

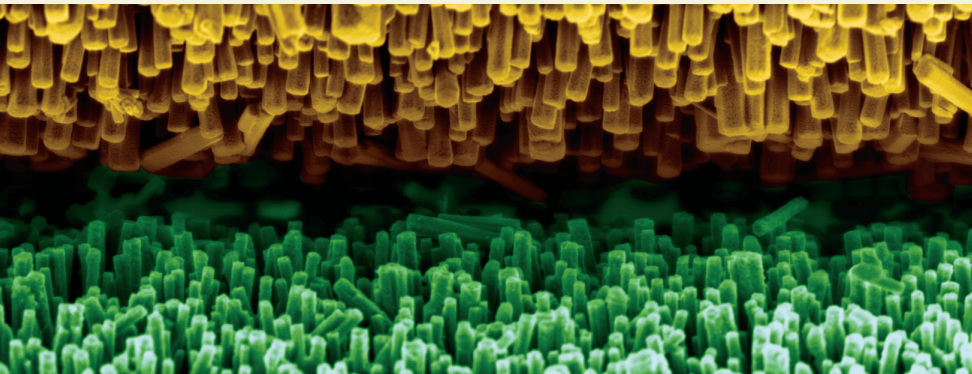
**SPIE Europe**   
**Microtechnologies**  
for the New Millennium

**Conference: 4–6 May 2009**

International Congress Centre (Maritim Hotel)  
Dresden, Germany

Technical  
Programme

NETWORK WITH PEERS — HEAR THE LATEST RESEARCH



**SPIE Europe**

# SPIE Europe Microtechnologies for the New Millennium

**Conference: 4–6 May 2009**

International Congress Centre (Maritim Hotel)  
Dresden, Germany



## Welcome!

Take this opportunity to participate in the 4th SPIE Europe International Symposium on Microtechnologies for the New Millennium.

Enjoy Dresden, Germany, the heart of Europe, the ideal place to meet with your colleagues to discuss the latest advances on a variety of technologies, which are already shaping this millennium. Five exciting conferences on VLSI-Circuits, MEMS and Smart Sensors, Nanotechnology, and Bio-Inspired Systems, and Photonic Materials and Devices have been planned for this event. You will have a unique opportunity to hear about the latest advances on biosensors, sensory-information processing, GHz data communications, energy harvesting, molecular electronics, or the combination between living tissue and microelectronics, among many other cutting-edge topics.

Exchange new ideas, address your shared concerns, and get access to information not yet published in these topical areas, share your research with other engineers, scientists, researchers, and managers. Accepted and presented, your paper will be permanently archived in the SPIE Digital Library, where it will be made available to others in the international scientific community who seek to learn, make discoveries, and innovate.

We welcome you to enjoy the best of German hospitality as well as participating in a most stimulating scientific symposium.

### *2009 Symposium Chair*



**Thomas Becker**, EADS  
Deutschland GmbH (Germany)

### *2009 Symposium Co-chairs*



**José Feliciano López**, Univ. de Las  
Palmas de Gran Canaria (Spain)



**Gerhard Krötz**, University of Applied  
Sciences in Kempten (Germany)



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- Ulrich Schmid**, Technische Univ. Wien, Austria
- Herbert R. Shea**, École Polytechnique Fédérale de Lausanne, Switzerland
- Achim Wixforth**, Univ. of Augsburg, Germany

# Daily Schedule/Special Events

Monday 4 May	Tuesday 5 May	Wednesday 6 May
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## Conferences

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Conf. 7364: <b>Nanotechnology</b> (Wixforth), p.13
Conf. 7365: <b>Bioengineered and Bioinspired Systems</b> (Rodríguez-Vázquez), p.15
Conf. 7366: <b>Photonic Materials, Devices, and Applications</b> (Serpenguzel), p.17

## Special Events

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### PLENARY SESSION 1 Monday 4 May, 8.30 to 11.05

08.30 to 08.35

#### Welcome and Introduction

08.35 to 08.50

#### Welcome

**Dirk Hilbert**, Mayor of Economic Affairs, City of Dresden, FR Germany

08.50 to 09.00

#### Presentation of the SPIE Fellowship to Henri Rajbenback

**Majeh Razeghi**, Northwestern Univ., USA

09.00 to 09.50

#### Future Memory Technologies

**Wolfgang Mueller**, Qimonda Dresden GmbH & Co. OHG, Germany

09.50 to 10.40

#### EPOSS: European Technology Platform on Smart System Integration

**Günter Lugert**, Siemens AG, Germany

### PLENARY SESSION 2 Tuesday 5 May, 8.20 to 9.30

8.30 to 8.40

#### Introduction

8.40 to 9.25

#### Microsystems and Smart Systems Technologies: A European Perspective

**Henri Rajbenbach**, European Commission, Directorate-General Information Society and Media, Belgium

**Griet Van Caenegem**, European Commission, Micro- and Nano Systems Unit, Belgium

### PLENARY SESSION 3 Wednesday 6 May, 8.30 to 9.25

8.30 to 8.40

#### Introduction

8.40 to 9.25

#### Energy Harvesting and Power Management

**Jean-Michel Léger**, CEA-LETI, France

## Monday 4 May

17.45 to 19.30

### Welcome Reception

All attendees are invited to relax, socialize, and enjoy light refreshments. Please remember to wear your conference registration badges. Dress is casual.

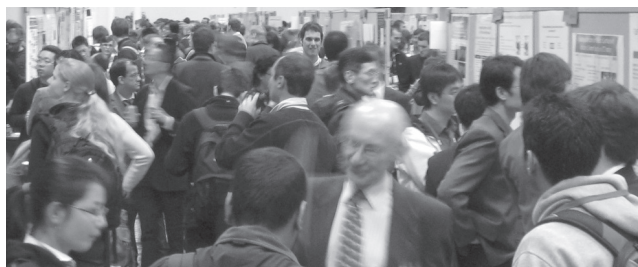
## Tuesday 5 May

16.00 to 17.30

### Poster Session and Reception

All symposium attendees are invited to attend the Tuesday poster session provided as an opportunity to enjoy networking and refreshments while reviewing poster papers. The interactive poster sessions are designed to promote opportunities for networking with colleagues in your field. Attendees are encouraged to review the high-quality papers that are presented in this alternate format and to interact with the poster authors.

Poster presenters may post their papers starting at 11.00 on Tuesday in the Conference Area Hallway. Any papers left on the boards following the end time of the poster session will be considered unwanted and will be discarded. SPIE *Europe* assumes no responsibility for posters left up after the end of the poster session. Poster authors should be at their papers from 16.00 to 17.30 to answer questions from attendees. Attendees are requested to wear their conference registration badges to the poster sessions.



19.00 to 23.00

### Conference Dinner

*Restaurant an den Festungsmauern*

A conference dinner has been arranged for all of the conference participants for Tuesday evening, 5 May at the famous "Festungsmauern" Restaurant. All conference attendees are invited to this dinner, but please confirm your attendance on your registration form by 24 April. We are told that Count August The Strong and his entourage have a habit of dropping in at the restaurant!

### Guest Tickets

A guest ticket for the attendance of your guest at the Welcome Reception and the conference dinner can be booked via the registration form. Cost is €75.00.

## PLENARY SESSION 1 Monday 4 May, 08.30 to 11.05

08.30 to 08.35

### Welcome and Introduction



**Thomas Becker**, EADS Deutschland GmbH (Germany)  
2009 Symposium Chair

08.35 to 08.50

### Welcome by the Mayor of Economic Affairs of the City of Dresden



**Dirk Hilbert**, Mayor of Economic Affairs, City of Dresden, FR Germany

08.50 to 09.00



**Presentation of the SPIE Fellowship to Henri Rajbenbach, European Commission, Directorate-General Information Society and Media, Belgium**

Presented by: **Manijeh Razeghi**, Northwestern Univ., USA

09.00 to 09.50

### Future Memory Technologies



**Wolfgang Mueller**, Qimonda Dresden GmbH & Co. OHG, German

50-60nm DRAM technologies have been already introduced into mass production. Full process integration results for 40nm DRAM, and key technologies for the 30nm DRAM node have been presented previously. No technical roadblocks are seen down to the 30nm node, however some of the key technologies such as capacitor dielectrics with capacitance equivalent (oxide) thickness (CET) of  $CET < 0.5\text{nm}$  have still to be proven. In order further reduce the cell size to 4F2 vertical cell structures are under development. As a DRAM 1T1C successor technology the Capacitor-less DRAM cell has been proposed, both for stand-alone memory and embedded memory applications.

Out of the many candidates for emerging memories, phase-change random access memory (PCRAM) is the most mature technology. Recently, the introduction of the first products in 65nm technology in 2009 has been announced. Scalability of the phase change element to below 10nm has been demonstrated.

In this presentation we will review the outlook for the memory technical roadmap to 20nm, and the key technical challenges ahead. Focus will be on the enabling unit processes, the cell structure, the capacitor structure, the capacitor materials, and the cell transistor. The required innovations for the periphery logic transistor scaling will be presented. The prospects for capacitor-less DRAM and PCRAM as DRAM successor technology will be discussed.

*Biography:* **Wolfgang Mueller** is Qimonda Fellow and currently engaged in DRAM technology development for beyond 40nm nodes.

Wolfgang Mueller joined the company - namely the SIEMENS Research Laboratories - in 1978 as a R&D engineer. He has served in a variety of positions, including process integration manager, project- and program manager of the DRAM Development Alliance with IBM and Toshiba in East Fishkill, NY, USA; and head of the technology innovations group.

Wolfgang Mueller holds a Doctorate degree in Electrical Engineering and a Masters Degree in Physics both from the Technical University Vienna, Austria.

He is author of more than 70 technical papers

09.50 to 10.40

### EPOSS: European Technology Platform on Smart System Integration



**Günter Lugert**, Siemens AG, Germany

In 1952 born in Czech Republic, he received his university education in Mathematics, Chemistry and Physics at the University of Regensburg/Germany and University of Boulder/Col./USA. After his Master and PhD in Physics in 1990 he worked on research projects for both, scientific and industrial programmes in Germany and in France dealing with Epitaxy, solid state characteristics and magnetic properties of thin films.

1992 he joined the Automotive Division of Siemens AG. His responsibilities covered manufacturing support, worldwide process development, technology and simulation in the product development. In his last assignment at SV, Günter Lugert headed the Innovation Center in the Powertrain Division. With his team he covered advanced development topics around technology, control and power electronics for hybrid vehicles and new vehicle architecture concepts. In 2004 he joined the Corporate Technology where he is responsible for the R&D of Sensor, Actuator and Control Systems.

**Günter Lugert** is heading the Executive Committee and the Steering Group of EPoSS.

# Plenary Presentations

## PLENARY SESSION 2

Tuesday 5 May, 08.30 to 09.25

08.30 to 08.40

### Introduction



**José Feliciano López**, Univ. de Las Palmas de Gran Canaria (Spain)  
2009 Symposium Chair

08.40 to 09.25

### Microsystems and Smart Systems Technologies : A European Perspective



**Griet Van Caenegem**, European Commission, Micro- and Nano Systems Unit, Belgium

*Presented by:* **Henri Rajbenbach**, European Commission, Directorate-General Information Society and Media, Belgium

At present, the European industry holds a good competitive position in the area of Microsystems and Smart Systems Technologies. In order to maintain its leading position, Europe has a number of challenges to face in relation to the rapid product change, higher quality, lower cost and shorter time to market. Innovation and investment in strategic research priorities are crucial to support Europe's international competitiveness and growth in this area. In the field of smart systems integration there has been launched the European Technology Platform EPOSS in 2006.

Micro and nanotechnologies have been broadly covered in previous Framework Programmes and also within Framework Programme 7. The new projects in this domain also ensure a good coverage of the targeted objectives in terms of heterogeneous integration technologies and systems. The R&D priorities for the coming years are defined in the ICT workprogramme 2009-2010, which will coherently complement the existing project portfolio in the area with an emphasis on smart heterogeneous integrated systems for a wide range of applications such as bio-medical, telecommunication or environmental applications. Also integration of microsystems on smart fabrics and interactive textiles or networked sensors integrated in physically limited areas will be addressed in future calls.

*Biography:* **Griet Van Caenegem**, graduated in 1994, at University of Ghent as Engineer in physics. She started first professional experience at Alcatel Microelectronics as process engineer and became in 1997 a production support supervisor. In 2001 she applied for a position at the European Commission as scientific officer in the area of microsystems. Till present she is working at the EC in the area of smart systems and is responsible for projects in the area of medical, telecom and automotive applications.

## PLENARY SESSION 3

Wednesday 6 May, 08.30 to 09.25

08.30 to 08.40

### Introduction



**Gerhard Krötz**, Univ. of Applied Sciences in Kempten, Germany  
2009 Symposium Chair

08.40 to 09.25

### Energy Harvesting and Power Management



**Jean-Michel Léger**, CEA-LETI, France

Energy harvesting techniques have been the subject of a growing interest over the past years due to the continuous decrease of ICs and sensors power consumption, thus making it feasible under favourable circumstances to develop autonomous sensor nodes. After a short review of the different available sources and the related recoverable energy in various typical environments, we will detail several realizations of transducers with a focus on mechanical and thermal energy harvesting. Moreover, dedicated power management units, required since the scavenged energy and the systems power consumption profiles usually do not match, will be presented.

*Biography:* **Jean-Michel Léger** received the M.S. (Engineer diploma) degree in physics from the National Polytechnic Institute in Grenoble in 1986 and the PhD. in 1990 from University Joseph Fourier (Grenoble). He joined CEA-LETI in 1990 where he is now a Senior R&D engineer in the Systems Division. He is heading a 20 people laboratory working on sensors, magnetometry -he is currently in charge of the development of the main scientific payload for the ESA SWARM project- and energy harvesting applications, a research field that started at LETI in 2002.



# Conference 7362 - Room: Conference 6

Monday-Wednesday 4-6 May 2009 • Proceedings of SPIE Vol. 7362

## Smart Sensors, Actuators and MEMS

Conference Chair: **Ulrich Schmid**, Vienna Univ. of Technology (Austria)

Conference Co-Chairs: **Carles Cané**, Ctr. Nacional de Microelectrónica (Spain); **Herbert R. Shea**, École Polytechnique Fédérale de Lausanne (Switzerland)

Programme Committee: **Eduard Arzt**, INM-Leibniz Institute for New Materials (Germany); **Fred Barlow**, Univ. of Arkansas (USA); **Joan Bausells**, Ctr. Nacional de Microelectrónica (Spain); **Guido Faglia**, Univ. degli Studi di Brescia (Italy); **Carles Ferrer**, Univ. Autònoma de Barcelona (Spain); **Pavel Fiala**, Brno Univ. of Technology (Czech Republic); **Benno Gerum**, University of Applied Sciences of Isny (Germany); **Katia M. Grenier**, Ctr. National de la Recherche Scientifique (Japan); **Moustapha Hafez**, Commissariat à l'Énergie Atomique (France); **Klas Hjort**, Uppsala Univ. (Sweden); **Christian Hoffmann**, EPCOS OHG (Austria); **Arno Hoogerwerf**, Ctr Suisse d'Electronique et de Microtechnique SA (Switzerland); **Enrique Iborra**, Univ. Politécnica de Madrid (Spain); **Gianfranco Innocenti**, Ctr. Ricerche Fiat (Italy); **Konrad Kapser**, Infineon Technologies AG (Germany); **Roy Knechtel**, X-Fab Semiconductor Foundries AG (Germany); **Andreas Kugi**, Vienna Univ. of Technology (Austria); **Jeong-Bong Lee**, The Univ. of Texas at Dallas (USA); **Monika Leester-Schaedel**, Technische Univ. Braunschweig (Germany); **Dean P. Neikirk**, The Univ. of Texas at Austin (USA); **Joachim Nurnus**, Micropelt GmbH (Germany); **Sergio P. Pacheco**, Freescale Semiconductor, Inc. (USA); **Erwin Peiner**, Technische Univ. Braunschweig (Germany); **José Luis Sánchez de Rojas Aldavero**, Universidad de Castilla-La Mancha (Spain); **Pietro Siciliano**, Consiglio Nazionale delle Ricerche (Italy); **Florian Solzbacher**, The Univ. of Utah (USA); **Christos Tsamis**, National Ctr. for Scientific Research Demokritos (Greece); **Michael J. Vellekoop**, Vienna Univ. of Technology (Austria); **Jürgen Wöllenstein**, Fraunhofer-Institut für Physik Messtechnik (Germany); **Volker Ziegler**, EADS Innovation Works (Germany)

### Monday 4 May

Room: Conference 6 ..... Mon. 11.05 to 11.10

#### Opening Remarks

**Ulrich Schmid**, Vienna Univ. of Technology (Austria)

#### SESSION 1

Room: Conference 6 ..... Mon. 11.10 to 12.30

#### Energy Scavengers

Session Chairs: **Arno C. Hoogerwerf**, Ctr. Suisse d'Electronique et de Microtechnique SA (Switzerland); **Carles Cané**, Ctr. Nacional de Microelectrónica (Spain)

11.10: **Coupled piezoelectric-circuit FEA to study influence of a resistive load on power output of piezoelectric energy devices**, Meiling Zhu, Cranfield Univ. (United Kingdom); Emma Worthington, James Njuguna, Cranfield Univ. (United States) ..... [7362-01]

11.30: **Increasing sensitivity of vibration energy harvester**, Hadas Zdenek, Cestmir Ondrusek, Vladislav Singule, Brno Univ. of Technology (Czech Republic) ..... [7362-02]

11.50: **Analytical characterization and experimental validation of performances of piezoelectric vibration energy scavengers**, Eugenio Brusa, Univ. degli Studi di Udine (Italy); Sasa Zelenika, Univ. of Rijeka (Croatia); Luciano Moro, Denis Benasciutti, Univ. degli Studi di Udine (Italy) ..... [7362-03]

12.10: **Thermoelectric thin film power generators: self-sustaining power supply for smart systems**, Joachim Nurnus, Micropelt GmbH (Germany) ..... [7362-04]

Lunch Break ..... 12.30 to 14.30

#### SESSION 2

Room: Conference 6 ..... Mon. 14.30 to 15.50

#### Biosensors

Session Chairs: **Herbert R. Shea**, Ecole Polytechnique Fédérale de Lausanne (Switzerland); **Ulrich Schmid**, Technische Univ. Wien (Austria)

14.30: **New transducer material concepts for biosensors and surface functionalization (Invited Paper)**, Anita Lloyd Spetz, Ruth Pearce, Linnea Hedin, Volodymyr Khranovskyy, Per-Olov Käll, Kajsa Uvdal, Rositza Yakimova, Linköpings Univ. (Sweden) ..... [7362-05]

15.10: **Fast detection of air contaminants using immunobiological methods**, Katrin Schmitt, Carsten Bolwien, Gerd Sulz, Fraunhofer-Institut für Physik Messtechnik (Germany) ..... [7362-06]

15.30: **Sputtered polycrystalline AlN as a platform for biofunctionalized devices**, Maria Jesús Oliver-Gomez, Jorge Hernandez, Univ. de Castilla-La Mancha (Spain); Jimena Olivares, Marta Clement, Univ. Politécnica de Madrid (Spain); Abdallah Ababneh, Univ. des Saarlandes (Germany); Ulrich Schmid, Technische Univ. Wien (Austria); José L. Sánchez-Rojas, Univ. de Castilla-La Mancha (Spain) ..... [7362-07]

Coffee Break ..... 15.50 to 16.10

### SESSION 3

Room: Conference 6 ..... Mon. 16.10 to 17.10

#### Resonant MEMS

Session Chairs: **Erwin Peiner**, Technische Univ. Braunschweig (Germany); **Kevin S. Spetz**, E-Systems Medical Technologies (USA)

16.10: **Design optimization of exciting sensitivity for micromachined piezoelectric circular transducer based on FEA**, Yang Liu, Chenguang Cai, Yanan Han, Leon Xu, Antti Salo, Nokia Research Ctr. (China) ..... [7362-08]

16.30: **Analysis of the quality factor of piezoelectric-actuated micro-resonators**, Tomas Manzanque-Garcia, Jorge Hernando, J. Licesio Rodriguez-Aragon, Univ. de Castilla-La Mancha (Spain); Abdallah Ababneh, Helmut Seidel, Univ. des Saarlandes (Germany); Ulrich Schmid, Technische Univ. Wien (Austria); José L. Sánchez-Rojas, Univ. de Castilla-La Mancha (Spain) ..... [7362-09]

16.50: **An envelope model to describe the sensor dynamics of vibratory gyroscopes**, Markus Egretzberger, Andreas Kugi, Technische Univ. Wien (Austria) ..... [7362-10]

### Tuesday 5 May

#### SESSION 4

Room: Conference 6 ..... Tues. 09.30 to 10.50

#### Packaging

Session Chairs: **Volker Ziegler**, EADS Deutschland GmbH (Germany); **Guido Faglia**, Univ. degli Studi di Brescia (Italy)

09.30: **Manufacturing, assembling and packaging of miniaturized implants for neural prostheses and brain-machine interfaces (Invited Paper)**, Thomas Stieglitz, Albert-Ludwigs-Univ. Freiburg (Germany) ..... [7362-11]

10.10: **Packaging of MEMS microphones**, Gregor Feiertag, Anton Leidl, EPCOS AG (Germany); Matthias Winter, Univ. des Saarlandes (Germany) ..... [7362-12]

10.30: **Adhesive wafer bonding using photosensitive polymer layers**, Viorel Dragoi, EV Group E. Thallner GmbH (Austria); Erkan Cakmak, EV Group Inc. (United States); Craig McEwen, Shin-Etsu MicroSi Inc. (United States); Elliott S. Capsuto, Shin-Etsu MicroSi, Inc. (United States); Eric Pabo, EV Group Inc. (United States) ..... [7362-13]

Coffee Break ..... 10.50 to 11.10

#### SESSION 5

Room: Conference 6 ..... Tues. 11.10 to 12.30

#### Polymer Devices

Session Chairs: **Thomas Stieglitz**, Albert-Ludwigs-Univ. Freiburg (Germany); **Monika Leester-Schaedel**, Technische Univ. Braunschweig (Germany)

11.10: **Voltage tuning of the resonance frequency of electroactive polymer membranes over a range of more than 75%**, Philippe Dubois, Samuel Rosset, Muhamed Niklaus, Herbert R. Shea, Ecole Polytechnique Fédérale de Lausanne (Switzerland) ..... [7362-14]

11.30: **Tactile sensors based on conductive polymers**, Julian Castellanos-Ramos, Rafael Navas-Gonzalez, Univ. de Málaga (Spain); Haritz Maciador, Estibalitz Ochoteco, Ctr. for Research in Electrochemical Technologies (Spain); Fernando Vidal-Verdú, Univ. de Málaga (Spain) ..... [7362-15]

# Conference 7362

- 11.50: **New concept for dielectric elastomer actuators: hydrostatic coupling**, Federico Carpi, Gabriele Frediani, Danilo De Rossi, Univ. di Pisa (Italy). [7362-16]
- 12.10: **Ionic polymer-metal composites containing Cu/Ni electrode with increased blocking force and durability**, Hyung-Kun Lee, Nak-Jin Choi, Sunkyung Jung, Kang-Ho Park, ETRI (Korea, Republic of) [7362-17]
- Lunch Break . . . . . 12.30 to 14.30

## SESSION 6

**Room: Conference 6 . . . . . Tues. 14.30 to 15.50**

### Piezoelectric MEMS

*Session Chairs:* **Roy Knechtel**, X-FAB Semiconductor Foundries AG (Germany); **Jeong-Bong Lee**, The Univ. of Texas at Dallas (USA)

- 14.30: **Aluminium nitride: promising and full CMOS compatible piezoelectric material for MOEMS applications**, Holger Conrad, Technische Univ. Dresden (Germany); Jan-Uwe Schmidt, Wolfram Pufe, Fabian Zimmer, Thilo Sandner, Harald Schenk, Hubert K. Lakner, Fraunhofer-Institut für Photonische Mikrosysteme (Germany). [7362-18]
- 14.50: **Characterization and simulation of resonantly driven beams excited by high quality AlN thin films**, Jorge Hernando, José L. Sánchez-Rojas, Univ. de Castilla-La Mancha (Spain); Helmut Seidel, Abdallah Ababneh, Univ. des Saarlandes (Germany); Ünsal Sökmen, Erwin Peiner, Technische Univ. Braunschweig (Germany); Ulrich Schmid, Technische Univ. Wien (Austria) [7362-19]
- 15.10: **What happens turning a 250µm thin piezo-stack sideways? An experimental and analytical approach to one-side-actuated piezoelectric micro drives, regarding electrode layouts and directions of deflection**, Sandy Zähringer, Norbert Schwesinger, Technische Univ. München (Germany) [7362-20]
- 15.30: **Robust superelastic, metallic amplification unit for piezoelectric microactuators**, Christian H. Bolzmacher, Karin Bauer, EADS Deutschland GmbH (Germany); Ulrich Schmid, Technische Univ. Wien (Austria); Moustapha Hafez, Commissariat à l'Energie Atomique (France); Helmut Seidel, Univ. des Saarlandes (Germany) [7362-21]
- Coffee Break . . . . . 15.50 to 16.10

### Posters—Tuesday • Tues. 16.00 to 17.30

*All symposium attendees are invited to attend Tuesday poster session provided as an opportunity to enjoy networking and refreshments while reviewing poster papers. The interactive poster sessions are designed to promote opportunities for networking with colleagues in your field. Attendees are encouraged to review the high-quality papers that are presented in this alternate format and to interact with the poster authors.*

*Poster presenters may post their poster papers starting at 11:00 hrs on Tuesday in the Conference Area Hallway. Any papers left on the boards following the end time of the poster session will be considered unwanted and will be discarded. SPIE Europe assumes no responsibility for posters left up after the end of the poster session. Poster authors should be at their papers from 16:00 to 17:30 hrs to answer questions from attendees. Attendees are requested to wear their conference registration badges to the poster sessions.*

- Position encoding and closed loop control of MOEMS translatory actuators**, Martin Lenzhofer, Andreas Kenda, Andreas Tortschanoff, Albert Frank, Martin Kraft, Carinthian Tech Research AG (Austria); Thilo Sandner, Harald Schenk, Fraunhofer-Institut für Photonische Mikrosysteme (Germany) [7362-37]
- ICP cryogenic dry etching for shallow and deep etching in silicon**, Ünsal Sökmen, Michael Balke, Andrej Stranz, Sönke Fündling, Erwin Peiner, Hergo H. Wehmann, Andreas Waag, Braunschweig Univ. of Technology (Germany) [7362-38]
- Method for improving the drop test performance of MEMS microphones**, Matthias Winter, Univ. des Saarlandes (Germany); Sefeddine Ben Aoun, Technische Univ. München (Germany); Gregor Feiertag, Anton Leidl, Patrick Scheele, EPCOS AG (Germany) [7362-39]
- Test-bed for the remote health monitoring system for bridge structures using FBG sensors**, Chin-Hyung Lee, Ki-Tae Park, Bong-Chul Joo, Yoon-Koog Hwang, Korea Institute of Construction Technology (Korea, Republic of) [7362-40]
- Influence of back pressure and sputter power on grain size, phase composition and resistivity of tantalum thin films**, Michael Grosse, Univ. des Saarlandes (Germany); Ulrich Schmid, Technische Univ. Wien (Austria) [7362-41]
- Selective wet chemical etching of metallic thin films designed by laser interference metallurgy**, Rodolphe J. A. Catrin, Carsten Gachot, Günter Marchand, Frank Mücklich, Univ. des Saarlandes (Germany); Ulrich Schmid, Technische Univ. Wien (Austria) [7362-42]
- Piezoresistive chemical sensors based on hydrogels**, Gerald U. Gerlach, Margarita Guenther, Volker Schulz, Joerg Sorber, Technische Univ. Dresden (Germany) [7362-43]

- Deformation measurements of high-speed MEMS with sub-picosecond pulses using combined digital holographic two-wavelength contouring and single phase reconstruction**, Thomas Hansel, Uwe Griebner, Max-Born-Institut für Nichtlineare Optik und Kurzzeitspektroskopie (Germany); Jens Bonitz, Christian Kaufmann, Technische Univ. Chemnitz (Germany) [7362-44]
- HIGH RESOLUTION EDDY CURRENT SENSOR SYSTEM FOR THE**, Martin H. Schulze, Henning Heuer, Martin Küttner, Fraunhofer-Institut für Zerstörungsfreie Prüfverfahren (Germany) [7362-45]
- Fabrication and characterization of YSZ membranes for micro-solid oxide fuel cells**, Iñigo Garbayo, Albert Tarancón, Ctr. Nacional de Microelectrónica (Spain); José Santiso, Andrea Cavallaro, Jaume Roqueta, CIN2 (Spain); Gemma Garcia, Univ. Autònoma de Barcelona (Spain); Isabel Gràcia, Carles Cané, Neus Sabaté, Ctr. Nacional de Microelectrónica (Spain) [7362-46]
- Advanced manufacturing technology and detection technique for microfluidic devices**, Werner E. Hoffmann, Wonhee Hwang, Holger Mühlberger, Horst Demattio, Achim Voigt, Forschungszentrum Karlsruhe GmbH (Germany); Benno Steinbrecht, arvato digital services Manufacturing EMEA (Germany); Michael Rapp, Andreas E. Guber, Volker Saile, Forschungszentrum Karlsruhe GmbH (Germany) [7362-47]
- RF MEMS switches based on an alloy of aluminum-silicon-copper**, Stefan M. Klein, Christoph Comtesse, Helmut Seidel, Univ. des Saarlandes (Germany); Volker Ziegler, Ulrich Prechtel, EADS Innovation Works (Germany); Ulrich Schmid, Technische Univ. Wien (Austria) [7362-48]
- Micromechanical sensors based on lateral and longitudinal displacement of a cantilever sensing element: a comparative performance study**, Jovan Matovic, Technische Univ. Wien (Austria); Zoran Jak?ic, Univ. of Belgrade (Serbia) [7362-49]
- Adsorption-desorption noise in plasmonic chemical/biological sensors in multiple analyte environment**, Olga Jak?ic, Nikola Tesla School of Electrical Engineering (Serbia); Zoran Jak?ic, Univ. of Belgrade (Serbia); Jovan Matovic, Technische Univ. Wien (Austria) [7362-50]
- Ultrasonic Motor Model and Power Analysis for Autonomous Industrial Applications**, Jens Teichler, Ryan Chadny, Christian Schroll, ABB Corporate Research (Germany) [7362-51]
- Motion planning for an adaptive wing structure with macro-fiber composite actuators**, Johannes Schröck, Thomas Meurer, Andreas Kugi, Technische Univ. Wien (Austria) [7362-52]
- Effect of process variables in frit bonding in MEMS wafer level packaging**, Srinivasan Sridharan, Ferro Corp. (United States); Viorel Dragoi, EV Group E. Thalner GmbH (Austria); Jim Henry, Ferro Corp. (United States) [7362-53]
- Novel measurement and monitoring system for forming processes based on piezoresistive thin film systems**, Saskia N. Biehl, Sebastian Staufenbiel, Frank Hauschild, Fraunhofer-Institut für Schicht- und Oberflächentechnik (Germany) [7362-54]
- Flexible multisensor system**, Marco Santoro, Ente per le Nuove Tecnologie, l'Energia e l'Ambiente (Italy) [7362-55]
- Investigation of energy-efficient driver circuits for piezoelectrically driven fluidic microactuators**, Hossein Pakar, Gabriele Schrag, Gerhard Wachutka, Technische Univ. München (Germany) [7362-56]
- Growth of ZnO nanorods on patterned templates for energy harvesting applications**, Christos Tsamis, George Niarchos, Eleni Makarona, National Ctr. for Scientific Research Demokritos (Greece) [7362-57]
- Characterisation of the intrinsic stress gradient in micromachined parylene membranes**, Teresa Zoepfl, Stefan Klare, Gerhard Wachutka, Gabriele Schrag, Technische Univ. München (Germany) [7362-58]
- Comparison between AlN thin films with different crystal orientations for MEMS applications**, Abdallah Ababneh, Günter Marchand, Helmut Seidel, Univ. des Saarlandes (Germany); Jorge Hernando, José L. Sánchez-Rojas, Univ. de Castilla-La Mancha (Spain); Ünsal Sökmen, Erwin Peiner, Technische Univ. Braunschweig (Germany); Ulrich Schmid, Technische Univ. Wien (Austria) [7362-59]
- Constant-charge biased RF MEMS switch**, Jeong-Bong Lee, Kyung-Hak Choi, The Univ. of Texas at Dallas (United States) [7362-60]
- Design, fabrication and characterization of a micro-fluxgate intended for parallel robot application**, Maren R. Kirchhoff, Gerrit Bogdanski, Stephanus Büttgenbach, Technische Univ. Braunschweig (Germany) [7362-61]
- SAW-grade SiO2 for advanced microfluidic devices**, Andreas Winkler, Siegfried Menzel, Hagen Schmidt, Leibniz-Institut für Festkörper- und Werkstoffforschung Dresden (Germany) [7362-62]
- Semi-active multi-sensor RFID tags for logistics**, Jürgen Wöllenstein, Fraunhofer-Institut für Physik Messtechnik (Germany); Michael Schmidt, scemtec Transponder Technology GmbH (Germany); Jutta Dührkoph, Süderelbe Logistik GmbH (Germany); Udo Weimar, Univ. Tübingen (Germany); Olaf Kiesewetter, UST Umweltsensortechnik GmbH (Germany); Guido Moosmann, Schreiner Group GmbH & Co. KG (Germany); Thomas Becker, EADS Deutschland GmbH (Germany) [7362-63]
- Power management circuit for resonant energy harvesters**, Tomas Jirku, Miloslav Steinbauer, Brno Univ. of Technology (Czech Republic); Martin Kluge, EADS Deutschland GmbH (Germany) [7362-64]



## Wednesday 6 May

## SESSION 9

Room: Conference 6 ..... Wed. 09.30 to 10.50

## Reliability

*Session Chairs:* **José Luis Sánchez-Rojas**, Univ. de Castilla-La Mancha (Spain); **Erwin Peiner**, Technische Univ. Braunschweig (Germany)

09.30: **New methods and instrumentation for functional, yield and reliability testing of MEMS on device, chip and wafer level** (*Invited Paper*), Ingrid J. De Wolf, IMEC (Belgium) ..... [7362-22]

10.10: **Single crystalline silicon-based surface micromachining for high-precision inertial sensors: technology and design for reliability**, Roy Knechtel, X-FAB Semiconductor Foundries AG (Germany) ..... [7362-23]

10.30: **Reliability of Ag thin films sputter deposited on different substrates**, Achim Bittner, Helmut Seidel, Univ. des Saarlandes (Germany); Ulrich Schmid, Technische Univ. Wien (Austria) ..... [7362-24]

Coffee Break ..... 10.50 to 11.10

## SESSION 8

Room: Conference 6 ..... Wed. 11.10 to 12.30

## Chemical Sensors

*Session Chairs:* **Ingrid J. De Wolf**, IMEC (Belgium); **Ulrich Schmid**, Technische Univ. Wien (Austria)

11.10: **FIB generated antimony nanowires as chemical sensors**, Alois Lugstein, Amra Avdic, Emmerich Bertagnolli, Technische Univ. Wien (Austria) ..... [7362-25]

11.30: **ZnO nanowires for optical gas sensing: comparison between MBE and evaporation grown nanostructures**, Silvia Todros, Camilla Baratto, Elisabetta Comini, Guido Faglia, Matteo Ferroni, Andrea Ponzoni, Univ. degli Studi di Brescia (Italy); Martin Eickhoff, Justus-Liebig-Univ. Giessen (Germany); Thomas A. Wassner, Technische Univ. München (Germany); Giorgio Sberveglieri, Univ. degli Studi di Brescia (Italy) ..... [7362-26]

11.50: **Fast transient temperature operating micromachined emitter for mid-infrared for optical gas sensing systems**, Carolin Peter, Jürgen Hildenbrand, Andreas Kürzinger, Fraunhofer-Institut für Physik Messtechnik (Germany); Falk Naumann, Matthias Ebert, Ralf B. Wehrspohn, Fraunhofer-Institut für Werkstoffmechanik Halle (Germany); Jürgen Wöllenstein, Fraunhofer-Institut für Physik Messtechnik (Germany) ..... [7362-27]

12.10: **AC impedance spectroscopy modeling of TiO<sub>2</sub> top-down nanometric chemical detector array and gas sensing properties**, Luca Francioso, Chiara De Pascali, Simona Capone, Enrico Melissano, Massimo Catalano, Pietro Siciliano, Consiglio Nazionale delle Ricerche (Italy) ..... [7362-28]

Lunch Break ..... 12.30 to 14.30

## SESSION 9

Room: Conference 6 ..... Wed. 14.30 to 15.50

## Materials

*Session Chairs:* **José Luis Sánchez-Rojas**, Univ. de Castilla-La Mancha (Spain); **Roy Knechtel**, X-FAB Semiconductor Foundries AG (Germany)

14.30: **Tuned wettability of material surfaces for tribological applications in miniaturized systems by laser interference metallurgy**, Carsten Gachot, Michael Hans, Rodolphe J. A. Catrin, Frank Mücklich, Univ. des Saarlandes (Germany) ..... [7362-29]

14.50: **Electrical and mechanical characterization of low-temperature cofired ceramics for high-temperature sensor applications**, Andreas Roosen, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); Michael Grosser, Markus O. Ziegler, Univ. des Saarlandes (Germany); Ulrich Schmid, Technische Univ. Wien (Austria) ..... [7362-30]

15.10: **New perspectives for pressure and force sensors**, Günter Schultes, Ralf Koppert, Dirk Goettel, Olivia Freitag-Weber, Anne-Catherine Probst, HTW des Saarlandes (Germany); Ulf Werner, Leibniz-Institut fuer Neue Materialien GmbH (Germany) ..... [7362-31]

15.30: **Silicon oxide sacrificial layers deposited by pulsed-DC magnetron sputtering for MEMS applications**, Sheila González-Castilla, Jimena Olivares, Marta Clement, Univ. Politécnica de Madrid (Spain); Lucía Vergara, Consejo Superior de Investigaciones Científicas (Spain); Laura Pulido, Enrique Iborra, Jesús G. Sangrador, Univ. Politécnica de Madrid (Spain) ..... [7362-32]

Coffee Break ..... 15.50 to 16.10

## SESSION 10

Room: Conference 6 ..... Wed. 16.10 to 17.30

## Optical Systems

*Session Chairs:* **Herbert R. Shea**, Ecole Polytechnique Fédérale de Lausanne (Switzerland); **Carles Cané**, Ctr. Nacional de Microelectrónica (Spain)

16.10: **3.0-3.7µm infrared sensor system for cell analysis**, Sander van den Driesche, Technische Univ. Wien (Austria); Wojciech Witarski, Slovak Academy of Sciences (Slovakia); Michael J. Vellekoop, Technische Univ. Wien (Austria) ..... [7362-33]

16.30: **Micromirrors to application potential in spectrofotometers and ended-ended systems**, Armando G. Rojas D.D.S., Instituto Nacional de Astrofísica, Óptica y Electrónica (Mexico) and Univ. de Sonora (Mexico) ..... [7362-34]

16.50: **Silicon comb-drive X-Y microstage with frame-in-the-frame architecture for MOEMS applications**, Sylwester Bargiel, Karolina Laszczyk, Christophe Gorecki, Univ. de Franche-Comté (France); Jerzy M. Krezel, Malgorzata Kujawinska, Warsaw Univ. of Technology (Poland) ..... [7362-35]

17.10: **Design and fabrication of self-assembling micromirror arrays**, Qingdang Li, Andreas Jäkel, Volker Viereck, Jürgen Schmid, Hartmut H. Hillmer, Univ. Kassel (Germany) ..... [7362-36]

## Closing Remarks

Room: Conference 6 ..... Wed. 17.30

**Ulrich Schmid**, Vienna Univ. of Technology (Austria); **Carles Cané**, Ctr. Nacional de Microelectrónica (Spain); **Herbert R. Shea**, École Polytechnique Fédérale de Lausanne (Switzerland)

# Conference 7363 - Room: Conference 5

Monday-Wednesday 4-6 May 2009 • Proceedings of SPIE Vol. 7363

## VLSI Circuits and Systems

*Conference Chair:* **Teresa Riesgo**, Univ. Politécnica de Madrid (Spain)

*Conference Co-Chairs:* **Eduardo de la Torre**, Univ. Politécnica de Madrid (Spain); **Leandro Soares Indrusiak**, Technische Univ. Darmstadt (Germany)

*Programme Committee:* **Said Fares Al-Sarawi**, The Univ. of Adelaide (Australia); **Sebastián A. Bota**, Univ. de les Illes Balears (Spain); **João C. Ferreira**, Univ. of Porto/INESC Porto (Portugal); **Angel de Castro**, Univ. Autónoma de Madrid (Spain); **Massimo Conti**, Univ. Politecnica delle Marche (Italy); **Marcelino B. Dos Santos**, IST-INESC (Portugal); **Francisco V. Fernández**, Instituto de Microelectrónica de Sevilla (Spain); **Paul D. Franzon**, North Carolina State Univ. (USA); **Eby G. Friedman**, Univ. of Rochester (USA); **Dake Liu**, Linköping Univ. (Sweden); **Sebastián López Suárez**, Univ. de Las Palmas de Gran Canaria (Spain); **Celia López-Ongil**, Univ. Carlos III de Madrid (Spain); **Antonio López-Martín**, Univ. Pública de Navarra (Spain); **Marie-Minerve Louerat**, Univ. Paris VI (France); **Gustavo Marrero**, Univ. de Las Palmas de Gran Canaria (Spain); **Salvador Mir**, TIMA Lab. (France); **Pere Lluís Miribel-Català**, Univ. de Barcelona (Spain); **Félix Moreno**, Univ. Politécnica de Madrid (Spain); **Antonio Núñez Ordóñez**, Univ. de Las Palmas de Gran Canaria (Spain); **Belén Pérez-Verdú**, Ctr. Nacional de Microelectrónica (Spain); **Juan José Rodríguez Andina**, Univ. de Vigo (Spain); **Ángel B. Rodríguez-Vázquez**, Anafocus (Spain); **Marco Domenico Samtambroglio**, Politecnico di Milano (Italy); **César Sanz**, Univ. Politécnica de Madrid (Spain); **Gilles Sassatelli**, Lab. d'Informatique de Robotique et de Microelectronique de Montpellier (France); **José Silva Matos**, Univ. do Porto (Portugal); **Walter Stechele**, Technische Univ. München (Germany)

### Monday 4 May

#### Opening Remarks

**Room: Conference 5 . . . . . Mon. 11.05 to 11.10**

**Teresa Riesgo**, Univ. Politécnica de Madrid (Spain)

#### SESSION 1

**Room: Conference 5 . . . . . Mon. 11.10 to 12.30**

#### Reconfigurable Hardware

*Session Chairs:* **Leandro Soares Indrusiak**, Technische Univ. Darmstadt (Germany); **Celia López-Ongil**, Univ. Carlos III de Madrid (Spain)

11.10: **Survey of reconfigurable architectures for multimedia applications**, Teresa Cervero, Sebastián López Suárez, Gustavo M. Callico, Félix B. Tobajas Guerrero, Valentin de Armas Sosa, José López Feliciano, Roberto Sarmiento Rodríguez, Univ. de Las Palmas de Gran Canaria (Spain) . . . . . [7363-01]

11.30: **Method for run time hardware code profiling for algorithm acceleration**, Vladimir Matev, Eduardo de la Torre, Teresa Riesgo, Univ. Politécnica de Madrid (Spain) . . . . . [7363-02]

11.50: **Non-rectangular reconfigurable cores for systems-on-chip**, Pedro M. Alves, Univ. of Porto (Portugal); João C. Ferreira, Univ. of Porto/INESC Porto (Portugal) . . . . . [7363-03]

12.10: **Using partial reconfiguration for SoC design and implementation**, Yana E. Krasteva, Jorge Portilla, Univ. Politécnica de Madrid (Spain); Félix B. Tobajas Guerrero, Univ. de Las Palmas de Gran Canaria (Spain); Eduardo de la Torre, Univ. Politécnica de Madrid (Spain) . . . . . [7363-04]

Lunch Break . . . . . 12.30 to 14.30

#### SESSION 2

**Room: Conference 5 . . . . . Mon. 14.30 to 15.50**

#### Sensors and Signal Conditioning

*Session Chairs:* **Sebastián A. Bota**, Univ. de les Illes Balears (Spain); **Eduardo de la Torre**, Univ. Politécnica de Madrid (Spain)

14.30: **Polytopol computing for multi-core and distributed systems**, Henk Spaanenburg, Univ. of New Hampshire (United States); Johan Ranefors, GlimWorks (Sweden); Lambert Spaanenburg, Lund Univ. (Sweden) . . . . . [7363-05]

14.50: **Workload analysis and pipeline stalls of SMP system: preliminary ideas for speed-up remote sensing application**, Yi Guo, Andrés Cardona Cardona, Carles Ferrer Ramis, Lena Kanellou, Univ. Autónoma de Barcelona (Spain) . . . . . [7363-06]

15.10: **0.35µm CMOS adaptive circuits for sensor conditioning systems**, Guillermo Zatorre-Navarro, Teltronic S.A.U. (Spain); Nicolás Medrano-Marques, Concepcion Aldea, Jesús Revuelto, Santiago Celma, Univ. of Zaragoza (Spain); Maria Teresa Sanz, Instituto Nacional de Astrofísica, Óptica y Electrónica (Mexico) . . . . . [7363-07]

15.30: **Low-power portable integrated micro electrode potentiostat for in-situ electrochemical measurements**, Jordi Colomer-Farrarons, Univ. de Barcelona (Spain); Ivon Rodríguez, Martin Arundell, Institute for Bioengineering of Catalonia (Spain); Pere L. Miribel-Català, Josep Samitier, Univ. de Barcelona (Spain) . . . . . [7363-08]

Coffee Break . . . . . 15.50 to 16.10

### SESSION 3

**Room: Conference 5 . . . . . Mon. 16.10 to 17.10**

#### Design for Communication Systems

*Session Chairs:* **Ángel B. Rodríguez-Vázquez**, Anafocus (Spain); **João C. Ferreira**, Univ. of Porto/INESC Porto (Portugal)

16.10: **Hardware implementation of a scheduler for high-performance switches with quality of service support**, Rubén P. Arteaga Mesa, Félix B. Tobajas Guerrero, Valentin de Armas Sosa, Roberto Sarmiento Rodríguez, Univ. de Las Palmas de Gran Canaria (Spain) . . . . . [7363-09]

16.30: **Resonance-based hybrid continuous-time/discrete-time cascade sigma-delta modulators: application to 4G wireless telecom**, José M. de la Rosa, Alonso Morgado, Rocio del Rio, Instituto de Microelectrónica de Sevilla (Spain) . . . . . [7363-10]

16.50: **Improved 10GBase-LX4 limiting amplifier in a low-cost 0.18 µm CMOS technology**, Jose María García del Pozo, Santiago Celma, Aránzazu Otín, Univ. of Zaragoza (Spain) . . . . . [7363-12]

### Tuesday 5 May

#### SESSION 4

**Room: Conference 5 . . . . . Tues. 09.30 to 10.50**

#### VLSI Technology

*Session Chairs:* **Massimo Conti**, Univ. Politecnica delle Marche (Italy); **Hagen Saemrow**, Univ. Rostock (Germany)

09.30: **Double edge triggered feedback Flip-Flop based on Independent Gate FinFETs in 32nm technology**, Farzan Jazayeri, Univ. of Tehran (Iran, Islamic Republic of) . . . . . [7363-13]

09.50: **Titanium nitride diffusion barrier for copper using plasma immersion ion implantation**, Mukesh Kumar, Dinesh Kumar, Kurukshetra Univ. (India) . . . . . [7363-14]

10.10: **New ultra-low-energy DT-CMOS inverter scheme: power efficiency and temperature stability**, Samaneh Soleimani Amiri, Univ. of Tehran (Iran, Islamic Republic of) . . . . . [7363-15]

10.30: **Passivation of silicon wafer patterned by aluminum for MEMS/MOEMS micromachining**, Ani Duan, Vestfold Univ. College (Norway) . . [7363-16]

Coffee Break . . . . . 10.50 to 11.10

## SESSION 5

**Room: Conference 5 . . . . . Tues. 11.10 to 12.30**

### Multimedia Applications

*Session Chairs:* **Sebastián López Suárez**, Univ. de Las Palmas de Gran Canaria (Spain); **Félix Moreno**, Univ. Politécnica de Madrid (Spain)

11.10: **Anisotropic quality measurement applied to H.264 video compression**, Gustavo M. Callico, Sebastián López Suárez, Oliver Sosa Báez, Univ. de Las Palmas de Gran Canaria (Spain); Gabriel Cristóbal, Elena Gil, Salvador Gabarda, Consejo Superior de Investigaciones Científicas (Spain); José López Feliciano, Roberto Sarmiento Rodríguez, Univ. de Las Palmas de Gran Canaria (Spain) . . . . . [7363-17]

11.30: **System for emulating the broadcasting of a DAB ensemble containing data services**, David Samper, Pedro J. Lobo, Manuel César Rodríguez, César Sanz, Univ. Politécnica de Madrid (Spain) . . . . . [7363-18]

11.50: **ESL flow for a hardware H.264/AVC decoder using TLM-2.0 and high level synthesis: quantitative study**, Marcos Thadani, Pedro P. Carballo, Pedro H. Fernández, Gustavo M. Callico, Antonio Núñez Ordóñez, Univ. de Las Palmas de Gran Canaria (Spain) . . . . . [7363-19]

12.10: **Implementation of a media synchronization algorithm for multi-standard IP set-top box systems**, Esther Estevez, David Samper, Fernando Pescador, Matias J. Garrido, César Sanz, Univ. Politécnica de Madrid (Spain) . . . . . [7363-20]

Lunch Break . . . . . 12.30 to 14.30

## SESSION 6

**Room: Conference 5 . . . . . Tues. 14.30 to 15.50**

### Network on a Chip

*Session Chairs:* **Félix B. Tobajas Guerrero**, Univ. de Las Palmas de Gran Canaria (Spain); **João M. Castro Ferreira**, INESC Porto (Portugal)

14.30: **Performance analysis of mixed communication architectures: bus and network-on-chip**, Massimo Conti, Stefano Gigli, Eros Renzetti, Univ. Politecnica delle Marche (Italy) . . . . . [7363-21]

14.50: **Cache-aware network-on-chip for chip multiprocessors**, Konstantinos Tatas, Costas Kyriacou, Frederick Institute of Technology (Cyprus); George Dekoulis, Lancaster Univ. (United Kingdom); Demetris Demetriou, Costas Avraam, Anastasia Christou, Frederick Institute of Technology (Cyprus) . . . . . [7363-22]

15.10: **Dynamic power management of network-on-chip**, Massimo Conti, Stefano Gigli, Luca Casagrande Montesi, Andrea Primavera, Univ. Politecnica delle Marche (Italy) . . . . . [7363-23]

15.30: **NoC generation of an optimal memory distribution for multimedia systems**, Raúl Regidor, Félix B. Tobajas Guerrero, Valentin de Armas Sosa, Univ. de Las Palmas de Gran Canaria (Spain); Eduardo de la Torre, Teresa Riesgo, Univ. Politécnica de Madrid (Spain); Roberto Sarmiento Rodríguez, Univ. de Las Palmas de Gran Canaria (Spain) . . . . . [7363-24]

Coffee Break . . . . . 15.50 to 16.10

### Posters—Tuesday • Tues. 16.00 to 17.30

*All symposium attendees are invited to attend Tuesday poster session provided as an opportunity to enjoy networking and refreshments while reviewing poster papers. The interactive poster sessions are designed to promote opportunities for networking with colleagues in your field. Attendees are encouraged to review the high-quality papers that are presented in this alternate format and to interact with the poster authors.*

*Poster presenters may post their poster papers starting at 11:00 hrs on Tuesday in the Conference Area Hallway. Any papers left on the boards following the end time of the poster session will be considered unwanted and will be discarded.*

*SPIE Europe assumes no responsibility for posters left up after the end of the poster session. Poster authors should be at their papers from 16:00 to 17:30 hrs to answer questions from attendees. Attendees are requested to wear their conference registration badges to the poster sessions.*

**Adaptive interface between resistive sensors and microcontrollers**, Jesús Revuelto, Univ. of Zaragoza (Spain); Nicolas Medrano, Univ. de Zaragoza (Spain); Belen Calvo D.D.S., Univ. of Zaragoza (Spain); Guillermo Zatorre-Navarro, Teltronic S.A.U. (Spain); Santiago Celma, Univ. of Zaragoza (Spain) . . . . . [7363-41]

**Considerations on the design of conventional receivers for wireless optical channels using a Monte Carlo based ray-tracing algorithm**, Silvestre Rodríguez Pérez, Beatriz Rodríguez Mendoza, Oswaldo B. González Hernández, Alejandro J. Ayala Alfonso, Univ. de La Laguna (Spain) . . . . . [7363-42]

**New analog MIN/MAX/median filter for data processing in hardware implemented neural networks**, Rafal Dlugosz, Swiss Federal Institute of Technology (Switzerland); Marta Kolasa, Univ. of Technology and Life Sciences (Poland) . . . . . [7363-43]

**Analytical approach-based algorithm for trimming CMOS bandgap voltage reference**, Mohamed Lamine Hafiane, Zohir Dibi, Univ. de Batna (Algeria) . . . . . [7363-44]

**Design for testability of 10 bits continuous time sigma delta ADC**, Mohamed Lamine Hafiane, Zohir Dibi, Univ. de Batna (Algeria); Otto Manck, Technische Univ. Berlin (Germany) . . . . . [7363-45]

**Autonomous low-noise system for broadband measurements of the cosmic microwave background radiation**, George Dekoulis, Lancaster Univ. (United Kingdom) . . . . . [7363-46]

## Wednesday 6 May

### SESSION 7

**Room: Conference 5 . . . . . Wed. 09.30 to 10.50**

### Design of Analog Circuits

*Session Chairs:* **Marie-Minerve Louerat**, Univ. Paris VI (France); **Pere Lluís Miribel-Català**, Univ. de Barcelona (Spain)

09.30: **Flexible CMOS low-noise amplifiers for beyond-3G wireless handheld devices**, Edwin C. Becerra-Alvarez, Instituto de Microelectrónica de Sevilla (Spain); Federico Sandoval-Ibarra, CINVESTAV - Unidad Guadalajara (Mexico); José M. de la Rosa, Instituto de Microelectrónica de Sevilla (Spain) . . . . . [7363-25]

09.50: **Comprehensive procedural approach for transferring or comparative analysis of analogue IP building blocks towards different CMOS technologies**, Dorine M. Gevaert, CECO (Belgium) . . . . . [7363-26]

10.10: **Low voltage CMOS low drop-out voltage regulator**, Mohammad U. Abbasi, Salma Bakr, Freescale Semiconductor India Pvt. Ltd. (India) . . . . . [7363-27]

10.30: **0.18 um CMOS inductorless AGC amplifier with 50 dB input dynamic range for 10GBase-LX4 ethernet**, Francisco Aznar, Santiago Celma, Belen Calvo D.D.S., Concepcion Aldea, Univ. of Zaragoza (Spain) . . . . . [7363-28]

Coffee Break . . . . . 10.50 to 11.10

### SESSION 8

**Room: Conference 5 . . . . . Wed. 11.10 to 12.30**

### Smart Power

*Session Chairs:* **Roberto Sarmiento Rodríguez**, Univ. de Las Palmas de Gran Canaria (Spain); **Mohammad U. Abbasi**, Freescale Semiconductor India Pvt. Ltd. (India)

11.10: **100mA fractional step-down charge pump with digital control** (*Invited Paper*), Marcelino Santos, Instituto Superior Técnico (Portugal) and INESC-ID (Portugal); Valter Sadio, Abílio Parreira, Instituto Superior Técnico (Portugal); Floriberto Lima, MIPS Technologies, Inc. (Portugal) . . . . . [7363-29]

11.50: **ModelSim-PSIM mixed signal simulation for power electronics digital control design**, Mario Garcia Valderas, Pablo Zumel, Antonio Lázaro Blanco, Celia Lopez Ongil, Luis Entrena Arrontes, Univ. Carlos III de Madrid (Spain) . . . . . [7363-30]

12.10: **Dynamic OSR sigma delta controller for monolithic switching converters**, Massimo Conti, Simone Orcioni, Rocco D'Aparo, Univ. Politecnica delle Marche (Italy) . . . . . [7363-31]

Lunch Break . . . . . 12.30 to 14.30

### SESSION 9

**Room: Conference 5 . . . . . Wed. 14.30 to 15.50**

### Test and Reliability

*Session Chairs:* **José Silva Matos**, Univ. do Porto (Portugal); **Marcelino B. Dos Santos**, IST-INESC (Portugal)

14.30: **New approach to accelerate SEU sensitivity evaluation in circuits with embedded memories**, Marta Portela-García, Mario Garcia Valderas, Celia Lopez-Ongil, Luis Entrena Arrontes, Univ. Carlos III de Madrid (Spain) . . . . . [7363-32]

14.50: **Analysis of faults of drowsy SRAM cell considering the effect of process variation**, Mamatha Samson, M. B. Srinivas, International Institute of Information Technology (India) . . . . . [7363-33]

15.10: **Analysis of power-bus current transients in SRAM memories for single event upset detection.**, Gabriel Torrens, Jaume Verd, José L. Merino, Sebastián A. Bota, Tomeu Alorda, Jaume Segura, Univ. de les Illes Balears (Spain) . . . . . [7363-34]

15.30: **Practical aspects of redundant transistors in respect of gate oxide breakdown**, Hagen Saemrow, Claas Cornelius, Univ. Rostock (Germany); Frank Sill, Univ. Federal de Minas Gerais (Brazil); Dirk Timmermann, Univ. Rostock (Germany) . . . . . [7363-35]

Coffee Break . . . . . 15.50 to 16.10

# Conference 7363

## SESSION 10

**Room: Conference 5 . . . . . Wed. 16.10 to 17.30**

### Digital Design

*Session Chairs:* **Antonio Núñez Ordóñez**, Univ. de Las Palmas de Gran Canaria (Spain); **César Sanz**, Univ. Politécnica de Madrid (Spain)

16.10: **Static power dissipation in adder circuits: the UDSM domain**, Steve Cayouette, Dhamin Al-Khalili, Royal Military College of Canada (Canada)[7363-39]

16.30: **Approach to an FPGA embedded, autonomous object recognition system: run-time learning and adaptation**, Ruben Salvador, Carlos Terleira, Felix Moreno, Teresa Riesgo, Univ. Politécnica de Madrid (Spain) . . . . . [7363-37]

16.50: **Tiled architecture of a CNN-mostly IP system**, Lambert Spaanenburg, Suleyman Malki, Lund Univ. (Sweden) . . . . . [7363-38]

17.10: **Optimization of input-constrained systems**, Lambert Spaanenburg, Suleyman Malki, Lund Univ. (Sweden) . . . . . [7363-36]

### Closing Remarks

**Room: Conference 5 . . . . . Wed. 17.30 to 17.35**

**Teresa Riesgo**, Univ. Politécnica de Madrid (Spain); **Eduardo de la Torre**, Univ. Politécnica de Madrid (Spain); **Leandro Soares Indrusiak**, Technische Univ. Darmstadt (Germany)

# Conference 7364 - Room: Conference 4

Monday-Wednesday 4-6 May 2009 • Proceedings of SPIE Vol. 7364

## Nanotechnology

Conference Chair: **Achim Wixforth**, Univ. of Augsburg (Germany)

Conference Co-Chairs: **Axel Lorke**, Univ. Duisburg-Essen (Germany); **Friedrich C. Simmel**, Technische Univ. München (Germany)

Programme Committee: **Robert H. Blick**, Univ. of Wisconsin, Madison (USA); **V. G. Dolgoplov**, Institute of Semiconductor Physics (Russian Federation); **Klaus Ensslin**, ETH Zürich (Switzerland); **Alfred Gold**, Ctr. d'Elaboration de Matériaux ed d'Etrudes Structurales (France); **Alexander O. Govorov**, Ohio Univ. (USA); **Kenji Ikushima**, The Univ. of Tokyo (Japan); **Joerg K. N. Lindner**, Univ. Augsburg (Germany); **Poul Erik Lindelof**, Nano-Science Ctr. (Denmark); **Harri K. Lipsanen**, Helsinki Univ. of Technology (Finland); **Paolo Lugli**, Technische Univ. München (Germany); **Pierre M. Petroff**, Univ. of California/Santa Barbara (USA); **Anatoly Sidorenko**, Univ. Chisinau (Moldova); **Mansour Shayegan**, Princeton Univ. (USA); **Martin Stutzmann**, Technische Univ. München (Germany); **Richard J. Warburton**, Heriot-Watt Univ. (United Kingdom); **Andreas D. Wieck**, Ruhr-Univ. Bochum (Germany)

### Monday 4 May

#### Opening Remarks

Room: Conference 4 ..... Mon. 11.05 to 11.10

**Achim Wixforth**, Univ. of Augsburg (Germany); **Axel Lorke**, Univ. Duisburg-Essen (Germany); **Friedrich C. Simmel**, Technische Univ. München (Germany)

#### SESSION 1

Room: Conference 4 ..... Mon. 11.10 to 12.30

#### Characterisation

Session Chair: **Achim Wixforth**, Univ. Augsburg (Germany)

11.10: **Electronic and optical properties of self-assembled semiconductor quantum rings** (*Invited Paper*), Vladimir M. Fomin, Univ. Antwerpen (Belgium) and State Univ. of Moldova (Moldova) and Technische Univ. Eindhoven (Netherlands); Vladimir N. Gladilin, Katholieke Univ. Leuven (Belgium) and Univ. Antwerpen (Belgium) and State Univ. of Moldova (Moldova); Jozef T. Devreese, Univ. Antwerpen (Belgium) and Technische Univ. Eindhoven (Netherlands); Niek A. J. M. Kleemans, Murat Bozkurt, Paul M. Koenraad, Technische Univ. Eindhoven (Netherlands) ..... [7364-01]

11.50: **TBA**

12.10: **Characterization of nano-thin films and membranes by use of atomic force acoustic microscopy methods**, Malgorzata Kopycinska-Mueller, André Striegler, Fraunhofer-Institut für Zerstörungsfreie Prüfverfahren (Germany) and Technische Univ. Dresden (Germany); Bernd Köhler, Fraunhofer-Institut für Zerstörungsfreie Prüfverfahren (Germany); Klaus-Jürgen Wolter, Technische Univ. Dresden (Germany); Norbert G. Meyendorf, Fraunhofer-Institut für Zerstörungsfreie Prüfverfahren (Germany) ..... [7364-03]

Lunch Break ..... 12.30 to 14.30

#### SESSION 2

Room: Conference 4 ..... Mon. 14.30 to 15.50

#### Fabrication I

Session Chair: **Achim Wixforth**, Univ. Augsburg (Germany)

14.30: **Smart tubes** (*Invited Paper*), Oliver G. Schmidt, Leibniz-Institut für Festkörper- und Werkstofforschung Dresden (Germany) ..... [7364-04]

15.10: **Local charge storage and decay mechanisms in silica**, Carsten Maedler, Harald Graaf, Christian von Borczyskowski, Technische Univ. Chemnitz (Germany) ..... [7364-05]

15.30: **Magneto-transport properties of nanocomposite transition-metal/carbon systems**, Shengqiang Zhou, Forschungszentrum Dresden-Rossendorf (Germany) ..... [7364-06]

Coffee Break ..... 15.50 to 16.10

#### SESSION 3

Room: Conference 4 ..... Mon. 16.10 to 17.30

#### Self-assembly and Nanotemplates

Session Chair: **Axel Lorke**, Univ. Duisburg-Essen (Germany)

16.10: **Self-organization of pentacene nanofibers from solution for organic field effect transistors**, Olaf Karthaus, Jun-ichi Nishide, Hiroyuki Sasabe, Keisuke Kai, Hiroaki Kubo, Chitose Institute of Science and Technology (Japan) ..... [7364-07]

16.30: **Self-assembly of nanoparticles in electrical field**, Václav Bouda, Czech Technical Univ. in Prague (Czech Republic) ..... [7364-08]

16.50: **Nano-structure formation driven by local protonation of polymer thin films**, Carsten Maedler, Technische Univ. Chemnitz (Germany); Sailaja Chada, Mingdi Yan, Andres H. La Rosa, Portland State Univ. (United States) ..... [7364-09]

17.10: **Creation of nanostructures on silicon by selective binding of dyes**, Harald Graaf, Thomas Baumgaertel, Christian von Borczyskowski, Technische Univ. Chemnitz (Germany) ..... [7364-10]

### Tuesday 5 May

#### SESSION 4

Room: Conference 4 ..... Tues. 09.30 to 10.50

#### Novel Devices

Session Chair: **Axel Lorke**, Univ. Duisburg-Essen (Germany)

09.30: **Programmable lab-on-a-chip system for single cell analysis** (*Invited Paper*), Stefan Thalhammer, Helmholtz Zentrum München, GmbH (Germany); Achim Wixforth, Univ. Augsburg (Germany) ..... [7364-11]

10.10: **Attainability of negative differential conductance in tunnel Schottky structures with 2D channels: theory and experiment**, Michael Feiginov, Technische Univ. Darmstadt (Germany); Igor N. Kotel'nikov, Institute of Radio-engineering and Electronics (Russian Federation) ..... [7364-12]

10.30: **Bio-mimicking rotary nanomotors**, Lev Murokh, Queens College/CUNY (United States); Anatoly Smirnov, The Institute of Physical and Chemical Research (RIKEN) (Japan); Franco Nori, The Institute of Physical and Chemical Research (RIKEN) (Japan) and Univ. of Michigan (United States); Sergey Savel'ev, Loughborough Univ. (United Kingdom) and The Institute of Physical and Chemical Research (RIKEN) (Japan) ..... [7364-13]

Coffee Break ..... 10.50 to 11.10

#### SESSION 5

Room: Conference 4 ..... Tues. 11.10 to 12.30

#### Hybrid Nanosystems

Session Chair: **Vladimir M. Fomin**, Univ. Antwerpen (Belgium)

11.10: **Nonlinear finite element analysis of interfacial properties of CNT reinforced nanocomposites**, Hossein Sadeghi, Mehdi Sadeghpour, Sharif Univ. of Technology (Iran, Islamic Republic of) ..... [7364-14]

11.30: **Subnanometer diagnostics of bottom-up synthesis of silicon functionalizations**, Peter Hess, Nils Salingue, Ruprecht-Karls-Univ. Heidelberg (Germany); Dominic Lingenfeller, Robert Bosch GmbH (Germany); Pavel Prunici, Malibu GmbH (Germany) ..... [7364-15]

11.50: **Luminescence and photovoltaic effect of multilayer structures based on CdSe and CdSe/ZnS nanoparticles embedded into organic semiconductors**, Sergey V. Dayneko, Alexander A. Chistyakov, Kirill V. Zaharchenko, Moscow Engineering Physics Institute (Russian Federation); Vladimir A. Oleinikov, Shemyakin and Ovchinnikov Institute of Bioorganic Chemistry (Russian Federation); Alexei R. Tameev, Marina G. Tedoradze, Viktor I. Zolotarevskiy, A. N. Frumkin Institute of Physical Chemistry and Electrochemistry (Russian Federation) ..... [7364-16]

12.10: **Epoxy/carbon nanotube composite-based temperature sensor with linear characteristics**, Heinz-Christoph Neitzert, Andrea Sorrentino, Luigi Vertuccio, Univ. degli Studi di Salerno (Italy) ..... [7364-17]

Lunch Break ..... 12.30 to 14.30

## SESSION 6

Room: Conference 4 ..... Tues. 14.30 to 15.50

### Fabrication II

Session Chair: **Alexey E. Zhukov**, Ioffe Physico-Technical Institute (Russian Federation)

14.30: **Patterning of Si substrates for Ge/Si(001) island grown by low-energy plasma enhanced CVD**, Monica Bollani, Daniel Chrastina, Giovanni Isella, Davide Colombo, Roman Sordan, Lab. for Epitaxial Nanostructures on Silicon and Spintronics (Italy) ..... [7364-18]

14.50: **Deposition of nanocrystalline TiO<sub>2</sub> thin film on silicon using Sol-Gel technique and its characterization**, Mukesh Kumar, Anuj Kumar, Dinesh Kumar, Kurukshetra Univ. (India) ..... [7364-19]

15.10: **Mesoscale honeycomb films for templating inorganic nanomaterials and microspheres**, Olaf Karthaus, Kenichi Kon, Chitose Institute of Science and Technology (Japan) ..... [7364-20]

15.30: **Heterojunction solar cell fabricated by spin-coating of a CNT/PEDOT:PSS heteroemitter on top of a crystalline silicon absorber**, Heinrich C. Neitzert, Univ. degli Studi di Salerno (Italy); Stefan Schwertheim, Marcel Leinhos, Katrina Meusinger, Wolfgang R. Fahrner, FernUniv. in Hagen (Germany) [7364-21]

Coffee Break ..... 15.50 to 16.10

### Posters—Tuesday • Tues. 16.00 to 17.30

All symposium attendees are invited to attend Tuesday poster session provided as an opportunity to enjoy networking and refreshments while reviewing poster papers. The interactive poster sessions are designed to promote opportunities for networking with colleagues in your field. Attendees are encouraged to review the high-quality papers that are presented in this alternate format and to interact with the poster authors.

Poster presenters may post their poster papers starting at 11:00 hrs on Tuesday in the Conference Area Hallway. Any papers left on the boards following the end time of the poster session will be considered unwanted and will be discarded.

SPIE Europe assumes no responsibility for posters left up after the end of the poster session. Poster authors should be at their papers from 16:00 to 17:30 hrs to answer questions from attendees. Attendees are requested to wear their conference registration badges to the poster sessions.

## Wednesday 6 May

### SESSION 7

Room: Conference 4 ..... Wed. 09.30 to 10.50

### Nanoparticles/Nanopatterns

Session Chair: **Eduard V. Deviatov**, Institute of Solid State Physics (Russian Federation)

09.30: **Investigation of size effects of argentum and palladium nanoparticles on photovoltaic characteristics of polymer layers**, Revina A. Alexandra, Marina G. Tedoradze, A. N. Frumkin Institute of Physical Chemistry and Electrochemistry (Russian Federation); Sergey V. Dayneko, Moscow Engineering Physics Institute (Russian Federation); Svatislav N. Stepanenko, Krylov K. Krylov, Moscow State Academy of Fine Chemical Technology (Russian Federation) ..... [7364-22]

09.50: **Nanoparticle contamination control for EUVL Technology—Especially for Photomasks in Carrier and Scanners**, Heinz J. Fissan, Christof Asbach, Thomas A. J. Kuhlbusch, Institut für Energie- und Umwelttechnik e.V. (Germany); Jing Wang, David Y. Pui, Univ. of Minnesota (United States); Se-Jin Yook, Hanyang Univ. (Korea, Republic of); Jung Hyeun Kim, The Univ. of Seoul (Korea, Republic of) ..... [7364-23]

10.10: **Scanning probe measurements of CuI doped single-walled carbon nanotubes**, Alexey A. Zhukov, Institute of Solid State Physics (Russian Federation); Andrey A. Eliseev, Lomonosov Moscow State Univ. (Russian Federation); Valentina K. Gartman, Institute of Solid State Physics (Russian Federation) ..... [7364-24]

10.30: **Mechanisms of the vortex dynamics in the patterned high-Tc superconducting films**, Vladimir M. Fomin, Univ. Antwerpen (Belgium) and State Univ. of Moldova (Moldova) and Forschungszentrum Jülich GmbH (Germany); Roger Würdenweber, Forschungszentrum Jülich GmbH (Germany) . . . . [7364-25]

Coffee Break ..... 10.50 to 11.10

### SESSION 8

Room: Conference 4 ..... Wed. 11.10 to 12.10

### Nanoscale Transport

Session Chair: **Heinz J. Fissan**, Institut für Energie- und Umwelttechnik e.V. (Germany)

11.10: **Experimental realization of a Fabry-Perot-type interferometer by co-propagating edge states in the integer and fractional quantum Hall effect regimes (Invited Paper)**, Eduard V. Deviatov, Institute of Solid State Physics (Russian Federation); Bastian Marquardt, Axel Lorke, Univ. Duisburg-Essen (Germany); Giorgio Biasiol, Lab. Nazionale TASC/INFN (Italy); Lucia Sorba, Lab. Nazionale TASC/INFN (Italy) and Scuola Normale Superiore di Pisa (Italy) ..... [7364-26]

11.50: **Tunneling through electron-beam modified self-assembled monolayers**, Eugeniu Balaur, Andrew G. Peele, La Trobe Univ. (Australia) ..... [7364-27]

### Closing Remarks

Room: Conference 4 ..... Wed. 12.10 to 12.15

Conference Sponsor



# Conference 7365 - Room: Conference 3

Monday-Wednesday 4-6 May 2009 • Proceedings of SPIE Vol. 7365

## Bioengineered and Bioinspired Systems

*Conference Chair:* **Ángel B. Rodríguez-Vázquez**, AnaFocus and Instituto de Microelectrónica de Sevilla-CNM-CSIC (Spain)

*Conference Co-Chairs:* **Ricardo A. Carmona**, Instituto de Microelectrónica de Sevilla-CNM-CSIC (Spain); **Gustavo Liñán-Cembrano**, Instituto de Microelectrónica de Sevilla-CNM-CSIC (Spain)

*Programme Committee:* **Paolo Arena**, Univ. degli Studi di Catania (Italy); **Gert Cauwenberghs**, Univ. of California, San Diego (USA); **Radu Dogaru**, Univ. Politehnica Bucuresti (Romania); **Antoine Dupret**, Univ. Paris-Sud-XI (France); **José M. Ferrández**, Univ. Politécnica de Cartagena (Spain); **Roman Genov**, Univ. of Toronto (Canada); **Giacomo Indiveri**, ETH Zürich (Switzerland); **Pedro Julian**, Univ. Nacional del Sur (Argentina); **Laura Maria Lechuga**, CIN2 Research Ctr. on Nanoscience and Nanotechnology (Spain); **Ramón Ruiz-Merino**, Univ. Politécnica de Cartagena (Spain); **Josep Samitier-Marti**, Univ. de Barcelona (Spain); **Luis Serrano**, Univ. Pública de Navarra (Spain); **Bertram Shi**, Hong Kong Univ. of Science and Technology (Hong Kong, China); **Ronald Tetzlaff**, Johann Wolfgang Goethe-Univ. Frankfurt am Main (Germany); **Fernando Vidal-Verdú**, Univ. de Malaga (Spain); **Akos Zarandy**, Computer and Automation Research Institute (Hungary)

### Monday 4 May

#### Opening Remarks

**Room: Conference 3 . . . . . Mon. 11.05**

**Ángel B. Rodríguez-Vázquez**, AnaFocus and Instituto de Microelectrónica de Sevilla-CNM-CSIC (Spain)

### Tuesday 5 May

#### SESSION 1

**Room: Conference 3 . . . . . Tues. 11.10 to 12.30**

#### Bioinspired Vision Chips and Algorithms

*Session Chair:* **Paolo Arena**, Univ. degli Studi di Catania (Italy)

11.10: **Low-power focal-plane dynamic texture segmentation based on programmable image binning and diffusion hardware**, Jorge Fernández-Berni, Ricardo A. Carmona-Galán, Univ. de Sevilla (Spain) . . . . . [7365-01]

11.30: **Hierarchical artificial retina architecture**, Adi N. Azar, Alice Parker, Univ. of Southern California (United States) . . . . . [7365-02]

11.50: **Programmable active pixel sensor to investigate neural interactions within the retina**, Matthew D. Hart, Mark L. Prydderch, Science and Technology Facilities Council (United Kingdom); Keith Mathieson, James D. Morrison, Univ. of Glasgow (United Kingdom) . . . . . [7365-03]

12.10: **New segmentation algorithm implemented on the Eye-RIS CMOS vision system**, Fethullah Karabiber, Istanbul Univ. (Turkey); Paolo Arena, Sebastiano S. De Fiore, Guido Vagliaisndi, Luigi Fortuna, Univ. degli Studi di Catania (Italy); Sabri Arik, Istanbul Univ. (Turkey) . . . . . [7365-04]

Lunch Break . . . . . 12.30 to 14.30

### Monday 4 May

#### SESSION 2

**Room: Conference 3 . . . . . Mon. 14.30 to 15.50**

#### Bioinspired Robot Control and Navigation

*Session Chair:* **Gustavo Liñán-Cembrano**, Ctr. Nacional de Microelectrónica (Spain)

14.30: **STDP-based behavior learning on the TriBot robot**, Paolo Arena, Sebastiano S. De Fiore, Luca Patané, Antonio Sorbello, Cristina Ventura, Univ. degli Studi di Catania (Italy) . . . . . [7365-05]

14.50: **New bio-inspired perceptual control architecture applied to solve navigation tasks**, Paolo Arena, Sebastiano S. De Fiore, Luca Patané, Univ. degli Studi di Catania (Italy) . . . . . [7365-06]

15.10: **Path planning on cellular nonlinear network using active wave computing technique**, Ramazan Yeniceri, Mustak E. Yalcin, Istanbul Teknik Üniv. (Turkey) . . . . . [7365-07]

15.30: **Embedding the AnaFocus Eye-RIS vision system in roving robots to enhance the action-oriented perception**, Luis Alba Soto, Sergio Morillas, Juan Listan, Amanda Jimenez, AnaFocus (Spain); Paolo Arena, Luca Patané, Univ. degli Studi di Catania (Italy) . . . . . [7365-08]

Coffee Break . . . . . 15.50 to 16.10

### SESSION 3

**Room: Conference 3 . . . . . Mon. 16.10 to 17.30**

#### Biological Models and Artificial Senses

*Session Chair:* **Jean Tomas**, Univ. Bordeaux I (France)

16.10: **Infrared sensilla in the beetle *Melanophila acuminata* as model**, Helmut Schmitz, Univ. Bonn (Germany); Herbert Bousack, Forschungszentrum Jülich GmbH (Germany); Norbert Hess, DIAS Infrared GmbH (Germany); Volkmar Norkus, Technische Univ. Dresden (Germany) . . . . . [7365-09]

16.30: **Electric fishes as natural models for technical sensor systems**, Gerhard von der Emde, Univ. Bonn (Germany); Herbert Bousack, Christina Huck, Kavita Mayekar, Yi Zhang, Forschungszentrum Jülich GmbH (Germany) [7365-10]

16.50: **Direct interfaces for smart skins based on FPGAs**, Fernando Vidal-Verdú, Oscar Oballe-Peinado, Julian Castellanos-Ramos, Jose Antonio Hidalgo-Lopez, Univ. de Málaga (Spain) . . . . . [7365-11]

17.10: **Bio-inspired tactile sensing arrays**, Ravinder S. Dahiya, Maurizio Valle, Univ. degli Studi di Genova (Italy); Leandro Lorenzelli, Fondazione Bruno Kessler (Italy); Giorgio Metta, Univ. degli Studi di Genova (Italy) . . . . . [7365-12]

### Tuesday 5 May

#### SESSION 4

**Room: Conference 3 . . . . . Tues. 09.30 to 10.50**

#### Biomedical Applications and Devices

*Session Chair:* **Fernando Vidal-Verdú**, Univ. de Malaga (Spain)

09.30: **Spatio-temporal analysis of brain electrical activity in epilepsy based on cellular nonlinear networks**, Frank Gollas, Johann Wolfgang Goethe-Univ. Frankfurt am Main (Germany); Ronald Tetzlaff, Technische Univ. Dresden (Germany) . . . . . [7365-13]

09.50: **Control electronics in an endoscopic capsule with locomotive and sensing and actuating capabilities**, Oscar Alonso, Lluís Freixas, Josep Samitier, Angel Diéguez, Univ. de Barcelona (Spain) . . . . . [7365-14]

10.10: **Nanostructured bio/non-bio interfaces for a new class of hybrid biosensors**, Luca De Stefano, Edoardo De Tommasi, Ilaria Rea, Ivo Rendina, Istituto per la Microelettronica e Microsistemi (Italy); Paola Giardina, Annunziata Armenante, Sara Longobardi, Univ. Federico II of Naples (Italy); Michele Giocondo, Univ. della Calabria (Italy) . . . . . [7365-15]

10.30: **MPC-based algorithm for automated blood glucose control in type1 diabetic patients**, Fatemeh Mohandespour, Javad Poshtan, Iran Univ. of Science and Technology (Iran, Islamic Republic of); Emad A. Poshtan, Blekinge Institute of Technology (Sweden) . . . . . [7365-16]

Coffee Break . . . . . 10.50 to 11.10

# Conference 7365

## SESSION 5

Room: Conference 3 ..... Tues. 11.10 to 12.30

### Biocompatible Materials Fabrication and Technologies

Session Chair: **Ángel B. Rodríguez-Vázquez**, Anafocus (Spain)

11.10: **Direct fabrication of surface architectures on polymers and copolymers using laser interference patterning**, Andres F. Lasagni, Fraunhofer-Institut für Werkstoff- und Strahltechnik (Germany); Diego Acevedo, Univ. Nacional de Río Cuarto (Argentina); Marina Cornejo, Leibniz-Institut für Oberflächenmodifizierung e.V. (Germany); Fernando Lasagni, Fundación Andaluza de Desarrollo Aeronáutico (Spain); Frank Mücklich, Univ. des Saarlandes (Germany) ..... [7365-17]

11.30: **Rapid fabrication of biocompatible hydrogels microdevices using laser interference lithography**, Andres F. Lasagni, Fraunhofer-Institut für Werkstoff- und Strahltechnik (Germany); Dajun Yuan, Peng Shao, Suman Das, Georgia Institute of Technology (United States) ..... [7365-18]

11.50: **Lens-less microscope using wavelength multiplexing**, Dror Fixler, Bar-Ilan Univ. (Israel) ..... [7365-19]

12.10: **Novel method for a flexible double sided microelectrode fabrication process**, Thomas Doerge, Sascha Kammer, Markus Hanauer, Adam Sossalla, Siegfried Steltenkamp, Fraunhofer-Institut für Biomedizinische Technik (Germany) ..... [7365-20]

Lunch Break ..... 12.30 to 14.30

## SESSION 6

Room: Conference 3 ..... Tues. 14.30 to 15.50

### Neural Networks and Soft Computing

Session Chair: **Ronald Tetzlaff**, Technische Univ. Dresden (Germany)

14.30: **Multiple objects tracking from AER images**, Francisco Gómez-Rodríguez, M. Lourdes Miró-Amarante, Gabriel Jiménez, Alejandro Linares-Barranco, Univ. de Sevilla (Spain) ..... [7365-21]

14.50: **Reconfigurable neighborhood function for parallel analog WTM Kohonen neural network implemented in CMOS technology**, Rafal Dlugosz, Univ. de Neuchâtel (Switzerland); Marta Kolasa, Univ. of Technology and Life Sciences (Poland) ..... [7365-22]

15.10: **Token-passing communication protocol in hardware based real-time spiking neural networks**, Bilel Belhadj-Mohamed, Jean Tomas, Yannick Bornat, Olivia Malot, Sylvie Renaud, Univ. Bordeaux 1 (France) ..... [7365-23]

15.30: **AER-based digital cochlea**, M. Lourdes Miró-Amarante, Francisco Gómez-Rodríguez, Gabriel Jiménez, Antón Cívit, Univ. de Sevilla (Spain) ..... [7365-24]

## Wednesday 6 May

## SESSION 7

Room: Conference 3 ..... Wed. 09.30 to 10.30

### Microfluidics and Lab-on-a-Chip

Session Chair: **Ricardo A. Carmona-Galán**, Univ. de Sevilla (Spain)

09.30: **Sorting of solid and soft objects in vortices driven by surface acoustic waves**, Thomas Franke, Susanne Braunmüller, Thomas Frommelt, Achim Wixforth, Univ. Augsburg (Germany) ..... [7365-25]

09.50: **Characterization of novel micro fluidic approaches for increased sensitivity of sensors measuring surface reactions**, Frank Sonntag, Udo Klotzbach, Fraunhofer Institut für Werkstoff- und Strahltechnik (Germany) ..... [7365-26]

10.10: **Novel lab-on-a-chip system for the label-free detection of DNA hybridisation and protein-protein interaction by Surface Plasmon Resonance (SPR)**, Udo Klotzbach, Frank Sonntag, Fraunhofer Institut für Werkstoff- und Strahltechnik (Germany) ..... [7365-27]

### Closing Remarks

Room: Conference 3 ..... Wed. 10.30 to 10.35

**Ángel B. Rodríguez-Vázquez**, AnaFocus and Instituto de Microelectrónica de Sevilla-CNM-CSIC (Spain); **Ricardo A. Carmona**, Instituto de Microelectrónica de Sevilla-CNM-CSIC (Spain); **Gustavo Liñán-Cembrano**, Instituto de Microelectrónica de Sevilla-CNM-CSIC (Spain)



# Conference 7366 - Room: Conference 1/2

Monday-Wednesday 4-6 May 2009 • Proceedings of SPIE Vol. 7366

## Photonic Materials, Devices, and Applications

Conference Chair: **Ali Serpenguzel**, Koç Univ. (Turkey)

Conference Co-Chairs: **Gonçal Badenes**, Institut de Ciències Fotòniques (Spain); **Giancarlo C. Righini**, CNR (Italy)

Programme Committee: **Michael J. Adams**, Univ. of Essex (United Kingdom); **Mario N. Armenise**, Politecnico di Bari (Italy); **Richard M. De La Rue**, Univ. of Glasgow (United Kingdom); **Patrice Féron**, Ecole Nationale Supérieure des Sciences Appliquées et de Technologie (France); **Maurizio Ferrari**, Consiglio Nazionale delle Ricerche (Italy); **Gershon Kurizki**, Weizmann Institute of Science (Israel); **El-Hang Lee**, Inha Univ. (Korea, Republic of); **Alfred Leipertz**, Friedrich-Alexander-Univ. Erlangen (Germany); **Eric D. Mazur**, Harvard Univ. (USA); **Manuel Nieto-Vesperinas**, Consejo Superior de Investigaciones Científicas (Spain); **Alim Örmeci**, Max-Planck-Institut für Physik Komplexer Systeme (Germany); **Ekmel Ozbay**, Bilkent Univ. (Turkey); **Yong-Le Pan**, Yale Univ. (USA); **Roberto R. Panepucci**, Florida International Univ. (USA); **Lorenzo Pavesi**, Univ. degli Studi di Trento (Italy); **Valerio Pruneri**, Institut de Ciències Fotòniques (Spain); **Manijeh Razeghi**, Northwestern Univ. (USA); **Ivo Rendina**, Consiglio Nazionale delle Ricerche (Italy); **José R. Salcedo**, Multiwave Photonics, S.A. (Portugal); **Vahid H. Sandoghdar**, Eidgenössische Technische Hochschule (Switzerland); **Niyazi Serdar Sariciftci**, Johannes Kepler Univ. Linz (Austria); **Gustav Schweiger**, Ruhr-Univ. Bochum (Germany)

### Monday 4 May

#### Opening Remarks

Room: Conference 1/2 ..... Mon. 11.05 to 11.10

Ali Serpenguzel, Koç Univ. (Turkey)

**Please Note:** Sessions 1A and 1B run concurrently

#### SESSION 1A

Room: Conference 1 ..... Mon. 11.10 to 12.30

##### Silicon Photonics I

Session Chair: **Ali Serpenguzel**, Koç Univ. (Turkey)

11.10: **Silicon photonics in the UK** (*Invited Paper*), Graham T. Reed, Nicholas M. Wright, Frederic Y. Gardes, Goran Z. Mashanovich, David J. Thomson, Univ. of Surrey (United Kingdom) ..... [7366-01]

11.50: **CARS-based silicon photonics** (*Invited Paper*), Nathalie Vermeulen, Christof Debaes, Hugo Thienpont, Vrije Univ. Brussel (Belgium) ..... [7366-02]

Lunch Break ..... 12.30 to 14.30

#### SESSION 1B

Room: Conference 2 ..... Mon. 11.10 to 12.30

##### Quantum Structures

Session Chair: **Giancarlo Cesare Righini**, Istituto di Fisica Applicata Nello Carrara (Italy)

11.10: **Cavity-enhanced emission in electrically driven quantum dot single-photon-emitters** (*Invited Paper*), Dieter Bimberg, Anatol Lochmann, Erik Stock, Technische Univ. Berlin (Germany) ..... [7366-03]

11.50: **Exciton-photon interaction in quantum structures** (*Invited Paper*), Ulrike Woggon, Technische Univ. Berlin (Germany) ..... [7366-04]

Lunch Break ..... 12.30 to 14.30

**Please Note:** Sessions 2A and 2B run concurrently

#### SESSION 2A

Room: Conference 1 ..... Mon. 14.30 to 15.50

##### Silicon Photonics II

Session Chair: **Graham T. Reed**, Univ. of Surrey (United Kingdom)

14.30: **Micro and nanophotonics in silicon: new perspectives and applications** (*Invited Paper*), Ivo Rendina, Giuseppe Coppola, Luca De Stefano III, Mario Iodice, Vito Mocella, Luigi Sirleto, Istituto per la Microelettronica e Microsistemi (Italy) ..... [7366-05]

15.10: **Nano- to micro-scale photonic device structures** (*Invited Paper*), Richard M. De La Rue, Univ. of Glasgow (United Kingdom) ..... [7366-06]

Coffee Break ..... 15.50 to 16.10

#### SESSION 2B

Room: Conference 2 ..... Mon. 14.30 to 15.50

##### Nanophotonics I

Session Chair: **Maurizio Ferrari**, Univ. degli Studi di Trento (Italy)

14.30: **Assemblies of colloidal nanocrystals as building blocks for photonic devices** (*Invited Paper*), Nikolai Gaponik, Technische Univ. Dresden (Germany) ..... [7366-07]

15.10: **Polymer ceramic nanocomposites** (*Invited Paper*), Onder M. Pekcan, Kadir Has Univ. (Turkey) ..... [7366-08]

Coffee Break ..... 15.50 to 16.10

Room: ..... Mon. 16.10 to 17.30

Please Note: Sessions 3A and 3B run concurrently

## SESSION 3A

Room: Conference 1 ..... Mon. 16.10 to 17.30

### Silicon Photonics III

Session Chair: **Ivo Rendina**, Istituto per la Microelettronica e Microsistemi (Italy)

- 16.10: **Ge on silicon waveguide photodetectors for optical telecommunications**, Johann Osmond, Laurent Vivien, Univ. Paris-Sud-XI (France); Jean-Marc Fédéli, Commissariat à l'Energie Atomique (France); Delphine Marris-Morini, Paul Crozat, Univ. Paris-Sud-XI (France); Jean-François Damlencourt, Commissariat à l'Energie Atomique (France); Eric Cassan, Univ. Paris-Sud-XI (France); Yves Lecunff, Commissariat à l'Energie Atomique (France); Suzanne C. Laval, Univ. Paris-Sud-XI (France) ..... [7366-09]
- 16.30: **8 Gb/s 0.5 V integrated Ge-on-SOI photodetector**, Johann Osmond, Univ. Paris-Sud-XI (France); Giovanni Isella, Daniel Chrastina, Hans von Känel, Lab. for Epitaxial Nanostructures on Silicon and Spintronics (Italy); Rolf Kaufmann, Ctr. Suisse d'Electronique et de Microtechnique SA (Switzerland); Laurent Vivien, Gilles Rasigade, Delphine Marris-Morini, Paul Crozat, Eric Cassan, Suzanne C. Laval, Univ. Paris-Sud-XI (France) ..... [7366-10]
- 16.50: **Tunable silicon photonic wires fabricated by contact lithography and thermal oxidation**, Oliver Horn, Julia Amthor, Timo Lipka, Jörg Müller, Technische Univ. Hamburg-Harburg (Germany) ..... [7366-11]
- 17.10: **Biodiesel sensing using silicon-on-insulator technologies**, Alvaro Casas Bedoya, Meng Yee Ling, Joost Brouckaert, Dries Van Thourhout, Roel G. Baets, IMEC (Belgium) ..... [7366-12]

## SESSION 3B

Room: Conference 2 ..... Mon. 16.10 to 17.30

### Nanophotonics II

Session Chair: **Nikolai Gaponik**, Technische Univ. Dresden (Germany)

- 16.10: **Er<sup>3+</sup>: activated photonic structures fabricated by sol-gel and rf-sputtering techniques** (*Invited Paper*), Maurizio Ferrari, Guillaume Alombert-Goget, Cristina Armellini, Univ. degli Studi di Trento (Italy); Simone Berneschi, Istituto di Fisica Applicata Nello Carrara (Italy); B. N. Shivakiran Bhaktha, Univ. degli Studi di Trento (Italy); Brigitte Boulard, Univ. du Maine (France); Massimo Brenci, Istituto di Fisica Applicata Nello Carrara (Italy); Andrea Chiappini, Alessandro Chiasera, Univ. degli Studi di Trento (Italy); Claire Duverger-Arfulso, Univ. du Maine (France); Patrice Féron, Ecole Nationale Supérieure des Sciences Appliquées et de Technologie (France); Rogeria R. Gonçalves, Univ. de São Paulo (Brazil); Yoann Jestin, Univ. degli Studi di Trento (Italy); Luca Minati, Istituto per la Ricerca Scientifica e Tecnologica (Italy); Enrico Moser, Univ. degli Studi di Trento (Italy); Gualtiero Nunzi Conti, Ctr. Studi e Ricerche Enrico Fermi (Italy) and Istituto di Fisica Applicata Nello Carrara (Italy); Stefano Pelli, Istituto di Fisica Applicata Nello Carrara (Italy); D. Narayana Rao, Univ. of Hyderabad (India); Richard Retoux, Ecole Nationale Supérieure d'Ingenieurs de Caen et Ctr. de Recherche (France); Giancarlo C. Righini, Istituto di Fisica Applicata Nello Carrara (Italy); Giorgio Speranza, Istituto per la Ricerca Scientifica e Tecnologica (Italy) ..... [7366-13]
- 16.50: **Design of surface plasmon polariton enhanced nanoantennas**, Lyudmyla N. Raguin, Christian Hafner, Rüdiger Vahldieck, ETH Zürich (Switzerland) ..... [7366-14]
- 17.10: **Effects of Bloch's hydrodynamic model on surface plasmon polariton dispersion curve and enhanced transmission of light through single nanoapertures**, Arif E. Cetin, Ozgur E. Mustecaplioglu, Koç Univ. (Turkey) ..... [7366-15]

## Tuesday 5 May

Please Note: Sessions 4A and 4B run concurrently

## SESSION 4A

Room: Conference 1 ..... Tues. 09.30 to 10.50

### Photonic Atoms I

Session Chair: **Ali Serpengüzel**, Koç Univ. (Turkey)

- 09.30: **Microresonator array sensor** (*Invited Paper*), Thomas Weigel, Gustav Schweiger, Ralf Nett, Ruhr-Universität Bochum (Germany) ..... [7366-16]
- 10.10: **Design of erbium-doped microsphere lasers**, Francesco Prudeniano, Luciano Mescia, Luca A. Allegretti, Antonella D'Orazio, Marco De Sario, Tommaso Palmisano, Politecnico di Bari (Italy); Patrice Féron, Ecole Nationale Supérieure des Sciences Appliquées et de Technologie (France); Maurizio Ferrari, Univ. degli Studi di Trento (Italy); Giancarlo C. Righini, Gualtiero Nunzi Conti, Istituto di Fisica Applicata Nello Carrara (Italy) ..... [7366-17]
- 10.30: **TBA**
- Coffee Break ..... 10.50 to 11.10

## SESSION 4B

Room: Conference 2 ..... Tues. 09.30 to 10.50

### Quantum Communication

Session Chair: **Paolo Tombesi**, Univ. degli Studi di Camerino (Italy)

- 09.30: **How to maximize the capacity of general quantum noisy channels** (*Invited Paper*), Goren Gordon, Gershon Kurizki, Weizmann Institute of Science (Israel) ..... [7366-19]
- 10.10: **Quantum communications in the presence of noise** (*Invited Paper*), Konrad Banaszek, Univ. Mikolaja Kopernika (Poland) ..... [7366-20]
- Coffee Break ..... 10.50 to 11.10

Please Note: Sessions 5A and 5B run concurrently

## SESSION 5A

Room: Conference 1 ..... Tues. 11.10 to 12.30

### Photonic Atoms II

Session Chair: **Gustav Schweiger**, Ruhr-Universität Bochum (Germany)

- 11.10: **Silicon quantum dots in microdisk resonators: Purcell effect, stress-induced Q-factor tuning and enhancement** (*Invited Paper*), Georg Pucker, Istituto per la Ricerca Scientifica e Tecnologica (Italy); Alessandro Pitanti, Univ. degli Studi di Trento (Italy); Mher Ghulinyan, Istituto per la Ricerca Scientifica e Tecnologica (Italy); Minmin Xie, Daniel Navarro-Urrios, Univ. degli Studi di Trento (Italy); Alberto Lui, Istituto per la Ricerca Scientifica e Tecnologica (Italy); Lorenzo Pavesi, Univ. degli Studi di Trento (Italy); Andrea Simoni, Fondazione Bruno Kessler (Italy) ..... [7366-21]
- 11.50: **Photonic membranes and photonic crystal resonators for all-optical signal processing**, Eugene Y. Glushko, Lyudmila A. Karachevtseva, Alexander E. Glushko, V. Lashkariy Institute of Semiconductor Physics (Ukraine); Vladimir N. Evteev, Alexander N. Stepanyuk, Krivoy Rog Pedagogical Institute (Ukraine) ..... [7366-22]
- 12.10: **Silicon microspheres for optical modulation applications**, Emre Yuçe, Mohammed S. Murib, Koç Univ. (Turkey); Oguzhan Gürlü, Istanbul Teknik Üniv. (Turkey); Ali Serpengüzel, Koç Univ. (Turkey) ..... [7366-23]
- Lunch Break ..... 12.30 to 14.30

## SESSION 5B

Room: Conference 2 ..... Tues. 11.10 to 12.30

### Quantum Communication II

Session Chair: **Gershon Kurizki**, Weizmann Institute of Science (Israel)

- 11.10: **Multiphoton entanglement decoherence** (*Invited Paper*), Harald Weinfurter, Ludwig-Maximilians-Universität München (Germany); Nikolai Kiesel, Roland Krischek, Christian Schmid, Witlef Wieczorek, Max-Planck-Institut für Quantenoptik (Germany); Mohamed Bourennane, Stockholm Univ. (Sweden); Marek Zukowski, Univ. Gdanski (Poland) ..... [7366-24]
- 11.50: **Multiphoton entanglement: production and applications** (*Invited Paper*), Marek Zukowski, Univ. Gdanski (Poland) ..... [7366-25]
- Lunch Break ..... 12.30 to 14.30

Please Note: Sessions 6A and 6B run concurrently

## SESSION 6A

Room: Conference 1 ..... Tues. 14.30 to 15.50

## Photonic Applications

Session Chair: **Valerio Pruneri**, ICFO - Instituto de Ciencias Fotónicas (Spain)

14.30: **Coherent white light confocal fluorescence imaging and fluorescence lifetime imaging microscopy**, Silvia Soria, Istituto di Fisica Applicata Nello Carrara (Italy); Franco Quercioli, Raffaella Mercatelli, Istituto dei Sistemi Complessi (Italy); Federica Bianco, Ilaria Cacciari, Stefano Pelli, Giancarlo C. Righini, Istituto di Fisica Applicata Nello Carrara (Italy). . . . . [7366-26]

14.50: **Ratiometric wavelength monitor using a pair of symmetrical multimode interference structures based on silicon-on-insulator (SOI)**, Agus M. Hatta, Gerald Farrell, Dublin Institute of Technology (Ireland) . . . . . [7366-27]

15.10: TBA

15.30: **Laser-based 3D photostructuring of polymeric materials by two-photon polymerization technique**, Aleksandr Ovsianikov, Shizhou Xiao, Belal Bhuiyan, Boris N. Chichkov, Laser Zentrum Hannover e.V. (Germany) . . . [7366-29]

Coffee Break . . . . . 15.50 to 16.10

## SESSION 6B

Room: Conference 2 ..... Tues. 14.30 to 15.30

## Quantum Communication III

Session Chair: **Marek Zukowski**, Univ. Gdanski (Poland)

14.30: **Inhibition of decoherence in flying qubits (Invited Paper)**, Paolo Tombesi, David Vitali, Marco Lucamarini, Giovanni Di Giuseppe, Sajeev Damodarapur, Univ. degli Studi di Camerino (Italy) . . . . . [7366-30]

15.10: **High intensity polarization entangled source with a 2D nonlinear photonic crystal**, Qin Wang, Kungliga Tekniska Högskolan (Sweden) and Technical Univ. of Denmark (Denmark); Anders Karlsson, Kungliga Tekniska Högskolan (Sweden) . . . . . [7366-31]

Coffee Break . . . . . 15.50 to 16.10

## Posters—Tuesday • Tues. 16.00 to 17.30

All symposium attendees are invited to attend Tuesday poster session provided as an opportunity to enjoy networking and refreshments while reviewing poster papers. The interactive poster sessions are designed to promote opportunities for networking with colleagues in your field. Attendees are encouraged to review the high-quality papers that are presented in this alternate format and to interact with the poster authors.

Poster presenters may post their poster papers starting at 11:00 hrs on Tuesday in the Conference Area Hallway. Any papers left on the boards following the end time of the poster session will be considered unwanted and will be discarded. SPIE Europe assumes no responsibility for posters left up after the end of the poster session. Poster authors should be at their papers from 16:00 to 17:30 hrs to answer questions from attendees. Attendees are requested to wear their conference registration badges to the poster sessions.

**Segmentation of remote sensing images for building detection**, Hamid Moayeri, Islamic Azad Univ. (Iran, Islamic Republic of) . . . . . [7366-52]

**Laser-written high-contrast waveguides in glass**, Alexander M. Streltsov, Nicholas Borrelli, James E. Dickinson, T. J. Kiczanski, Stephan Logunov, Joseph Schroeder, Corning Inc. (United States) . . . . . [7366-53]

**Asymmetric hollow POF waveguide coupler design for portable optical access card system**, Abang Annuar Ehsan, Sahbudin B. H. Shaari, Univ. Kebangsaan Malaysia (Malaysia); Mohd Kamil Abd-Rahman, Univ. Teknologi Mara (Malaysia) . . . . . [7366-55]

**Fabrication and characterization of photonic crystal cavities in the visible**, Nils C. Nüsse, Berliner Elektronenspeicherring-Gesellschaft für Synchrotronstrahlung m.b.H. (Germany); Michael Barth, Humboldt-Univ. zu Berlin (Germany); Bernd Löchel, Berliner Elektronenspeicherring-Gesellschaft für Synchrotronstrahlung m.b.H. (Germany); Oliver Benson, Humboldt-Univ. zu Berlin (Germany) . . . . . [7366-56]

**Development of optical micro-resonance-based sensor for detection and identification of micro-particles and biological agents**, Vladimir A. Saetchnikov, Elina A. Tcherniavskaia, Belarusian State Univ. (Belarus); Gustav Schweiger, Ruhr-Univ. Bochum (Germany) . . . . . [7366-57]

**Near-infrared resonant cavity enhanced silicon microsphere photodetector**, Mohammed S. Murib, Emre Yuçe, Koç Univ. (Turkey); Oguzhan Gürlü, Istanbul Teknik Ünv. (Turkey); Ali Serpengüzel, Koç Univ. (Turkey) . . . . . [7366-58]

**Terahertz emitters and detectors for radially and azimuthally polarized beams**, Stephan F. Winnerl, Burkhard Zimmermann, Peter Falk, Harald Schneider, Manfred Helm, Forschungszentrum Dresden-Rossendorf (Germany) . . . . . [7366-59]

**Dielectric functions of size-controlled Si nanocrystals embedded in silica matrix**, Rong J. Zhang, Fudan Univ. (China) . . . . . [7366-60]

**Structure dependent electro-optic properties of CdSe nanostructures**, Farzana Aslam, Christian von Ferber, Coventry Univ. (United Kingdom) . [7366-61]

**(100) GaAs surface treatment by Ar+ sputter etching for AlGaAs/GaAs quantum cascade laser processing**, Ewa Papis, Anna Baranska, Instytut Technologii Elektronowej (Poland); Anna Szerling, Instytut Technologii Elektronowej (Qatar); Piotr Karbownik, Anna Wójcik-Jedlinska, Maciej Bugajski, Witold Rzdokiewicz, Instytut Technologii Elektronowej (Poland); Jacek Szade, Univ. of Silesia (Poland); Andrzej Wawro, Instytut Fizyki (Poland) . . . . . [7366-62]

**Large-area Terahertz emitters based on GaInAsN**, Peter Falk, Stephan F. Winnerl, Harald Schneider, Manfred Helm, Forschungszentrum Dresden-Rossendorf (Germany); Klaus Köhler, Fraunhofer-Institut für Angewandte Festkörperphysik (Germany) . . . . . [7366-63]

**Metal-oxide semiconductor light-emitting devices based on Ge nanocrystals co-implanted with Er ions**, Alope Kanjilal, Forschungszentrum Dresden-Rossendorf (Germany); Lars Rebohle, Forschungszentrum Rossendorf-Dresden (Germany); Matthias Voelskow, Wolfgang Skorupa, Manfred Helm, Forschungszentrum Dresden-Rossendorf (Germany) . . . . . [7366-64]

**Erbium doped germanium based sulphide optical waveguide amplifier for near- and mid-IR**, Virginie Nazabal, Univ. de Rennes 1 (France); Patrice Camy, CIMAP (France); Petr Nemeč, Univ. Pardubice (Czech Republic); Joël Charrier, Hervé Lhermite, Univ. de Rennes 1 (France); Jean Louis Doualan, CIMAP (France); Shaoqian Zhang, Univ. de Rennes 1 (France); Miloslav Frumar, Univ. Pardubice (Czech Republic); Jean-Luc Adam, Univ. de Rennes 1 (France) . . . . . [7366-65]

**UV radiation-induced surface modulation time evolution in polymeric materials**, Ileana G. Apostol, National Institute for Lasers, Plasma and Radiation Physics (Romania) . . . . . [7366-66]

**Surface plasmon resonance analysis of Ag nanoparticles generated by pulsed laser ablation**, Antonino Picciotto, Georg Pucker, Alberto Lui, Istituto per la Ricerca Scientifica e Tecnologica (Italy); Lorenzo Torrisi, Istituto Nazionale Di Fisica Nucleare (Italy) . . . . . [7366-67]

**Tuneable relief Bragg gratings on integrated LiNbO3 waveguides produced by deep UV excimer laser processing**, Marco Chiarini, Carlo Gavazzi Space S.p.A. (Italy); Gian G. Bentini, Marco Bianconi, Alessio Nubile, Simone Sugliani, Pietro De Nicola, Gian Battista Montanari, Istituto per la Microelettronica e Microsistemi (Italy) . . . . . [7366-69]

**Erbium-doped chalcogenide fiber ring laser for mid-IR applications**, Francesco Prudeniano, Luciano Mescia, Luca A. Allegretti, Marco De Sario, Tommaso Palmisano, Vincenzo Petruzzelli, Politecnico di Bari (Italy); Frédéric Smektala, Institut Carnot de Bourgogne (France); Virginie Moizan, Virginie Nazabal, Johann Troles, Univ. de Rennes 1 (France) . . . . . [7366-70]

**Thermo-optic and elasto-optic tuning of silicon nanowires**, Julia Amthor, Oliver Horn, Timo Lipka, Jörg Müller, Technische Univ. Hamburg-Harburg (Germany) . . . . . [7366-71]

**Amorphous silicon as high index photonic material**, Timo Lipka, Oliver Horn, Julia Amthor, Jörg Müller, Technische Univ. Hamburg-Harburg (Germany) . . . . . [7366-72]

**Energy transfer processes in semiconductor quantum dots: bacteriorhodopsin hybrid system**, Aliaksandra Rakovich, Yury P. Rakovich, The Univ. of Dublin, Trinity College (Ireland); Igor R. Nabiev, Univ. de Reims Champagne-Ardenne (France); John F. Donegan, The Univ. of Dublin, Trinity College (Ireland) . . . . . [7366-73]

# Conference 7366

**Finite element simulations of light propagation through subwavelength apertures**, Sven Burger, Zuse Institute Berlin (Germany) and JCMwave GmbH (Germany); Bernd H. Kleemann, Carl Zeiss AG (Germany); Lin W. Zschiedrich, Frank Schmidt, Zuse Institute Berlin (Germany) and JCMwave GmbH (Germany) . . . . . [7366-74]

**Femtosecond laser-induced two-photon photopolymerization for structuring of micro-optical and photonic devices**, Mangirdas Malinauskas, Vytautas Purlys, Marius Rutkauskas, Vladimir Chorosajev, Roaldas Gadonas, Vilnius Univ. (Lithuania) . . . . . [7366-75]

**Dual pump configuration on oscillator of wavelength conversion on four wave mixing using PCF**, Mohd Nizam Abdullah, Univ. Kebangsaan and National Metrology Lab. (Malaysia); Sahbudin Shaari, Abang Annuar Ehsan, Univ. Kebangsaan (Malaysia); Mohd Nasir Zainal Abidin, Abdul Rashid Zainal Abidin, National Metrology Lab. (Malaysia) . . . . . [7366-76]

## Wednesday 6 May

**Please Note:** Sessions 7A and 7B run concurrently

### SESSION 7A

**Room: Conference 1 . . . . . Wed. 09.30 to 10.50**

#### Photonic Crystals, Glasses, Metamaterials I

*Session Chair:* **Rainer F. Mahrt**, IBM Zürich Research Lab. (Switzerland)

09.30: **Magical world of metamaterials** (*Invited Paper*), Ekmel Ozbay, Humeyra Caglayan, Bilkent Univ. (Turkey) . . . . . [7366-32]

10.10: **Photonic glasses as matrices for self tuning random lasers** (*Invited Paper*), Ceferino López, Consejo Superior de Investigaciones Científicas (Spain) . . . . . [7366-33]

Coffee Break . . . . . 10.50 to 11.10

### SESSION 7B

**Room: Conference 2 . . . . . Wed. 09.30 to 10.50**

#### Terahertz Photonics

*Session Chair:* **El-Hang Lee**, Inha Univ. (Korea, Republic of)

09.30: **Terahertz fiber waveguides: an overview** (*Invited Paper*), Giancarlo C. Righini, Consiglio Nazionale delle Ricerche (Italy) . . . . . [7366-34]

10.10: **Reflective Terahertz imaging at sub-wavelength resolution** (*Invited Paper*), Gian Piero Gallerano, Ente per le Nuove Tecnologie, l'Energia e l'Ambiente (Italy) . . . . . [7366-35]

Coffee Break . . . . . 10.50 to 11.10

**Please Note:** Sessions 8A and 8B run concurrently

### SESSION 8A

**Room: Conference 1 . . . . . Wed. 11.10 to 12.30**

#### Photonic Crystals, Glasses, Metamaterials II

*Session Chair:* **Richard M. De La Rue**, Univ. of Glasgow (United Kingdom)

11.10: **Extrinsic losses of photonic-crystal waveguides** (*Invited Paper*), Philippe Lalanne, Institut d'Optique (France) . . . . . [7366-36]

11.50: **Photonic bandgap structures with organic materials for lasing and switching applications** (*Invited Paper*), Rainer F. Mahrt, Thilo Stöferle, Nikolaj Moll, IBM Zürich Research Lab. (Switzerland); Thorsten Wählrind, Jens Bolten, AMO GmbH (Germany) . . . . . [7366-37]

Lunch Break . . . . . 12.30 to 14.30

### SESSION 8B

**Room: Conference 2 . . . . . Wed. 11.10 to 12.30**

#### Photonic Devices

*Session Chair:* **Giancarlo Cesare Righini**, Istituto di Fisica Applicata Nello Carrara (Italy)

11.10: **Quantum dot in a well infrared photodetectors for high operating temperature focal plane arrays** (*Invited Paper*), Manijeh Razeghi, Northwestern Univ. (United States) . . . . . [7366-38]

11.50: **Resonant tunneling diode-laser diode optoelectronic integrated circuit operating as a voltage controlled oscillator** (*Invited Paper*), Charles N. Ironside, Univ. of Glasgow (United Kingdom); Jose M. L. Figueiredo, Bruno Romeira, Univ. do Algarve (Portugal); Thomas J. Slight, Edward Wasige, Liqun Wang, Univ. of Glasgow (United Kingdom) . . . . . [7366-39]

Lunch Break . . . . . 12.30 to 14.30

**Please Note:** Sessions 9A and 9B run concurrently

### SESSION 9A

**Room: Conference 1 . . . . . Wed. 14.30 to 15.50**

#### Photonic Crystals, Glasses, Metamaterials III

*Session Chair:* **Ekmel Özbay**, Bilkent Univ. (Turkey)

14.30: **Liquid crystal silicon photonics** (*Invited Paper*), Romeo Beccherelli, Domenico Donisi, Giovanni Gilardi, Consiglio Nazionale delle Ricerche (Italy); Rita Asquini, Marco Trotta, University of Rome "La Sapienza" (Italy); Antonio d'Alessandro, University of Rome "La Sapienza" (Italy) and University of Rome "La Sapienza" (Italy); Anna Tasolamprou, Dimitrios C. Zografopoulos, Emmanouil E. Kriezis, Aristotle University of Thessaloniki (Greece) . . . . . [7366-40]

15.10: **Lasing in diffusive random media** (*Invited Paper*), Hakan E. Tureci, ETH Zürich (Switzerland); Li Ge, Yale Univ. (United States); Stefan Rotter, Technische Univ. Wien (Austria); A. Douglas Stone, Yale Univ. (United States) . . . . . [7366-41]

Coffee Break . . . . . 15.50 to 16.10

### SESSION 9B

**Room: Conference 2 . . . . . Wed. 14.30 to 15.50**

#### Integrated Photonics

*Session Chair:* **Manijeh Razeghi**, Northwestern Univ. (USA)

14.30: **Integration of optical nanowires and plasmonic wires with photonic crystal devices for nanophotonic circuit application** (*Invited Paper*), El-Hang Lee, Inha Univ. (Korea, Republic of) . . . . . [7366-42]

15.10: **PICSiP: new system-in-package technology using a high bandwidth photonic interconnection layer for converged microsystems**, Tolga Tekin, Michael Töpfer, Herbert Reichl, Fraunhofer-Institut für Zuverlässigkeit und Mikrointegration (Germany) . . . . . [7366-43]

15.30: **New integrated devices for infrared interferometry: integrated single mode Young's slit interferometer at the atmospheric M-band (4.87 $\mu$ m)**, Olga Caballero-Calero, Romain Grille, Guillermo Martin, Alain Deboulbé, Pierre Y. Kern, Univ. Joseph Fourier (France); Mercedes Carrascosa, Ángel García-Cabañes, Univ. Autónoma de Madrid (Spain) . . . . . [7366-44]

Coffee Break . . . . . 15.50 to 16.10

**Please Note:** Sessions 10A and 10B run concurrently

**SESSION 10A**

**Room: Conference 1 . . . . . Wed. 16.10 to 17.30**

**Photonic Crystals, Glasses, Metamaterials IV**

*Session Chair: Ceferino López*, Consejo Superior de Investigaciones Cientificas (Spain)

16.10: **Double metamaterials as a guiding layer for optical sensing applications**, Mohammed M. Shabat, Sofyan Taya, Max-Planck-Institut für Physik Komplexer Systeme (Palestinian Territory, Occupied) . . . . . [7366-45]

16.30: **Design and fabrication of Si-based photonic crystal stamps with electron beam lithography**, Reyhaneh Jannesary, Saeid Zamiri Hossein Zahdeh, Kurt Hingerl, Johannes Kepler Univ. Linz (Austria) . . . . . [7366-46]

16.50: **Axicon-shape photonic crystals and limited-diffraction light propagation**, Hamza Kurt, TOBB Univ. of Economics and Technology (Turkey) . . . . . [7366-47]

17.10: **TBA**

**SESSION 10B**

**Room: Conference 2 . . . . . Wed. 16.10 to 17.30**

**Novel Photonic Materials**

*Session Chair: Tolga Tekin*, Fraunhofer-Institut für Zuverlässigkeit und Mikrointegration (Germany)

16.10: **Nickel electrodes transparent from UV to IR** (*Invited Paper*), Valerio Pruneri, Dhriti S. Ghosh, Luis Martinez, The Institute of Photonic Sciences (Spain) . . . . . [7366-49]

16.50: **Material and design engineering of (Al)GaN for high-performance avalanche photodiodes and intersubband applications**, Manijeh Razeghi, Northwestern Univ. (United States). . . . . [7366-50]

17.10: **X-ray photoelectron spectroscopy of SiO<sub>2</sub>-HfO<sub>2</sub> amorphous and glass-ceramic waveguides: a comparative study**, Giorgio Speranza, Luca Minati, Simona Torrenco, Istituto per la Ricerca Scientifica e Tecnologica (Italy); Guillaume Alombert-Goget, Maurizio Ferrari, Yoann Jestin, Univ. degli Studi di Trento (Italy); Giancarlo C. Righini, Istituto di Fisica Applicata Nello Carrara (Italy) . . . . . [7366-51]

**Closing Remarks**

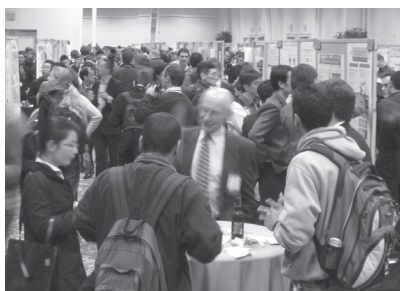
**Room: Conference 1/2 . . . . . Wed. 17.30 to 17.35**

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# General Information



## Venue

4-6 May 2009  
Maritim Hotel & International Congress Centre  
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D – 01067 Dresden  
Phone +49 (0) 351 216-0  
Fax +49 (0) 351 216-1000  
email: [info.dre@maritim.de](mailto:info.dre@maritim.de)

## Registration Hours

*Main Entrance Foyer of the Congress Centre*

Sunday, 3 May . . . . . 17.00 to 19.00  
Monday, 4 May . . . . . 08.00 to 17.00  
Tuesday, 5 May . . . . . 08.00 to 17.00  
Wednesday, 6 May . . . . . 08.00 to 12.00

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## Speaker Services

### Speaker Check-In Desk

- All Conference rooms will have a computer workstation, LCD projector, screen, lapel microphone, and laser point.
- All presenters are requested to use the rooms of their conference in the breaks or in the mornings to test their presentations.

## Interactive Poster Sessions and Receptions

*Poster Terrace*

Tuesday, 5 May . . . . . 16.10 to 17.30

An interactive poster session will be held on Tuesday, 5 May from 16.10 to 17.30. The authors will be able to set up their poster papers in the interactive session areas after 9.00 on Tuesday, 5 May. Supplies for posting papers will be available in the poster terrace area. The viewable size of the poster board is 1m wide x 1m high. Attendees can preview the posters during the day before the formal reception. Poster viewing will culminate in the formal interactive poster session with light refreshments starting at 16.10. Authors need to be present at their posters for discussion with attendees during the formal session from 16.10 to 17.30. Subsequently, it is each author's responsibility to remove his/her presentation immediately at the end of the session. SPIE *Europe* assumes no responsibility for presentations left up after this time. Attendees are requested to wear their conference registration badge to gain access to the interactive poster session and reception.

## Networking Events

### Welcome Reception

Congress Centre Terrace

Monday, 4 May 2009. . . . . 18.30 to 20.00

A welcome reception is being arranged for all of the conference participants for Monday evening, from 18.30 to 20.00. All conference attendees are invited to this reception as a chance to meet and renew relationships with colleagues. Please check for the exact location on your arrival at the event.

### Coffee Breaks

Coffee will be served during the appropriate breaks in the meeting room foyer. For exact times please check the programme.

### Conference Dinner

Restaurant an den Festungsmauern

Tuesday, 5 May 2009 . . . . . 19.00 to 23.00

A conference dinner has been arranged for all of the conference participants for Tuesday evening, 5 May at the famous "Festungsmauern" Restaurant. All conference attendees are invited to this dinner, but please confirm your attendance on your registration form by 24 April. We are told that Count August The Strong and his entourage have a habit of dropping in at the restaurant...!

## Policies

### Audio/Video/Digital Recording Policy

For copyright reasons, audio, video or digital recording of any conference session or poster is strictly prohibited without written prior consent from each specific presenter to be recorded. Individuals not complying with this policy will be asked to leave a given session and to surrender their film or disc. It is the responsibility of the presenter to notify SPIE if consent is given.

### Unsecured Items

Personal belongings such as briefcases, backpacks, coats, book bags, etc., should not be left unattended in meeting rooms or public areas. These items will be subject to removal by security upon discovery.

## Travel Information

### By Air:

Flughafen Dresden GmbH (Airport Code: DRS)

Flughafenstrasse

01109 Dresden

Tel: 0049 351 88 13 36 0

To check on your departure flight, please use the Dresden Airport Live Flight information which you can find at: [http://www.dresden-airport.de/en/reisende\\_und\\_besucher/fluginformation/flugtafel\\_abflug.html](http://www.dresden-airport.de/en/reisende_und_besucher/fluginformation/flugtafel_abflug.html)

### Public transport to the airport:

From the Congress Centre, the fastest route to the airport is to walk to the Central Station "Dresden Mitte" which will take about 7 minutes. At the station board S-Bahn line 2 to the airport and arrive there about 20 minutes later. A timetable will lay out at the registration desk.

A single ticket for the Dresden tariff zone is Euro 1.80 (valid on S-Bahn, tram and city bus). This fare makes the Dresden S2 line one of the most inexpensive airport shuttle services in Germany. Tickets can be obtained at ticket vending machines in the station or at the airport information desk on the Arrivals level of the terminal.

### Taxi

The taxi journey from the city centre (e.g. Postplatz) to the airport ranges from Euro 16 to 18. The taxi stand is directly in front of the terminal entrance..

### By train:

There are regular train connections from everywhere in Germany and the neighbouring countries. To book your train ticket, visit the Deutsche Bahn website at <http://reiseauskunft.bahn.de/bin/query.exe/en>.

Trains from Dresden Central Station to Frankfurt Airport will take approximately 5 hours.

### Microtechnologies for the New Millennium

May 4-6, 2009  
Dresden, Germany


MEET WITH SUCCESS THE HERTZ WAY  
HERTZ CAR RENTAL CHECKLIST

1. Call the Hertz International Reservation Center at 1-800-654-3001 in the USA or your local Hertz Reservation Center to receive a special discount for the Microtechnologies For the New Millennium Meeting. Reservations may also be placed online at [www.hertz.com](http://www.hertz.com). You will receive 15% off qualifying retail rates with Unlimited Mileage at participating locations in Germany.

Be sure to identify yourself as a Microtechnologies For the New Millennium Meeting attendee. The PC# below must be on your advance reservation to receive this special offer. You must present this coupon at time of rental in order to receive this discount.

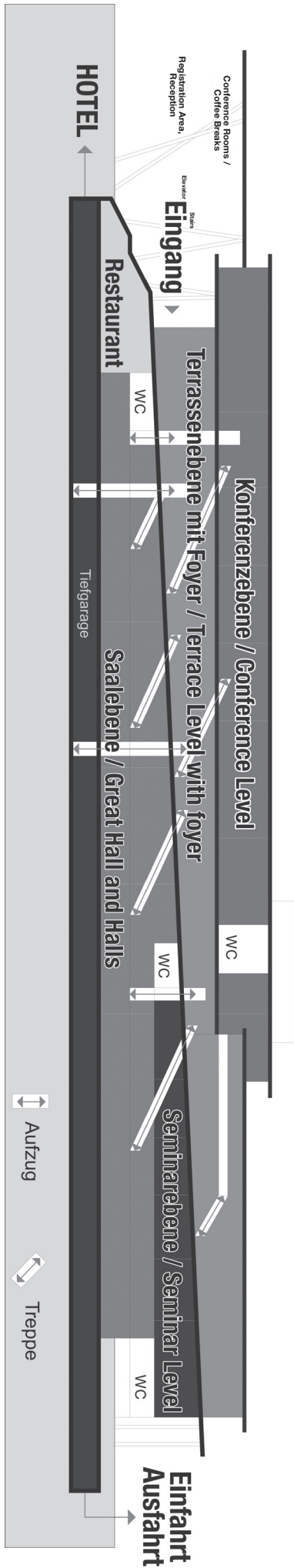
2. This special offer is available for rentals from May 1-31, 2009.

ENJOY YOUR TRIP!

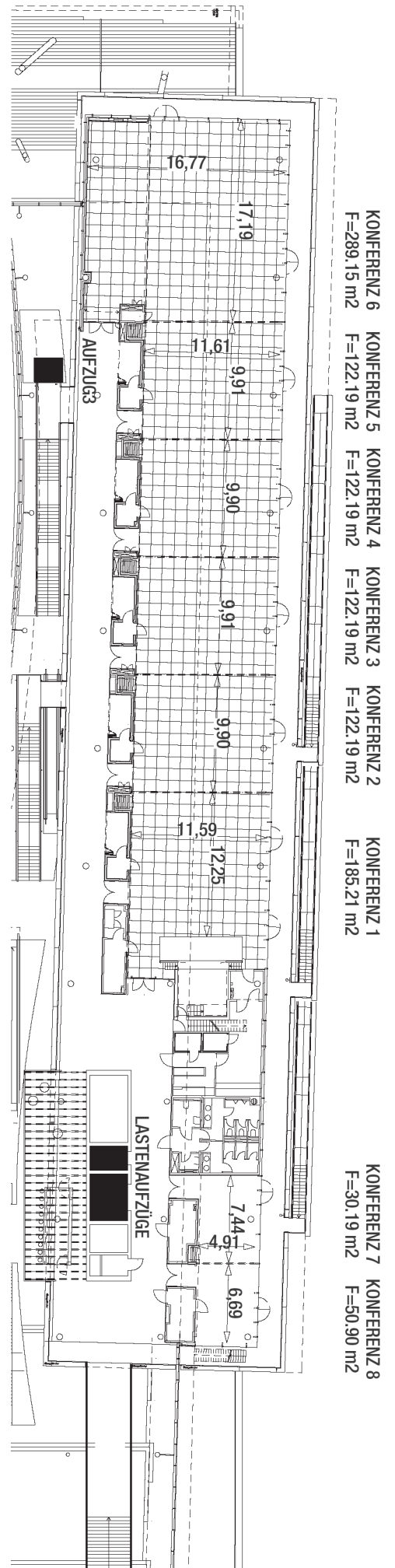
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