




TUESDAY 17

8.00	9.00	10.30	11.15	11.45	13.00	14.00	15.35	16.05	17.30
WELCOME	OPENING SESSION	S1 ADVANCES IN GAS METROLOGY							
		S2 INDUSTRIAL INNOVATION							

WEDNESD. 18

8.00		9.00		10.30		11.00		12.30		13.30		14.30		15.00		16.00		19.00		
WELCOME	SHORT COURSES																			GALA DINNER
	Accreditation				Uncertainties				Optical technics				Hydrogen quality							
	POSTER SESSION & EXHIBITION																			

THURSDAY 19

8.00	9.00	9.45	10.55	11.25	13.00	14.00	16.00	16.30
			♀	♀	♀	♀		
WELCOME	PLENARY SESSION	S3-1 ENERGY TRANSITION    The journey towards decarbonisation					CLOSING SESSION	
		S4 CLIMATE AND AIR QUALITY      S3-2 ENERGY TRANSITION Hydrogen						

FRIDAY 20

9.00	13.00	14.00	17.00
EXHIBITION & NETWORKING			



## 09.00 OPENING SESSION

Cosimi CORLETO - **CFM President**  
Annarita BALDAN & Martine CARRÉ - **GAS2022 Co-chairs**  
Robert WIELGOSZ - **BIPM Chemistry Department Director**

### S1 ADVANCES IN GAS METROLOGY

Chair: Dr Paul BREWER - **NPL**

- 10.30 Developments in standardisation in ISO/TC 158 between 2019 and 2022.  
Adriaan VAN DER VEEN - **VSL**
- 10.55 Equivalence of primary standards for nitrogen dioxide measurements.  
Edgar FLORES JARDINES - **BIPM**
- 11.45 Development of a reference standard to ensure the quality of the ammonia measurements performed in France. Taniana MACÉ - **LNE**
- EURAMET 12.10 Results of an international proficiency test for the measurement of soloxanes and total silicon in biomethane. Lucy CULLETON - **NPL**
- 12.35 Real-time mass spectrometry: from unravelling electrochemical reaction mechanism to trace analysis of impurities in hydrogen gas. Peyman KHANIPOUR - **BAM**
- EURAMET 14.00 Gas reference materials for underpinning atmospheric measurements of stable isotopes of nitrous oxide. Aimee HILLIER - **NPL**
- EURAMET 14.25 Realisation of gas reference materials of CO<sub>2</sub> in air at known isotopic composition. Francesca DURBIANO - **INRIM**
- EURAMET 14.50 Improved cryo filling system for filling SI-traceable reference gas mixtures into cylinders. Tobias BÜHLMANN - **METAS**
- EURAMET 15.15 Stable isotope reference materials of carbon dioxide. Eric MUSSEL WEBBER - **NPL**
- EURAMET 16.05 PROMETH2O - Metrology for trace water in ultra-pure process gases. Vito C. FERNICOLA - **INRIM**
- 16.30 Towards traceable HCl reference gas standards. Stefan PERSIJN - **VSL**
- 16.55 Stability study of hydrogen sulphide reference gas mixtures produced in support of air quality monitoring in South Africa. Nompumelelo LESHABANE - **NMISA**

### S2 INDUSTRIAL INNOVATION

Chair: Mrs Tracey JACKSIER - **AIR LIQUIDE**

- 10.30 Analyzer for measuring the composition of natural gas containing high amounts of hydrogen—a cost effective approach. Konstantin HARR - **SIEMENS**
- 10.55 Real time measurements of carbon dioxide in natural gas liquids recovery process with online TDLAS based analyzer. Airat AMEROV - **AMETEK**
- 11.45 Characterization by TD-GC×GC-TOFMS of volatile organic impurities in renewable gases produced by pyrogasification and methanation.  
Agathe LEGENDRE - **ESPCI PARIS**
- 12.10 A novel optical detection method for cooled-mirror dew point measurements of natural gas. Andrew BENTON & Andrew STOKES - **MICHELL INSTRUMENTS**
- 12.35 NGD as gas detectors and their use in process gas chromatographs.  
Eric COLINET - **APIX ANALYTICS**
- 14.00 Quantum cascade laser cavity ring-down spectroscopy analyzers for PPT-level CO and CO<sub>2</sub> detection. Erika COYNE - **TIGER OPTICS**
- 14.25 Process analytics for hydrogen liquefier and purity monitoring.  
Frederic THIELAND - **SIEMENS**
- 14.50 Reactive gas mixtures stability investigation with advanced builtin regulators.  
Jean-Luc BLANC - **AIR LIQUIDE**
- 15.15 Probing gas evolution in the field of Li-ion batteries. Cyril MARINO - **SERMA**
- EURAMET 16.05 Innovative calibration strategies for quality assurance and quality control of reactive trace gas analyzers. Ruthger VAN ZWIETEN - **PICARRO**
- 16.30 The adaptation of the accredited laboratory to provide ISO 17034 certified reference materials and the analysis of the new breed of fuel gases.  
Jessica SPINDLER - **EFFECTECH**
- 16.55 How does the new international recommendation OIML R 126 (2021) support the use of a test gas simulating human breath with different environmental conditions to test the Evidential Breath Analysers? Laetitia DELETTE - **LNE**
- EURAMET 17.20 The quantumPascal EMPIR project: novel traceability of gas pressures to the new SI.  
Tom MOSES RUBIN - **PTB**

17.30 COCKTAIL

09.00

## SHORT COURSES & POSTER SESSION

09.00

### SHORT COURSE

Accreditation in gas analysis. Tatiana MACÉ - **LNE** & Werner WETERINGS - **AIR LIQUIDE**



11.00

### SHORT COURSE

Validation of methods and uncertainty. Adriaan VAN DER VEEN - **VSL**



13.30

### SHORT COURSE

An overview of optical technics for gas measurement. Lucien LONIGRO - **AP2E**



15.00

### SHORT COURSE

Hydrogen quality assurance (covering heat, industry and transport applications). Arul MURUGAN - **NPL**

### POSTERS \*



- Absorption spectroscopy for partial pressure assessments in metrology (Activity of the quantumPascal EU-project). André KUSSICKE - **PTB**
- Development of a new spot online analysis method to control H<sub>2</sub> quality on hydrogen refueling station. Mathilde RIZAND - **ENGIE LAB CRIGEN**
- Influence of gas transport on the temperature and thus on the pressures assessed with quantum-based methods (Activity of the quantumPascal EU-project). Clayton FORSSÉN - **UMEA UNIVERSITY**

- On demand calibration gases. Damien FERNANDEZ - **ALYTECH**
- Long-term atmospheric monitoring of background CH<sub>4</sub> and CO<sub>2</sub> at mace head atmospheric research station, Ireland using LI-COR LI-7810 and LI-7815 trace gas analyzers. Graham LEGGETT - **LI-COR BIOSCIENCES**
- Development of an experimental platform for metrological performance evaluation of sensor system. Alexandre BESCOND - **LNE**
- Calorific value of energy gases - The reference gas combustion calorimeter of LNE-LCM and its deployment for the determination of gross calorific values of two gas mixtures. Refat RAZOUK - **LNE**

### POSTERS \*

- Development of analytical strategy for online comprehensive characterization on site of CO<sub>2</sub> "off-gas" coming out gas upgrading on landfill gas. Etienne BASSET - **ENGIE LAB CRIGEN**
- Towards stable static reference gas standards for hydrogen chloride in nitrogen at 10 µmol/mol. Annarita BALDAN - **VSL**
- New data on solid formation in liquefied natural gas. Paul HOLLAND - **EFFECTECH**
- Evaluation of the performances of commercial analyzers dedicated to natural gas/hydrogen blends. Sami NICOLAS - **GRTGAZ RICE**
- On-line measurement of the biomethane energy, quality and odorization by one dedicated MicroGC. Ronan CASTEL-COZIC - **SRA INSTRUMENTS**
- Developing a metrological concept for laser diagnostics and numerical modelling for energy gas studies using shock tube. Solmaz NADIRI - **PTB**
- Inter-laboratory comparisons and accreditation in the calibration of gas analyzers. Laurent MARTINEZ - **ETALONAIR**
- Stability and homogeneity of gas natural mixtures containing sulfur compounds when subjected to condensation of its components. Francesco PIGAZZINI - **SIAD**
- Influence of the carbon dioxide concentration in the determination of sulfur dioxide using an I.R. analyzer. Laura GAGNI - **SIAD**
- Long-term test to determine the stability of gas mixtures: methodology to ensure the system consistency and stability for gas mixture preparation. Giorgio BISSOLOTTI - **SIAD**
- Optimal total analytical solution for fuel-cell-grade hydrogen using cavity ring-down spectroscopy and mass spectrometry. Benjamin MATTEIET - **TIGER OPTICS**
- Latest developments in measuring low concentrations of CO, NO<sub>x</sub> and SO<sub>2</sub> for emission monitoring according EN15267-3. Camiel HEFFELS - **SIEMENS**
- High-speed refinery gas analyzer as efficient solution for oil industry. Omar MAYORGA - **SHIMADZU**
- Hydrogen impurity analysis with the agilent 8890 GC/PDHID system and agilent 990 Micro GC platform. Laurent PASCAUD - **AGILENT**

\* Posters will be displayed all the symposium long in the exhibition area.  
Two time slots are dedicated for the poster session: from **11.00 to 12.30** and from **13.30 to 15.00**.  
During these two time slots, each author will present her of his poster, will answer any question or discuss research results in more detail.

19.00 BOAT CRUISE & GALA DINNER - LE BISTRO PARISIEN

09.00

## PLENARY SESSION

Mrs Maguelonne CHAMBON - **LNE**  
Mrs Annarita BALDAN - **VSL**  
Mrs Céline PASCALE - **METAS**  
Mrs Sophie LARDY-FONTAN - **LNE**

EURAMET / European Partnership on Metrology  
EMN for Energy Gases  
EMN for Climate and Ocean Observation  
proposed EMN for Pollution Monitoring

### S3-1 ENERGY TRANSITION *The journey towards decarbonisation* Chair: Mr Paul HOLLAND - **EFFECTECH**

- 09.45 Decarbonising the Gas Grid. Arul MURUGAN - **NPL**
- 10.10 Improvement of the European quality infrastructure for the measurement of sulfurcontent of biogas and biomethane. Jianrong LI - **VSL**
- 10.35 Conversion of a natural gas pipeline to hydrogen transport and the effects of impurities on the hydrogen quality. Henk TOP - **DNV**



- 11.25 Remove technical barriers to use biomethane as fuel and injection into natural gas grids. Christophe ERHEL - **AFG ASSOCIATION FRANÇAISE DU GAZ**
- 11.50 Development of standardized methods for the monitoring of amines, terpenes and ammonia in biomethane. Béatrice SANZ - **GRTGAZ RICE**
- 12.15 Siloxane measurement in biomethane: an update on ASTM D8230-19 and evaluation of online siloxane measurement. Russell BORA - **GTI ENERGY**
- 12.40 Measurement support for transition fuels and renewable gases. Matthew HAMMOND - **EFFECTECH**



- 14.00 Return-of-experiments for syngas and bioSNG quality monitoring during R&D studies for biomass and waste (RDF) gasification and methanation. Etienne BASSET - **ENGIE LAB CRIGEN**
- 14.25 Reducing uncertainty in natural gas analysis. Rob STRIK - **PAC**
- 14.50 High-pressure density data of hydrogen-containing natural gases for the extension of equation-of-state models. Dirk TUMA - **BAM**
- 15.15 SGERG-mod-H2 the revitalised SGERG88 equation of state for hydrogen-enriched natural gases. Jos VAN DER GRINTEN - **PTB**
- 15.40 New sensor(s) for gas quality monitoring of current, emerging and future energy gas mixtures. Tony WIMPENNY - **ENDET**

### S4 CLIMATE AND AIR QUALITY Chair: Mr Stefan PERSIJN - **VSL**

- 09.45 Carbon and oxygen isotope fractionation of pressurized CO2 as a function of temperature. Tracey JACKSIER - **AIR LIQUIDE**
- 10.10 Improvement of reactive trace gases measurement methods. Therese SALAMEH - **IMT LILLE DOUAI**
- 10.35 Protocol for SI-traceable measurement results of elemental mercury concentrations in air. Iris DE KROM - **VSL**



- 11.25 An SI-traceable transmission curve reference material to improve comparability of proton transfer reaction mass spectrometry (PTR-MS) measurements. David R. WORTON - **NPL**
- 11.50 Monitoring pesticides in ambient air: method harmonization thanks to an analytical inter-laboratory comparison (ILC). Béatrice LALERE - **LNE**
- 12.15 Continuous monitoring of vocs up to pahs using automatic thermal desorption-gas chromatography. Fabien DEPRETTI - **CHROMATOTEC**
- 12.40 Efficient, scalable, SI-traceable, and automated characterization of low-cost sensor systems. Maitane ITURRATE-GARCIA - **METAS**



### S3-2 ENERGY TRANSITION Hydrogen Chair: Mr Valentijn VAN MISPELAAR - **SHELL GLOBAL SOLUTIONS**

- 14.00 The importance of analytical equivalence in underpinning hydrogen-fuel quality assurance. Abigail MORRIS - **NPL**
- 14.25 Combination of OFCEAS spectroscopy and low pressure sampling, a solution for determining traces for the purity of hydrogen. Etienne SMITH - **AP2E**
- 14.50 Humidity response time testing facility for hygrometers used in hydrogen quality applications. Paul CARROLL - **NPL**
- 15.15 Innovations in FT-IR spectroscopy for enhanced sensitivity in hydrogen analysis. Jay ROBERTS - **THERMO FISHER**
- 15.40 Evaluating analysis methods for measuring low level sulfur in hydrogen. Koen VINK - **PAC**

16.00 CLOSING SESSION



09.00

## EXHIBITION & NETWORKING



17.00

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