

Page	
2-3	Forewords / Vorwort
4-5	Programmes at a Glance / Programmübersicht
5	Opening Ceremony and AMA Innovation Award / Eröffnungsfeier und AMA Innovationspreis
6	Comittees / Beiräte
7	Floor Plan / Raumübersicht
8-11	Conference Programme, Tuesday, 19 May 2015
12-13	Poster Session, Tuesday, 19 May 2015
14-19	Conference Programme, Wednesday, 20 May 2015
20-25	Conference Programme, Thursday, 21 May 2015
26	Journal of Sensors and Sensor Systems (JSSS)
27	How to get to the Conferences / Anreise Exhibition / Ausstellung SENSOR+TEST
28	Conference Information / Kongressinformationen Registration Form / Anmeldung

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Vereinigte Fachverlage



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Service Company of AMA  
Association for Sensor and Measurement

## AMA Conferences 2015

Nuremberg Exhibition Centre, Germany

**19. – 21.5.2015**

## SENSOR 2015

17th International Conference  
on Sensors and Measurement  
Technology

## IRS<sup>2</sup> 2015

14th International Conference  
on Infrared Sensors & Systems



## Welcome to the AMA Conferences 2015

A cordial welcome on behalf of the Executive Board and the Science Committee of the AMA Association for Sensors and Measurement to all session chairs, presenters, and participants of the AMA Conferences 2015.

It is our pleasure to present the AMA Conferences SENSOR and IRS<sup>2</sup>, which not only offer a high-quality program, but also a record number of contributions, and thus continue the successful development of these conferences.

Traditionally, these conferences attract an interested audience of experts dealing with the latest research results. The purpose of the AMA conferences is to provide scientists from universities, research institutes, and industry an opportunity to exchange ideas and thus to promote cooperation in the multidisciplinary areas of sensors and measurement technology.

Success stories – especially of small and medium-sized enterprises that were able to attain a prominent position on the world market – have their roots in this very network. Therefore, we are pleased to see how novel ideas from the AMA conferences are first published in AMAs open access 'Journal of Sensors and Sensor Systems' (JSSS) and then, typically within a few years, introduced in the market and presented as innovations at the SENSOR+TEST Fair.

It is precisely at this transition point at which the AMA Association grants its AMA Innovation Award during the opening ceremony of the SENSOR+TEST. The renowned award acknowledges exceptional research and development projects with clear market potential. This interaction between the SENSOR+TEST and the AMA Conferences not only provides novel ideas for tomorrow's solutions, but also serves the AMA Association's main objective: to support networking between the many innovators in sensor and measurement technology.

Our special thanks to the chairmen of the conferences, the session chairs, and the lecturers. Their commitment is the foundation for the success of the AMA Conferences as a platform for the discussion of scientific ideas and as an innovation driver for the sensor industry.



Wolfgang Wiedemann  
Sensor-Technik Wiedemann GmbH  
Chairman of the AMA Association  
for Sensors and Measurement



Prof. Dr. Andreas Schütze  
Saarland University,  
Lab for Measurement Technology  
Chairman of the AMA Science Committee

**Welcome to the 2015 SENSOR  
Conference in Nuremberg**

On behalf of our colleagues of the Programme Committee and the organiser, AMA Service GmbH, we'd like to cordially invite you to the 2015 SENSOR Conference. Once again, the conference will be held at Nuremberg Exhibition Centre in conjunction with SENSOR + TEST 2015: the 22th International Trade Fair for Sensor and Measuring Technologies. Welcome to the Metropolitan region of Nuremberg. This region is famous for a long tradition of extraordinary science and inventions in various fields of technology.

The 2015 SENSOR Conference is dedicated to novel technologies in the field of sensors and sensor systems as well as test and measurement. Oral and poster sessions on the latest research results in sensor technology and related subjects will be held. The interesting topics include gas-, chemical- and biosensors, optical sensors, as well as acoustic sensors. Furthermore, there will be structured sessions covering new sensor technologies, sensor modelling, flow measurement, medical- and bio-sensors, optical sensors, calibration and maintenance.

During the recent two decades, the Nuremberg SENSOR Conference has advanced to be a major part of the international conference scene in sensorics, with a still growing number of attendees. We will have 4 to 5 oral session blocks in parallel each conference day.

Each conference day will start with a plenary talk on emerging sensor topics, such as adaptive optical technologies, microwave sensor technologies, sensors and actuators for intelligent materials and, nanotechnologies in sensorics. The plenary sessions will be accompanied by structured sessions on related topics.

Surely, the 2015 SENSOR Conference will again be an interesting and exciting forum for engineers and scientists working on development, research, and application of sensors and measuring. Traditionally, this conference is also establishing a close link between universities, research institutes and industry.

We are looking forward to an exciting and informative 2015 SENSOR Conference and hope to see you in Nuremberg.



Reinhard Lerch  
University Erlangen-Nuremberg



Roland Werthschützky  
Technical University Darmstadt

Chairman of SENSOR Conference Committee



**Welcome to the 14th International IRS<sup>2</sup>  
Conference!**

On behalf of the Program Committee and the organizers I would like to invite you cordially to come to Nuremberg and to participate in the IRS<sup>2</sup> Infrared Sensors & Systems Conference.

Currently, IR sensors and systems are a very dynamic field not only in research and development but also as an enabling technology for plenty of applications in process control, building services, household appliances as well as in the huge field of safety and security. The IRS<sup>2</sup> 2015 Conference will again consider this industrial importance by picking up the most recent trends, results and products – after the great success two years ago – in a special session “Recent Developments in IR Industry”. IR components and systems, spectroscopy and gas analysis as well as measurement signal processing are other focal points in this year.

Since its beginning it has been always the goal of the IRS<sup>2</sup> Conference that developers, manufacturers and users of infrared components and systems present their latest research results and products to be discussed with scientists and engineers. We are sure that IRS<sup>2</sup> 2015 again will be a connecting link between research, development and application as well as between industry, research institutions and academia in all fields of infrared sensor technology.

The IRS<sup>2</sup> Infrared Sensors & Systems Conference complements the SENSOR 2015 Conference and the SENSOR+TEST fair. This enables excellent opportunities to widen the horizon, to establish contacts with prospective business partners and to benefit from this platform for information, communication, and professional exchange.

We are looking forward to meeting you in Nuremberg!



G. Gerlach, Technical University Dresden  
Chairman of IRS<sup>2</sup> Conference Committee



## SENSOR 2015

Part A  
NCC West, Room London

Tuesday, 19 May 2015

## SENSOR 2015

Part B  
NCC West, Room Amsterdam

Tuesday, 19 May 2015

## SENSOR 2015

Part C  
NCC West, Room Venedig

Tuesday, 19 May 2015

10:00 Opening Ceremony

Opening address  
Opening speech  
(NCC West, Room London)

Presentation of the AMA Innovation Award 2015

11:45 *Lunch Break*  
13:30 **A1** Force and Torque  
15:00 *Coffee Break and*  
15:00-16:30 *Poster Session*  
16:30 **A2** Mechanical Sensors

11:45 *Lunch Break*  
13:30 **B1** Sensor Design and Modeling  
15:00 *Coffee Break and*  
15:00-16:30 *Poster Session*  
16:30 **B2** MEMS & NEMS

11:45 *Lunch Break*  
13:30 **C1** MEMS Applications  
15:00 *Coffee Break and*  
15:00-16:30 *Poster Session*  
16:30 **C2** Applications

Wednesday, 20 May 2015

Wednesday, 20 May 2015

Wednesday, 20 May 2015

08:30 Plenary Talk  
09:15 Plenary Talk  
(NCC West, Room London)

10:00 *Coffee Break*  
10:30 **A3** Ultrasound I  
12:00 *Lunch Break*  
13:30 **A4** Ultrasound II  
14:50 *Coffee Break*  
15:10 **A5** Acoustic Sensing

10:00 *Coffee Break*  
10:30 **B3** Magneto-resistive Sensors  
12:00 *Lunch Break*  
13:30 **B4** Sensor Materials  
14:50 *Coffee Break*  
15:10 **B5** Packaging

10:00 *Coffee Break*  
10:30 **C3** High Temperature Sensors  
12:00 *Lunch Break*  
13:30 **C4** Medical Sensors  
14:50 *Coffee Break*  
15:10 **C5** Medical Systems

Part A  
NCC West, Room Dublin  
Thursday, 21 May 2015

Part B  
NCC West, Room Amsterdam  
Thursday, 21 May 2015

Part C  
NCC West, Room Venedig  
Thursday, 21 May 2015

08:30 Plenary Talk  
09:15 Plenary Talk  
(NCC West, Room London)

10:00 *Coffee Break*  
10:20 **A6** Material Characterization  
11:50 *Lunch Break*  
13:00 **A7** Impedance Spectroscopy  
14:20 *Coffee Break*  
14:50 **A8** Strain Sensing

10:00 *Coffee Break*  
10:20 **B6** Flow I  
11:50 *Lunch Break*  
13:00 **B7** Flow II  
14:30 *Coffee Break*  
14:50 **B8** Fluid-Structure Interaction Sensing

10:00 *Coffee Break*  
10:20 **C6** Geometrical Measurements  
11:50 *Lunch Break*  
13:00 **C7** Automotive Sensors  
14:20 *Coffee Break*  
14:50 **C8** Calibration & Testing

## SENSOR 2015

Part D  
NCC West, Room Zürich

Tuesday, 19 May 2015

10:00 Opening Ceremony

Opening address  
Opening speech  
(NCC West, Room London)

Presentation of the AMA Innovation Award 2015

11:45 Lunch Break  
13:30 D1 Optical Metrology  
15:00 Coffee Break and  
15:00-16:30 Poster Session  
16:30 D2 Optical Sensors

Wednesday, 20 May 2015

08:30 Plenary Talk  
09:15 Plenary Talk  
(NCC West, Room London)

10:00 Coffee Break  
10:30 D3 Optical Measurement Technology  
12:00 Lunch Break  
13:30 D4 New Technologies  
14:50 Coffee Break  
15:10 D5 Chemical & Bio Sensors

Part D  
NCC West, Room Zürich  
Thursday, 21 May 2015

08:30 Plenary Talk  
09:15 Plenary Talk  
(NCC West, Room London)

10:00 Coffee Break  
10:20 D6 Sensor Electronic  
11:50 Lunch Break  
13:00 D7 Energy Harvesting  
14:20 Coffee Break  
14:50 D8 Signales & Systems

## IRS<sup>2</sup> 2015

NCC West, Room Dublin

Tuesday, 19 May 2015

11:45 Lunch Break  
13:30 Welcome  
13:35 Session 1  
Calibration and Accuracy  
15:00 Coffee Break and  
15:00-16:30 Poster Session  
16:30 Session 2  
Spectroscopy and Gas Analysis

Wednesday, 20 May 2015

10:00 Coffee Break  
10:30 Session 3  
IR Components and Systems  
12:00 Lunch Break  
13:30 Session 4  
Recent Developments in IR Industry

## SENSOR 2015

15:30 E5 Gas Sensors I

Part E  
NCC West, Room London  
Thursday, 21 May 2015

10:00 Coffee Break  
10:20 E6 Gas Sensors II  
11:50 Lunch Break  
13:00 E7 Gas Sensors III  
14:20 Coffee Break  
14:50 E8 Gas Sensors IV

## Opening Ceremony

NCC West, Room London  
Tuesday, 19 May 2015

10:00-10:45 Opening Ceremony

Chairs:

G. Gerlach, Technical University Dresden, (Germany)  
R. Lerch, University Erlangen-Nuremberg, (Germany)  
R. Werthschützky, Technical University Darmstadt,  
(Germany)

10:00-10:20 Opening speech

10:20-10:25 Break

10:25-11:10 Presentation of the AMA Innovation  
Award 2015

W. Wiedemann, Sensor-Technik Wiedemann GmbH,  
Kaufbeuren (Germany), Chairman of the AMA-Board  
A. Schütze, Universität des Saarlandes, Saarbrücken  
(Germany); Chairman of the Jury

The nominated innovations:

**Ultragenaue Frequenzmessung mit kristallinen  
Halbleiterspiegeln**

Prof. Dr. Markus Aspelmeyer, Dr. Garrett Cole, Dr. Christi-  
an Pawlu (Crystalline Mirror Solutions GmbH, Wien)

**Großflächige Nanotopographiemessung spiegelnder  
Oberflächen**

Alexander Tobisch, Dr. Martin Schellenberger, Prof.  
Dr.-Ing. Lothar Pfitzner (Fraunhofer IISB, Erlangen) und  
Daniel Raseghi, Meinrad Spitz (E+H Metrology GmbH)

**Ge-on-Si-Photodiode mit Black-Silicon-Lichtfalle**

Martin Steglich, Dr. Ernst-Bernhard Kley (Fr.-Schiller-Uni-  
versität Jena) und Dr. Michael Oehme, Prof. Jörg Schulze  
(Universität Stuttgart)

**Breitbandiges low-power FMCW-Radar**

**Füllstandsmessgerät**

Dr. Christoph Schmits, Dr. Michael Vogt (KROHNE Inno-  
vation GmbH, Duisburg) und Prof. Dr. Nils Pohl, Timo  
Jaeschke, Christian Schulz (Ruhr-Universität Bochum)

**Tachyon1024 Microcore SWaP-C, 1 kHz ungekühlter MWIR  
Bildwandler für industrielle Anwendungen**

Dr. Germán Vergara, Rodrigo Linares, Raul Gutierrez,  
Arturo Baldasano (New Infrared Technologies S.L.,  
Boadilla del Monte)

**lumiMEMS : Basistechnologie zum Auslesen von Chemo-  
sensoren basierend auf Microcantilevern**

Dr. Gino Putrino, Prof. Adrian Keating, Prof. Mariusz  
Martyniuk, Prof. Lorenzo Faraone, Prof. John Dell  
(University of Western Australia)

11:10-11:20 Pictures of the Nominates

11:20 Lunch Break

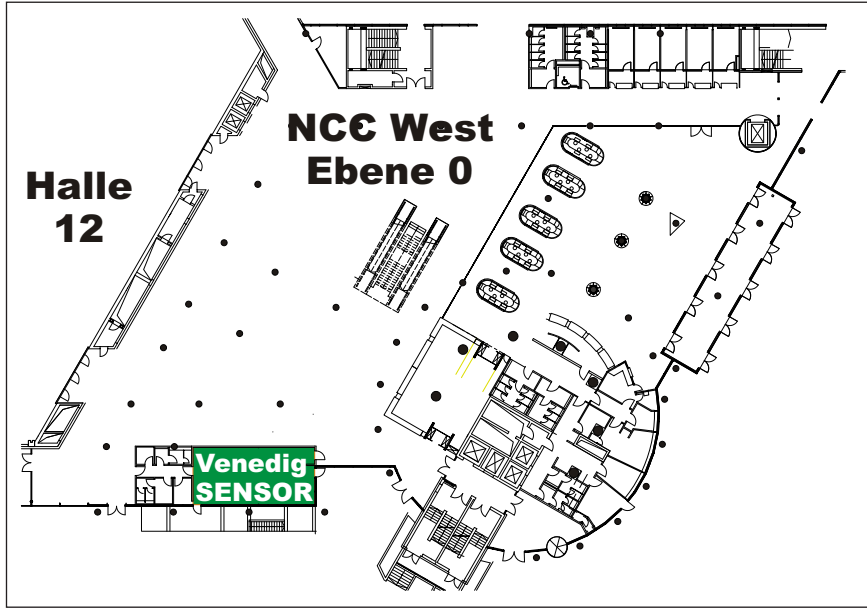
## SENSOR Conference Committee

Prof. Dr. R. Lerch (chairman)	University Erlangen-Nuremberg, Erlangen (Germany)
Prof. Dr. R. Werthschützky (chairman)	Technical University Darmstadt, Darmstadt (Germany)
<b>Members</b>	
Prof. Dr. S. Büttgenbach	Technical University Braunschweig, Braunschweig (Germany)
Dr. C. Cavalloni	Kistler Instrumente AG, Winterthur (Switzerland)
Prof. Dr. J. Czarske	Technical University Dresden, Dresden (Germany)
Prof. Dr. W. Daum	Federal Institute for Materials Research and Testing (BAM), Berlin (Germany)
Prof. Dr. F. L. Dickert	University Wien, Wien (Austria)
Dr. W. Drahm	Endress+Hauser GmbH+Co. KG, Freising (Germany)
Prof. Dr. G. Fischerauer	University Bayreuth, Bayreuth (Germany)
Prof. Dr. M. Fleischer	Siemens, München (Germany)
Prof. Dr. B. Henning	University Paderborn, Paderborn (Germany)
Prof. Dr. B. Jakoby	Johannes-Kepler-University Linz, Linz (Austria)
Dr. U. Kaiser	Endress+Hauser GmbH+Co. KG, Reinach (Switzerland)
Prof. Dr. M. Kaltenbacher	Technical University Wien, Wien (Austria)
Prof. Dr. O. Kanoun	Technical University Chemnitz, Chemnitz (Germany)
Prof. Dr. A. König	Technical University Kaiserslautern, Kaiserslautern (Germany)
Prof. Dr. W. Lang	University Bremen, IMSAS Bremen (Germany)
Prof. Dr. H. J. Lilienhof	Westfälische Hochschule, Gelsenkirchen (Germany)
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Prof. Dr. R. Moos	University Bayreuth, Bayreuth (Germany)
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K. Pfaller	Audi AG, Ingolstadt (Germany)
Prof. Dr. F. Puente Leon	Karlsruher Institute of Technology KIT, Karlsruhe (Germany)
Prof. Dr. L. Reindl	Albert-Ludwigs-University Freiburg, Freiburg (Germany)
Dr. A. Schäfer	Hottinger Baldwin Messtechnik GmbH, Darmstadt (Germany)
Prof. Dr. G. Scholl	University of the Federal Armed Forces Hamburg, (Germany)
Dr. A. Schubert	MSA Technologies and Enterprise Services GmbH, Berlin (Germany)

Prof. A. Schütze	University of the Saarland, Saarbrücken (Germany)
Prof. Dr. M. Sellen	MICRO-EPSILON Messtechnik GmbH & Co. KG, Uhingen (Germany)
Prof. Dr. K. D. Sommer	Physikalisch-Technische Bundesanstalt, Braun- schweig (Germany)
P. Spies	Fraunhofer-Institut -IIS-, Nürnberg (Germany)
Prof. Dr. H.-R. Tränkle	Grünwald (Germany)
Prof. Dr. T. Tschudi	Darmstadt (Germany)
Prof. Dr. R. Tutsch	University Braunschweig, Braunschweig (Germany)
Prof. Dr. G. A. Urban	Albert-Ludwigs-University Freiburg, Freiburg (Germany)
Prof. Dr. M. J. Vellekoop	University Bremen, IMSAS Bremen (Germany)
Prof. Dr. E. Wagner	Freiburg (Germany)
Prof. Dr. A. Weckenmann	Friedrich-Alexander-University Erlangen-Nuremberg, Erlangen (Germany)
Prof. Dr. J. Wilde	Albert-Ludwigs-University Freiburg, Freiburg (Germany)
Prof. H. Yamasaki	Tokio (Japan)
Prof. Dr. B. Zagar	Johannes-Kepler-University Linz, Linz (Austria)
Prof. Dr. St. Zimmermann	Leibniz University Hannover, Hannover (Germany)

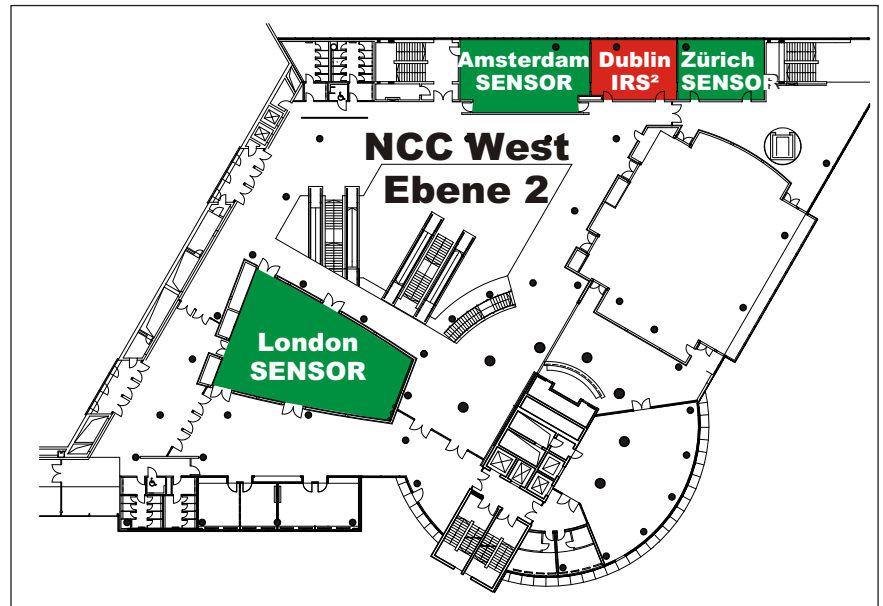
## IRS Conference Committee

Prof. Dr. G. Gerlach (chairman)	Technical University Dresden, Dresden (Germany)
Prof. Dr. G. Hofmann	DIAS Infrared, Dresden, Dresden (Germany)
Dr. J. Hollandt	Physikalisch-Technische Bundesanstalt, Berlin (Germany)
Dr. U. Kienitz	Optris GmbH, Berlin (Germany)
Prof. Dr. W. Minkina	Czestochowa University of Technology, Czestochowa (Poland)
Prof. Dr. K.-P. Möllmann	Fachhochschule Brandenburg, Brandenburg (Germany)
Dr. R. Riesenberg	Leibniz Institute of Photonic Technology (IPHT), Jena (Germany)
Dr. J. Schieferdecker	Heimann Sensor GmbH, Dresden (Germany)
Dr. H. Schlemmer	Airbus DS Optronics GmbH, Oberkochen (Germany)
Prof. Dr. M. Tacke	Fraunhofer Institute IOSB, Ettlingen (Germany)
Dr. M. Walther	Fraunhofer Institute IAF, Freiburg (Germany)
Dr. J. Wendler	AEG Infrarot Module, Heilbronn (Germany)



Level 0

Level 2



## SENSOR 2015 - Part A

NCC West, Room London

## SENSOR 2015 - Part B

NCC West, Room Amsterdam

## SENSOR 2015 - Part C

NCC West, Room Venedig

NCC West (Room London)

**10:00 - 10:45 Opening Ceremony**

Chairs:

G. Gerlach, Technical University Dresden, Dresden (Germany),  
R. Lerch, University Erlangen-Nuremberg, Erlangen (Germany),  
R. Werthschützky, Technical University Darmstadt, Darmstadt (Germany)

**10:00 - 10:20 Opening address**

10:20 - 10:25 Break

10:25 - 11:10 Presentation of the AMA Innovation Award 2015

**11:10 - 11:20 Pictures of the Nominees**

11:20 *Lunch Break*

### **A1: Force and Torque**

Chair: A. Schäfer, Hottinger Baldwin Messtechnik GmbH, Darmstadt (Germany)

13:30

#### **A1.1 Build up systems for calibration tasks**

T. Kleckers, Hottinger Baldwin Messtechnik GmbH, Darmstadt (Germany)

14:00

#### **A1.2 Processing and evaluation of measured data from build-up systems with special regard to various designs**

M. Wagner, Physikalisch-Technische Bundesanstalt (PTB), Braunschweig (Germany)

14:20

#### **A1.3 Measurement and traceability of torque on large drives**

G. Beaho, Hottinger Baldwin Messtechnik GmbH, Darmstadt (Germany)

14:40

#### **A1.4 Dynamic Calibration of a Multi-Component Force-/Torque Transducer**

J. Schleichert, T. Fröhlich, Ilmenau University of Technology, Ilmenau (Germany)

15:00 *Coffee Break*

11:20 *Lunch Break*

### **B1: Sensor Design and Modelling**

Chair: A. Hauck, SIMetris GmbH, Erlangen (Germany)

13:30

#### **B1.1 Light weight signal processing for a wireless capacitive sensing platform for mobile applications**

St. Mühlbacher-Karrer, H. Zangl, Institute of Smart System Technologies, Klagenfurt (Austria)

14:00

#### **B1.2 Identification of temperature-dependent model parameters of ultrasonic piezo-composite transducers**

M. Webersen, F. Bause, J. Rautenberg, B. Henning, University of Paderborn, Paderborn (Germany)

14:20

#### **B1.3 Simulation driven development of a novel ultrasonic liquid level sensor**

A. Hauck, M. Meiler, SIMetris GmbH, Erlangen (Germany)

14:40

#### **B1.4 Finite element simulation of surface acoustic wave-based sensors**

K. Shaposhnikov, M. Kaltenbacher, Vienna University of Technology, Vienna; P. Nicolay, Carinthian Tech Research (CTR AG), Villach (Austria)

15:00 *Coffee Break*

11:20 *Lunch Break*

### **C1: MEMS Applications**

Chair: J. Vellekoop, University Bremen, IMSAS, Bremen (Germany)

13:30

#### **C1.1 Sensorial surfaces for condition-based maintenance**

C. Winkelmann, Winkelmann Mikrosysteme, Bremen (Germany)

14:00

#### **C1.2 Dark field particle tracking with enhanced sizing precision by confining particles**

C. Haiden, F. Keplinger, Vienna University of Technology, Vienna (Austria); T. Wopelka, M. Jech, AC<sup>2</sup>T research, Wiener Neustadt (Austria); M. J. Vellekoop, University of Bremen, Bremen (Germany)

14:20

#### **C1.3 Human serum from kidney cancer patients analyzed with a new sensitive Fast Liquid Differential Scanning Calorimetry sensor**

R. Splinter, A.W. van Herwaarden, Xensor Integration BV, Delfgauw (The Netherlands); S. Pastorekova, Slovak Academy of Sciences, Bratislava (Slovak Republic)

14:40

#### **C1.4 Characterization of Si Mid-infrared Photonic Components for Chemical and Gas Sensing**

U. Hedenig, T. Grille, Infineon Technologies Austria AG, Villach (Austria); G. A.D. Ritchie, J. M. Kirkbride, University of Oxford, Oxford (United Kingdom); V. Lavchiv, B. Jakoby, Johannes Kepler University, Linz (Austria)

15:00 *Coffee Break*

Poster Session 15:00 - 16:30 - see pages 12 - 13



NCC West (Room London)

10:00 - 10:45 **Opening Ceremony**

Chairs:

G. Gerlach, Technical University Dresden, Dresden (Germany),  
R. Lerch, University Erlangen-Nuremberg, Erlangen (Germany),  
R. Werthschützky, Technical University Darmstadt, Darmstadt (Germany)

10:00 - 10:20 **Opening address**

10:20 - 10:25 Break

10:25 - 11:10 Presentation of the AMA Innovation Award 2015

11:10 - 11:20 **Pictures of the Nominatees**

11:20 *Lunch Break*

**D1: Optical Metrology**

Chair: P. Lehmann, University Kassel, Kassel (Germany)

13:30

**D1.1 Speckle-Insensitive Laser-Doppler Vibrometry with Adaptive Optics and Signal Diversity**

C. Rembe, A. Dräbenstedt, Polytec GmbH, Waldbronn (Germany)

14:00

**D1.2 Hybrid optical sensor for extreme temperature measurement in next generation higher efficiency greener power plants**

N. A. Riza, University College Cork (UCC), Cork (Ireland)

14:20

**D1.3 Multi-sensor system for dynamic deformation and vibration measurements at high speed rotors**

K. Philipp, R. Kuschmierz, A. Fischer, J. Czarske, Laboratory of Measurement and Testing Techniques, Dresden; A. Filippatos, A. Langkamp, M. Gude, Institute of Lightweight Engineering and Polymer Technology, Dresden (Germany)

14:40

**D1.4 Photovoltaic cells with increased voltage output for optical power supply of sensor electronics**

H. Helmers, C. E. Garza, L. Wagner, S. K. Reichmuth, E. Oliva, D. Lackner, S. P. Philipps, A. W. Bett, Fraunhofer Institute for Solar Energy Systems (ISE), Freiburg (Germany)

15:00 *Coffee Break*

11:20 *Lunch Break*

**13:30 Welcome**

G. Gerlach, Technical University Dresden (Germany)

**1: Calibration and Accuracy**

Chair: J. Hollandt, Physikalisch-Technische Bundesanstalt, Berlin (Germany)

13:30

**1.1 Calibration process of microbolometer cameras**

H. Budzier, G. Gerlach, TU Dresden, Institute of Solid-state Electronics, Dresden (Germany)

14:00

**1.2 Spectrally resolved radiometric characterisation and calibration using supercontinuum laser in the NIR**

L. Bünger, R. D. Taubert, K. Anhalt, Physikalisch-Technische Bundesanstalt (PTB), Berlin (Germany)

14:20

**1.3 Design of a sample holder for spectral- and angle-resolved emissivity measurement under vacuum at temperatures up to 1000 °C**

M. Reiniger, A. Adibekyan, C. Monte, J. Hollandt, Physikalisch-Technische Bundesanstalt, Berlin (Germany)

14:40

**1.4 Atmospheric transmission coefficient modeling in infrared for thermovision measurements**

W. Minkina, D. Klecha, Czestochowa University of Technology, Czestochowa (Poland)

15:00 *Coffee Break*

Poster Session 15:00 - 16:30 - see pages 12 - 13

## SENSOR 2015 - Part A NCC West, Room London

### A2: Mechanical Sensors

Chair: C. Cavalloni, Kistler Instrumente AG, Winterthur (Switzerland)

16:30

#### A2.1 Ceramic based pressure sensor with highly sensitive thin film

M. Cerino, R. Britz, D. Göttel, ZeMA - Zentrum für Mechatronik und Automatisierungstechnik gemeinnütz. GmbH, Saarbrücken; T. Kuberczyk, A. Landes, M. Langosch, A.-C. Probst, D. Vollberg, G. Schultes, HTW des Saarlandes, Saarbrücken (Germany)

16:50

#### A2.2 Capacitive sensor mats for pressure detection with high sensitivity

H. Böse, E. Fuß, Fraunhofer-Institut für Silicidforschung ISC, Würzburg (Germany)

17:10

#### A2.3 Miniaturized silicon strain gauge elements to accurately measure mechanical quantities

T. Frank, A. Cyriax, A. Gruen, M. Kermann, M. Khatri, CIS Forschungsinstitut für Mikrosensorik und Photovoltaik GmbH, Erfurt (Germany)

17:30

**A2.4 Accurate determination of viscosity and mass density of fluids using a piezoelectric tuning fork resonant sensor**  
A.O. Niedermayer, M. Heinisch, B. Jakoby, J. Kepler University, Linz; T. Voglhuber-Brunnmaier, Danube University Krems, Wiener Neustadt (Austria)

18:00 *Poster Award in Room London*

18:10 *Get Together*

## SENSOR 2015 - Part B NCC West, Room Amsterdam

### B2: MEMS & NEMS

Chair: H. K. Trieu, Technical University Hamburg-Harburg, Hamburg (Germany)

16:30

#### B2.1 Demonstration of detection system based on MEMS suspended cantilever and on-chip optical read-out

M. Zawierta, G. Putrino, M. Martyniuk, A. Keating, K. K. M. B. Dilusha Silva, R. Woodward, L. Faraone, J. Dell, The University of Western Australia, Crawley; M. Myers, CSIRO, Kensington; R. Jeffery, Panorama Synergy Ltd, Sydney (Australia)

16:50

#### B2.2 Novel waterproof multi-axis-micro-force-and tactile-sensors for tooling machines and MEMS testing

T. Meiss, F. Pabst, C. Minamisava, K. Ohde, EvoSense Research & Development GmbH, Darmstadt; N. Stefanova, R. Werthschützky, Technische Universität Darmstadt, Darmstadt (Germany)

17:10

#### B2.3 From basic flow property to MEMS multiparameter sensors

R. Beigelbeck, F. Kohl, A. Jachimowicz, Donau-Universität Krems, Wiener Neustadt; B. Jakoby, Johannes-Kepler-Universität Linz, Linz (Austria)

17:30

#### B2.4 Strömungssensoren mit galvanisch erzeugten Drähten als sensitive Elemente

S. Quednau, Technische Universität Darmstadt, Darmstadt (Germany)

18:00 *Poster Award in Room London*

18:10 *Get Together*

## SENSOR 2015 - Part C NCC West, Room Venedig

### C2: Applications

Chair: A. Schubert, MSA Technologies and Enterprise Services GmbH, Berlin (Germany)

16:30

#### C2.1 Wireless sensor for temperature and flux measurements in an axial flux machine

A. Bock, J. Funck, A. Giedymin, C. Gühmann, TU Berlin, Berlin (Germany); D. Liu, R. Burke, University of Bath, Bath (United Kingdom)

16:50

#### C2.2 Design and selection criteria of high temperature accelerometers for aerospace propulsion

H. Ensinger, Sensoren-Beratung Ensinger, Reilingen (Germany) B. Metz, PCB Piezotronics, Inc., Depew, NY (USA)

17:10

#### C2.3 Surveillance of drying processes of forage layers in silos

A. Stacheter, D. Becker, Institute of Sensor and Actuator Technology, Coburg (Germany)

17:30

#### C2.4 Measurement system for circulating stator currents: Towards condition monitoring of large MW-scale synchronous motors

S. Wildermuth, U. Ahrend, R. Disselkötter, ABB AG, Ladenburg (Germany); P. Rodriguez ABB AB, Västerås (Sweden); P. Rzeszucinski ABB Sp. z o.o., Krakow (Poland); C. T. Pinto ABB India Limited, Mumbai (India)

18:00 *Poster Award in Room London*

18:10 *Get Together*

**SENSOR 2015 - Part D**  
NCC West, Room Zürich

**D2: Optical Sensors**

Chair: N. Weber, Fraunhofer-Institut -IIS-, Erlangen (Germany)

16:30

**D2.1 Pseudo-data generation software for FBG-optical fiber based shape sensing**

H. Pauer, M. Ali Azabi, C. Ledermann, W. Tuschmann, H. Wörn, Karlsruhe Institute of Technology – KIT, Karlsruhe (Germany)

16:50

**D2.2 Distributed fiber optical sensing inside the foundation slab of a high-rise building**

C. Horch, J. Hupfer, F. Schäfer, Fraunhofer Institute for High-Speed Dynamics, Freiburg (Germany)

17:10

**D2.3 Unambiguous wide-range optical voltage sensor with dual operating wavelengths**

X. Gu, S. V. Marchese, K. Bohnert, ABB Switzerland Corporate Research Center, Baden-Dättwil (Switzerland)

17:30

**D2.4 Integration of Si-based UV-photodiodes into a 0.35  $\mu\text{m}$  modular CMOS platform**

C. Henkel, D. Gäbler, D. Sommer, S. Thiele, X-FAB Semiconductor Foundries AG, Erfurt (Germany); X. Cao, Branch Office Plymouth, Devon (United Kingdom); T. B. Chuan, X-FAB Sarawak Sdn Bhd, Sarawak (Malaysia)

18:00 *Poster Award in Room London*

18:10 *Get Together*

**IRS<sup>2</sup> 2015**

NCC West, Room Dublin

**2: Spectroscopy and Gas Analysis**

Chair: R. Riesenberg, Leibniz-Institut für Photonische Technologien e. V. (IPHT), Jena (Germany)

16:30

**2.1 Miniaturized infrared spectrometer based on planar focusing gratings**

T. May, A. Brown, E. Keßler, U. Hübner, E. Voigt, R. Riesenberg, H.-G. Meyer, Leibniz-Institut für Photonische Technologien, Jena; A. Wuttig, Codion Optics GmbH, Jena; A. Wagner, Analytik Jena AG, Jena (Germany)

17:00

**2.2 Enhanced resolution Fabry-Pérot microspectrometers**

M. Ebermann, N. Neumann, InfraTec GmbH, Dresden; K. Hiller, M. Seifert, Chemnitz Univ. of Technology; M. Meinig, S. Kurth, Fraunhofer ENAS, Chemnitz (Germany)

17:20

**2.3 Compact photoacoustic gas measuring system for carbon dioxide indoor air quality monitoring applications**

A. Ambs, J. Huber, Fraunhofer Institute for Physical Measurement Techniques (IPM), Freiburg; J. Wöllenstein, University of Freiburg, Freiburg (Germany)

17:40

**2.4 Novel pyroelectric detectors for accurate THz power measurements**

A. Steiger, R. Müller; Physikalisch-Technische Bundesanstalt (PTB), Berlin; W. Bohmeyer, K. Lange, Sensor- und Lasertechnik (SLT), Neuenhagen (Germany)

18:00 *Poster Award in Room London*

18:10 *Get Together*

## Poster Session

### NCC West, Level 2

## SENSOR

15:00 – 16:30

### P1: Automotive

#### P1.1 Gasoline sensor based on ZnO

M.S. Aleksanyan, V.M. Arakelyan, V.M. Aroutiounian, A.G. Sayunts, Yerevan State University, Yerevan (Armenia)

#### P1.2 Kinetic energy harvesting in automotive applications

J. Happel, J. Harmstorf, A. Kneifel, K.-L. Krieger, ITEM Universität Bremen, Bremen (Germany)

#### P1.3 Inductance of a double-body compression spring as a favorable seat occupancy sensor

F. Wießner, K. Fr. Eichhorn, FTZ Leipzig e.V., Leipzig (Germany)

#### P1.4 A novel tire sensor system for sensing contact force distribution between tire and driving surface

D. Stapp, M. Dimitrov, D. Ertogrul, P. Kieper, U. Konigorski, Technische Universität Darmstadt, Darmstadt (Germany)

### P2: Mechanical

#### P2.1 Pattern definition of foil based sensors with ultrafast UV lasers

M. Langosch, M. Cerino, A. Landes, D. Vollberg, A.-C. Probst, G. Schultes, Hochschule für Technik und Wirtschaft des Saarlandes, Saarbrücken; D. Göttel, Zentrum für Mechatronik und Automatisierungstechnik gemeinnützige GmbH, Saarbrücken (Germany)

#### P2.2 Using mechanical spring for monitoring conveyor systems

H. Zur, Mechanische Werkstätten Wurzen GmbH, Bennewitz; Ch. Rückerl, K. Eichhorn, FTZ Leipzig, Leipzig (Germany)

#### P2.3 Strain gauges made of laser patterned hot stamping foil

J. Hielscher, A. Lyashenko, D. Foik, R. Werthschützky, Technische Universität Darmstadt, Darmstadt (Germany)

#### P2.4 Investigation on strain gauges made from carbon black based ink

A. Jäger, T. Meiß, R. Werthschützky, Technische Universität Darmstadt, Darmstadt (Germany)

### P3: Ultrasound

#### P3.1 Intelligent ultrasonic flow metering

G. Jedelhauser, acam-messelectronic gmbh, Stutensee-Blankenloch (Germany)

#### P3.2 Ultrasonic time reversal for haptic interaction

S. Wöckel, H. Arndt, U. Steinmann, J. Auge, Institut für Automation und Kommunikation (ifak) e.V. Magdeburg, Magdeburg (Germany)

#### P3.3 Detection of ultrasonic plate waves using ceramic strip transducers

L. Claes, F. Bause, J. Rautenberg, B. Henning, University of Paderborn, Paderborn (Germany)

### P4: Magnetic Sensors

#### P4.1 Rotational speed direction detection based on the output duty cycle of a differential hall-effect gear tooth sensor

C. Liu, J.-G. Liu, ChenYang Technologies GmbH & Co. KG, Finsing (Germany); J. Qiu, University of Shanghai for Science and Technology, Shanghai (China)

#### P4.2 Mapping permanent magnets with high angular accuracy

S. Spasic, M. Blagojevic, N. Markovic, Z. Mitrovic, L. Popovic, R.S. Popovic, SENIS AG, Baar (Switzerland)

#### P4.3 6D magnetic field distribution measurements of permanent magnets with magnetic field camera scanner

K. Vervaeke, Magcam NV, Researchpark Haasrode, Leuven (Belgium)

### P5: Optical Sensors

#### P5.1 Polymer planar bragg grating sensor for 2D strain sensing

M. Rosenberger, W. Eisenbeil, S. Hessler, S. Belle, R. Hellmann, University of Applied Sciences Aschaffenburg, Aschaffenburg; B. Schmauss, University Erlangen-Nuremberg, Erlangen (Germany)

#### P5.2 Measurement system to determine the contraction time of the forearm skeletal muscle

S. Guttke, HTWK Leipzig, Leipzig; Ch. Rückerl, Research and Transfer Center at HTWK Leipzig, Leipzig (Germany)

#### P5.3 Electrical fiber optical temperature sensor for high Voltage applications

M. Richter, R. Weigel, A. Kölpin, T. Bosselman, Siemens AG, Erlangen (Germany)

#### P5.4 Development of a spectral camera for cartilage monitoring

A. Kuehn, A. Graf, U. Wenzel, S. Princz, R. Miller, H. Mantz, M. Hessling, University of Applied Sciences Ulm, Ulm (Germany)

#### P5.5 Optical bragg gratings in inorganic-organic hybrid polymers for highly sensitive temperature measurements

M. Girschikofsky, S. Belle, R. Hellmann, University of Applied Sciences Aschaffenburg, Aschaffenburg; M. Förthner, L. Frey, Friedrich Alexander University Erlangen-Nuremberg, Erlangen; R. Fader, M. Rommel, Fraunhofer Institute for Integrated Systems and Device Technology (IISB), Erlangen (Germany)

### P6: Medical

#### P6.1 Reference-less human motion recognition using MEMS-based inertial motion sensors and stochastic signal modelling

M. Kamil, M. Haid, T. Chobtrong, E. Günes, P. Abrante-Perez, N. Berezowski, Hochschule Darmstadt, Darmstadt (Germany)

### P7: Spectroscopy

#### P7.1 New reference material for Imaging XPS (X-ray Photoelectron Spectroscopy) instrument characterization

S. Bütetfisch, T. Weimann, I. Busch, H.- U. Danzebrink, T. Dziomba, Physikalisch-Technische Bundesanstalt, Braunschweig; T. Gross, W. Unger, BAM Bundesanstalt für Materialforschung und -prüfung, Berlin (Germany)

#### P7.2 NIR spectroscopy based method for characterisation of biological tissue

M. Lange, T. Reuter, F. Meuche, fzmb GmbH – Research Centre for Medical Technology and Biotechnology, Bad Langensalza (Germany)

#### P7.3 AdBlue quality control using impedance spectroscopy

A. Fendri, P. Büschel, A. Abedkafi, O. Kanoun, Technische Universität Chemnitz; Buchholz, Seuffer GmbH & Co. KG, Calw (Germany)

Poster Session  
NCC West, Level 2

**P8: Gas**

**P8.1 Linear gas sensor for methane based on a selectively permeable membrane**

M. Bartholmai, S. Ebert, P. P. Neumann, R. Noske, BAM, Berlin; W. Rehak, Optotransmitter-Umweltschutz-Technologie e.V. (OUT e.V.), Berlin; D. Lazik, Helmholtz Centre for Environmental Research – UFZ (Germany)

**P8.2 Colorimetric detection of Bi (III) based on pyridine-2, 6-dicarboxylic acid modified silver nanoparticles**

G. Khayatian, S. Mohammadi, University of Kurdistan, Sanandaj (Iran)

**P8.3 Study of MWCNT/SnO<sub>2</sub> nanocomposite acetone and toluene vapor sensors**

V. M. Aroutiounian, Z. N. Adamyan, A. G. Sayunts, E. A. Khachaturyan, A. Z. Adamyan, Yerevan State University, Yerevan (Armenia)

**P8.4 Switching-type lambda sensor manufactured by joining of sintered zirconia via glass solder paste**

F. Schubert, S. Wollenhaupt, J. Kita, G. Hagen, R. Moos, Department of Functional Materials, Bayreuth (Germany)

**P8.5 Highly sensitive carbon nanotubes-SnO<sub>2</sub> nanocomposite sensor for acetone detection**

S. Salehi, E. Nikan, A. A. Khodadadi, Y. Mortazavi, University of Tehran, Tehran (Iran)

**P8.6 A new mathematical procedure for simultaneous analysis of gases with resistive gas sensors**

R. Seifert, H. B. Keller, Karlsruhe Institute of Technology (KIT), Eggenstein-Leopoldshafen (Germany)

**P8.7 Micro gas sensor by MEMS processes for selective dual gas detection of carbon monoxide and methane**

I. Kim, Ajou University, Suwon ; K. Nam, R&D Center, Maccor Inc, Bucheon; W.-Y. Choi, Gangneung-Wonju National University, Gangneung, Gangwon; Y.-W. Song, Korea Institute of Science and Technology, Seongbuk-gu, Seoul (South Korea)

**P8.8 UTAM ZnO nanostructured thin film CO sensor**

A. J. Mohammed, Al-Mustansiriyah University, Baghdad (Iraq); G. Wilde, University of Münster, Münster (Germany)

**P9: Electronics**

**P9.1 Low cost microwave total power radiometer sensor for industrial applications**

R. J. Hadi, C. Sandhagen, A. Bangert, University of Kassel, Kassel; B. Jungstand, A. Göller, hf sensor GmbH, Leipzig (Germany)

**P9.2 Fast and efficient dual-forecasting algorithm for WSNs**

F. Derbel, F. Strakosch, Leipzig University of Applied Sciences, Leipzig (Germany)

**P9.3 Sensors with SOI FET primary transducers and frequency output**

A. V. Leonov, A. A. Malykh, V. N. Mordkovich, Institute of Microelectronics Technology and High Purity Materials Russian Acad., Chernogolovka, Moscow; M. I. Pavliuk, JSC, Zelenograd, Moscow (Russia)

**P10: Applications**

**P10.1 Humidity sensors made of graphene**

H. A. Zakaryan, V.M. Aroutiounian, Yerevan State University, Yerevan (Armenia)

**P10.2 Single walled carbon nanotubes / phthalocyanine based hybrid material for chemiresistive gas sensing application**

A. Kumar Sharma, R. Saini, R.K. Bedi, A. Mahajan, Guru Nanak Dev University, Amritsar (India)

**P10.3 Low temperature ethanol sensors using cerium doped tin oxide nanostructures**

A. Johari, M.C. Bhatnagar, IIT Delhi, New Delhi (India)

**P10.4 Consistency based sensor defect detection**

J.-F. Ehlenbröcker, U. Mönks, V. Lohweg, Ostwestfalen-Lippe University of Applied Sciences, Lemgo (Germany)

**P10.5 Effect of electrical conduction property on electromagnetic flow meter**

X.-Z. Zhang, Tsinghua University, Beijing (China)

**IRS<sup>2</sup> 2015**

15:00 – 16:30

**P1 Reducing the measurement uncertainty of shutter-less microbolometer-based infrared measurement systems**

A. Tempelhahn, H. Budzier, V. Krause, G. Gerlach, Technical University Dresden, Dresden, (Germany)

**P2 Investigation of InAsSbP quantum dots for mid-infrared applications**

V. Harutyunyan, K. Gambaryan, V. Aroutiounian, Yerevan State University, Yerevan (Armenia)

## SENSOR 2015 - Part A NCC West, Room London

## SENSOR 2015 - Part B NCC West, Room Amsterdam

## SENSOR 2015 - Part C NCC West, Room Venedig

NCC West (Room London)

Chairs:

G. Gerlach, Technical University Dresden, Dresden (Germany)  
R. Lerch, University Erlangen-Nuremberg, Erlangen (Germany)  
R. Werthschützky, Technical University Darmstadt, Darmstadt (Germany)

8:30 - 9:15

### 2. Plenary Talk

**Integration of piezo-sensors and actuators into light constructional components**  
W.-G. Drossel, Fraunhofer-Institut - IWU -, Dresden (Germany)

9:15 - 10:00

### 3. Plenary Talk

**Optical nanosensor technology – from basic research to industrial applications**  
T. Härtling, Fraunhofer-Institut - IKTS -, Dresden (Germany)

10:00 *Coffee Break*

### A3: Ultrasound I

Chair: B. Henning, University Paderborn, Paderborn (Germany)

10:30

#### A3.1 Measurement of the pure liquid's sound velocity in a bubbly sample volume

J. Rautenberg, M. Münch, SensAction AG, Coburg (Germany)

11:00

#### A3.2 Applications of a compact ultrasonic 3D sensor for recognition of shape and orientation of objects

Chr. Walter, H. Schweinzer, Vienna University of Technology, Vienna (Austria)

11:20

#### A3.3 Waveguide characteristics of elastic pipes filled with multiphase fluids

S. Wöckel, H. Arndt, U. Steinmann, J. Auge, Institut für Automation und Kommunikation (ifak) e.V. Magdeburg, Magdeburg (Germany)

11:40

#### A3.3 Annular Arrays for novel measurement methods

E. Kühnicke, M. Wolf, S. Kümmitz, M. Lenz, Technische Universität Dresden, Dresden (Germany)

12:00 *Lunch Break*

10:00 *Coffee Break*

### B3: Magnetoresistive Sensors

Chair: R. Slatter, Sensitec GmbH, Lahnau (Germany)

10:30

#### B3.1 Magnetoresistive (MR) Sensors for angle-, path- and current measurement in harsh environments

R. Slatter, Sensitec GmbH, Lahnau (Germany)

11:00

#### B3.2 Sensors based on tunnel magnetoresistance - New technology, new opportunities

R. Lehdorff, J. Paul, SENSiTEC GmbH, Mainz (Germany)

11:20

#### B3.3 Modern scale based magneto resistive sensors systems

A. Voss, A. Bartos, TE Connectivity Sensor Solutions Germany, Dortmund (Germany)

11:40

#### B3.4 Practical tunneling magnetoresistive Z-axis sensors

J. G. Deak, MultiDimension Technology Co., Ltd., Jiangsu Province (China)

12:00 *Lunch Break*

10:00 *Coffee Break*

### C3: High Temperature Sensors

Chair: H. Fritze, Technische Universität Clausthal, Glosar (Germany)

10:30

#### C3.1 Acoustic and electrical properties of piezoelectric materials for high-temperature sensing applications

W. L. Johnson, National Institute of Standards and Technology, Boulder, CO (USA)

11:00

#### C3.2 Miniaturized langasite structures for high-temperature sensor applications

M. Schulz, J. Sauerwald, H. Fritze, Clausthal University of Technology, Goslar (Germany)

11:20

#### C3.3 A 600°C wireless and passive temperature sensor based on Langasite SAW resonators

B. Wall, R. Gruenwald, M. Klein, Vectron International GmbH, Teltow (Germany);  
G. Bruckner, CTR Carinthian Tech Research AG, Villach/St. Magdalen (Austria)

11:40

#### C3.4 Precise microacoustic characterization of new piezoelectric crystals for high-temperature sensors

H. Schmidt, A. Sotnikov, S. Biryukov, M. Weihnacht, IFW Dresden, Dresden (Germany)

12:00 *Lunch Break*

NCC West (Room London)

Chairs:

G. Gerlach, Technical University Dresden, Dresden (Germany)  
R. Lerch, University Erlangen-Nuremberg, Erlangen (Germany)  
R. Werthschützky, Technical University Darmstadt, Darmstadt (Germany)

8:30 - 9:15

**2. Plenary Talk**

**Integration of piezo-sensors and actuators into light constructional components**  
W.-G. Drossel, Fraunhofer-Institut - IWU -, Dresden (Germany)

9:15 - 10:00

**3. Plenary Talk**

**Optical nanosensor technology – from basic research to industrial applications**  
T. Härtling, Fraunhofer-Institut - IKTS -, Dresden (Germany)

10:00 Coffee Break

**D3: Optical Measurement Technology**

Chair: B. Zagar, Johannes-Kepler-University Linz, Linz (Austria)

10:30

**D3.1 Fiber bragg grating measurement**

A. Koch, M. Schmid, TU München, Munich (Germany)

11:00

**D3.2 Non-destructive imaging and spectroscopy methods using laser light**

H. Grün, RECENDT, Linz (Austria)

11:20

**D3.3 Real-time detection and measurement of cracks in fatigue test applications**

T. Thurner, TU Graz, Graz (Austria)

11:40

**D3.4 Multimode laser doppler velocimeter for flow measurements in the manifold of a fuel cell stack**

S. Burgmann, M. E. Kinaci, Zentrum für Brennstoffzellen-Technik GmbH (ZBT), Duisburg;  
L. Büttner, J. Czarske, F. Schmieder, Technische Universität Dresden, Dresden (Germany)

12:00 Lunch Break

10:00 Coffee Break

**3: IR Components and Systems**

Chair: G. Gerlach, Technical University Dresden, Dresden (Germany)

10:30

**3.1 Silicon-based MWIR detection using photon upconversion**

S. Wolf, J. Herbst, F. Kühnemann, Fraunhofer Institute for Physical Measurement Techniques IPM, Freiburg (Germany)

11:00

**3.2 A TES bolometer for THz FT-spectroscopy**

M. Kehrt, J. Beyer, C. Monte, J. Hollandt, Physikalisch-Technische Bundesanstalt (PTB), Berlin (Germany)

11:20

**3.3 Type-II superlattice radiation thermometer**

M. J. Hobbs, J. R. Willmott, P. Droegmoeller, Land Instruments International, Dronfield, Derbyshire; J. P. R. David, C.H. Tan, The University of Sheffield, Sheffield (UK)

11:40

**1.4 Efficient infrared emitter with high radiant power**

M. Schossig, T. Ott, V. Norkus, G. Gerlach, Technical University Dresden, Dresden (Germany)

12:00 Lunch Break

## SENSOR 2015 - Part A

NCC West, Room London

### A4: Ultrasound II

Chair: J. Rautenberg, University Paderborn Paderborn, (Germany)

13:30

#### A4.1 Spray-on ferroelectrics for fabrication of custom tailored composite transducers for NDE and SHM

B. Tittmann, K. Sinding, A. Orr, B. Reinhardt, N. Malarich, The Pennsylvania State University, Pennsylvania (USA)

13:50

#### A4.2 Measurement of frequency dependent radiation patterns of ultrasonic (wedge) transducers

P. Ploß, S. J. Rupitsch, R. Lerch, University Erlangen-Nuremberg, Erlangen (Germany)

14:10

#### A4.3 Modular phased array US doppler platform for measurements in liquid metals

H. Beyer, R. Nauber, N. Thieme, L. Büttner, J. Czarske, Technische Universität Dresden, Dresden (Germany)

14:30

#### A4.4 Broadband and resonance-free sensing and emitting of airborne ultrasound

M. Daschewski, J. Prager, M. Gaal, M. Weise, Federal Institute for Materials Research and Testing, Berlin (Germany)

14:50 *Coffee Break*

## SENSOR 2015 - Part B

NCC West, Room Amsterdam

### B4: Sensor Materials

Chair: A. Sutor, University Erlangen-Nuremberg, Erlangen (Germany)

13:30

#### B4.1 Wavelength selective metamaterial absorber for thermal detectors

A. Shoshi, T. Maier, H. Brückl, Donau-Universität Krems, Wiener Neustadt (Austria)

13:50

#### B4.2 Optimization of silica gel beds for the use in humidity controller setups

N. Rogge, T. Fröhlich, Technische Universität Ilmenau, Ilmenau; F. Hilbrunner, Sartorius Weighing Technology GmbH, Göttingen (Germany)

14:10

#### B4.3 Investigations of the electrical contacting of new piezoresistive polymer-ceramics

L. Tang, F. Roth, T. Rossner, J. Lotichius, J. Hielscher, N. Nicoloso, R. Werthschützky Technische Universität Darmstadt, Darmstadt (Germany)

14:30

#### B4.4 Novel gold nanoparticle organic composites: characterization of optical and sensing properties

Y. Daskal, R. Dittrich, Y. Joseph, C. Himcinschi, B. Abendroth, G. Gärtner, J. Walter, TU Berg-akademie Freiberg, Freiberg (Germany)

14:50 *Coffee Break*

## SENSOR 2015 - Part C

NCC West, Room Venedig

### C4: Medical Sensors

Chair: G. Urban, Albert-Ludwigs-University Freiburg, Freiburg (Germany)

13:30

#### C4.1 A coplanar probe design for humidity spot measurements of human brain tissue

T. Reinecke, S. Ahrens, S. Zimmermann, Leibniz University Hannover, Hannover; L. Hagemeyer, M. Klintschar, Hannover Medical School, Hannover (Germany)

13:50

#### C4.2 NIVA\_B – non-invasive determination of blood glucose

H. Fischer, A. Völkel, M. Bussas, TROUT GmbH, Kassel (Germany)

14:10

#### C4.3 Wireless tear glucose sensor system

A. Hennig, A. Grabmaier, Fraunhofer IMS, Duisburg (Germany); C. Wilson, J. Lauko, NovioSense B.V., AT Nijmegen (The Netherlands)

14:30

#### C4.4 Ultrasonic dispersion of particles in lab-on-chip systems for enzyme-linked-immunoassays

L. Brandhoff, M. J. Vellekoop, University of Bremen, Bremen (Germany)

14:50 *Coffee Break*



**SENSOR 2015 - Part D**  
NCC West, Room Zürich

**D4: New Technologies**

Chair: W. Lang, University Bremen, IMSAS, Bremen (Germany)

13:30

**D4.1 Inkjet and aerosol Jet® printed sensors on 2D and 3D substrates**

B. Polzinger, J. Keck, V. Matic, W. Eberhardt, Hahn-Schickard-Gesellschaft – Institut für Mikroaufbautechnik (HSG-IMAT), Stuttgart; H. Kück, Universität Stuttgart, Stuttgart (Germany)

13:50

**D4.2 Investigation of DRIE etching performance on signal quality of a SOI based pressure sensors for harsh environments**

P. Mackowiak, F. Meinecke, X. Gao, O. Ehrmann, K.-D. Lang, Technical University Berlin, Berlin; B. Mukhopadhyay, T. Hai Hoang, Q.-C. Dao, Fraunhofer Insitute for Reliability and Microintegration, Berlin; H.-D. Ngo, University of Applied Sciences, Berlin (Germany)

14:10

**D4.3 Silicon probing tips coated with protective aluminum oxide thin films for fast tactile cantilever sensors**

H. S. Wasisto, F. Yu, M. Ali Deeb, TU Braunschweig, Braunschweig; L. Doering, U. Brand, Physikalisch-Technische Bundesanstalt, Braunschweig; S. Völlmeke, CiS Forschungsinstitut für Mikrosensorik und Photovoltaik GmbH, Erfurt; A. Bakin, A. Waag, E. Peiner, Laboratory of Emerging Nanometrology, Braunschweig (Germany)

14:30

**D4.4 Printed sensor for integrating in aluminum during casting**

G. Dumstorff, W. Lang, Institute for microsensors, -actuators and -systems, Bremen (Germany)

14:50 *Coffee Break*

**IRS<sup>2</sup> 2015**

NCC West, Room Dublin

**4: Recent Developments in IR Industry**

Chair: J. Schieferdecker, Heimann Sensor GmbH, Dresden (Germany)

13:30

**4.1 Key technology trends and emerging applications for compact thermal imagers**

T. Hoelter, A. Kathman, A. Richards, M. Walters, FLIR Systems, Goleta (USA)

14:00

**4.2 High-dynamic infrared cameras for non-contact temperature measurement from 300 °C to 3000 °C**

C. Schiewe, U. Hoffmann, D. Wassilew, R. Teichmann, G. Hofmann, DIAS Infrared GmbH, Dresden (Germany)

14:20

**4.3 A multispectral VIS/SWIR sensor suite with integrated laser range finder**

M. Münzberg, M. Hübner, Airbus DS Optronics GmbH, Oberkochen (Germany)

14:40

**4.4 New miniaturized thermopile IR arrays with medium resolution**

M. Schnorr, B. Forg, F. Herrmann, W. Leneke, M. Simon, J. Schieferdecker, Heimann Sensor GmbH, Dresden (Germany)

15:00

**4.5 High performance immersed pyroelectric IR detector**

A. Doctor, Laser Components Pyro Group Inc, Stuart, FL, (USA)

15:20 *Closing Remarks*

15:30 *End*

## SENSOR 2015 - Part A

NCC West, Room London

### A5: Acoustic Sensing

Chair: G. Fischerauer, University Bayreuth, Bayreuth (Germany)

15:10

#### A5.1 Simulation assisted ultrasonic defect characterization in heavy rotor forgings

K. T. Fendt, H. Mooshofer, Siemens AG, Munich;  
S. J. Rupitsch, H. Ermert, Friedrich-Alexander University Erlangen-Nuremberg, Erlangen (Germany)

15:30

#### A5.2 Ultrasound transmission system for TDOA localization with unsynchronized beacons

A. Ens, J. Bordoy, J. Wendeberg, C. Schindelbauer, L. M. Reindl, University of Freiburg, Freiburg (Germany)

15:50

#### A5.3 Laser-acoustic characterization of coatings

F. Singer, Institute of Sensor and Actuator Technology, Coburg (Germany)

16:10

#### A5.4 Unidirectional acoustic sensor based on the particle velocity gradient

S. Yu, Y. Yang, School of Marine Science and Technology, Northwestern Polytechnical University, Xi'an (China);  
G. Carrillo Pousa, D. Fernández Comesaña, Microflown Technologies, Arnhem (The Netherlands)

16:30 *End*

## SENSOR 2015 - Part B

NCC West, Room Amsterdam

### B5: Packaging

Chair: J. Wilde, Albert-Ludwigs-University Freiburg, IMTEK, Freiburg (Germany)

15:10

#### B5.1 Flip-chip package for pressure sensors with operation-temperatures up to 500 °C

R. Zeiser, P. Wagner, S. Ayub, J. Wilde, University of Freiburg – IMTEK, Freiburg (Germany)

15:30

#### B5.2 'nCapsulate' freeform sensor packaging

O. Maiwald, J. Raben, Sencio BV, Nijmegen (The Netherlands)

15:50

#### B5.3 The influence of coating on the sensor wiring in medical guide wires

N. Stefanova, T. Opitz, T. Rossner, T. Meiss, R. Werthschützky, Technische Universität Darmstadt, Darmstadt (Germany)

16:10

#### B5.4 First Investigation of LTCC package for high temperature SAW sensors

J. Bardong, CTR Carinthian Tech Research AG, Villach/St. Magdalen (Austria); G. Radosavljevic, S. Toskov, A. Binder, Technische Universität Wien, Wien (Austria)

16:30 *End*

## SENSOR 2015 - Part C

NCC West, Room Venedig

### C5: Medical Systems

Chair: J. Lillenhof, Westfälische Hochschule, Gelsenkirchen (Germany)

15:10

#### C5.1 Force sensor for measuring interaction forces of cardiologists during heart catheterizations

T. Opitz, A. Sacakli, N. Stefanova, T. Rossner, T. Meiss, R. Werthschützky, Technische Universität Darmstadt, Darmstadt (Germany)

15:30

#### C5.2 Implantable EMG measuring system

M. Völker, N. Antonios, H. Zhou, J. Hauer, Fraunhofer-Institut für Integrated Circuits IIS, Erlangen;  
R. Ruff, K.-P. Hoffmann, Fraunhofer-Institut für Biomedical Engineering IBMT, St. Ingbert (Germany)

15:50

#### C5.3 Sonographic detection of nanoparticles used for magnetic drug targeting

M. Fink, H. Ermert, M. Löffler, B. Tewes, A. Sutor, A. Koch, Friedrich-Alexander University Erlangen-Nuremberg, Erlangen; S. Lyer, C. Alexiou, University Hospital Erlangen, Erlangen (Germany)

15:50

#### C5.4 Increasing the reliability of applications in AAL by distinguishing moving persons from pets by means of a sensor floor

R. Hoffmann, A. Steinhage, C. Lauterbach Future-Shape GmbH, Höhenkirchen-Siegertsbrunn (Germany)

16:30 *End*

**SENSOR 2015 - Part D**  
NCC West, Room Zürich

**D5: Chemical & Bio Sensors**

Chair: S. Zimmermann, Leibniz University Hannover, Hannover (Germany)

15:10

**D5.1 Quantification of volatile organic compounds in the ppb-range using partial least squares regression**

M. Bastuck, C. Bur, T. Sauerwald, A. Schütze, Saarland University, Saarbrücken (Germany);

A. Lloyd Spetz, M. Andersson, Linköping University (Sweden)

15:30

**D5.2 Optimized manufacturing of industrial hydrogel sensors**

M. Windisch, J. Lienig, TU Dresden, Dresden;

K.-J. Eichhorn, R. Schulze, Leibniz Institute of Polymer Research Dresden, Dresden (Germany)

15:50

**D5.3 Laser induced fluorescence spectroscopic sensor for real-time identification of fossil diesel fuel, biodiesel and their blends**

Z. Fan, V. Gross, J. Krahl, Coburg University of Applied Sciences and Arts, Coburg (Germany)

16:10

**D5.4 A CMOS based polysilicon nanowire biosensor for monitoring the cardiovascular disease markers in human serum**

I.-S. Wang, C.-C. Peng, C.-T. Lin, National Taiwan University, Taipei; J.-K. Lee, National Taiwan University Hospital, H.-H.Tsai, H.-H. Liao, National Applied Research Laboratories, Hsinchu (Taiwan)

16:30

End

**SENSOR 2015 - Part E**  
NCC West, Room Dublin

**E5: Gas Sensors I**

Chair: M. Fleischer, Siemens, München (Germany)

15:30

**E5.1 Chromosensitive Gasdetektion**

K. Schmitt, C. Pannek, J. Wöllenstein Fraunhofer Institute for Physical Measurement Techniques IPM, Freiburg (Germany)

16:00

**E5.2 Artificial inverse opal structures for sensing applications**

T. Wagner, Universität Paderborn, Paderborn (Germany)

16:20

**E5.3 Photonic Microstructures for Gas Detection in the MIR**

A. Popescu, Siemens AG, Munich (Germany)

16:40

**E5.4 Semiconductor nanocrystals – versatile building blocks for innovative microsystems**

T. Otto, J. Martin, A. Weiß, Fraunhofer Institute for Electronic Nano Systems - ENAS, Chemnitz (Germany)

17:00

End

NCC West (Room London)

Chairs:

R. Lerch, University Erlangen-Nuremberg, Erlangen (Germany)  
R. Werthschützky, Technical University Darmstadt, Darmstadt (Germany)

8:30 - 9:15

**4. Plenary Talk**

**Smart adaptive photonic sensor systems**

J. Czarske, Technical University Dresden, Dresden (Germany)

9:15 - 10:00

**5. Plenary Talk**

**Microwave Sensors: Enabling Technologies for Life Sciences, Environmental and Industrial Process Monitoring?**

R. Jakoby, Technical University Darmstadt, Darmstadt (Germany)

10:00 *Coffee Break*

**A6: Material Characterization**

Chair: St. Rupitsch, Friedrich-Alexander University Erlangen-Nuremberg, Erlangen (Germany)

10:20

**A6.1 Utilizing guided acoustic waves to measure dispersive material properties of polymers**

J. Rautenberg, F. Bause, B. Henning, University of Paderborn, Paderborn (Germany)

10:50

**A6.2 Inverse method for determining material parameters of piezoceramics and passive materials**

M. Weiß, J. Ilg, St. J. Rupitsch, R. Lerch, Friedrich-Alexander University Erlangen- Nuremberg, Erlangen (Germany)

11:10

**A6.3 Testing of thin permanent magnets at higher frequencies**

D. Perchtold, M. Kaltenbacher, Vienna University of Technology, Wien (Austria); H. Husstedt, Deutsches Hörgeräte Institut GmbH, Lübeck (Germany)

11:30

**A6.4 Characterization of the polarization state of embedded piezoelectric transducers by thermal waves and thermal pulses**

A. Eydam, G. Suchanek, G. Gerlach Technische Universität Dresden, Dresden (Germany)

11:50 *Lunch Break*

10:00 *Coffee Break*

**B6: Flow I**

Chair: W. Drahm, Endress+Hauser GmbH+Co. KG, Freising (Germany)

10:20

**B6.1 MEMS-based micro-coriolis density and flow measurement technology**

C. Huber, M. Schuerch, Endress+Hauser Flowtec AG, Reinach; F. Steinhoff, P. Reith, S. Wirth, H. Feth, A. Rasch, TrueDyne Sensors AG, Reinach (Switzerland)

10:50

**B6.2 Multiphase flow metering with nuclear magnetic resonance spectroscopy**

A. Bilgic, J. Kunze, KROHNE Messtechnik GmbH, Duisburg (Germany)

11:10

**B6.3 Gas density and viscosity measurement using microcantilever sensor**

A. Badarlis, A. Kalfas, Aristotle University of Thessaloniki, Thessaloniki (Greece); A. Pfau, Endress+Hauser Flowtec AG, Reinach (Switzerland)

11:30

**B6.4 Towards metering of tap water by lorentz force velocimetry: Realization and improvement of non-contact flow measurement method**

S. Vasilyan, T. Fröhlich, Technische Universität Ilmenau, Ilmenau (Germany)

11:50 *Lunch Break*

10:00 *Coffee Break*

**C6: Geometrical Measurements**

Chair: A. Weckenmann, Friedrich-Alexander University Erlangen-Nuremberg, Erlangen (Germany)

10:20

**C6.1 Function-Oriented measurements of micro gears for lifetime evaluation**

B. Haefner, G. Lanza, Karlsruhe Institute of Technology (KIT), Karlsruhe (Germany)

10:50

**C6.2 Calibration concept for dimensional measurements with optical multiscale multi-sensor systems**

A. Loderer, W. Hartmann, T. Hausotte, Friedrich-Alexander University Erlangen- Nuremberg, Erlangen (Germany)

11:10

**C6.3 Compact optical sensor for the measurement of surface microtopographies on turbine blades**

Y. Li, M. Kästner, E. Reithmeier, Gottfried Wilhelm Leibniz Universität Hannover, Hannover (Germany)

11:30

**C6.4 Tactile and non-contact sensors for coordinate measuring technology**

R. Christoph, I. Schmidt, Werth Messtechnik GmbH, Gießen (Germany)

11:50 *Lunch Break*

**SENSOR 2015 - Part D**  
NCC West, Room Zürich

**SENSOR 2015 - Part E**  
NCC West, Room London

NCC West (Room London)

Chairs:

R. Lerch, University Erlangen-Nuremberg, Erlangen (Germany)  
R. Werthschützky, Technical University Darmstadt, Darmstadt (Germany)

8:30 - 9:15

**4. Plenary Talk**

**Smart adaptive photonic sensor systems**

J. Czarske, Technical University Dresden, Dresden (Germany)

9:15 - 10:00

**5. Plenary Talk**

**Microwave Sensors: Enabling Technologies for Life Sciences, Environmental and Industrial Process Monitoring?**

R. Jakob, Technical University Darmstadt, Darmstadt (Germany)

10:00 *Coffee Break*

**D6: Sensor Electronic**

Chair: A. König, Technical University Kaiserslautern, Kaiserslautern (Germany)

10:20

**D6.1 Universal and dynamically reconfigurable sensor interface in lab-on-spoon multi-sensor system**

R. Freier, A. König, Technical University Kaiserslautern, Kaiserslautern (Germany)

10:40

**D6.2 An ultra-low power wake-up receiver for real-time constrained wireless sensor networks**

F. Derbel, S. Bdiri, HTWK Leipzig, Leipzig (Germany)

11:00

**D6.3 Wearable electronics – market & technology analysis**

G. Girardin, YOLE Développement Le Quartz, Lyon-Villeurbanne (France)

11:20

**D6.4 Handheld readout system for field-effect based biosensors arrays for label-free detection of biomolecules**

T. Chien Nguyen, M. Schwartz, J. Blinn, S. Ingebrandt, University of Applied Sciences Kaiserslautern, Zweibrücken; X. T. Vu, RWTH Aachen University, Aachen (Germany)

11:50 *Lunch Break*

10:00 *Coffee Break*

**E6: Gas Sensors II**

Chair: St. Zimmermann, Leibniz Universität Hannover, Hannover (Germany)

10:20

**E6.1 Electrochemical sensors - at the heart of dräger gas detection systems**

P. Tschuncky, Drägerwerk AG & Co. KGaA, Lübeck (Germany)

10:50

**E6.2 Correlation of ammonia storage and dielectric properties of SCR catalyst materials by microwave cavity perturbation**

M. Dietrich, D. Rauch, R. Moos, University of Bayreuth, Bayreuth; U. Simon, RWTH Aachen University, Aachen (Germany); A. Porch, Cardiff University, Cardiff (United Kingdom)

11:10

**E6.3 Miniaturized photoacoustic CO<sub>2</sub> sensors for consumer applications**

J. Huber, Fraunhofer Institute for Physical Measurement Techniques (IPM), Freiburg; J. Wöllenstein, University of Freiburg, Freiburg; S. Kolb, A. Dehé, F. Jost, Infineon Technologies AG, München (Germany)

11:30

**E6.4 Sensitive detection of benzene in the presence of interferences by high kinetic energy ion mobility spectrometry**

A. T. Kirk, J. Langejuergen, M. Allers, J. Oermann, S. Zimmermann, Leibniz University Hannover, Hannover (Germany)

11:50 *Lunch Break*

## SENSOR 2015 - Part A

NCC West, Room Dublin

### A7: Impedance Spectroscopy

Chair: O. Kanoun, Technical University Chemnitz, Chemnitz (Germany)

13:00

#### A7.1 Flexible free standing SU-8 microfluidic impedance spectroscopy sensor for 3D molded interconnect devices application

M.-P. Schmidt, A. Oseev, A. Brose, Otto von Guericke University Magdeburg, Magdeburg; C. Engel, TEPROSA GmbH, Magdeburg; S. Hirsch, University of Applied Sciences Brandenburg, Brandenburg an der Havel (Germany)

13:20

#### A7.2 Impedance investigation of milk dilution

A. Abdelkafi, P. Büschel, A. Fendri, O. Kanoun, Technische Universität Chemnitz, Chemnitz (Germany)

13:40

#### A7.3 Efficient implementation of a multitone – sine – generation method for electrical impedance spectroscopy sensors

A. Renner, TU Kaiserslautern, Kaiserslautern; M. Herz, iC-Haus GmbH, Bodenheim (Germany)

14:00

#### A7.4 Cell optimization for the IISIC CMOS-chip serving as a front-end for integrated impedance spectroscopy

A. Renner, J. Lappas, A. König, TU Kaiserslautern, Kaiserslautern (Germany)

14:20 *Coffee Break*

## SENSOR 2015 - Part B

NCC West, Room Amsterdam

### B7: Flow Ilt

Chair: R. Beigelbeck, Danube University Krems Center for Integrated Sensor Systems (Austria)

13:00

#### B7.1 Micromachined flow sensors - a review

J. Lötters, Bronkhorst High-Tech B. V., Ruurlo; J. Groenesteijn, D. Alveringh, T.S.J. Lammerink, M.C. Elwenspoek, R.J. Wiegerink, University of Twente, Enschede (The Netherlands)

13:30

#### B7.2 Development of Flow Sensors Based on Printed Board Design for Air Conditioning Systems

T. Glatzl, S. Cerimovic, H. Steiner, F. Keplinger, T. Sauter, A. Jachimowicz, Technische Universität Wien, Wien (Austria)

13:50

#### B7.3 Novel method for determination of gas properties and flow speed

C. Hepp, F. Krogmann, Innovative Sensor Technology IST AG, Ebnat-Kappel (Switzerland); G. Urban, Albert-Ludwigs-Universität Freiburg, Freiburg (Germany)

14:10

#### B7.4 On the conditions for the determination of the thermal properties of flowing gases by using oscillatory thermal excitation

D. Reyes Romero, Innovative Sensor Technology – IST AG, Ebnat-Kappel (Switzerland); G. Urban, Albert-Ludwigs-Universität Freiburg, Freiburg, (Germany)

14:30 *Coffee Break*

## SENSOR 2015 - Part C

NCC West, Room Venedig

### C7: Automotive Sensors

Chair: K. Pfaller, Audi AG, Ingolstadt (Germany)

13:00

#### C7.1 Onboard determination of fuel stability in plug-in hybrid diesel cars by dielectric relaxation spectroscopy

M. Eskiner, F. Bär, M. Rossner, University of Applied Sciences and Arts, Coburg; A. Munack, Thünen-Institute of Agricultural Technology (TI), Braunschweig; J. Krahl, Fuels Joint Research Group, Coburg (Germany)

13:20

#### C7.2 Dual-sensor-package technology supporting ASIL-D in safety-related automotive applications

W. Scheibenzuber, Infineon Technologies AG, Neubiberg; F. Moissl, Infineon Technologies AG, Regensburg (Germany); J. Nimler Elemparo, Infineon Technologies Malaysia Sdn. Bhd., Kulim (Malaysia); O. Borghetti, H. Witschnig, F. Rasbornig Infineon Technologies Austria AG, Villach (Austria)

13:40

#### C7.3 Waveform-based state determination for catalytic converters

I. Motroniuk, R. Stöber, G. Fischerauer, Universität Bayreuth, Bayreuth (Germany)

14:20 *Coffee Break*

**SENSOR 2015 - Part D**  
NCC West, Room Zürich

**D7: Energy Harvesting**

Chair: G. Schöll, University of the Federal Armed Forces  
Hamburg, Hamburg (Germany)

13:00

**D7.1 A hybrid simulation approach for piezoelectric vibration energy harvesting**

D. Gedeon, S. T. Meyer, S. J. Rupitsch, R. Lerch, University  
Erlangen-Nuremberg, Erlangen (Germany)

13:20

**D7.2 Autarkic monitoring with bluetooth low energy (BLE)**

J.-M. Gruber, Zurich University of Applied Sciences,  
Winterthur (Switzerland)

13:40

**D7.3 Mechanical energy converter study for lotic water sensor applications**

T. J. Schröder, Ch. Schöberlein, Ch. Schmidt, T. Keutel,  
O.Kanoun, Technische Universität Chemnitz, Chemnitz  
(Germany)

14:00

**D7.4 CMOS integrated miniaturized photovoltaic cells for autonomous sensor nodes: simulations and experimental results**

A. Goehlich, M. Stühlmeier, H. Vogt, Fraunhofer Institut  
für Mikroelektronische Schaltungen und Systeme, Duis-  
burg (Germany)

14:20 *Coffee Break*

**SENSOR 2015 - Part E**  
NCC West, Room London

**E7: Gas Sensors III**

Chair: A. Schütze, Saarland University,  
Saarbrücken (Germany)

13:00

**E7.1 Fast ion-selective ppb-level gas sensor based on pulsed atmospheric pressure chemical ionization and ion-ion recombination**

A. Heptner, N. Angerstein, S. Zimmermann,  
Leibniz University Hannover, Hannover (Germany)

13:20

**E7.2 Temperature modulated thermoelectric gas sensors**

G. Hagen, N. Leupold, S. Wiegärtner,  
H. Wittmann, R. Moos, University of Bayreuth,  
Bayreuth (Germany)

13:40

**E7.3 Photonic metal oxide gas sensors: from optical excitation to new sensing concepts**

T. Wagner, Universität Paderborn, Paderborn;  
D. Meixner, Universität Gießen, Gießen (Germany)

14:00

**E7.4 Real-time composition determination of gas mixtures**

J.C. Lötters, E.J. van der Wouden, W. Sparreboom, Bronk-  
horst High-Tech BV, Ruurlo; J. Groenesteijn, T.S.J. Lamme-  
rink, R.J. Wiegerink, University of Twente, Enschede  
(The Netherlands)

14:20 *Coffee Break*

## SENSOR 2015 - Part A NCC West, Room Dublin

### A8: Strain Sensing

Chair: E. Manske, Technical University Ilmenau, Ilmenau (Germany)

14:50

#### A8.1 Areal optical surface measurement – how to get reliable topography data

H. Schmidt, T. Hausotte, University Erlangen-Nuremberg, Erlangen (Germany)

15:10

#### A8.2 Technical textiles for monitoring applications in construction

M.-B. Schaller, GGB Gesellschaft für Geomechanik und Baumesstechnik mbH, Espenhain; E. Thiele, Sächsisches Textilforschungsinstitut (STFI) e.V. Chemnitz, Chemnitz (Germany)

15:30

#### A8.3 Embedded surface-pressure measurement with flexible piezoelectric thin-film sensors

D. Stapp, M. Dimitrov, D. Ertogrul, P. Kieper, U. Konigorski, Technische Universität Darmstadt, Darmstadt (Germany)

15:50     *End*

## SENSOR 2015 - Part B NCC West, Room Amsterdam

### B8: Fluid-Structure Interaction Sensing

Chair: St. Becker, University Erlangen-Nuremberg, Erlangen (Germany)

14:50

#### B8.1 Methods and sensor applications to analyze fluid-structure-acoustic problems

S. Becker, S. Müller, University Erlangen-Nuremberg, Erlangen (Germany)

15:20

#### B8.2 Simultaneous measurements of the liquid phase velocity and gas bubble trajectories in a two-phase flow at gas-evolving electrodes

D. Baczyszalski, C. J. Kähler, C. Cierpka, Bundeswehr University Munich, Neubiberg; T. Weier, Helmholtz-Zentrum Dresden-Rossendorf, Dresden (Germany)

15:40

#### B8.3 Using a high speed camera for high resolution 3D measurements of sound-flow interaction

J. Gürtler, A. Döring, D. Haufe, J. Czarske, A. Fischer, TU Dresden, Dresden; A. Schulz, TU Berlin, Berlin; F. Bake, L. Enghardt, German Aerospace Center Berlin (Germany)

16:00     *End*

## SENSOR 2015 - Part C NCC West, Room Venedig

### C8: Calibration & Testing

Chair: K. D. Sommer, Physikalisch-Technische Bundesanstalt, Braunschweig (Germany)

14:50

#### C8.1 Modelling and control of a pressure and temperature test chamber for pure memspresure sensors

J. Lotichius, E. Christmann, R. Werthschützky, Technische Universität Darmstadt, Darmstadt (Germany)

15:10

#### C8.2 CT measurements of microparts: Numerical uncertainty determination and structural resolution

M. Fleßner, E. Helmecke, T. Hausotte, Friedrich-Alexander-Universität Erlangen-Nürnberg, Erlangen; A. Staude, BAM Federal Institute for Materials Research and Testing, Berlin (Germany)

15:30

#### C8.3 Optical tests on submarine and land vehicle periscopes in parallel with environmental tests

M. Honlet, K. Wehrenberg, Airbus DS Optronics GmbH, Oberkochen (Germany)

15:50

#### C8.4 Partially estimated polynomial MEMS sensor calibration

A. Dickow, G. Feiertag, Munich University of Applied Sciences, Munich (Germany)

16:10

#### C8.4 Thermal decoupling of heat sources by means of PCM-shielding

M. Schalles, T. Fröhlich, M. Röser, Technische Universität Ilmenau, Ilmenau; J. Flügge, Physikalisch Technische Bundesanstalt, Braunschweig (Germany)

16:30     *End*



**SENSOR 2015 - Part D**  
NCC West, Room Zürich

**D8: Signals & Systems**

Chair: A. König, Technical University, Kaiserslautern,  
Kaiserslautern (Germany)

14:50

**D8.1 Detecting and compensating sensor faults in a  
hydraulic condition monitoring system**

N. Helwig, A. Schütze, ZeMa-Centre for Mechatronics and  
Automotion gGmbH, Saarbrücken (Germany)

15:10

**D8.2 Multi-parameter low-power sensor network for  
aquatic research**

L. Wahn, H.K. Trieu, J. Müller, TU Hamburg-Harburg,  
Hamburg; T. Gentz, M. Schlüter, Alfred Wegener Institute  
for Polar and Marine Research, Bremerhaven (Germany)

15:30

**D8.3 Evaluation of laser sensors for precise line follow  
applications**

M. Albert, D. Eck, K. Schilling, Zentrum für Telematik e.V.,  
Gerbrunn (Germany)

16:10     *End*

**SENSOR 2015 - Part E**  
NCC West, Room London

**E8: Gas Sensors IV**

Chair: R. Moos, University of Bayreuth, Bayreuth  
(Germany)

14:50

**E8.1 Colorimetric gas sensors for RFID-Applications**

K. Schmitt, C. Pannek, J. Wöllenstein, Fraunhofer Institute  
for Physical Measurement Techniques, Freiburg  
(Germany)

15:10

**E8.2 Nanostructured WO<sub>3</sub> semiconductor gas sensor for  
selective detection of naphthalene**

M. Leidinger, T. Sauerwald, A. Schütze, Saarland  
University, Saarbrücken (Germany); J. Huotari,  
J. Lappalainen, University of Oulu, Oulu (Finland)

15:30

**E8.3 Tracer gas experiments in subways using an  
integrated measuring and analysis system for sulphur  
hexafluoride**

M. Brüne, A. Pflitsch, J. Spiegel, Ruhr-University Bochum,  
Bochum; K. Potje-Kamloth, Fraunhofer ICT-IMM, Mainz;  
C. Stein, smartGAS Mikrosensorik GmbH, Heilbronn  
(Germany)

15:50

**E8.4 Detecting poisoning of metal oxide gas sensors by  
temperature cycled operation**

M. Schüler, T. Sauerwald, A. Schütze, Saarland University,  
Saarbrücken (Germany)

16:10     *End*

## Aims and Scope

Journal of Sensors and Sensor Systems (JSSS) is an international open-access journal dedicated to science, application and advancement of sensors and sensors as part of measurement systems. The emphasis is on sensor principles and phenomena, measuring systems, sensor technologies and applications.

The goal of JSSS is to provide a platform for scientists and academicians as well as for developers, engineers and users to discuss new developments and advancements in sensors and sensor systems.

## Issuing Body

Journal of Sensors and Sensor Systems (JSSS) is published by the Copernicus GmbH (Copernicus Publications) on behalf of the AMA Association for Sensors and Measurement (AMA).

ISSN: 2194-8771  
eISSN: 2194-878X  
www.j-sens-sens-syst.net

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## Journal Subject Areas

Sensor principles and phenomena

- Mechanical and inertial sensors
- Thermal sensors
- Optical and infrared sensors
- Magnetic sensors
- Chemical and biochemical sensors

Measurement systems

- Sensor signal processing and electronics
- Sensor-actuator systems
- Multi-sensor systems
- Sensor networks

Measurement theory, uncertainty and modeling of measurements

- Measurement uncertainty
- Measurement theory and science

Sensor technologies

- Sensor materials
- Modeling and simulation
- MEMS technology
- Packaging
- Characterization and test

Applications

- Process control
- Automation
- Smart home
- Robotics
- Production measurement technology
- Automotive and mobility
- Medical
- Environmental monitoring
- Safety and security
- Energy (Generation, Transport, Distribution, Storage, Consumption)
- Biotechnology

Manuscript Types

- Regular Research Articles** report original scientific work.
- Short Communications** report original scientific work that is of an urgent nature. The length is limited to 2 journal pages.
- Review Papers** review recent progress in a particular topic by synthesis of primary sources, mainly research papers presented in academic journals.
- Feature Articles** transfer comprehensive knowledge in areas of special excitement and progress.



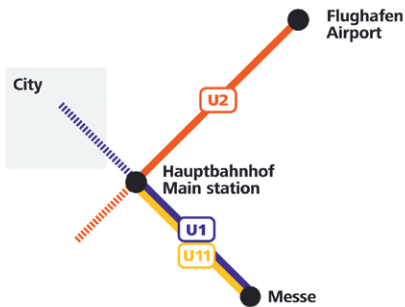
Newly  
launched  
Journal!

## By train

At the Main Station take the underground railway U1 or U11 in direction „Langwasser“ and get off at the station „Messe“. Travelling time: approx. 8 minutes

## Bahn

ab Hauptbahnhof U-Bahn-Linie U1 oder U11 in Richtung Langwasser bis Haltestelle „Messe“. Fahrzeit: ca. 8 Min.



## By air

At the airport take the underground railway U2 to the Main Station („Hauptbahnhof“). Then follow instructions as above (by train). Travelling time: approx. 20 minutes

## Flugzeug

ab Flughafen U-Bahn-Linie U2 bis Hauptbahnhof, dann wie Bahn. Fahrzeit: ca. 20 Minuten

## By car

Leave the highway A6 at exit „Langwasser“ or the A73 at exit "Zollhaus" or "Fischbach" (A9). Then follow the signs "Messe".

## Pkw

Autobahnabfahrt „Langwasser“ (A6) oder „Zollhaus“ (A73), dann Hinweisschildern zum Messezentrum folgen.



## Venue / Veranstaltungsort

NCC CongressCenter Nürnberg  
NCC West  
Messezentrum  
90471 Nürnberg

## Tourist Info / Hotel Reservation

Tourist Informationen / Hotelreservierung  
Congress- und Tourismus-Zentrale Nürnberg  
Tel. +49 911 2336-121 or -122  
Fax +49 911 2336-167  
zv@ctz-nuernberg.de  
www.tourismus.nuernberg.de

## Info Hotlines

Flughafen / Airport Nürnberg:  
Tel. +49 911 937-00  
www.airport-nuernberg.de

## Deutsche Bahn AG / Rail connections:

Tel. +49 1806 996633  
www.bahn.de

## Taxi

Tel. +49 911 19410

## Opening Hours of the Exhibition / Messe-Öffnungszeiten

19 May 2015	9:00 a.m. - 6:00 p.m.
20 May 2015	9:00 a.m. - 6:00 p.m.
21 May 2015	9:00 a.m. - 5:00 p.m.

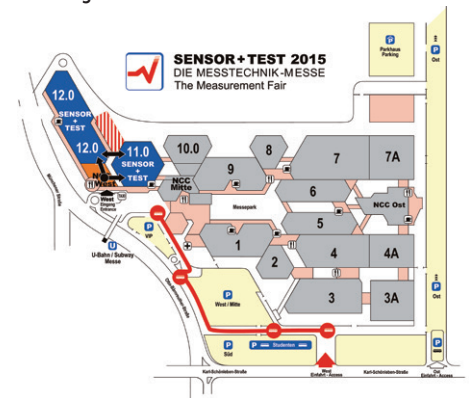
## Admission Fee / Eintrittspreis

1-day ticket / Tageskarte: 18.00 Euro, incl. VAT

Visitors have free access to the exhibition upon redemption of a complementary filled in voucher at the ticket office.

Der Besuch der Messe ist bei Abgabe eines ausgefüllten Eintrittsgutscheins an der Tageskasse kostenfrei.

## Nürnberg Exhibition Centre



## Conference Office

The Conference Registration Desk for participants is located in the NCC West. Participants will receive their conference documents here against presentation of their confirmation of registration. The conference documents will not be forwarded prior to the event.

## Opening hours

19 May 2015 8:00 a.m. – 6:00 p.m.  
20 May 2015 8:00 a.m. – 6:00 p.m.  
21 May 2015 8:00 a.m. – 4:30 p.m.

## Registration

Please register online at:  
<http://www.ama-science.org/direct/registration>  
On receipt of the registration, we will send you a confirmation of registration / the invoice. Participants will not be admitted to the conference unless their fees have been paid in full.

## The registration fee includes:

- participation in the AMA conferences
- Proceedings
- admission to the SENSOR+TEST 2015 exhibition
- refreshments during coffee breaks in the foyer of the Conference rooms
- Get-together

## Cancellation

Cancellation must be made in writing and sent to the organiser. Cancellation up to 28 April 2015 will be subject to a processing fee of 25% on the registration fee. There will be no refund if cancellation is made after 28 April 2015. In this case you will be sent the respective conference documents after the event.

If you are not able to attend the Conference, you may transfer your confirmation of registration to a colleague.

## Kongressschalter

Der Kongressschalter befindet sich im Eingangsbereich des NCC West. Die Kongressteilnehmer erhalten vor Ort am Kongresscounter gegen Vorlage ihrer Anmeldebestätigung die Kongressunterlagen. Vor der Veranstaltung werden keine Kongressunterlagen verschickt.

## Öffnungszeiten

19. Mai 2015 8:00 – 18:00 Uhr  
20. Mai 2015 8:00 – 18:00 Uhr  
21. Mai 2015 8:00 – 16:30 Uhr

## Anmeldung

Bitte melden Sie sich online an, unter:  
<http://www.ama-science.org/direct/registration>  
Die Anmeldebestätigung / Rechnung wird nach Eingang der schriftlichen Anmeldung per Post versandt. Die endgültige Registrierung erfolgt nach Eingang der Teilnahmegebühr.

## Die Tagungsgebühr beinhaltet:

- Teilnahme an den AMA Kongressen
- Proceedings
- Dauerkarte für die SENSOR+TEST 2015
- Getränke während der Kaffeepausen im Kongressfoyer
- Abendveranstaltung

## Stornierung

Stornierungen müssen schriftlich erfolgen. Bei Stornierung der Anmeldung bis zum 28. April 2015 wird eine Bearbeitungsgebühr von 25 % der Teilnahmegebühr erhoben. Bei Abmeldung nach dem 28. April 2015 ist die Teilnahmegebühr in voller Höhe fällig. In diesem Fall werden die entsprechenden Tagungsunterlagen nach dem Kongress zugesandt.

Die Anmeldebestätigung kann bei Nichtteilnahme an eine Person Ihrer Wahl übertragen werden.

Please register online at

<http://www.ama-science.org/direct/registration>

Registration fees and further informations:

	Regular	Student / PHD Student <sup>1)</sup>	AMA Member <sup>3)</sup>
19.05.2015	410.00 € <input type="checkbox"/>	130.00 € <input type="checkbox"/>	370.01 € <input type="checkbox"/>
20.05.2015	410.00 € <input type="checkbox"/>	130.00 € <input type="checkbox"/>	370.01 € <input type="checkbox"/>
21.05.2015	410.00 € <input type="checkbox"/>	130.00 € <input type="checkbox"/>	370.01 € <input type="checkbox"/>
19.-21.05.2015	635.00 € <input type="checkbox"/>	185.00 € <input type="checkbox"/>	572.00 € <input type="checkbox"/>
Streifenkarten <sup>2)</sup>	150.00 € <input type="checkbox"/>		135.00 € <input type="checkbox"/>

All fees in Euro inkl. VAT. / Alle Preise verstehen sich in Euro inkl. MwSt.

After 27 April 2015 participation fees will be increased by 40,00 €, incl. VAT. Nach dem 27. April 2015 erhöht sich die Teilnahmegebühr um 40,00 € inkl. MwSt.

<sup>1)</sup> Registration with a effective student pass only. On these special rates no discount are granted. Proceedings are not included.

<sup>1)</sup> Anmeldung nur mit Kopie des gültigen Studentenausweises oder einer gültigen Immatrikulationsbescheinigung. Auf Studententariife wird kein AMA Rabatt gewährt. Proceedings sind nicht enthalten.

<sup>2)</sup> Participation in 3 conference lectures. Proceedings and Get-together are not included.

<sup>2)</sup> Teilnahme an 3 Kongressvorträgen. Proceedings und Abendveranstaltung sind nicht enthalten.

<sup>2)</sup> Members of AMA Association for Sensors and Measurement are granted a 10% discount on the registration fee (except on student tariff).

<sup>2)</sup> Mitglieder des AMA Verbandes für Sensorik und Messtechnik e.V. erhalten 10 % Rabatt auf die Teilnahmegebühren (außer beim Studententarif).