements of new materials in complex spatial arrangements with buried interfaces and with nm depth resolution.

This workshop will address topics related to the European research project TReND (Traceable characterisation of Nanostructured Devices) aiming at both the accurate measurement and reliable characterisation of material and device properties at the nanoscale level to support the competitiveness of the European semiconductor and photovoltaics industry. No single technique can provide the traceability required for all kinds of materials, therefore the TReND project will include accurate comparisons between a set of different techniques.

**TOPICS:**
- Traceable chemical and dimensional depth characterization of inorganic nanolayers and buried interfaces,
- Chemical speciation and phase identification of physical location of surfaces, buried nanolayers and interfaces,
- Improved elemental and species depth profiling based on X-ray analytical methods,
- Metrology for 3D nanoscale chemical imaging of inorganic electronic and organic photovoltaic devices,
- Quantitative measurements of electrical properties of the surface and subsurface of organic thin films.

Animation by: Mr BECKHOFF - PTB / Germany and Mrs LEPY - CEA-LNHB / France
With the participation of the following institutes: CMI / Czech Republic, BAM / Germany, LETI / France, IMEC / Belgium, NPL / UK, MTA / Hungary, HZB / Germany
MEASUREMENT AND TRACEABILITY IN FOOD PROCESSING

15:30

Measures make it possible to assess product fit for consumption: any measurement error can have dramatic consequences for consumers, as well as for the production companies involved, or even for the whole food processing chain. Other quality measurements also help determine the price of a product. Metrology is widely used in the food processing industry, but its importance remains largely ignored outside of this sector.

Debates about key questions:

- What about measurement and its implementation in the manufacturing process?
- How to measure and control temperature in a baking oven, how to make a packaging meet a dual requirement, …?
- Which are the tools of metrology to meet these requirements?

Animation: Mrs SAUVAGEOT - LNE / France
With: Mr CLAUDEL - CETIAT / France, Mr GILMORE - NPL / United Kingdom, Mrs MAUFRAND - Groupe DELPEYRAT / France
Mrs MAZOYER - ANIA / France, Mr TROSSAT - ACTILAIT / France

17:30

POSTER - 13:45 to 15:15

FLOW

- Measurement of ventilation flow rate at terminal device
  Mrs CARE - CETIAT / France
- New electromagnetic flowmeters for liquid metal
  Mr VEIL, Mr MIKHAILOVA - SRC Nizhniy Tagil / Russia
- Improving liquid flow measurements for drug delivery application
  Mr DAVID - CETIAT / France, Mr LUCAS, Mrs HIRZAE - YSL / The Netherlands, Mr GERSL - CMI / Czech Republic,
  Mr MELVAD - DTI / Denmark, Mr BISIG - METAS / Switzerland, Mrs BATISTA - IPQ / Portugal, Mr AKSELLI - Tubitak / Turkey
- Calibration and use of syringe pumps
  Mrs BATISTA, Mr ALMEIDA, Mrs FILIPE - IPQ, Mr COSTA - Hospital Garcia de Orta / Portugal
- Representativeness of flow rate measurements for pressure differential devices
  Mr YEAO - EDF / France
- The INRIM water flowrate primary standard revamping
  Mr MARINARI, Mr SPAZZINI - INRIM / Italy
- Standard for high viscosity and multiphase liquid flow measurement
  Mr WU, Mr LUO - National Metrology Center / Singapore

HEALTH

- Conformity assessment of a high performance liquid chromatography calibration
  Mrs VARGAS HOYOS, Mr GONZALEZ HORTA - CMI / Cuba
- Calibration laboratory for low level dosimetry
  Mr BENCEA, Mrs CELAREL, Mr CENUSA - NIPNE / Romania
- Design, construction and characterisation of an irradiator to perform calibration of the ambient dose equivalent
  Mr OLIVEIRA - IST, Mr CARVALHO - University of Lisbon, Mr CARDOSO, Mr SANTOS - IST / Portugal
- How to adapt metrology for a medical biology laboratory?
  Mr ROSS - CEM / France
- Construction of a large section graphite calorimeter for measurements in small fields used in radiotherapy
  Mr DUPRENEUX, Mr BORDE, Mrs DAURES, Mr DELAUNAY, Mr OSTRONSKY - CEA / France
- Metrological approach for the quantification of metalloproteins
  Mrs SWART, Mrs ZAKEL - PTB / Germany, Mrs FISICARO - LNE / France, Mrs GOENAGA-INFANTE - LGC / UK
- Traceability of the biochemical measurements results: cases studies on the metrological and practical aspects
  Mrs DUTA - National Institute of Metrology / Romania
TUESDAY 8 OCTOBER 2013

POSTER - 13:45 to 15:15

HEALTH

- Application of TDCR-Geant4 modeling in the primary measure of activity
  Mr THIAM - CEA / France

- Biologically weighted quantities in radiotherapy: an European joint research project
  Mr RABUS - PTB / Germany & all

- Development of a new in-water-phantom graphite calorimeter for the measurement of absorbed dose to water in medium energy x-ray beams
  Mr PINTO, Mrs PIMPINELLA, Mr GUERRA - ENEA-INMRI / Italy, Mrs ASTESANOAEI - University of Iasi / Romania, Mr LORETI, Mr QUINI, Mrs TONI - ENEA-INMRI / Italy

- Metrology for dosimetry at IFIN-HH
  Mr BERCEA, Mrs CELAREL, Mr CENUSA - NIPNE / Romania

- Traceable pH and ISE measurements in clinical chemistry
  Mr BASTKOWSKI - PTB / Germany

- Evaluation of the beta spectral shapes
  Mr MOUGEOT - CEA / France

STATISTICS

- New mathematical and statistical approaches to uncertainty evaluation in the context of regression and inverse problems
  Mr FISCHER - LNE / France

- Pitfalls in uncertainty estimation: few measurements, non-gaussian distributions
  Mrs PETRY - SMD / Belgium

- Covariance in calibration process
  Mr DUBOIS - Delta Mu / France

- Direct and inverse calibration curves of measuring instruments: selection and fitting
  Mr GRANOY SPRY, Mrs SIRATA - CSRI Elektropribor / Russia

- Uncertainties estimation of portable measuring arm by Monte Carlo method
  Mrs ROMDIANI, Mr LUIIION, Mr HENNEBELLE, Mr FONTAINE - University of Bourgogne / France

- Analysis of a national low dc resistance inter-laboratories comparison
  Mr GALLIANA, Mr GASPAROTTO, Mr CAPPA - INRIM / Italy

- Uncertainty associated with measurement of mineral micropolllutants in natural and waste waters: differences observed between analytical methods during proficiency testing schemes
  Mr DE KUYSSCHE - IUT of Lille, Mr CHARPENTIER - AGLAE, Mr PENHOAT, Mr CURTOALE - IUT of Lille, Mr GUARINI - AGLAE / France

- Regpy: a software for estimating the calibration function and obtaining measurement result based on an indication
  Mrs YARDIN - LNE / France

TUESDAY 8 OCTOBER 2013

POSTER - 13:45 to 15:15

MECHANICAL QUANTITIES

- Conceptual design of multi-capacity load cell
  Mr OSMAN, Mr HASAN, Mr EL-HAKEEM - NIS, Mr ROUTA, Mr ATIA - University of Cairo / Egypt

- Characterisation of flexure pivots for the French watt balance experiment
  Mr PINOT - LNE / France

- Metrological behavior of the load cells work under initial load
  Mr ABDELHAKEEM - NIS / Egypt

- Implementation of bidimensional wall correction using pressure signature at the TA-3 wind tunnel
  Mr FERNANDO, Mr DE MORAES, Mrs LUISA, Mr COSTA REIS, Mr MATSUO, Mr CHISAKI - IAE / Brazil

- Use of pooled standard deviation of paired samples in calculating measurement uncertainty by the Monte Carlo method
  Mr BECKERT, Mr DOMENEGHETTI, Mr BOND - University of Santa Catarina / Brazil

- Extension of dissemination of mass unit below 1 mg in Romania
  Mrs VALCU - National Institute of Metrology / Romania

FOOD PROCESSING

- Feasibility study for the development of a honey reference material
  Mrs ZAPPA - ENEA, Mrs DEPERO, Mrs BORGGESE - University of Brescia, Mrs GATTI, Mrs GIORGANO, Mrs ZOANI - ENEA / Italy

- Estimation of uncertainty to the homogeneity study in the certification of a candidate certified reference material in fish matrix
  Mr ULRICH, Mr DE S. SARKIS - IPEN / Brazil

- Accreditation with flexible scope of a GC-MS analytical method for the determination of pesticides residues in fruits and vegetables
  Mrs NOCENTINI, Mrs FOCARDI, Mrs FORTINI, Mr VONCI, Mrs BIANCALANI - LISLT / Italy

- Metrological compatibility of alcohol contents measurements
  Mrs FURTADO, Mrs MADEIRA, Mr PELLEGRINO, Mrs DIAS, Mrs SPOHR, Mrs FILIPE - IPQ / Portugal

- ComptAAN energy project: measurement for energy management in food industries
  Mr CLAUDEL - CETIAT / France
S10 RISK MANAGEMENT IN MEDICINE
Chairman: Hans KOCHE - PTB / Germany • Jean CHAUVADRA - ip / France

09:00 • Metrology for patients care
Mr CRISTIAN, Mrs STUMPF , Mr MORO - Biocordis / France

09:25 • Assessing the risk of minimally invasive surgery: a metrological approach
Mrs NAU, Mr POLLMANNS, Mr SCHMITT - University of Aachen / Germany

09:50 • Production of a certified reference material for glucose, creatinine and total cholesterol and organisation of a commutability study coupled to a multicentric evaluation of field methods trueness
Mr DELATOUR, Mrs HEUILLET, Mrs LALERE, Mrs VASLIN-REIMANN - LNE / France

10:15 • International implementation of ICEB accredited courses in cleanroom metrology
Mrs ALLOUL-MARMOR, Mrs VANDRIESSCHE - Aspec / France

10:40 • Metrology for safety MRI
Mr ITTERMANN - PTB / Germany

S11 SURFACE TEXTURE AND FORM
Chairman: Thierry COOREVITS - Arts et Métiers Paris Tech / France

09:00 • Inspection of the cooling towers at EDF: uncertainty of the 3D-shape measurement
Mr MOREAU, Mr BAILLY - EDF / France, Mr GRUSSENMEYER - INSA / France, Mr BORLIN - University of Umea / Sweden, Mr CHAMBIERG, Mr BOUDON - EDF / France

09:20 • Roughness and contamination characterisations of worn surfaces
Mr SILVESTRI, Mrs AZOUIGUI – LCM LNE-CNAM / France, Mr GEE - NPL / UK

09:40 • Imperfect drillings measurements on production lines by industrial vision
Mr HAIRRE, Mr SULWA, Mr VOISIN - University of Bourgogne / France

10:00 • Effect of form error in datumfeatures on evaluated geometries
Mr FORBES, Mr WILSON - NPL, Mr HANSEN, Mr ORCHARD - Rolls-Royce / UK

10:20 • Micro roughness measurement in industrial environment. Case of mechanical parts
Mr LEROY - PSA Peugeot Citroën / France

10:40 • Development of a new apparatus for cylindrical form measurement with nanometric-level accuracy
Mr VISSIERE - Geomnia / France

MEASUREMENT FUELING LOW CARBON TECHNOLOGIES
Countries within the European Union have set themselves ambitious targets to reduce carbon emissions whilst at the same time maintaining a secure energy supply. Low carbon technologies are seen as the panacea moving towards a greener economy with an enormous market potential.

Debates about key questions:
• Whether regulation is required to drive standards and development?
• How measurement can accelerate the development in absence of regulation?
• How the measurement industry can support the implementation of the European Energy Strategy under horizon 2020?

Animation by: Mrs BURSTON - NPL / UK

With the participation of: Axpo Group, BIPM, EDF, European Commission, LNE, Peugeot Citroën Automobiles, Solar Century

The measurement of temperatures above 1000 °C is both difficult and yet vital for the success of a wide range of industrial processes: aerospace/space (1300 to 3000 °C), nuclear fuel production and essential nuclear safety testing (1800 °C to 2500 °C), refractory metals production (2500+ °C), silicon carbide, carbon/carbon composites and iron, steel, glass and ceramics manufacture.

Due to growing environmental concerns (emissions,”zero waste”) and legislation and in the face of ex-EU competition these industries require improved process efficiency. One of the simplest ways of achieving this is by improved high temperature measurement.

The HiTeMS project (High temperature metrology for industrial applications) started in 2011 and brings together 15 Europeans partners, to develop a suite of methods and techniques for improving the measurement of high temperatures. Problems associated with non-contact thermometry such as window transmission, emissivity and reflected radiation and contact thermometry such as sensor drift and in-situ drift mitigation will be addressed.

Animation by: Mr MACHIN - NPL / UK, Mr SADLI - LCM LNE-CNAM / France

With the participation of the following institutes: NPL, LCM LNE-CNAM, UME
WEDNESDAY 9 OCTOBER 2013

S13 METROLOGY AT THE HEART OF INNOVATION
Chairman: Marc HIMBERT - LCM LNE-CNAM / France

11:35 > 12:50

New challenges for metrology in chemistry and biology
Martin MILTON - BIPM

R&D in metrology: 2020 prospects
Kamal HOSSAIN - EURAMET

Measurement in work flow
A surprising industrial testimony

S14 ENERGY CHALLENGES
Chairman: Maguelonne CHAMBON - LNE / France

12:50 CEA visit

WEDNESDAY 9 OCTOBER 2013

S15 ENVIRONMENTAL AWARENESS
Chairman: Annarita BALDAN - VSL / The Netherlands • Bernd GUETTLER - PTB / Germany

15:30 European project: traceable measurements for monitoring critical pollutants under the European Water Framework Directive 2000/60/EC
Mrs CABILLIC - LNE / France

15:55 European project: metrology for chemical pollutants in air
Mrs BALDAN - VSL / The Netherlands

16:20 Metrological needs for monitoring aquatic environments: from metrological traceability demonstration to decision making process
Mrs LABOT-FONTAN, Mrs GUIGUES, Mrs LALERE, Mrs VASLIN-REIMANN - LNE / France

16:45 A dissolved oxygen calibration bench
Mrs SAUFETAT, Mrs LE BIHAN, Mr COMPERE - Ifremer / France

17:10 Measuring soot particles from automotive exhaust emissions
Mr ANDRES - METAS / Switzerland, Mrs GEHRKENS-JORDAN, Mr THEDENS - PTB / Germany

THE METROLOGICAL REQUIREMENTS SPECIFIC TO HIGH-TECH FIELDS

15:30 The new technological developments of products and industrial processes require higher levels of measurement, and stricter standards in product design and manufacture. At the same time, cost constraints often resulted in limiting metrology applications in companies. Wider use of metrology led to greater effectiveness, moving it from limited product manufacturing control activities to larger measurement process control in design.

Short presentation and debates about key questions:
• How do metrological requirements meet such needs for technical and cost performance?
• How to define what is “just necessary”?
• How the current frames of reference used need to be adjusted?
• What new requirements are to be taken into account?

Animation: Mr DAUBENFELD - Peugeot Citroën Automobiles / France
With: Mr BOSVELD - Philips Healthcare / The Netherlands, Mr JENDF - Symetis / Switzerland,
Mr LEREOUBOIS - Safran / France, Mr MACHIONE Eurocopter / France, Mr CORDUANT - Renault / France

17:30
ENERGY

- Cost-benefit analysis of renewable energy systems under uncertainties
  Mr. MATHIOULAKIS, Mr. PANARAS, Mr. BELESSIOTIS - NCSR Demokritos / Greece

- Track condition estimation method uncertainty in vehicle efficiency measurement system
  Mr. VALJAOTS, Mr. LAANEOTS, Mr. SELL - University of Tallinn / Estonia

- Building energy efficiency: one metrological support example to vocational education and training
  Mr. FILTZ, Mr. HAY, Mr. DUBARD - LNE / France

- Materials metrology for energy and photonics
  Mr. FILTZ, Mr. HAY, Mr. DUBARD - LNE / France

POSTER - 13:45 to 15:15

WEDNESDAY 9 OCTOBER 2013

ENVIRONMENT / CHEMISTRY

- The influence of temperature and CO, in exhaled breath
  Mrs. ANGHEL, Mr. IACOBESCU - National Institute of Metrology / Romania

- Calibration gases for existing air quality directive pollutants at limits values.
  Mrs. MACE - LNE / France

- Metrological study of typical Brazilian diesel
  Mr. FONSECA, Mr. BATISTA, Mrs. SILVA, Mrs. PISSURNO, Mr. SOARES, Mrs. JESUS, Mr. SILVA, Mr. DARODA, Mr. CUNHA - INMETRO / Brazil

- Control of measurement, analysis and testing processes
  Mrs. DE LIMA FIORAVANTE - INMETRO / Brazil

- Toward a better traceability of the electrochemical measurements
  Mrs. CHAMPION - LNE / France

- The effect of salinity level on conductivity sensors calibration
  Mrs. LE BIHAN, Mrs. SALVETAT, Mr. COMPERE - Ifremer / France

- Metrological traceability in chemistry: an overview of two INRIM activities
  Mrs. ORRU, Mrs. ROLLE - INRIM / Italy

- Development of gases mole fraction and concentration transference procedures with Fourier spectroscopy
  Mr. KONOPELKO, Mr. BELOBORODOV, Mr. RUMIANTSEV, Mr. SELUKOV - Mendeleyev Institute for Metrology / Russia

- Total reflection X-ray fluorescence spectroscopy for environmental and biological analysis
  Mrs. BILQ, Mrs. DEPERO, Mrs. BONTEMPI, Mrs. BORGESI - University of Brescia, Mr. CINOSI, Mr. SERALESSANDRI, Mr. SIVIERO - GNR / Italy

- Volatil organic compounds exposure measurement in industrial environment
  Mr. COUDERT - C&C IngeScience / France

- Two variants of Winkler titration for dissolved oxygen measurements
  Mrs. SALVETAT, Mrs. LE BIHAN, Mr. COMPERE - Ifremer / France, Mrs. HELM, Mr. JALUKSE, Mr. LEITO - University of Tartu / Estonia

TRAINING

- 2013: year of the first graduates in metrology in Algeria
  Mrs. KHANAFI-BENGHAILAM - University of Setif / Algeria

- « Instrumentations-measurement-quality » training for careers in the field of high technologies
  Mrs. RAZET - LCM LNE-CNAM / France
S17 ELECTRICAL METROLOGY
Chairman: Isabel GODINHO - IPQ / Portugal • Luc ERARD - LNE / France

9:00 Automated impedance metrology extending the quantum toolbox
Mr PALAFAX - PTB / Germany, & all

9:25 Development of cryogenic current comparators for low-current metrology
Mr RENGNEZ, Mr SERON, Mr DEVILLE, Mr PIQUEMAL - LNE / France

9:50 Scattering parameter metrology: toward an improved traceability of vector network analyser measurements in France
Mrs VINCENT - LNE / France

10:15 Inductive voltage divider calibration with sampling method
Mr COMINBOEUF - METAS / Switzerland

10:40 Wide frequency range quadrature bridge-comparator
Mr SURDU, Mr LAMEKO, Mr SURDU, Mr KURSIN - Ukrmetrteststandard / Ukraine

S18 ACHIEVING TRACEABILITY
Chairman: Georgia HARRIS - NIST / USA • Nieves MEDINA - CEM / Spain

9:00 Impact assessment of the metrology research
Mr ERARD - LNE / France

One accreditation body’s perspective
Mr KNAKE, Mrs WRIGHT - AZLA / USA

9:50 A new certified reference material by CETAMA: its certification approach
Mrs RIGAUX, Mr RIVIER, Mrs ROUDIL, Mr EYSERIC, Mr TUFFERY, Mr RUAS - CEA / France

10:15 Improving the product verification process in advanced manufacturing supply chains
Mr JONES, Mr COOPER - NPL / UK

10:40 Outsourcing of metrology
Mr REALL, Mr VASTY - A+ Metrologie / France
For a decade, nanotechnologies have provided a growing number of potential applications in the key sectors of industry, in health services and environment-related fields. The development of nanomaterials raises issues as regards their use and possible risks to health, environment, and safety. It requires a nanometrology capable of taking up the many metrological challenges nanotechnologies raise. This new science of measurement needs a greater multidisciplinary approach than traditional metrology and the emergence of new concepts. It includes the measurement of dimensional quantities and of other physical or chemical quantities as well.

Short presentation and debates about key questions:
• What are the main issues facing industry in this field?
• A review of the major R&D efforts being carried out currently,
• What are the future developments required to meet the needs of industries?

Animation: Mr FELTIN - Club nanoMétrologie / France
With: Mr FOUCHER - CEA-LETI / France, Mrs ROURE - Ministère en charge de l’Industrie / France, Mr CHAMBonNET - 35 Photonics / France, Mrs NOLLEAU - Meberis Pharma / France, Mr GARNAES - DFM / Denmark, Mr DAI GAILIANG - PTB / Germany

11:00 M S20 NANO TECHNOLOGY
Chairman: François PIQUEMAL - LNE / France

11:35 Nanoscale transport measurement with multiple probe scanning tunneling microscopy
Mr GRANDIDIER - CNRS / France

12:00 Two years experience of the nanometrology Club
Mr PIQUEMAL - LNE / France & all.

12:25 Characterisation of epitaxial and CVD graphene with double metal-graphene contacts for gas sensing
Mr NOVIKOV, Mr LEBEDA - University of Aalto, Mr WALDEN - Finnish Metrological Institute, Mr HAMALAIKENEN, Mr ISAKKA, Mr SATRAPINSKI - MIKES / Finland

12:50 13:45
The assessment of product conformity is intended to guarantee that the products meet both legal requirements and technical standards applicable, as set by regulation authorities. The assessment of conformity covers the processes, tests and audits conducted in the production plants. It contributes to consumer health and safety protection as well as environmental protection. It facilitates trade, while protecting the interests of the parties.

Debates about key questions:
• What is the role of metrology in such business activities?
• How to determine whether the measurement results are within the limits set by the regulation, or by the technical standards applicable to the products
• How to manage the production process to evaluate the conformity and the uncertainties involved in such results, especially near the acceptance levels?
• Which standards used in the assessment of conformity: ISO/CEI 17020 and 17025, the new 2012 version.

Animation: Mr LARQUIER - BEA Métoologie / France
With: Mr GERVAISE - SGS Multilab / France, Mr GORJUP - LNE / France, Mr MORELLEC - GE HEALTHCARE / France
Mr PIERSON - ANSES / France

15:45 - 16:10

THURSDAY 10 OCTOBER 2013

RISK MANAGEMENT AND PRODUCT CONFORMITY

13:45

Correction for window transmission in radiation thermometry using high temperature fixed points
Mr LOWE, Mr MACHIN - NPL / UK

Characterisation by spectroscopy of the temperature profile in a shock tube
Mr BONNET, Mr BOUDET, Mr LUC - CEA, Mr HERVE - University of Nanterre / France

Comparative study between the experimental temperature and the calculated one of couple steel-tungsten carbide animated by a rotation movement
Mrs KHANAFI-BENGALEM - University of Setif / Algeria

A European multi-institute project for providing improved and easier traceability to the kelvin
Mrs DEL CAMPO - CEM / Spain & all

Thermal characterization of vortex multi swirling jet in confined mode with or without obstacle
Mr BRAHIA - University of Chlef / Algeria

Thermostatic chambers control in laboratories: the beginning of difficulties?
Mr BLANQUART, Mr CRETINON / France

Improving references and dissemination in the field of high-temperatures at LNE-CNAM
Mr SADLI - LCM LNE-CNAM / France & all

Reducing uncertainty in practical temperature calibration based on proposed changes to the mise en pratique for the realisation of the kelvin
Mr LOWE - NPL, Mr WILLMOTT, Mr BROUGHTON - Land Instruments International / UK

Development of a humid air generator based on a dilution principle
Mr GEORGIN, Mr BONDOUX, Mr BERNARD, Mr SALEM - CETIAT / France

Probabilistic approach for uncertainty propagation through a thermal time constant model in case of natural and forced convection
Mr PIERRAT - LJ Consulting & LJK-LAB, Mr GEORGIN - CETIAT / France

Electromagnetic characterisation of materials for industrial applications up to 110 GHz
Mr NDIAYE - LNE / France

Measurement of rail road electrical energy
Mr AGAZAR, Mr POLETAEFF, Mr FORTUNE, Mrs BLANC, Mr FEUILATRE - LNE / France
POSTER - 11:15 to 12:45

ELECTRICITY

- 1 Ω - 10 kΩ high accuracy standard setup for calibration of multifunction electrical instruments
  Mr. Capra, Mr. Galliana, Mr. Lanzillotti, Mr. Serazio - INRIM / Italy

- Grid-based computational algorithm for accurate AC conductivity measurements
  Mr. Poxtilov, Mr. Paker, Mr. Kubarsepp - University of Tallinn and Metosert, Mr. Martens - University of Tallinn, Mr. Kolyskin - University of Riga / Estonia

- Automatic bench for current transformer calibration
  Mr. Belleres, Mr. Agazar - LNE / France

- Traceability of 5-parameter measurement at intermediate frequencies (100 kHz – 10 MHz).
  Mr. Zadie, Mr. Pollet, Mrs. Litwin, Mrs. Vincent-Drouar, Mr. Allal - LNE / France

- Improvement of the accuracy of the logometric impedance meters in wide frequency range
  Mr. Surdu, Mr. Lameko, Mr. Paniach - Ukrometrostandar / Ukraine

- Development of a reference Phasor Measurement Unit for the grid monitoring
  Mr. Ndjimabaka, Mrs. Blanc - LNE / France

- Conception of a platform for magnetic compass calibration
  Mr. Le Men - SHOM / France

- An interlaboratory comparison programme on high frequency electromagnetic field measurements in a controllable environment performed in Greece
  Mr. Karabetsos - Greek Atomic Energy Commission / Greece

- Calibration system developed for harmonic measurements with DFT techniques
  Mr. Pinto, Mr. Steemer, Mrs. Foiatto - University of Rio Grande do Sul / Brazil

- Development of an Arduino shield for measurement and characterisation of resistive sensors
  Mr. Donato, Mr. Alosio, Mr. Neri - University of Messina, Mrs. Latino - CNR, Mr. Capra, Mr. Galliana - INRIM / Italy

- Institutional system of the federal electricity commission
  Mrs. Montoya, Mrs. Santaella - Comision Federal de Electricidad / Mexico

TIME / FREQUENCY

- Time as unique base quantity
  Mr. Dragun - GDF DATA BANKS / Romania

- Compact atomic clock prototype based on coherent population trapping
  Mr. Danet, Mr. Yun, Mrs. Kozlova, Mr. Guermanel, Mr. De Clercq - LNE SYRTE / France

- Time and frequency measurement standards of Ukraine
  Mr. Nyezhmakov, Mr. Romanko, Mr. Prokopov - Institute of Metrology / Ukraine

MANAGEMENT

- Internationally accepted IT security standards and legal metrology
  Mr. Thiel, Mr. Hartmann, Mr. Grottker, Mr. Richter - PTB / Germany

- Installation of a reference material production laboratory
  Mrs. Bothorel - Manumesure / France

- Club of accredited laboratories: sharing experience, crossed audits and improvement of the quality of measurements
  Mr. Bouillion - CT2M / France

- Centre for intercomparisons
  Mrs. Hajradinovic, Mrs. Jonasson - SP / Sweden

- Methods validation: NF T90-210 or NF V03-110?
  Mr. Geinet - CT2M / France

OPTICS AND SOFT METROLOGY

- A new approach to bandwidth correction in spectrometer measurements using the Richardson-Lucy method
  Mr. Eckstadt, Mr. Schmailling, Mr. Wubbele, Mr. Kruger, Mr. Elster - PTB / Germany

- Strain fields measurement of non rigid solid by scanning laser coupled with a camera
  Mr. Rahel, Mr. Wang, Mr. Roy, Mr. Fontaine - University of Bourgogne / France

- Hyperspectral imaging: a tool for biological measurements
  Mr. Pisanl, Mr. Zucco, Mrs. Caricato, Mrs. Egidi - INRIM / Italy

- A high resolution set up devoted to the measurement of the bidirectional reflectance distribution function around the specular peak at LNE-CNAM
  Mrs. Ouaret, Mrs. Kambouris - LNE-LNE-CNAM / France

- Characterisation of the cryogenic radiometer at new laser wavelengths
  Mrs. Coutin, Mr. Bouard - LCM LNE-CNAM / France

- Traceable radiometry for remote measurement of climate parameters
  Mr. Eterline, Mr. Dubard - LNE / France

- News from the IPQ’s primary photometry laboratory
  Mr. Pires, Mr. Nunes, Mrs. Laundos, Mr. Pellegrino, Mrs. Filippe - IPQ / Portugal

- Assurance of metrological traceability of results obtained by the use of computerised instruments
  Mrs. Sapozhnikova, Mr. Tapanov - Mendeleiev Institute for Metrology / Russia
The Collège Français de Métrologie and Hexagon Metrology are pleased to welcome you.

**WEDNESDAY 9 OCTOBER FOR METROLOGY 2013 EVENING DINNER**

Upon registration

Get the better of your metrology

[QR Code]
LOCATION OF THE CONGRESS
PARIS EXPO PORTE DE VERSAILLES - Pavilion 7.2
1 place de la Porte de Versailles - 75015 PARIS - France - www.viparis.com

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Congress fees include:
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• catalogue of the exhibition,
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Cancellations must be sent to the General Secretary before September 20, 2013. The seminar fee payment will then be returned by bank transfer after the congress with a deduction of 120€ for administration costs. Cancellations received after September 20, 2013 will not be refunded.

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All presentations will be held in French or English and will be simultaneously translated.

HOTELS
Information on www.metrologie2013.com, link “How to get there”.

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<thead>
<tr>
<th>Session</th>
<th>Date</th>
<th>Price Before 30 June</th>
<th>Price After 30 June</th>
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<tbody>
<tr>
<td>Tuesday 6, afternoon</td>
<td>CEA</td>
<td>80 Euros TTC</td>
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<tr>
<td>Wednesday 9, afternoon</td>
<td>PEUGEOT</td>
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<td>Thursday 10, morning</td>
<td>LNE</td>
<td>80 Euros TTC</td>
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I am interested in the sessions:

- Tuesday 8, afternoon: CEA
- Wednesday 9, afternoon: PEUGEOT
- Thursday 10, morning: LNE

Limited places, registration allocated in order of booking

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