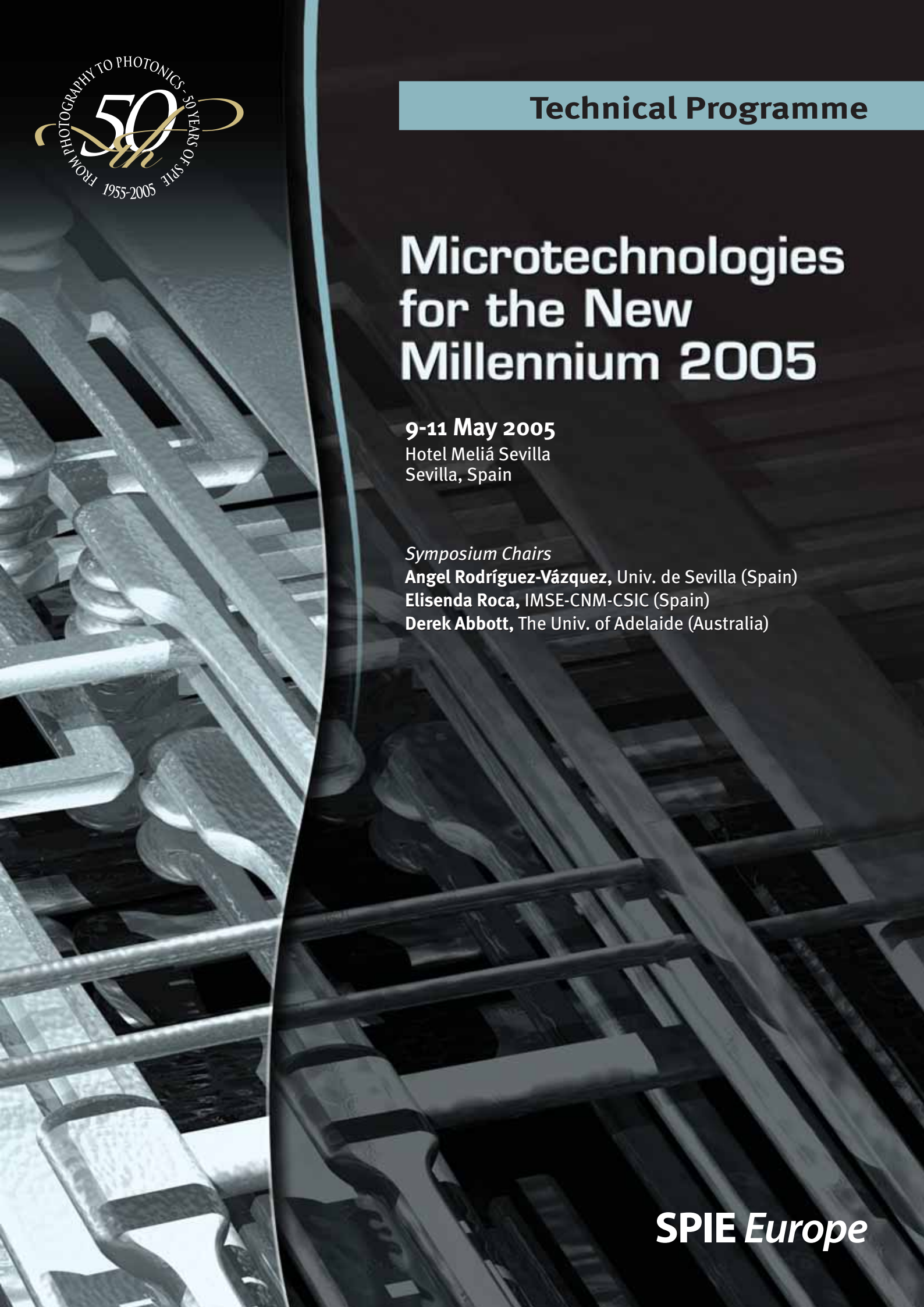

Technical Programme

Microtechnologies for the New Millennium 2005

9-11 May 2005
Hotel Meliá Sevilla
Sevilla, Spain

Symposium Chairs
Angel Rodríguez-Vázquez, Univ. de Sevilla (Spain)
Elisenda Roca, IMSE-CNM-CSIC (Spain)
Derek Abbott, The Univ. of Adelaide (Australia)

SPIE *Europe*

Microtechnologies for the New Millennium 2005

9-11 May 2005
Hotel Meliá Sevilla
Sevilla, Spain

Welcome to Sevilla!

We are glad that you are here in Sevilla to engage in five exciting parallel conferences that will explore the latest micro- and nanotechnologies that will take us into the new millennium. The developments in VLSI, MEMS, nanotechnology, quantum electronics, photonics, and the interplay between electronic and biological systems are all areas of intense interest.

We are happy that you have taken advantage of this excellent opportunity to participate in a conference at the cutting edge of technology. We welcome you to enjoy the best of Spanish hospitality as you participate in this stimulating scientific symposium.

Symposium Chairs

Angel Rodríguez-Vázquez,
Univ. de Sevilla (Spain)

Elisenda Roca,
IMSE-CNM-CSIC (Spain)

Derek Abbott,
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Registration and Information Desk Hours

Conference Area Hallway

Sunday ..... 15.00 to 19.30
Monday ..... 7:30 to 18:00
Tuesday-Wednesday ..... 8:00 to 17:30

Tea/Coffee and Lunch Breaks

Breaks will be in the Conference Area Hallway. See the individual conference programme for times.

Audio Visual Equipment

Meeting rooms will contain overhead and data projectors. Additional equipment will be made available only by special arrangement and may involve a rental fee. Note: Laptop computers are not provided.

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SPIE would like to express its deepest appreciation to the programme chairs, conference chairs, cochairs, programme committees, and session chairs who have so generously given of their time and advice to make this symposium possible. The symposium, like our other conferences and activities, would not be possible without the dedicated contribution of our participants and members.

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For information about the technical programme, email: meetinginfo@spie.org.

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Special Events

Sunday 8 May

Welcome Reception

19.00 to 21.30 hrs. at Los Alcazares (Arabic Palace)

Buses to the reception leave the venue at 19.00hrs. Tickets will be distributed during the pre-registration on Sunday and are required for admission. Due to strict admission restrictions by the city, arrivals after 19.30 hrs. cannot be guaranteed access to the reception.

Monday 9 May

Welcome and Opening Remarks

8.15 to 8.30 hrs • Room: Giralda I/II

Angel Rodríguez-Vázquez, Univ. de Sevilla (Spain)
Elisenda Roca, IMSE-CNM-CSIC (Spain)
Derek Abbott, The Univ. of Adelaide (Australia)

Plenary Presentation I

8.30 to 9.20 hrs • Room: Giralda I/II

Emerging Nanoelectronic Device Technologies
Wolfgang Porod, Univ. of Notre Dame, Center for Nano Science and Technology (USA)

Conference Dinner

20.00 hrs • Hacienda El Vizir

A conference dinner will be held at the Hacienda El Vizir outside of Seville. The cost of one ticket is included with your registration fees; please tick the appropriate box on the registration form to reserve a seat for yourself. You MUST preregister for the meeting by 25 April to attend the Conference Dinner. Buses will leave at the venue at 20.00 and return at 24.00.

Tuesday 10 May

Plenary Presentation II

8.30 to 9.20 hrs • Room: Giralda I/II

Foresight on Information Society Technologies
Ramón Compañó, European Commission
Joint Research Centre (DG JRC), Institute for Prospective Technological Studies (Spain)

All-Symposium Poster Session

16.40 to 18.20 hrs
Conference Area Hallway

Wednesday 11 May

Plenary Presentation III

8.30 to 9.20 hrs • Room: Giralda I/II

Micro-Technologies for Neural Interfaces
Eduardo Fernández, Instituto de Bioingeniería, Univ. Miguel Hernández (Spain)

Tourist Information

Seville, capital of Andalusia, Roman, Arabic, Renaissance, Baroque, Latin American, Marian, flamenco, bull-fighting, modern, festive, bright, perfumed, sea-faring, traditional, hospitable, gracious, cosmopolitan, religious...All of these adjectives, and many more can be applied to this city, which not only typifies all that is "Spanish" and "Andalusian," but also contains countless artistic, cultural, leisure, social and tourist attractions, that is has also become one of the most universal, best-known and most-visited cities in the world, birthplace and inspiration of writers, painters and artists in general.

"The Bullring"

It is very hard to find another urban centre which boasts such varied and unusual monuments and places of such beauty as the Giralda, the Cathedral, Los Reales Alcázares (Arabic Palace), the Torre del Oro, the Patio de los Naranjos, the Maestranza (bull-ring), the Casa de Pilatos, the Plaza de España, the María Luisa Park, the Maestranza theatre, the St. Telmo Palace, the Archivo de las Indias (Indian Archives), the Barrio de Santa Cruz (Santa Cruz district in the city centre), the Lonja, the Palacio Arzobispal (Archbishop's Palace), the Fábrica de Tabacos (Tobacco Factory), the Town Hall (Town Hall), the Dueñas Palace, the D.Fadrique tower, the city walls, the Macarena basilica, the Fine Art Museum, the Contemporary Art museum, the Alameda de Hércules, the barrio de Triana (Triana district), the bridges over the Guadalquivir, the Cartuja island and monastery and the site of Expo 92, the buildings from the Universal exhibition in 1929, the Casa de Luca de Tena, the patios of its traditional houses, the balconies and railings, as well as an endless number of churches, convents and other details which convert the ancient city centre into an open-air museum. If we add to this its taverns, its cuisine, its festivals, and the humour and hospitality of its people, we have formed a generous whole, full of colour, drama, light, music, joy, tradition and modernity which is difficult to match.

The Giralda

"Fiesta de Abril"

Food and Wine Tours

Food is an important event in the Spanish day and Seville has an abundance of restaurants and bars. This city is credited with the invention of "Tapas" which is now being copied all over Europe. There are more than a thousand bars where the choice of food is virtually unlimited, from seafood to ham and sausage, from vegetable to cheese. The Sevillians actually make a meal of them, moving from bar to bar and trying one dish at a time. Various companies can organise Tapas tours, cooking classes, wine tasting, one-day tours related to ham, olive oil and wine - as an example, try "A Question of Taste" at www.aqot.com.

In the Santa Cruz quarter, try Bar Giralda, Modesto, Las Teresas and Casa Robles.

In Triana, El Kiosco de las Flores, Casa Cuesta. In Santa Catalina, El Rinconcillo, El Bacalao and Quitapesares (Bar Perejil).

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Plenary Presentation I

Monday 9 May • 8.30 to 9.20 hrs
Room: Giralda I & II

Emerging Nanoelectronic Device Technologies

Wolfgang Porod
Univ. of Notre Dame, Center for Nano Science and Technology (USA))

This talk will present an overview of the current status and expected future developments of emerging research devices and circuit technologies. By their very nature, these comments will reflect the views of the author, but care will be taken to place these comments within the context of the International Technology Roadmap for Semiconductors (ITRS). We will review expected performance characteristics for processing, sensing, and (where applicable) for actuating, and we will discuss how these novel devices would compete with conventional evolutionary scaled-down silicon transistors.

Wolfgang Porod currently is Frank M. Freimann Professor of Electrical Engineering at the University of Notre Dame. He received his Diplom (M.S.) and Ph.D. degrees from the University of Graz, Austria, in 1979 and 1981, respectively. After appointments as a postdoctoral fellow at Colorado State University and as a senior research analyst at Arizona State University, he joined the University of Notre Dame in 1986 as an Associate Professor. He now also serves as the Director of Notre Dame's Center for Nano Science and Technology. His research interests are in the area of nanoelectronics, with an emphasis on new circuit concepts for novel devices. He has authored some 300 publications and presentations.

Professor Porod is a Fellow of the IEEE and has served (2002-2003) as the Vice President for Publications on the IEEE Nanotechnology Council. He also has been appointed an Associate Editor for the new IEEE Transactions on Nanotechnology. He has been active in the organization of numerous international conferences, Special Sessions and Tutorials, and as a speaker in IEEE Distinguished Lecturer Programs.

Plenary Presentation II

Tuesday 10 May • 8.30 to 9.20 hrs
Room: Giralda I & II

Foresight on Information Society Technologies

Ramón Compañó
European Commission
Joint Research Centre (DG JRC),
Institute for Prospective
Technological Studies (Spain)

Ambitious goals were set at the Lisbon Summit in 2000 for the European Union to become the most competitive and dynamic knowledge-based economy in the world by the end of the decade. In this context, the role and contribution of Information and Communication Technologies (ICTs) is particularly important for two reasons. First, it is indisputable that ICTs enhance the productivity and quality of services in all economic sectors. It is a systemic technology, affecting or enabling the necessary social and institutional changes needed to meet the Lisbon Objectives. Second, the ICT sector is a highly important industry per se and its success will be crucial to achieving these Objectives.

How can foresight accelerate to take the necessary process towards the Lisbon Objective? To be able to provide useful input on the prospects of ICT, we need to understand the underlying forces and factors that influence ICT research, development and deployment. These forces are not always obvious. An important step is to identify a number of driving forces and challenges confronting the European Information Society. The influencing factors may be of a social, economic, political or technological nature. They are interrelated in complex ways, and the factors themselves, as well as their relationships, may change over time. A first step in identifying key factors is to review some major European IST scenario studies, identifying the trends and other drivers and challenges portrayed as likely to be important influences on future societal changes. Trends need to be considered seriously; they are liable to affect whatever is foreseen and planned - for instance, one major trend is the aging population, which will influence labour and consumer market development, requirements for ICT applications in education and health, and so on. For technology trends, I will present the concept of technology trajectory projections which should deliver different information than conventional technology roadmaps.

Biography: Ramón Compañó studied physics at the Polytechnic University (RWTH) of Aachen, Germany, where he received his degree and PhD. Ramon was performing research at the University of Modena, Italy, before joining the European Commission in Brussels in 1993. He served first as project officer on material sciences and metrology and later on microelectronics. In 1996 he set-up a number nanotechnology activities within the IST programme, particularly on nano-electronics. In 2002, he moved to the strategy division of the IST programme and in 2004 to the Institute for Prospective Technological Studies (IPTS) in Seville, Spain. His research interest at the IPTS is foresight on IST and the impact of the convergence of technologies.

Plenary Presentation III

Wednesday 11 May • 8.30 to 9.20 hrs
Room: Giralda I & II

Micro-Technologies for Neural Interfaces

Eduardo Fernández
Instituto de Bioingeniería,
Univ. Miguel Hernández (Spain)

The development of neuroprosthetic devices can have high potential impact on brain research and brain-based industry, and is one of the central problems to be addressed in the next decades. We will review and summarize the most important physiological principles regarding this neuroprosthetic approach and present a survey of the present state of developments concerning the feasibility of a visual neuroprostheses, as a means through which a limited but useful visual sense could be restored to profoundly blind people. If we can understand more about the fundamental mechanisms of neuronal coding, and to safely stimulate nervous system, there will real potential to apply this knowledge clinically.

Biography: **Eduardo Fernández** received his M.D. and a Ph.D. degree in Neurosciences from the University of Alicante, Spain, in 1986 and 1990 respectively. He is currently Associate Professor at the University Miguel Hernandez (Spain) and Director of the Artificial Vision Laboratory at the Bioengineering Institute of the University Miguel Hernandez. He also serves as the Director of the Department of Histology and Anatomy. In the last years he has been using histological as well as electrophysiological techniques to understand how mammalian retinal cells and the circuitry within the retina can manage and code visual information. He is coordinating an European Project which aims to demonstrate the feasibility of a cortical visual neuroprostheses for the profoundly blind.

Monday-Wednesday 9-11 May 2005 • Proceedings of SPIE Vol. 5836

Smart Sensors, Actuators, and MEMS II

Conference Chair: **Carles Cané**, Ctr. Nacional de Microelectrónica (IMB-CSIC) (Spain)

Cochairs: **Jung-Chih Chiao**, Univ. of Texas/Arlington (USA); **Fernando Vidal Verdú**, Univ. de Málaga (Spain)

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Monday 9 May

Session 1 runs concurrent with session 2

SESSION 1

Room: Giralda III ..... Mon. 09.30 to 10.50

Materials I

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

09.30: **Ge and GeOx films as sacrificial layer for MEMS technology based on piezoelectric AlN: etching and planarization processes** *(Invited Paper),* J. Sangrador, J. Olivares, E. Iborra, L. Vergara, M. Clement, A. Sanz-Hervás, Univ. Politécnica de Madrid (Spain) ..... [5836-01]

09.50: **Simulation, fabrication and testing of aluminium nitride piezoelectric microbridges,** J. Olivares, M. Clement, E. Iborra, L. Vergara, Univ. Politécnica de Madrid (Spain); J. L. Sánchez-Rojas, L. M. Gutiérrez, J. Vázquez, Univ. de Castilla-La Mancha (Spain) ..... [5836-02]

10.10: **Nano-rods and nano-dots based TiO_2 thin films for sensing applications based on surface plasmon resonance,** M. G. Manera, Consiglio Nazionale delle Ricerche (Italy) and Univ. degli Studi di Lecce (Italy) ..... [5836-03]

10.30: **$BaTiO_3$ nanocomposite thin film as pyroelectric sensor,** M. Mat Salleh, A. Ibrahim, M. B. Yahaya, Univ. Kebangsaan Malaysia (Malaysia) ..... [5836-04]

Coffee Break ..... 10.50 to 11.20

SESSION 2

Room: Arenal I ..... Mon. 09.30 to 10.50

Actuators I

Chair: **Jin-Chern Chiou**, National Chiao Tung Univ. (Taiwan)

09.30: **Polymeric helices with submicron dimensions for MEMS devices** *(Invited Paper),* A. L. Elias, Univ. of Alberta (Canada); K. D. Harris, C. W. Bastiaansen, Technische Univ. Eindhoven (Netherlands); D. J. Broer, Philips Research Labs. (Netherlands) and Technische Univ. Eindhoven (Netherlands); M. J. Brett, Univ. of Alberta (Canada) ..... [5836-05]

09.50: **Development of a novel piezo-driven parallel-kinematics single crystal silicon micropositioning XY stage,** Q. Yao, P. Ferreira, Univ. of Illinois/Urbana-Champaign (USA) ..... [5836-06]

10.10: **Experimental investigations of a novel low-voltage multilayer piezoelectric motor,** H. Mojallali, R. Izadi-Zamanabadi, J. Helbo, Aalborg Univ. (Denmark); A. Jalali, J. Poshtan, Iran Univ. of Science and Technology (Iran) ..... [5836-07]

10.30: **Large displacement spring-like electro-mechanical thermal actuators with insulator constraint beams,** J. Luo, A. J. Flewitt, Univ. of Cambridge (United Kingdom); S. M. Spearing, Univ. of Southampton (United Kingdom); N. A. Fleck, W. I. Milne, Y. Q. Fu, Univ. of Cambridge (United Kingdom) ..... [5836-08]

Coffee Break ..... 10.50 to 11.20

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Sessions 3, 5 run concurrent with sessions 4, 6

SESSION 3

Room: Giralda III ..... Mon. 11.20 to 13.00

Electronics Integration

Chair: **Katia M. Grenier**, LAAS-CNRS (France)

11.20: **MEMS with integrated CMOS read-out circuit based on sub-micrometric cantilevers array for multiple sensing** *(Invited Paper),* M. Villarroya, J. Verd, J. Teva, G. Abadal, Univ. Autonoma de Barcelona (Spain); E. Figueras, F. Pérez-Murano, J. Esteve, Ctr. Nacional de Microelectrónica (Spain); N. Barniol, Univ. Autonoma de Barcelona (Spain) ..... [5836-09]

11.40: **Smart Sensors modeling using VHDL-AMS for microinstruments implementation with a distributed architecture,** C. Ferrer, B. Lorente, Univ. Autonoma de Barcelona (Spain); L. Barrachina, Univ. Autònoma de Barcelona (Spain) [5836-10]

12.00: **Large-signal model of a resonating cantilever-based transducer for system level electrical simulation,** J. Verd, J. Teva, G. Abadal, Univ. Autonoma de Barcelona (Spain); F. Pérez-Murano, J. Esteve, Ctr. Nacional de Microelectrónica (Spain); N. Barniol, Univ. Autonoma de Barcelona (Spain) ..... [5836-11]

12.20: **High level communication interface design for integrated MEMS and microinstrument bus,** M. Rodriguez, Univ. de La Laguna (Spain); C. Ferrer, Univ. Autònoma de Barcelona (Spain); E. Magdaleno, Univ. de La Laguna (Spain); B. Lorente, Univ. Autonoma de Barcelona (Spain); A. Ayala, Univ. de La Laguna (Spain) ..... [5836-12]

12.40: **Wafer level optoelectronic device packaging using MEMS** *(Invited Paper),* J. Lee, A. K. Nallani, Univ. of Texas/Dallas (USA) ..... [5836-13]

Lunch Break ..... 13.20 to 15.00

SESSION 4

Room: Arenal I ..... Mon. 11.20 to 13.20

Fabrication Techniques I

Chair: **Jeong-Bong Lee**, The Univ. of Texas at Dallas (USA)

11.20: **An integrated self-masking technique for providing low-loss metallized RF MEMS devices in a polysilicon only MEMS process** *(Invited Paper),* J. M. Wilson, North Carolina State Univ. (USA); R. Bashirullah, Univ. of Florida (USA); D. P. Nackashi, D. A. Winick, P. D. Franzon, North Carolina State Univ. (USA) ..... [5836-14]

11.40: **New fabrication technique for attaching optical fibre to silicon integrated waveguide,** R. M. Atta, G. J. Ensell, A. G. Evans, Univ. of Southampton (United Kingdom) ..... [5836-15]

12.00: **Mass balancing and spring element manipulation of micromechanical silicon-gyrometers with ultrashort laser pulses,** U. Klug, B. Rahn, U. Stute, Laser Zentrum Hannover e.V. (Germany) ..... [5836-16]

12.20: **Laser material micro-processing of shape memory alloys,** M. Fargas Ribas, A. von Busse, J. Bunte, Laser Zentrum Hannover e.V. (Germany) ..... [5836-17]

12.40: **Thermal-stress control of microshutter arrays in cryogenic applications for the James Webb space telescope,** D. P. Kelly, NASA Goddard Space Flight Ctr. (USA) and QSS Group, Inc. (USA); W. Chuang, Univ. of Maryland/College Park (USA); L. A. Hess, R. Hu, NASA Goddard Space Flight Ctr. (USA) and Raytheon Corp. ITSS (USA); M. D. Jhabvala, T. T. King, M. J. Li, J. P. Loughlin, S. H. Moseley, Jr., NASA Goddard Space Flight Ctr. (USA); C. Ray, NASA Goddard Space Flight Ctr. (USA) and Raytheon Corp. ITSS (USA); Y. Zheng, NASA Goddard Space Flight Ctr. (USA) and QSS Group, Inc. (USA) ..... [5836-18]

13.00: **Plasma activated wafer bonding for MEMS,** V. Dragoi, S. N. Farrens, P. Lindner, EV Group E. Thallner GmbH (Austria) ..... [5836-19]

Lunch Break ..... 13.00 to 15.00

Keynote Presentation

Room: Giralda III ..... Mon. 15.00 to 15.40

MEMS-based micro instruments for in-situ planetary exploration
(Invited Paper), T. George, Jet Propulsion Lab. (USA) ..... [5836-20]

SESSION 5

Room: Giralda III ..... Mon. 15.40 to 16.00

Optical Devices

Chair: **Armin Lambrecht**,
Fraunhofer-Institut für Physikalische Messtechnik (Germany)

15.40: **Silicon-nitride based micro optical components for optical pickup application,** C. Lee, Y. Chiu, C. Tien, H. D. Shieh, National Chiao Tung Univ. (Taiwan) .... [5836-21]

SESSION 6

Room: Arenal I ..... Mon. 15.40 to 16.20

MEMS Modelling

Chair: **Carles Ferrer**, Univ. Autònoma de Barcelona (Spain)

15.40: **MEMS mechanical characterization on different thin film materials by bending and scanning along micro-machined cantilevers,** J. H. He, Univ. of Cambridge (United Kingdom) and Institute of Microelectronics (Singapore); H. Le, Univ. of Cambridge (United Kingdom) ..... [5836-22]

16.00: **Optical monitoring and cooling of a silicon cantilever to the quantum limit,** P. Cohadon, O. Arcizet, A. Heidmann, M. Pinard, Univ. Pierre et Marie Curie (France) ..... [5836-23]

Tuesday 10 May

Session 7 runs concurrent with session 8

SESSION 7

Room: Giralda III ..... Tues. 09.30 to 10.50

Chemical Sensors I

Chair: **Armin Lambrecht**,
Fraunhofer-Institut für Physikalische Messtechnik (Germany)

09.30: **Suspended-gate thin film transistor as highly sensitive humidity sensor,** A. Salaün, H. Mahfoz-Kotb, T. Mohammed-Brahim, F. Le Bihan, H. Lhermite, F. Bendriaa, Univ. de Rennes 1 (France) ..... [5836-24]

09.50: **Non-selective NDIR array for gas detection,** R. Rubio, J. Santander, Ctr. Nacional de Microelectrónica (Spain); S. Marco, Univ. de Barcelona (Spain); L. Fonseca, Ctr. Nacional de Microelectrónica (Spain); J. Fonollosa, M. Moreno, Univ. de Barcelona (Spain) ..... [5836-25]

10.10: **Gas microsensing system with a FGMOS on a MEM microstructure,** J. L. González Vidal, A. Reyes-Barranca, M. d. l. L. Olvera, A. Maldonado, Instituto Politecnico Nacional (Mexico); W. Calleja-Arriaga, Instituto Nacional de Astrofisica Optica y Electronica (Mexico) ..... [5836-26]

10.30: **Cheap silicon technology integrated sol-gel combustion microsensor,** L. Francioso, D. S. Presicce, M. Epifani, P. Siciliano, Consiglio Nazionale delle Ricerche (Italy); A. Ficarella, Univ. degli Studi di Lecce (Italy) ..... [5836-27]

Coffee Break ..... 10.50 to 11.20

SESSION 8

Room: Arenal I ..... Tues. 09.50 to 10.50

Microfluidic Devices I

Chair: **Joan Bausells**, Ctr. Nacional de Microelectrónica (Spain)

09.50: **High speed simultaneous optical and impedance analysis of single particles** *(Invited Paper),* H. Morgan, D. Holmes, N. G. Green, Univ. of Southampton (United Kingdom) ..... [5836-28]

10.10: **Smart sensor for environmental applications,** G. E. Saint-Pierre, S. J. Setford, Cranfield Univ. (United Kingdom) ..... [5836-70]

10.30: **PCR device with integrated thermal cycling and fluorescence detection elements,** M. Bahrami, T. Melvin, J. S. Wilkinson, A. G. Evans, Univ. of Southampton (United Kingdom) ..... [5836-31]

Coffee Break ..... 10.50 to 11.30

Sessions 9, 11 run concurrent with sessions 10, 12

SESSION 9

Room: Giralda III ..... Tues. 11.20 to 13.20

Fabrication Techniques II

Chair: **Katia M. Grenier**, LAAS-CNRS (France)

Keynote Presentation

11.20: **SIGEM, low-temperature deposition of poly-SiGe MEMs structures on standard CMOS circuits** *(Invited Paper),* J. Ramos-Martos, J. Ceballos-Cáceres, A. Ragel-Morales, J. M. Mora-Gutiérrez, A. Arias-Drake, M. A. Lagos-Florido, J. M. Muñoz-Hinijosa, Ctr. Nacional de Microelectrónica (Spain); A. Mehta, A. Verbist, B. du Bois, Interuniv. MicroElectronics Ctr. (Belgium); K. Kehr, C. Leinenbach, Robert Bosch GmbH (Germany); S. R. van Aerde, ASM Europe (Belgium); J. Spengler, Philips Semiconductors (Germany); A. Witvrouw, Interuniv. MicroElectronics Ctr. (Belgium) ..... [5836-32]

12.00: **Advanced 3D micromachining techniques using V-UV laser sources in the nanosecond regime,** J. L. Ocana, C. L. Molpeceres, S. Lauzurica, M. Morales, Univ. Politecnica de Madrid (Spain) ..... [5836-33]

12.20: **Fabrication and characterization of porous silicon cantilevers for thermal sensors,** S. Chatzandroulis, C. Tsamis, A. G. Nassiopoulou, A. Tserepi, NCSR Demokritos (Greece) ..... [5836-34]

12.40: **CAD tool environment for MEMS process design support,** K. Hahn, J. Popp, T. Schmidt, A. Wagener, Univ. Siegen (Germany) ..... [5836-35]

13.00: **Ultra-precision machining of 30 micron PZT-on-silicon laminates for piezoelectric MEMS,** S. A. Wilson, R. Jourdain, R. W. Whatmore, Cranfield Univ. (United Kingdom); S. Arai, NSK Ltd. (Japan); J. Corbett, P. Morantz, Cranfield Univ. (United Kingdom); M. J. Hucker, C. Warsop, BAE Systems Advanced Technology Ctr. (United Kingdom) ..... [5836-88]

Lunch Break ..... 13.20 to 15.00

SESSION 10

Room: Arenal I ..... Tues. 12.00 to 13.20

Mechanical Devices

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

12.00: **Model building, control design and practical implementation of a high-precision high-dynamical MEMS acceleration sensor** *(Invited Paper),* H. Wolfram, R. Schmiedel, Chemnitz Univ. of Technology (Germany); S. Kurth, Technische Univ. Chemnitz (Germany); K. Hiller, Chemnitz Univ. of Technology (Germany); J. Mehner, Technische Univ. Chemnitz (Germany); T. Aurich, W. Guenther, GEMAC GmbH (Germany); W. Doetzel, T. Gessner, Chemnitz Univ. of Technology (Germany) [5836-36]

12.20: **Post-processing gap reduction in a micromachined resonator for vacuum pressure measurement,** D. Billep, Technische Univ. Chemnitz (Germany); J. Frömel, Fraunhofer-Institut fuer Zuverlaessigkeit und Mikrointegration (Germany); K. Hiller, Technische Univ. Chemnitz (Germany) ..... [5836-37]

12.40: **Velocity sensor with an internal feedback control loop,** M. Gavagni, A. Ronzoni, Univ. di Ferrara (Italy); P. Gardonio, S. J. Elliott, Univ. of Southampton (United Kingdom) ..... [5836-38]

13.00: **A novel suspended gate MOSFET pressure sensor,** J. A. Segovia, M. Fernandez-Bolaños, J. M. Quero, Univ. de Sevilla (Spain) ..... [5836-39]

Lunch Break ..... 13.20 to 15.00

SESSION 11

Room: Giralda III ..... Tues. 15.00 to 16.00

Materials II

Chair: **Pietro Siciliano**, Consiglio Nazionale delle Ricerche (Italy)

15.00: **Amorphous Si deposition method thanks traditional PECVD insulator equipments for seed layers performing,** O. O. de Sagazan, STMicroelectronics (France) ..... [5836-40]

15.20: **Nanocrystalline $Bi_4Ti_3O_{12}$ thin film for pressure sensor,** C. W. Chong, M. B. Yahaya, M. Mat Salleh, Univ. Kebangsaan Malaysia (Malaysia) ..... [5836-42]

15.40: **Surface effects at a polymeric interface in capillary driving process** *(Invited Paper),* I. Viola, National Nanotechnolgy Lab. of INFM (Italy); A. Zocco, A. Fischetti, STMicroelectronics (Italy); B. Foglieni, M. Ferrari, IRCCS H San Raffaele (Italy); R. Cingolani, G. Gigli, National Nanotechnolgy Lab. of INFM (Italy) . [5836-89]

SESSION 12

Room: Arenal I ..... Tues. 15.00 to 16.20

Microfluidic Devices II

Chair: **Christos Tsamis**, NCSR Demokritos (Greece)

15.00: **Three types of TiNi shape memory alloy based micropumps,** Y. Q. Fu, Univ. of Cambridge (United Kingdom) ..... [5836-43]

15.20: **Integrable silicon microsystem for three-dimensional flow focusing,** A. Luque, J. M. Quero, A. M. Gañán-Calvo, Univ. de Sevilla (Spain); J. Esteve, Ctr. Nacional de Microelectronica (Spain); S. Gonsalve, Univ. de Sevilla (Spain) ..... [5836-44]

15.40: **3D deformation analysis of flow and gas sensors membranes for reliability assessment,** N. Sabate, Univ. de Barcelona (Spain); J. Keller, A. Gollhardt, D. Vogel, Fraunhofer-Institut für Zuverlaessigkeit und Mikrointegration (Germany); I. Gracia, C. Cane, Ctr. Nacional de Microelectrónica (Spain); J. R. Morante, Univ. de Barcelona (Spain); B. Michel, Fraunhofer-Institut für Zuverlaessigkeit und Mikrointegration (Germany) ..... [5836-45]

16.00: **AC electric field microfluidic control in microsystems,** N. G. Green, H. Morgan, Univ. of Southampton (United Kingdom); A. Ramos, Univ. de Sevilla (Spain) [5836-46]

✔ Posters-Tuesday

The following posters will be displayed on Tuesday in the Conference Area Hallway. A poster reception will be held Tuesday evening from 16.40 to 18.20 hrs., with authors present at their poster papers to answer questions. Light refreshments will be served. Poster authors may set up their posters on Tuesday from 10.00 for all-day previewing. It is the author's responsibility to remove their posters at the end of the session. Papers not removed will be considered unwanted and will be discarded. SPIE assumes no responsibility for posters left up after the end of the poster session.

✔ **A linearly tunable capacitor fabricated by the post-CMOS process,** C. Dai, M. Liou, Y. Li, National Chung Hsing Univ. (Taiwan) ..... [5836-72]

✔ **A self-supported polypyrrole artificial muscle: design optimisation,** E. Ochoteco, J. Pomposo, H. Grande, J. Rodriguez, Ctr. for Research in Electrochemical Technologies (Spain) ..... [5836-73]

✔ **Optical microlenses for MOEMS,** R. Carrasco, Univ. Miguel Hernández de Elche (Spain) and Univ. de Franche-Comte (France); J. Dziuban, Univ. de Franche-Comte (France) and Warsaw Univ. of Technology (Poland); I. Moreno, Univ. Miguel Hernández de Elche (Spain); C. Gorecki, Univ. de Franche-Comte (France) [5836-74]

✔ **CMOS degradation effects due to electron beam lithography in smart NEMS fabrication,** F. Campabadal, Ctr. Nacional de Microelectronica (Spain); S. G. Nilsson, Lund Univ. (Sweden); G. Rius, E. Figueras, J. Esteve, Ctr. Nacional de Microelectronica (Spain) ..... [5836-75]

✔ **Latest developpement for SHAHIRA,** J. B. Baubert, Observatoire de Paris (France) and Chalmers Univ. of Technology (Sweden) ..... [5836-76]

✔ **A low-g bulk micromachined silicon accelerometer with area-changed differential capacitance,** Y. M. Burhanuddin, B. Badariah, A. Ahanchian, Univ. Kebangsaan Malaysia (Malaysia) ..... [5836-77]

✔ **Microhotplate-based silicon gas sensor arrays with linear temperature gradient for wine quality monitoring,** L. Lorenzelli, V. Guarnieri, A. Adami, M. Zen, Istituto Trentino di Cultura (Italy); L. Francioso, P. Siciliano, Consiglio Nazionale delle Ricerche (Italy); G. Agnusdei, OPTEL (Italy) ..... [5836-78]

✔ **Thin silicon shadow masks for organic light emitting diodes (OLED) deposition processes,** A. Tseng, National Taiwan Univ. (Taiwan) ..... [5836-79]

✔ **Research on a silicon-based NiCrAu micro-mirror for optical switch,** Y. Luo, Chongqing Univ. of Posts and Telecommunications (China) ..... [5836-81]

✔ **The influence of light on the gas sensitive properties of microstructured metal oxide thin films,** J. Woellenstein, J. Hildenbrand, E. Moretton, Fraunhofer-Institut für Physikalische Messtechnik (Germany) ..... [5836-82]

✔ **Gold/Titania nanocomposites thin films for gas optical gas sensing devices,** C. de Julian Fernandez, Univ. di Padova (Italy); M. G. Manera, Consiglio Nazionale delle Ricerche (Italy) and Univ. degli Studi di Lecce (Italy); J. Spadavecchia, Univ. degli Studi di Lecce (Italy); D. Buso, G. Mattei, A. Martucci, Univ. di Padova (Italy); R. Rella, Consiglio Nazionale delle Ricerche (Italy); L. Vasanelli, Univ. degli Studi di Lecce (Italy); M. Guglielmi, P. Mazzoldi, Univ. di Padova (Italy) ..... [5836-84]

✔ **Thermoelectric properties of Bismuth Telluride and Antimony Telluride thin films deposited by r.f. magnetron sputtering,** S. Kandasamy, K. Kalantar-zadeh, A. Holland, RMIT Univ. (Australia); G. Rosengarten, Univ. of Melbourne (Australia) and RMIT Univ. (Australia); W. Wlodarski, RMIT Univ. (Australia) ..... [5836-85]

✔ **Study of TiO_2-WO_3 and CoO_x Schottky diode based gas sensors,** W. Wlodarski, S. Kanadasamy, A. Trinchi, RMIT Univ. (Australia); E. Comini, G. Sberveglieri, Univ. degli Studi di Brescia (Italy) ..... [5836-86]

✔ **3D capacitive tactile sensor using DRIE micromachining,** C. Chieh-Tang, National Tsing Hua Univ. (Taiwan) ..... [5836-91]

Wednesday 11 May

Sessions 13, 15, 17 run concurrent with sessions 14, 16, 18

SESSION 13

Room: Giralda III . . . . . Wed. 09.30 to 10.50

Chemical Sensors II

Chair: **Pietro Siciliano,** Consiglio Nazionale delle Ricerche (Italy)

09.30: **Highly sensitive suspended-gate ion sensitive transistor for the detection of pH,** F. Bendriaa, F. Le Bihan, A. Salaun, Univ. de Rennes 1 (France) . . . . . [5836-47]

09.50: **Adsorption induced differential surface stress versus adsorption induced resonance frequency change: a comparison,** J. Amírola-Sanz, A. Rodríguez, Univ. Politècnica de Catalunya (Spain); L. Castañer, Univ. Politécnica de Catalunya (Spain); C. Horrillo, J. Lozano, J. Guiterrez, Consejo Superior de Investigaciones Cientificas (Spain) . . . . . [5836-48]

10.10: **A highly sensitive IR-optical sensor for ethylene-monitoring,** J. Woellenstein, S. Hartwig, Fraunhofer-Institut für Physikalische Messtechnik (Germany); L. Fonseca, Ctr. Nacional de Microlelecrónica (Spain); M. Moreno, Univ. de Barcelona (Spain); J. Hildenbrand, Fraunhofer-Institut für Physikalische Messtechnik (Germany) . . . . . [5836-49]

10.30: **Self-assembly layer of amino fluorenone derivative as optical receptor to detect cyclohexane vapour,** M. B. Yahaya, M. Mat Salleh, A. Ali Umar, Univ. Kebangsaan Malaysia (Malaysia) . . . . . [5836-50]

Coffee Break . . . . . 10.50 to 11.20

SESSION 14

Room: Arenal I . . . . . Wed. 09.30 to 10.50

Actuators II

Chair: **Jin-Chern Chiou,** National Chiao Tung Univ. (Taiwan)

09.30: **Design and simulation of comb-drive actuators incorporating gray-scale technology for tailored actuation characteristics** *(Invited Paper),* R. Ghodssi, B. C. Morgan, N. Pereira, Univ. of Maryland/College Park (USA) . . . . . [5836-51]

09.50: **Chemical and mechanical sensing in electrochemomecanical actuators,** T. F. Otero, G. Vazquez, J. J. López-Cascales, Univ. Politécnica de Cartagena (Spain) . . . . . [5836-52]

10.10: **Thermoneumatic actuator for tactile displays and smart actuation circuitry,** F. Vidal Verdú, M. Madueño, R. Navas-González, Univ. de Málaga (Spain) . [5836-53]

10.30: **Molecular orientation control for thermal and UV-driven polymer MEMS actuators,** K. D. Harris, Technische Univ. Eindhoven (Netherlands); R. Cuypers, Wageningen Univ. (Netherlands); P. Scheibe, Technische Univ. Eindhoven (Netherlands); J. Lub, T. Mol, Philips Research Labs. (Netherlands); C. W. Bastiaansen, Technische Univ. Eindhoven (Netherlands); D. J. Broer, Philips Research Labs. (Netherlands) . . . . . [5836-54]

Coffee Break . . . . . 10.50 to 11.20

Keynote Presentation

Room: Giralda III . . . . . Wed. 11.20 to 12.00

11.20: **MEMS above IC technology applied to a compact RF module** *(Invited Paper),* K. M. Grenier, L. Mazenq, LAAS-CNRS (France); E. Ojefors, P. Lindberg, A. Rydberg, Uppsala Univ. (Sweden); J. Berntgen, W. J. Rabe, Atmel Germany GmbH (Germany); E. Sonmez, P. Abele, H. Schumacher, Univ. Ulm (Germany); R. Plana, LAAS-CNRS (France) . . . . . [5836-55]

SESSION 15

Room: Giralda III . . . . . Wed. 12.00 to 13.00

RF MEMS

Chair: **Carles Ferrer,** Univ. Autònoma de Barcelona (Spain)

12.00: **High-Q micro-machined piezoelectric mechanical filters using coupled cantilever beams,** M. Zhu, P. B. Kirby, Cranfield Univ. (United Kingdom) . . . [5836-56]

12.20: **A current density distribution approach to the optimisation of RF-MEMS variable capacitors,** S. Ayoz, H. M. Tuncer, F. Udrea, Univ. of Cambridge (United Kingdom); R. Fritschi, A. Ionescu, Ecole Polytechnique Fédérale de Lausanne (Switzerland) . . . . . [5836-57]

12.40: **Efficient topology and design methodology for RF MEMS switches,** B. Ducarouge, D. Dubuc, S. Melle, K. M. Grenier, L. Mazenq, L. Bary, R. Plana, LAAS-CNRS (France) . . . . . [5836-58]

Lunch Break . . . . . 13.00 to 15.00

SESSION 16

Room: Arenal I . . . . . Wed. 12.00 to 13.00

Infrared Sensors

Chair: **Pietro Siciliano,** Consiglio Nazionale delle Ricerche (Italy)

12.00: **Micromachined IR-source with excellent blackbody like behaviour** *(Invited Paper),* W. Konz, M. Bauersfeld, J. Nurnus, Fraunhofer-Institut für Physikalische Messtechnik (Germany); V. Lehmann, Infineon Technologies AG (Germany); J. Woellenstein, Fraunhofer-Institut für Physikalische Messtechnik (Germany) . . . . . [5836-59]

12.20: **Design of infrared wavelength-selective microbolometers using planar multimode detectors,** D. P. Neikirk, S. Han, Univ. of Texas/Austin (USA) . . . [5836-60]

12.40: **Pyroelectric infrared detectors with high signal-to-noise ratio and very low microphonics,** V. Norkus, Technische Univ. Dresden (Germany) and DIAS Infrared GmbH (Germany); D. Chvedov, G. U. Gerlach, Technische Univ. Dresden (Germany); R. Köhler, DIAS Infrared GmbH (Germany) . . . . . [5836-61]

Lunch Break . . . . . 13.00 to 15.00

SESSION 17

Room: Giralda III . . . . . Wed. 15.00 to 16.40

Applications

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

15.00: **Development of a safe electro-thermal pyrotechnic igniter on silicon** *(Invited Paper),* P. Pennarun, Sr., C. Rossi, D. Esteve, V. Conedera, Ctr. National de la Recherche Scientifique (France) . . . . . [5836-62]

15.20: **Wearable human movement monitoring device aimed at providing personalized support in healthcare,** M. Prado, L. M. Roa, J. Reina-Tosina, M. Rovayo, Univ. de Sevilla (Spain) . . . . . [5836-63]

15.40: **2.4 GHz wireless sensor network for smart electronic shirts,** J. P. P. d. Carmo, Instituto Politecnico de Braganca (Portugal); P. Mendes, C. Couto, H. Correia, Univ. do Minho (Portugal) . . . . . [5836-64]

16.00: **Advanced optical metrology aimed at part inspection and reverse engineering for Mems and Nems,** R. Schmitt, RWTH-Aachen (Germany) and Fraunhofer - IPT (Germany); T. Pfeifer, U. Aleriano-Sanchez, RWTH-Aachen (Germany) . . . . . [5836-65]

16.20: **Development of a flexible tag microlab,** E. Abad, TEKNIKER (Spain); V. S. Raffa, B. Mazzolai, Scuola Superiore Sant'An (Italy); S. Marco, Univ. de Barcelona (Spain); A. Krenkow, T. Becker, EADS Deutschland GmbH (Germany) . . . . . [5836-29]

SESSION 18

Room: Arenal I . . . . . Wed. 15.00 to 16.20

Microfluidic Devices III

Chair: **Christos Tsamis,** NCSR Demokritos (Greece)

15.00: **A superparamagnetic bead driven fluidic device** *(Invited Paper),* B. Husband, T. Melvin, A. G. Evans, Univ. of Southampton (United Kingdom) . . . . . [5836-66]

15.20: **Microextractor controllated,** C. Aracil, J. Garcia, J. M. Quero, Univ. de Sevilla (Spain) . . . . . [5836-67]

15.40: **MEMS-based method of polymer bead handling for chemical array sensors,** D. P. Neikirk, B. Park, Y. S. Park, J. W. Kim, Y. Sohn, D. Romanovic, N. Christodoulides, J. T. McDevitt, Univ. of Texas/Austin (USA) . . . . . [5836-68]

16.00: **Impedance based flow sensor,** N. G. Green, H. Morgan, D. Holmes, Univ. of Southampton (United Kingdom) . . . . . [5836-69]

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VLSI Circuits and Systems II

Conference Chairs: **José F. López**, Univ. de Las Palmas de Gran Canaria (Spain); **Francisco V. Fernández**, IMSE-CNM-CSIC and Univ. Sevilla (Spain)

Cochairs: **José Maria López-Villegas**, Univ. de Barcelona (Spain); **José M. de la Rosa**, IMSE-CNM-CSIC (Spain)

Program Committee: **Sebastian A. Bota**, Univ. Illes Balears (Spain); **Joachim N. Burghartz**, Technische Univ. Delft (Netherlands); **Jose Cabanillas**, Qualcomm, Inc. (USA); **Herman Casier**, AMI Semiconductor (Belgium); **Massimo Conti**, Univ. Politecnica delle Marche (Italy); **Kamran Eshraghian**, Edith Cowan Univ. (Australia); **Joan Figueras**, Univ. Politècnica de Catalunya (Spain); **Christophe Gaillard**, Dolphin Integration (France); **Helmut Graeb**, Technische Univ. München (Germany); **Oscar Guerra**, Ctr. Nacional de Microelectrónica (Spain); **Luis Hernández**, Univ. Carlos III de Madrid (Spain); **Andre Ivanov**, Univ. of British Columbia (Canada); **Edmond Janssens**, STMicroelectronics (Belgium); **Andreas Kaiser**, IEMN-ISEN (France); **Steve Kang**, Univ. of California/Santa Cruz (USA); **Sandip Kundu**, Intel Corp. (USA); **Valentino Liberali**, Univ. degli Studi di Milano (Italy); **Dake Liu**, Linköping Univ. (Sweden); **Antonio López-Martín**, Univ. Publica de Navarra (Spain); **Marie-Minerve Louerat**, Univ. of Paris VI/LIP6 Lab. (France); **Salvador Mir**, TIMA Lab. (France); **Juan A. Montiel-Nelson**, Univ. de Las Palmas de Gran Canaria (Spain); **Ernesto H. Perea**, STMicroelectronics (France); **Belén Pérez-Verdú**, IMSE-CNM-CSIC (Spain); **Andrew Richardson**, Lancaster Univ. (United Kingdom); **Kaushik Roy**, Purdue Univ. (USA); **Josep Samitier-Marti**, Univ. de Barcelona (Spain); **Roberto Sarmiento**, Univ. de Las Palmas de Gran Canaria (Spain); **Javier J. Sieiro**, Univ. de Barcelona (Spain); **Walter Stechele**, Technische Univ. München (Germany); **Neil Weste**, NHEW R&D Pty Ltd. (Australia)

Monday 9 May

Keynote Session I

Room: Giralda I ..... **Mon. 09.30 to 10.10**

Chair: **Francisco V. Fernández**, IMSE-CNM-CSIC and Univ. Sevilla (Spain)

Keynote Presentation

Substrate noise coupling: a pain for mixed-signal systems on chip
(Invited Paper), P. Wambacq, Interuniv. MicroElectronics Ctr. (Belgium) .... [5837-01]

Sessions 1, 3 run concurrent with sessions 1, 4

SESSION 1

Room: Giralda I ..... **Mon. 10.10 to 10.50**

Mixed-Signal Design Methods

Chair: **Piet Wambacq,** IMEC (Belgium)

10.10: **New CAD issues and considerations for the design of mixed signal SOCs,** W. H. Kao, S. Zhang, Cadence Design Systems, Inc. (USA) ..... [5837-02]

10.30: **Reuse-based framework for the design of analog and mixed-signal ICs,** |R. Castro-López, F. V. Fernández, Á. Rodríguez-Vázquez, Ctr. Nacional de Microelectrónica (Spain) ..... [5837-03]

Coffee Break ..... 10.50 to 11.20

SESSION 2

Room: Giralda II ..... **Mon. 10.10 to 10.50**

High-Performance Interconnect

Chair: **Kevin T. Kornegay**, Cornell Univ. (USA)

10.10: **Area, power, and pin efficient bus structures using multi-bit-differential signaling,** D. M. Chiarulli, J. Bakos, S. P. Levitan, Univ. of Pittsburgh (USA) [5837-04]

10.30: **Design of CMOS trans-impedance amplifier for on-chip waveguide based optical clock distribution system,** C. V. Thangaraj, K. Stephenson, T. Chen, K. Lear, A. M. Raza, Colorado State Univ. (USA) ..... [5837-05]

Coffee Break ..... 10.50 to 11.20

SESSION 3

Room: Giralda I ..... **Mon. 11.20 to 13.20**

Sigma-Delta Data Converters

Chair: **José M. de la Rosa**, IMSE-CNM-CSIC and Univ. Sevilla (Spain)

11.20: **A continuous time low-pass sigma delta modulator implemented with transmission lines,** L. Hernandez, E. J. Prefasi, Univ. Carlos III de Madrid (Spain); P. Rombouts, Ghent Univ. (Belgium); S. Patón Álvarez, M. García Valderas, C. López Ongil, Univ. Carlos III de Madrid (Spain) ..... [5837-06]

11.40: **A dual-mode, complex, delta-sigma ADC in CMOS for wireless-LAN receivers,** J. Arias, Univ. de Valladolid (Spain); P. Kiss, V. Prodanov, V. Boccuzzi, M. Banu, Agere Systems (USA); D. Bisbal, J. San Pablo, L. Quintanilla, J. Barbolla, Univ. de Valladolid (Spain) ..... [5837-07]

12.00: **Continuous-time cascaded sigma-delta modulators for VDSL: a comparative study,** R. Tortosa, J. M. de la Rosa, A. Rodríguez-Vázquez, F. V. Fernández, Ctr. Nacional de Microelectrónica (Spain) ..... [5837-08]

12.20: **A 0.35 μm CMOS 17-bit@40-kS/s cascade 2-1 ΣΔ; modulator with programmable-gain and programmable chopper stabilization,** O. Guerra, S. Escalera, J. M. de la Rosa, Á. Rodriguez-Vazquez, Instituto de Microelectrónica de Sevilla (Spain) ..... [5837-09]

12.40: **Jitter effect comparison on continuous-time sigma-delta modulators with different feedback signal shapes,** J. San Pablo, D. Bisbal, L. Quintanilla, J. Arias, L. Enríquez, J. Vicente, J. Barbolla, Univ. de Valladolid (Spain) ..... [5837-10]

13.00: **Optimization algorithm for linearity enhancement in the design of continuous-time sigma-delta modulators,** S. Paton, L. Hernandez, R. Frutos, Univ. Carlos III de Madrid (Spain); A. Di Giandomenico, A. Wiesbauer, Infineon Technologies (Austria) ..... [5837-11]

Lunch Break ..... 13.20 to 15.00

SESSION 4

Room: Giralda II ..... **Mon. 11.20 to 13.00**

High-Performance Circuits and Architectures

Chair: **Kevin T. Kornegay**, Cornell Univ. (USA)

11.20: **Bounded budgeted parallel architecture versus control dominated architecture for hazard data-signal processors synthesis,** B. Le Gal, E. Casseau, E. Martin, Univ. de Bretagne-Sud (France) ..... [5837-12]

11.40: **A novel gigabit multidrop serial backplane for high-speed digital systems,** F. B. Tobajas, R. Esper-Chaín, R. Arteaga, V. De Armas, R. Sarmiento, Univ. de Las Palmas de Gran Canaria/IUMA (Spain) ..... [5837-14]

12.00: **A low-jitter clock and data recovery based on recovered data comparison,** S. J. Gao, Stevens Institute of Technology (USA); F. Li, Z. Wang, Southeast Univ. (China); H. Cui, Stevens Institute of Technology (USA) ..... [5837-15]

12.20: **Linearisation for analogue optical links using integrated CMOS predistortion circuits,** F. Lin, Univ. of Cambridge (United Kingdom); D. M. Holburn, R. J. Mears, Univ of Cambridge (United Kingdom) ..... [5837-16]

12.40: **A 40Gb/s driver circuit using a novel inductive bandwidth extension technique,** D. Kucharski, K. T. Kornegay, Cornell Univ. (USA) ..... [5837-17]

Lunch Break ..... 13.00 to 15.00

Session 5 runs concurrent with session 6

SESSION 5

Room: Giralda I . . . . . Mon. 15.00 to 16.20

Analog Circuits

Chair: **Javier J. Sieiro**, Univ. de Barcelona (Spain)

15.00: **A GmC filter design methodology for high-speed continuous-time sigma-delta A/D converters in a deep sub-micron technology,** R. Schoofs, M. Steyaert, W. Sansen, Katholieke Univ. Leuven (Belgium) . . . . . [5837-18]

15.20: **A 0.18 μm CMOS low-noise high-linearity seventh other elliptic low-pass continuous-time filter,** J. F. Bootello, M. Delgado-Restituto, Á. Rodríguez-Vazquez, Instituto de Microelectrónica de Sevilla (Spain) . . . . . [5837-19]

15.40: **CMOS current amplifiers exhibiting independent AC and DC current amplification,** D. Guckenberger, K. T. Kornegay, Cornell Univ. (USA) . . . . . [5837-20]

16.00: **An efficient 2-stage fractional charge pump based on frequency regulation,** A. Saiz-Vela, P. Miribel-Català, M. Puig-Vidal, J. Samitier, Univ. de Barcelona (Spain) . . . . . [5837-21]

Coffee Break . . . . . 16.20 to 16.40

SESSION 6

Room: Giralda II . . . . . Mon. 15.00 to 16.20

Multimedia I

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

15.00: **A quarter pixel precision motion estimation architecture for H.264/AVC video coding,** S. Lopez, Univ. de Las Palmas de Gran Canaria (Spain) and Research Institute for Applied Microelectronics (Spain); F. Tobajas, J. Bienes, A. Villar, V. de Armas, J. F. López, R. Sarmiento, Univ. de Las Palmas de Gran Canaria (Spain) . . . . [5837-22]

15.20: **Statistically optimized VLSI architecture for buffer used in EBCOT block coder of JPEG2000,** A. K. Gupta, S. Nooshabadi, D. S. Taubman, Univ. of New South Wales (Australia); J. A. Montiel-Nelson, Univ. de Las Palmas de Gran Canaria (Spain) . . . . . [5837-23]

15.40: **Hardware implementation of the wavelet transform for JPEG2000,** J. Hormigo, J. M. Prades, J. Villalba, E. Zapata, Univ. de Malaga (Spain) . . . . . [5837-24]

16.00: **Haar wavelet processor for adaptive on-line image compression,** J. Díaz, A. M. Burón, J. M. Solana, Univ. de Cantabria (Spain) . . . . . [5837-25]

Coffee Break . . . . . 16.20 to 16.40

Sessions 7, 8, and 9 run concurrently

SESSION 7

Room: Giralda I . . . . . Mon. 16.40 to 18.20

Analog, Mixed-Signal, and Power Circuit Design Methodologies and Tools

Chair: **Rafael Castro,** IMSE-CNM-SCIS (Spain)

16.40: **Impact of package parasitics on crosstalk in mixed-signal ICs,** V. Liberali, G. Boselli, Univ. degli Studi di Milano (Italy); V. Ferragina, N. Ghittori, G. Torelli, Univ. degli Studi di Pavia (Italy); G. Trucco, Univ. degli Studi di Milano (Italy) . . . . . [5837-26]

17.00: **Net order optimization in analog net bundles,** L. Schreiner, T. Jambor, M. Olbrich, E. Barke, Univ. Hannover (Germany) . . . . . [5837-27]

17.20: **Simulation-based high-level synthesis of Nyquist-rate data converters using MATLAB/SIMULINK,** J. Ruiz-Amaya, J. M. de la Rosa, M. Delgado-Restituto, A. Rodríguez-Vázquez, Ctr. Nacional de Microelectrónica (Spain) . . . . . [5837-73]

17.40: **A mismatch characterization and simulation environment for weak-to-strong inversion CMOS transistors,** J. Velarde-Ramirez, G. Vicente-Sanchez, T. Serrano-Gotarredona, B. Linares-Barranco, Instituto de Microelectrónica de Sevilla (Spain) . . . . . [5837-29]

18.00: **Modeling of power control schemes in induction cooking devices,** A. Beato, M. Conti, Univ. Politecnica delle Marche (Italy); C. Turchetti, Univ. Politecnica delle Marche (Israel); S. Orcioni, Univ. Politecnica delle Marche (Italy) . . . . . [5837-30]

SESSION 8

Room: Giralda II . . . . . Mon. 16.40 to 18.20

Circuit Design for RF Applications

Chair: **Roberto Rivoir**, Atmel Corp. (France)

16.40: **Behavioral study and design of a digital interpolator filter for wireless reconfigurable transmitters,** V. Ferragina, A. Frassone, N. Ghittori, P. Malcovati, A. Vigna, Univ. degli Studi di Pavia (Italy) . . . . . [5837-32]

17.00: **Modeling and design of high-order PLLs,** B. Daniels, G. Baldwin, R. J. Farrell, National Univ. of Ireland/Maynooth (Ireland) . . . . . [5837-33]

17.20: **Voltage-buffer-based low-power area-efficient SC FIR filter for wireless communication,** R. Dlugosz, Poznan Univ. of Technology (Poland); R. Wojtyna, Univ. of Technology and Agriculture Bydgoszcz (Poland) . . . . . [5837-34]

17.40: **Band-pass transimpedance read-out circuit for UHF MEMS resonator applications,** H. Campanella, Ctr. Nacional de Microelectrónica (Spain); A. Uranga, Univ. Autònoma de Barcelona (Spain); Z. Davis, J. Esteve, L. Terés, Ctr. Nacional de Microelectrónica (Spain); N. Barniol, Univ. Autònoma de Barcelona (Spain) . . . . . [5837-35]

18.00: **Integrable turn-on circuit for active sensors,** D. C. Ranasinghe, L. T. Hall, P. H. Cole, The Univ. of Adelaide (Australia) . . . . . [5837-130]

SESSION 9

Room: Arenal I . . . . . Mon. 16.40 to 18.20

Digital Circuits

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

16.40: **An integrated controller for a flexible and wireless atomic force microscopy,** J. Lacort, R. Casanova, J. Brufau, A. Arbat, A. Dieguez, Univ. de Barcelona (Spain); M. Nierlich, O. Steinmetz, Fraunhofer Institut Biomedizinische Technik (Germany); M. Puig, J. Samitier, Univ. de Barcelona (Spain) . . . . . [5837-36]

17.00: **A CMOS latched driver using bootstrap technique for low-voltage applications,** J. C. García-Montesdeoca, J. A. Montiel-Nelson, Univ. de Las Palmas de Gran Canaria (Spain); S. Nooshabadi, Univ. of New South Wales (Australia) . . . . . [5837-37]

17.20: **Performance analysis of full adders in CMOS technologies,** J. Castro, Ctr. Nacional de Microelectrónica (Spain); P. Parra, A. J. Acosta, Ctr. Nacional de Microelectrónica (Spain) and Univ. de Sevilla (Spain) . . . . . [5837-38]

17.40: **Temperature effects on circuit synchronism,** S. A. Bota, J. Segura, J. L. Ressell, M. Rosales, Univ. Illes Balears (Spain) . . . . . [5837-39]

18.00: **A digital adaptive filter architecture for hard-disk drive read channels,** T. Ndjountche, Quebec Univ. at Hull (Canada); F. Luo, QuickSilver Technology (USA) . . . . . [5837-40]

Tuesday 10 May

Keynote Session II

Room: Giralda I . . . . . Tues. 09.30 to 10.10

Chair: **Francisco V. Fernández,** IMSE-CNM-CSIC and Univ. Sevilla (Spain)

Keynote Presentation

Review of energy harvesting techniques and applications for microelectronics *(Invited Paper),* L. Mateu, F. Moll, A. Rubio, Univ. Politècnica de Catalunya (Spain) . . . . . [5837-41]

Session 10 runs concurrent with session 11

SESSION 10

Room: Giralda I . . . . . Tues. 10.10 to 10.50

Technology Reliability

Chair: **Marie-Minerve Louerat**, Univ. of Paris VI/LIP6 Lab. (France)

10.10: **Ring oscillator behavior after oxide breakdown,** R. Fernández, R. Rodríguez, M. Nafría, X. Aymerich, Univ. Autònoma de Barcelona (Spain) . . . . . [5837-42]

10.30: **Transient electro-thermal investigations of interconnect transient electro-thermal investigations of interconnect structures exposed to mechanical stress,** S. Holzer, C. Hollauer, H. Ceric, S. Wagner, E. Langer, T. Grasser, S. Selberherr, Technische Univ. Wien (Austria) . . . . . [5837-43]

Coffee Break . . . . . 10.50 to 11.20

SESSION 11

Room: Giralda II . . . . . Tues. 10.10 to 10.50

Baseband Design for Wireless Transceivers

Chair: **Jose M. de la Rosa,** IMSE-CNM-CSIC and Univ. Sevilla (Spain)

10.10: **A 2.5V 4mA GSM base-band transmit port with 2.8- mm2 area in CMOS 0.18 μm,** R. Rivoir, E. Marais, Atmel Corp. (France) . . . . . [5837-44]

10.30: **A programmable baseband chain for a WCDMA/WLAN(802.11b) multi-standard zero-IF receiver,** D. Rodríguez de Llera González, M. Ismail, Royal Institute of Technology (Sweden) . . . . . [5837-45]

Coffee Break . . . . . 10.50 to 11.20

Keynote Session III

Room: Giralda I . . . . . Tues. 11.20 to 12.00

Chair: **Edmond Janssens,** STMicroelectronics (Belgium)

Keynote Presentation

Low-power short-range transceivers for sensor networks applications *(Invited Paper),* J. M. López-Villegas, Univ. de Barcelona (Spain) . . . . . [5837-46]

Sessions 12, 14 run concurrent with sessions 13, 15

SESSION 12

Room: Giralda I . . . . . Tues. 12.00 to 13.20

Wireless Transceivers

Chair: **Edmond Janssens**, STMicroelectronics (Belgium)

12.00: **CMOS implementation of ultra-wideband systems,** W. Vereecken, M. Steyaert, Katholieke Univ. Leuven (Belgium) . . . . . [5837-47]

12.20: **A 2V 0.35-μm CMOS DECT RF front-end with on-chip frequency synthesizer,** D. Guermandi, E. Franchi, A. Gnudi, Univ. degli Studi di Bologna (Italy); P. Rossi, F. Svelto, R. Castello, Univ. degli Studi di Pavia (Italy) . . . . . [5837-48]

12.40: **High bit rate BPSK receiver,** A. A. Osorio-Marti, Univ. de Barcelona (Spain) . . . . . [5837-49]

13.00: **A dual-band RF transceiver for WLAN applications,** R. Sachdev, S. Singh, D. K. Sharma, Indian Institute of Technology Bombay (India) . . . . . [5837-50]

Lunch Break . . . . . 13.20 to 15.00

SESSION 13

Room: Giralda II . . . . . Tues. 12.00 to 13.20

Digital Design Methodologies and Tools I

Chair: **Antonio J. Acosta**, Ctr. Nacional de Microelectrónica (Spain)

12.00: **Power analysis methodology and library in SystemC,** M. Conti, S. Orcioni, G. B. Vece, Univ. Politecnica delle Marche (Italy) . . . . . [5837-51]

12.20: **Architectural energy estimation of embedded systems using cycle accurate simulation,** A. Abril, Univ. Pierre et Marie Curie Paris VI (France) and Philips Digital Systems Lab. (France); H. Mehrez, Univ. Pierre et Marie Curie Paris VI (France); J. Gobert, Philips Digital Systems Lab. (France); F. Petrot, Univ. Pierre et Marie Curie Paris VI (France); C. Miro, Philips Digital Systems Lab. (France) . . . . . [5837-52]

12.40: **Algorithms to get the maximum operation frequency for skew-tolerant clocking schemes,** D. Guerrero, M. J. Bellido, J. J. Chico, A. Millán, P. Ruiz, E. Ostua, Instituto de Microelectrónica de Sevilla (Spain) and Univ. de Sevilla (Spain) [5837-53]

13.00: **Data-driven array architectures: a rebirth?,** J. M. Cardoso, Univ. of Algarve (Portugal) and INESC-ID (Portugal) . . . . . [5837-13]

Lunch Break . . . . . 13.20 to 15.00

SESSION 14

Room: Giralda I . . . . . Tues. 15.00 to 16.20

Analog Test

Chair: **Salvador Mir**, Institut Polytechnique National de Grenoble (France)

15.00: **Embedded design-for-testability strategies to test high-resolution SD modulators,** S. Escalera, A. Espin, O. Guerra, Á. Rodriguez-Vazquez, Instituto de Microelectrónica de Sevilla (Spain) . . . . . [5837-55]

15.20: **Digital test of a ΣΔ modulator in a mixed-signal BIST architecture,** L. Rolindez, Institut Polytechnique National de Grenoble (France) and STMicroelectronics (France); S. Mir, G. Prenat, Institut Polytechnique National de Grenoble (France) . . . . [5837-56]

15.40: **Experimental comparison of different oscillation-based test techniques in an analog block,** K. Suenaga, R. Picos, S. A. Bota, M. Roca, E. Garcia, Univ. Illes Balears (Spain) . . . . . [5837-57]

16.00: **Voltage to frequency converter for DAC test,** R. J. Farrell, J. Hogan, National Univ. of Ireland/Maynooth (Ireland) . . . . . [5837-58]

Coffee Break . . . . . 16.20 to 16.40

SESSION 15

Room: Giralda II . . . . . Tues. 15.00 to 16.20

Modelling and Design of Passive RF Components

Chair: **José Maria López-Villegas**, Univ. de Barcelona (Spain)

15.00: **Design and modeling of an on-silicon spiral inductor library using improved EM simulations,** A. Goñi Iturri, S. L. Khemchandani, J. del Pino, J. García, B. González Pérez, A. Hernández Ballester, Univ. de Las Palmas de Gran Canaria (Spain) [5837-59]

15.20: **Modeling of passive components in VLSI technologies,** J. J. Sieiro, J. Cabanillas, J. M. Lopez-Villegas, Univ. de Barcelona (Spain) . . . . . [5837-60]

15.40: **Design considerations for high-frequency passive filters,** N. Sainz, L. Cendoya, Univ. de Navarra (Spain); H. Solar, U. Alvarado, Ctr. de Estudios e Investigaciones Técnicas de Gipuzkoa (Spain); J. de No, Univ. de Navarra (Spain) . . . . . [5837-61]

16.00: **Design considerations and trade-offs for passive RFID tags,** F. A. Hussien, D. Z. Turker, R. Srinivasan, M. Mobarak, F. Cortes, E. Sanchez-Sinencio, Texas A&M Univ. (USA) . . . . . [5837-62]

Coffee Break . . . . . 16.20 to 16.40

✔ Posters-Tuesday

The following posters will be displayed on Tuesday in the Conference Area Hallway. A poster reception will be held Tuesday evening from 16.40 to 18.20 hrs., with authors present at their poster papers to answer questions. Light refreshments will be served. Poster authors may set up their posters on Tuesday from 10.00 for all-day previewing. It is the author's responsibility to remove their posters at the end of the session. Papers not removed will be considered unwanted and will be discarded. SPIE assumes no responsibility for posters left up after the end of the poster session.

✔ **CMOS active resistor for VLSI applications based on an improved linearity differential structure,** C. Popa, Faculty of Electronics and Telecommunications (Romania) . . . . . [5837-105]

✔ **FGMOS multiplier circuit with improved linearity and frequency response,** C. Popa, Faculty of Electronics and Telecommunications (Romania) . . . . [5837-106]

✔ **A new geometrical approach to design centering of analog circuits,** S. Manetti, M. C. Piccirilli, F. Grasso, Univ. degli Studi di Firenze (Italy) . . . . . [5837-107]

✔ **CMOS integrated based lock-in pixel for heterodyne interferometry,** O. Soloviev, K. Makinwa, G. V. Vdovin, P. M. Sarro, Technische Univ. Delft (Netherlands) . . . . . [5837-108]

✔ **Single poly PMOS-based CMOS-compatible low-voltage OTP,** P. Vega-Castillo, W. H. Krautschneider, Technical Univ. Hamburg-Harburg (Germany) . . . [5837-110]

✔ **Modeling of frequency agile devices: development of PKI neuromodeling library based on hierarchical network structure,** P. Sánchez, J. Hinojosa, R. Ruiz, Univ. Politécnica de Cartagena (Spain) . . . . . [5837-111]

✔ **A temperature control system for integrated resistive gas sensor arrays,** G. Ferri, N. C. Guerrini, Univ. L'Aquila (Italy) . . . . . [5837-112]

✔ **CCII-based inductance simulators for mechanical oscillation control,** G. Ferri, N. C. Guerrini, Univ. L'Aquila (Italy) . . . . . [5837-113]

✔ **Novel low-voltage low-power fully differential buffer,** G. Ferri, Univ. L'Aquila (Italy) [5837-114]

✔ **Application of clock gating techniques at a flip-flop level to switching noise reduction in VLSI circuits,** P. Parra, Ctr. Nacional de Microelectrónica (Spain) and Univ. de Sevilla (Spain); J. Castro, Ctr. Nacional de Microelectrónica (Spain); M. Valencia, A. J. Acosta, Ctr. Nacional de Microelectrónica (Spain) and Univ. de Sevilla (Spain) . . . . . [5837-115]

✔ **DC modeling of PN integrated cross varactor,** J. A. García, B. Gonzalez Perez, J. del Pino Suarez, A. Goñi Iturri, S. L. Khemchandani, J. A. Perez Castellano, Univ. de Las Palmas de Gran Canaria (Spain) . . . . . [5837-116]

✔ **Sectored receivers model for calculation of the impulse response on IR wireless indoor channels using Monte Carlo based ray-tracing algorithm,** B. Rodríguez Mendoza, S. Rodríguez Pérez, Univ. de La Laguna (Spain); R. Pérez Jiménez, Univ. de Las Palmas de Gran Canaria (Spain); O. B. González Hernández, A. J. Ayala Alfonso, Univ. de La Laguna (Spain) . . . . . [5837-117]

✔ **Study of the proximity effect in high q inductors for wireless lan (wlan),** I. Cendoya, Univ. de Navarra (Spain); J. Mendizabal, Ctr. de Estudios e Investigaciones Técnicas de Gipuzkoa (Spain); N. Sainz, I. Gutierrez, Univ. de Navarra (Spain); C. Quemada, Ctr. de Estudios e Investigaciones Técnicas de Gipuzkoa (Spain); J. de No, Univ. de Navarra (Spain) . . . . . [5837-118]

✔ **Prototype board for the test of self-timed circuits developed in FPGAs,** M. S. Raya, R. J. Naharro, Univ. de Huelva (Spain); J. C. Ramírez, Instituto de Microelectrónica de Sevilla (Spain) . . . . . [5837-119]

✔ **An approach to a VHDL-AMS library for RF component models,** G. Domenech-Asensi, J. Hinojosa-Jimenez, J. Martinez-Alajarin, F. J. Garrigos-Guerrero, J. A. Lopez-Alcantud, Univ. Politecnica de Cartagena (Spain) . . . . . [5837-120]

✔ **Multiphase clock generator with controlled clock impulse width for programmable high order SC FIR filter realized in 0.35-μm CMOS technology,** R. Dlugosz, P. Pawlowski, Poznan Univ. of Technology (Poland) . . . . . [5837-121]

✔ **A fully integrated low-noise amplifier in SiGe 0.35 μm technology for 802.11a WIFI applications,** S. L. Khemchandani, R. Pulido, A. G. Iturri, R. Diaz, A. Hernández, J. d. P. Suarez, Univ. de Las Palmas de Gran Canaria (Spain) . . . . . [5837-122]

✔ **The design of capacitance variation detector for the obstacle detection system,** Y. Song, S. Kim, Korea Univ. (South Korea) . . . . . [5837-123]

✔ **Search strategy for relevant parasitic elements and reduction of their influence on the operation of SC FIR filters realized in CMOS technology,** R. Dlugosz, Politechnika Poznanska (Poland) . . . . . [5837-124]

✔ **A deterministic BIST scheme for test time reduction in VLSI circuits,** J. M. Solana, Univ. de Cantabria (Spain) . . . . . [5837-125]

✔ **Low-cost printed antennas design in the band of 2,4GHz,** P. Mart, M. Serra, R. Reig, Univ. de Vic (Spain) . . . . . [5837-126]

✔ **Rapid prototyping with visual data environment of an OFDM WLAN System,** M. Serra, P. Marti, R. Reig, Univ. de Vic (Spain) . . . . . [5837-127]

✔ **Design and optimization of power rectifiers for passive RFID systems in monolithic DMOS circuit,** B. Jamali, D. C. Ranasinghe, P. H. Cole, Z. Zhu, The Univ. of Adelaide (Australia) . . . . . [5837-128]

✔ **MEMS-based activator for active RFID labels,** D. C. Ranasinghe, P. H. Cole, The Univ. of Adelaide (Australia) . . . . . [5837-129]

Wednesday 11 May

Keynote Session IV

Room: Giralda I . . . . . Wed. 09.30 to 10.10

Chair: **Ángel Rodríguez-Vázquez,**
Ctr. Nacional de Microelectrónica and Univ. Sevilla (Spain)

Keynote Presentation

Integrated wireless systems: the future is arrived *(Invited Paper),* R. Rivoir, Atmel Corp. (France) . . . . . [5837-63]

Session 16 runs concurrent with session 17

SESSION 16

Room: Giralda I . . . . . Wed. 10.10 to 10.50

Reconfigurable Radio Systems

Chair: **Ángel Rodríguez-Vázquez**, Ctr. Nacional de Microelectrónica and Univ. Sevilla (Spain)

10.10: **Performance requirements for analog-to-digital converters in wideband reconfigurable radios,** D. Naughton, G. Baldwin, R. J. Farrell, National Univ. of Ireland/Maynooth (Ireland) . . . . . [5837-64]

10.30: **A modular testbed for software defined radio at 2.4 GHz ISM band,** S. Adi, G. Baldwin, R. J. Farrell, National Univ. of Ireland/Maynooth (Ireland) . . . . . [5837-65]

Coffee Break . . . . . 10.50 to 11.20

SESSION 17

Room: Giralda II . . . . . Wed. 10.10 to 10.50

Memory Circuits

Chair: **Antonio J. Acosta**, Ctr. Nacional de Microelectrónica (Spain)

10.10: **Design and simulation of an embedded DRAM cell made up with MOSFETs having alternative gate dielectrics,** N. Konofaos, Univ. of Patras (Greece) and Research Academic Computer Technology Institute (Greece); T. Voilas, Univ. of Patras (Greece); G. P. Alexiou, Univ. of Patras (Greece) and Research Academic Computer Technology Institute (Greece) . . . . . [5837-66]

10.30: **A Dickson charge pump circuit driven by boosted clock for low-voltage flash memories,** H. Kim, S. Kim, Korea Univ. (South Korea) . . . . . [5837-67]

Coffee Break . . . . . 10.50 to 11.20

Keynote Session V

Room: Giralda I . . . . . Wed. 11.20 to 12.00

Chair: **Oscar Guerra,** IMSE-CNM-CSIC (Spain)

Keynote Presentation

Practical considerations for real-time super-resolution implementation techniques over video coding platforms *(Invited Paper),* G. I. Marrero Callico, Univ. de Las Palmas de Gran Canaria (Spain) and Institute for Applied Microelectronics (Spain); S. Lopez Suarez, Univ. de Las Palmas de Gran Canaria (Spain); R. Peset Llopis, R. Sethuraman, Philips Research Labs. (Netherlands); A. Núñez Ordonez, J. López Feliciano, M. Marrero Martín, R. Sarmiento Rodríguez, Univ. de Las Palmas de Gran Canaria (Spain) . . . . . [5837-68]

Session 18 runs concurrent with session 19

SESSION 18

Room: Giralda I . . . . . Wed. 12.00 to 13.20

Multimedia II

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

12.00: **Real time super-resolution over raw and compressed video sequences,** D. Barreto Dos Santos, G. I. Marrero Callic, S. López Suárez, L. García Aguiar, A. Núñez Ordóñez, Univ. de Las Palmas de Gran Canaria (Spain) . . . . . [5837-69]

12.20: **A low-cost bidimensional smart pixel network for video coding operations,** S. Lopez, J. F. López, R. Sarmiento, Univ. de Las Palmas de Gran Canaria (Spain) . . . . . [5837-70]

12.40: **FPGA implementation of a fuzzy based video de-interlacing algorithm,** P. Brox, S. Sánchez-Solano, I. Baturone, Á. Barriga, Instituto de Microelectrónica de Sevilla (Spain) . . . . . [5837-71]

13.00: **Rapid-prototyping framework for multimedia SoC,** T. S. Mohamed, I. Amer, W. Badawy, Univ. of Calgary (Canada) . . . . . [5837-72]

Lunch Break . . . . . 13.20 to 15.00

SESSION 19

Room: Giralda II . . . . . Wed. 12.00 to 13.20

Analog and Mixed-Signal Design Methodologies and Tools

Chair: **Oscar Guerra,** IMSE-CNM-CSIC (Spain)

12.00: **A CAD tool for systematic design and non-linearities analysis of self-calibrating pipelined ADCs,** C. Azzolini, D. Vecchi, A. Boni, Univ. degli Studi di Parma (Italy) . . . . . [5837-74]

12.20: **On the suitability and development of layout templates for analog layout reuse and layout-aware synthesis,** R. Castro-López, F. V. Fernández, Á. Rodríguez-Vázquez, Ctr. Nacional de Microelectrónica (Spain) . . . . . [5837-28]

12.40: **Geometrically constrained parasitic-aware synthesis of analog ICs,** R. Castro-López, F. V. Fernández, Á. Rodríguez-Vázquez, Ctr. Nacional de Microelectrónica (Spain) . . . . . [5837-75]

13.00: **Simulation-based low-level optimization tool for analog integrated circuits,** G. Domenech-Asensi, Univ. Politecnica de Cartagena (Spain); J. A. Lopez-Alcantud, R. Ruiz-Merino, Univ. Politécnica de Cartagena (Spain) . . . . . [5837-76]

Lunch Break . . . . . 13.20 to 15.00

Sessions 20, 21, and 22 run concurrently

SESSION 20

Room: Giralda I . . . . . Wed. 15.00 to 16.20

Voltage-Controlled Oscillators

Chair: **Manuel Delgado-Restituto,**
Ctr. Nacional de Microelectrónica (Spain)

15.00: **Emitter degenerated voltage controlled oscillators for millimeter wave operation,** B. P. Welch, K. T. Kornegay, Cornell Univ. (USA) . . . . . [5837-77]

15.20: **A 3.2 GHz fully integrated low-phase noise CMOS VCO with self-biasing current source for the IEEE 802.11a/hiperLAN WLAN standard,** C. Quemada, I. Adin, G. Bistue, R. Berenguer, J. Mendizabal, Ctr. de Estudios e Investigaciones Tecnicas (Spain) . . . . . [5837-78]

15.40: **NMOS symmetric load ring VCOs modeling for submicron technologies,** M. H. S. Fino, Univ. Nova de Lisboa (Portugal) . . . . . [5837-79]

16.00: **An 18 GHz integrated double-balanced direct down-conversion mixer and emitter degenerated quadrature VCO in 47GHz ft SiGe,** Y. Wang, B. P. Welch, K. T. Kornegay, Cornell Univ. (USA) . . . . . [5837-80]

Coffee Break . . . . . 16.20 to 16.40

SESSION 21

Room: Giralda II . . . . . Wed. 15.00 to 16.20

Digital Test and Verification

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

15.00: **A functional validation methodology based on error models for measuring the quality of digital integrated circuits,** C. López-Ongil, L. Entrena-Arrontes, Univ. Carlos III de Madrid (Spain); T. Riesgo-Alcaide, J. Uceda-Antolín, Polytechnic Univ. of Madrid (Spain) . . . . . [5837-81]

15.20: **Built-in test engine and fault simulation for memory,** P. McEvoy, R. J. Farrell, National Univ. of Ireland/Maynooth (Ireland) . . . . . [5837-82]

15.40: **A one-step algorithm for finding the optimum solution of the state justification problem in RTL designs using MILP,** H. Navarro-Botello, J. A. Montiel-Nelson, J. Sosa, Univ. de Las Palmas de Gran Canaria (Spain) . . . . . [5837-83]

16.00: **A complete hardening method for the generation of fault tolerant circuits,** M. Portela-García, M. Garcia-Valderas, C. Lopez-Ongil, L. Entrena-Arrontes, Univ. Carlos III de Madrid (Spain) . . . . . [5837-84]

Coffee Break . . . . . 16.20 to 16.40

SESSION 22

Room: Giralda V . . . . . Wed. 15.00 to 16.20

Multimedia III

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

15.00: **Parallel-pipeline 2D DCT/IDCT processor architecture,** G. A. Ruiz, J. A. Michell, A. M. Buron, Univ. de Cantabria (Spain) . . . . . [5837-85]

15.20: **Computational demands of H264/AVC software coder functional blocks: a comparative analysis, over several platforms, oriented towards VLSI implementation,** J. Soriano, F. Ballester, M. Martínez, Univ. Politécnica de Valencia (Spain) . . . . . [5837-86]

15.40: **Evaluation of architectures for an ASP MPEG-4 decoder using a system-level design methodology,** L. García, V. Reyes, D. Barreto, G. Marrero, A. Nuñez, Univ. de Las Palmas de Gran Canaria (Spain) [5837-87]

16.00: **System-level design and power analysis of architectures for SATD calculus in the H.264/AVC,** M. Conti, F. Coppari, S. Orcioni, G. B. Vece, Univ. Politecnica delle Marche (Italy) . . . . . [5837-88]

Coffee Break . . . . . 16.20 to 16.40

Sessions 23, 24, and 25 run concurrently

SESSION 23

Room: Giralda I . . . . . Wed. 16.40 to 18.20

Data Converters

Chair: **Luis Hernández,**
Univ. Carlos III de Madrid (Spain)

16.40: **Design of a 12-bit 80MS/s pipeline analog-to-digital converter for broadband PLC and VDSL applications,** L. Díez-Villar, J. Ruiz-Amaya, J. F. Bootello, J. M. de la Rosa, M. Delgado-Restituto, Instituto de Microelectrónica de Sevilla (Spain) . . . . . [5837-89]

17.00: **Use of pipelined charge-summation ADCs for low-power high-performance systems,** R. J. Farrell, N. Duignan, National Univ. of Ireland/Maynooth (Ireland) . . . . . [5837-90]

17.20: **A simple 2.25mW, 70oMsamples/s, 4-bit flash analog-to-digital converter,** L. de Lamarre, Univ. Paris 6 (France); M. Louërat, ASIM (France) and Univ. Paris 6 (France); A. Kaiser, ISEN (France) . . . . . [5837-91]

17.40: **Design of a 12-bit 80MS/s CMOS digital-to-analog converter for PLC-VDSL applications,** J. Ruiz-Amaya, L. Díez-Villar, J. F. Bootello, J. M. de la Rosa, M. Delgado-Restituto, Instituto de Microelectrónica de Sevilla (Spain) . . . . . [5837-92]

18.00: **10bit, 100MS/s sample-and-hold amplifier adopting positive feedback technique,** G. Kim, S. Kim, Korea Univ. (South Korea) . . . . . [5837-93]

SESSION 24

Room: Giralda II . . . . . Wed. 16.40 to 18.20

FPGAs

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

16.40: **FPGA implementation of sparse matrix algorithm for information retrieval,** S. Bojanic, R. Jevtic, O. Nieto-Taladriz Garcia, Univ. Politecnica de Madrid (Spain) . . . . . [5837-94]

17.00: **Integrated circuit debug through FPGA emulation: application to a PIC-18 macrocell,** M. Garcia-Valderas, Univ. Carlos III de Madrid (Spain); E. de la Torre-Arnanz, Univ. Politecnica de Madrid (Spain); F. Casado-Ortiz, L. Entrena-Arrontes, Univ. Carlos III de Madrid (Spain); T. Riesgo-Alcaide, Univ. Politecnica de Madrid (Spain) . . . . . [5837-95]

17.20: **ACE16k-based stand-alone system for real-time pre-processing tasks,** L. Carranza, F. Jiménez-Garrido, G. Liñan-Cembrano, E. Roca, Ctr. Nacional de Microelectrónica (Spain); S. Espejo-Meana, Ctr. Nacional de Microelectronica (Spain); A. Rodríguez-Vázquez, Ctr. Nacional de Microelectrónica (Spain) . . . . . [5837-96]

17.40: **Self-similar module for FP/LNS arithmetic in high-performance FPGA systems,** L. Spaanenburg, Lund Univ. (Sweden); S. Möhl, Mitrion AB (Sweden) [5837-97]

18.00: **VLSI implementation of RSA encryption system using ancient Indian Vedic mathematics,** H. Thapliyal, International Institute of Information Technology (India) . . . . . [5837-98]

SESSION 25

Room: Giralda V . . . . . Wed. 16.40 to 18.20

Digital Design Methodologies and Tools II

Chair: **Manuel J. Bellido,**
Instituto de Microelectrónica de Sevilla (Spain)

16.40: **CHIADO: compilation of high-level computationally intensive algorithms to dynamically reconfigurable computing systems,** J. M. Cardoso, Univ. of Algarve (Portugal) . . . . . [5837-99]

17.00: **A methodology for characterization of arithmetic circuits on CMOS deep submicron technologies,** A. Estrada, Instituto de Microelectrónica de Sevilla. (Spain); C. J. Jiménez, M. Valencia, Instituto de Microelectrónica de Sevilla (Spain) . . . . . [5837-100]

17.20: **An efficient structural technique for Boolean decomposition,** A. Martinelli, E. Dubrova, Royal Institute of Technology (Sweden) . . . . . [5837-101]

17.40: **Technology mapping in library free logic synthesis,** J. Xue, D. Al-Khalili, C. Rozon, Royal Military College of Canada (Canada) . . . . . [5837-102]

18.00: **Computing a perfect input assignment for probabilistic verification,** M. Teslenko, E. Dubrova, H. Tenhunen, Royal Institute of Technology (Sweden) . . . . . [5837-103]

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Nanotechnology II

Conference Chair: **Paolo Lugli**, Technische Univ. München (Germany)

Cochairs: **Laszlo B. Kish**, Texas A&M Univ. (USA); **Javier Mateos**, Univ. de Salamanca (Spain)

Program Committee: **Xavier Aymerich**, Univ. Autònoma de Barcelona (Spain); **Sylvain Bollaert**, Univ. de Lille (France); **Juergen P. Brugger**, Ecole Polytechnique Fédérale de Lausanne (Switzerland); **Roberto Car**, Princeton Univ. (USA); **Alfonso Cebollada**, Ctr. Nacional de Microelectrónica (Spain); **Russell Cowburn**, Durham Univ. (United Kingdom); **Toshio Fukuda**, Nagoya Univ. (Japan); **Tomás González**, Univ. de Salamanca (Spain); **Stephen M. Goodnick**, Arizona State Univ. (USA); **Claes-Göran Granqvist, Sr.**, Uppsala Univ. (Sweden); **Rikizo Hatakeyama**, Tohoku Univ. (Japan); **Chennupati Jagadish**, Australian National Univ. (Australia); **Niels C. Nielsen**, Univ. of Aarhus (Denmark); **Motoichi Ohtsu**, Tokyo Institute of Technology (Japan) and Japan Science and Technology Corp. (Japan); **Yoondong Park**, Samsung Advanced Institute of Technology (South Korea); **Wolfgang Porod**, Univ. of Notre Dame (USA); **Ross Rinaldi**, National Nanotechnology Lab. (Italy); **Angel Rubio**, Univ. País Vasco (Spain); **Aimin M. Song**, Univ. of Manchester (United Kingdom); **Martin Stutzmann**, Technische Univ. München (Germany); **Akira Toriumi**, Univ. of Tokyo (Japan)

Monday 9 May

SESSION 1

Room: Triana ..... Mon. 09.30 to 10.50

Nanoprobes

Chair: **Paolo Lugli**, Technische Univ. München (Germany)

09.30: **Nanometer electrochemical probe array for biological cell monitoring,** Y. Tao, R. Fasching, F. Prinz, Stanford Univ. (USA) ..... [5838-01]

09.50: **Ordered arrays of near-field optical probes,** N. Sojic, Univ. of Bordeaux I (France); A. Chovin, P. Garrigue, ENSCPB (France); I. Manek-Hönninger, L. Servant, Univ. of Bordeaux I (France) ..... [5838-02]

Keynote Presentation

Room: Triana ..... 10.10 to 10.50

Imaging and manipulating heterostructure interfaces *(Invited Paper),* R. Clarke, Univ. of Michigan (USA) ..... [5838-03]

Coffee Break ..... 10.50 to 11.20

SESSION 2

Room: Triana ..... Mon. 11.20 to 13.20

Nanostructures I

Chair: **Alfonso Cebollada**, Ctr. Nacional de Microelectrónica (Spain)

11.20: **Electrospun tin oxide nanofibers,** I. Ramos, Univ. of Puerto Rico/Humacao (USA); J. J. Santiago-Aviles, Univ. of Pennsylvania (USA); R. Furlan, Univ. of Puerto Rico/Humacao (USA); W. Yu, Univ. of California/Davis (USA) ..... [5838-04]

11.40: **Energy level tuning of self-assembled quantum dots and quantum rings,** J. M. García, D. Granados, Instituto de Microelectrónica de Madrid (Spain) [5838-05]

12.00: **Nanoimprinting techniques** *(Invited Paper),* G. Gigli, Univ. degli Studi di Lecce (Italy) ..... [5838-06]

12.20: **Proposal of a miniaturized Orbitron pump for MEMS applications,** H. W. Koops, NaWoTec GmbH (Germany) ..... [5838-58]

12.40: **Charge storage in Si nanocrystals embedded in SiO_2 with enhanced C-AFM,** M. Porti, M. Avidano, M. Nafría, X. Aymerich, Univ. Autònoma de Barcelona (Spain); J. Carreras, B. Garrido, Univ. de Barcelona (Spain) ..... [5838-08]

13.00: **Self-assembled NiO nano-wires on epitaxial Ni films,** R. A. Lukaszew, Univ. of Toledo (USA); S. te Velthuis, Argonne National Lab. (USA); R. Clarke, Univ. of Michigan (USA) ..... [5838-49]

Lunch Break ..... 13.20 to 15.00

SESSION 3

Room: Triana ..... Mon. 15.00 to 16.20

Nanosensors

Chair: **Wolfgang Porod**, Univ. of Notre Dame (USA)

15.00: **Nanostructured mesoporous oxides for gas sensor applications,** E. Rossinyol, A. Marsal, J. Arbiol, F. Peir, A. Cornet, J. R. Morante, Univ. of Barcelona (Spain); B. Tian, D. Zhao, Fudan Univ. (China) ..... [5838-10]

15.20: **SWCNT aggregates for gas sensing applications,** A. Reale, M. Lucci, P. Regoliosi, A. Di Carlo, A. Fiori, E. Tamburri, S. Orlanducci, M. L. Terranova, Univ. degli Studi di Roma Tor Vergata (Italy); P. Lugli, Technische Univ. München (Germany) ..... [5838-11]

15.40: **Biosensing with diamond-based devices** *(Invited Paper),* J. Hernando, Technische Univ. München (Germany) ..... [5838-12]

16.00: **CNT aggregates for strain sensing applications,** P. Regoliosi, F. Brunetti, A. Reale, A. Di Carlo, E. Tamburri, S. Orlanducci, M. L. Terranova, Univ. degli Studi di Roma Tor Vergata (Italy); P. Lugli, Technische Univ. München (Germany) .... [5838-13]

Coffee Break ..... 16.20 to 16.40

SESSION 4

Room: Triana ..... Mon. 16.40 to 18.00

Molecular Electronics

Chair: **G. Cuniberti**, Univ. Regensburg (Germany)

16.40: **Investigation into the modeling of field-effect carrier mobility in disordered organic semiconductors,** H. L. Kwok, Univ. of Victoria (Canada) ..... [5838-14]

17.00: **Logic optimization technique for molecular nanoelectronics,** P. Farm, E. Dubrova, H. Tenhunen, Royal Institute of Technology (Sweden) ..... [5838-15]

17.20: **Mechanico-chemical interaction of SWNTs with different host matrices evidenced by SERS spectroscopy,** S. R. Lefrant, Univ. de Nantes (France); M. Baibarac, I. Baltog, National Institute of Materials Physics (Romania); C. Godon, J. Mévellec, Univ. de Nantes (France); L. Mihut, National Institute of Materials Physics (Romania) ..... [5838-16]

17.40: **Simulation of molecular devices and architectures: state of the art and future challenges** *(Invited Paper),* G. Csaba, Technische Univ. München (Germany) [5838-17]

Tuesday 10 May

SESSION 5

Room: Triana ..... Tues. 09.30 to 10.50

Nanomechanics

Chair: **Andrea Reale**, Univ. degli Studi di Roma Tor Vergata (Italy)

09.30: **Nanoelectromechanical transistors** *(Invited Paper),* D. Scheible, LMU (Germany) ..... [5838-18]

09.50: **Manipulation of micro-/nano-particle using nanotweezer,** J. Lee, J. Choi, G. Kang, Y. Kwak, Korea Advanced Institute of Science and Technology (South Korea); S. Kim, Korea Advanced Institute of Science and Technology (USA) ..... [5838-19]

Keynote Presentation

Room: Triana ..... 10.10 to 10.50

Nanomechanics *(Invited Paper),* K. Ekinci, Boston Univ. (USA) ..... [5838-20]

Coffee Break ..... 10.50 to 11.20

SESSION 6

Room: Triana ..... Tues. 11.20 to 13.20

Nanodevices

Chair: **R. Clarke**, Univ. of Michigan (USA)

11.20: **Focal plane arrays based on quantum dot infrared photodetectors,** M. Razeghi, W. Zhang, H. Lim, Northwestern Univ. (USA) ..... [5838-07]

11.40: **FDTD analysis of nano-antenna structures,** J. M. Rico-García, J. M. López-Alonso, J. Alda, Univ. Complutense de Madrid (Spain) ..... [5838-22]

12.00: **50 GHz operations of novel semiconductor nanodevices,** A. M. Song, Univ. of Manchester (United Kingdom) and Lund Univ. (Sweden); C. Balocco, M. Missous, Univ. of Manchester (United Kingdom); I. Maximov, L. Samuelson, Lunds Univ. (Sweden) ..... [5838-23]

12.20: **THz operation of self-switching nano-diodes and nano-transistors,** J. Mateos, Univ. de Salamanca (Spain); A. M. Song, Univ. of Manchester (United Kingdom); B. G. Vasallo, D. Pardo, T. González, Univ. de Salamanca (Spain) ..... [5838-24]

12.40: **Controlled growth of ordered SWCNTs for the realization of multielectrode Field Emitter Devices,** A. Di Carlo, F. Brunetti, P. Regoliosi, A. Reale, M. L. Terranova, S. Orlanducci, A. Fiori, E. Tamburri, Univ. degli Studi di Roma Tor Vergata (Italy) and Minas Lab. (Italy); V. Sessa, Univ. degli Studi di Roma Tor Vergata (Italy); M. Rossi, Univ. degli Studi di Roma La Sapienza (Italy); M. Cirillo, V. Merlo, Univ. degli Studi di Roma Tor Vergata (Italy) and Minas Lab. (Italy); P. Lugli, Technische Univ. München (Germany); C. Falessi, Alenia Marconi System (Italy) ..... [5838-25]

13.00: **Field-coupled nanomagnets for logic applications,** W. Porod, Univ. of Notre Dame (USA) ..... [5838-26]

Lunch Break ..... 13.20 to 15.00

SESSION 7

Room: Triana ..... Tues. 15.00 to 16.00

Nanobioengineering

Chair: **Giuseppe Gigli**, Univ. degli Studi di Lecce (Italy)

15.00: **Effects of high external electric fields on protein conformation,** P. P. Pompa, Univ. degli Studi di Lecce (Italy); A. Bramanti, Univ. degli Studi di Lecce (Italy) and STMicroelectronics (Italy); G. Maruccio, L. L. del Mercato, R. Cingolani, R. Rinaldi, Univ. degli Studi di Lecce (Italy) ..... [5838-27]

15.20: **Oversupercoiling and compactization of supercoiled DNA molecules in vitro without proteins,** A. P. Limanskii, Ukrainian Academy of Medical Sciences (Ukraine) ..... [5838-28]

15.40: **Carrier transport through DNA** *(Invited Paper),* G. Cuniberti, Univ. Regensburg (Germany) ..... [5838-29]

Coffee Break ..... 16.00 to 16.40

✔ Posters-Tuesday

The following posters will be displayed on Tuesday in the Conference Area Hallway. A poster reception will be held Tuesday evening from 16.40 to 18.20 hrs., with authors present at their poster papers to answer questions. Light refreshments will be served. Poster authors may set up their posters on Tuesday from 10.00 for all-day previewing. It is the author's responsibility to remove their posters at the end of the session. Papers not removed will be considered unwanted and will be discarded. SPIE assumes no responsibility for posters left up after the end of the poster session.

✔ **Surface diagnostics of giant magnetoresistance metal nanogranular films by nonlinear optical probes,** E. M. Kim, O. A. Aktsipetrov, T. V. Murzina, Moscow State Univ. (Russia) ..... [5838-41]

✔ **Hybrid nanocomposites based on II-VI semiconducting nanocrystals in organic polymers,** M. Tamborra, Univ. degli Studi di Bari (Italy) and CNR IPCF Bari Division (Italy); A. Petrella, R. Comparelli, Univ. degli Studi di Bari (Italy); L. M. Curri, M. Striccoli, Consiglio Nazionale delle Ricerche (Italy); P. D. Cozzoli, Univ. degli Studi di Bari (Italy); A. Agostiano, Consiglio Nazionale delle Ricerche (Italy) and Dip Chimica Bari University (Italy) ..... [5838-43]

✔ **Cyclodextrins mediated water phase transfer of organic capped colloidal nanocrystals,** R. Comparelli, N. Depalo, Univ. degli Studi di Bari (Italy); L. M. Curri, M. Striccoli, Consiglio Nazionale delle Ricerche (Italy); L. Catucci, Univ. degli Studi di Bari (Italy); A. Agostiano, Consiglio Nazionale delle Ricerche (Italy) and CNR IPCF Bari Division (USA) ..... [5838-44]

✔ **Unique carbon nanotube assembly in polystyrene/poly(methyl methacrylate) thin films,** I. Chin, S. J. Cho, K. Kim, H. J. Choi, Inha Univ. (South Korea) .... [5838-46]

✔ **Artificial lipid bilayers on a chip for single molecule sensing,** H. Morgan, M. Sandison, Univ. of Southampton (United Kingdom); R. Berry, G. Mendez, Univ. of Oxford (United Kingdom) ..... [5838-47]

✔ **Understanding the structural changes that take place in a polypyrrol film during its oxi-reduction process: A Molecular Dynamics Simulation Study.,** J. J. Lopez Cascales, Univ. Politécnica de Cartagena (Spain); T. Fernandez Otero, Univ. Politecnica de Cartagena (Spain) ..... [5838-50]

✔ **Magnetism and magneto-optics of Co nanoparticles embedded in dielectric and metallic matrices,** C. Clavero, A. Cebollada, G. Armelles, Instituto de Microelectrónica de Madrid (Spain); J. Arbiol, A. Cornet, F. Peiro, Univ. de Barcelona (Spain); Y. Huttel, Instituto de Ciencia de Materiales de Madrid (Spain) ..... [5838-52]

✔ **Luminescence in Ge nanostructures formed by dry and wet oxidation of SiGe films,** M. Avella, A. C. Prieto, J. Jimnez, Univ. de Valladolid (Spain); A. Rodriguez, E.T.S.I. de Telecomunicacion U.P.M. (USA); J. Sangrador, T. Rodriguez, E.T.S.I. de Telecomunicacion U.P.M. (Spain); A. Kling, Instituto Tecnologico E Nuclear (Portugal) ..... [5838-55]

✔ **Controlled growth of silicon nanowires,** Y. Y. Wong, Institute of Microengineering and Nanoelectronic (Malaysia); M. B. Yahaya, M. Mat Salleh, B. Yeop Majlis, Institute of Microengineering and Nanoelectronics (Malaysia) ..... [5838-57]

Wednesday 11 May

SESSION 8

Room: Triana ..... Wed. 09.30 to 10.50

Transport in Nanostructures

Chair: **Stephen M. Goodnick**, Arizona State Univ. (USA)

09.30: **Conductance quantization in nanoscale wires with surface disorder,** A. Garcia-Martin, Instituto de Microelectronica de Madrid (Spain); L. S. Froufe-Pérez, J. J. Saenz, Univ. Autonoma de Madrid (Spain) ..... [5838-31]

09.50: **Electron transport in silicon inversion slabs of nanometric thickness,** F. J. Gamiz, A. Godoy, J. B. Roldán, C. Sampedro, Univ. of Granada (Spain) . [5838-32]

10.10: **Non-equilibrium transport in quantum dots** *(Invited Paper),* R. Aquado, CSIC (Spain) ..... [5838-33]

10.30: **Spin polarization in quantum point contacts,** R. Akis, Arizona State Univ. (USA); J. Bird, Univ. at Buffalo/SUNY (USA); D. K. Ferry, S. M. Goodnick, B. Tierney, Arizona State Univ. (USA) ..... [5838-34]

SESSION 9

Room: Triana ..... Wed. 11.20 to 13.20

Nanostructures II

Chair: **Javier Mateos**, Univ. de Salamanca (Spain)

11.20: **Resonance Raman mapping of individual, suspended carbon nanotubes,** A. K. Swan, Y. Yin, A. Walsh, Boston Univ. (USA); S. Cronin, A. Stolyarov, Harvard (USA); M. Tinkham, Harvard Univ. (USA); W. Bacsa, B. B. Goldberg, M. S. Unlu, Boston Univ. (USA) ..... [5838-35]

11.40: **Electronic transport modification of single-walled carbon nanotubes by encapsulating alkali-metal ions,** R. Hatakeyama, T. Izumida, T. Hirata, G. Jeong, Tohoku Univ. (Japan); Y. Neo, H. Mimura, Shizuoka Univ. (Japan) ..... [5838-36]

12.00: **Direct evidence of Anderson localization in ion irradiated single-walled carbon nanotubes** *(Invited Paper),* J. Gomez, Univ. Autónoma de Madrid (Spain) .. [5838-37]

12.20: **Parallel writing on zirconium nitride thin films,** N. Farkas, Univ. of Akron (USA) ..... [5838-38]

12.40: **Photoemission from nanostructured a-C/diamond layers irradiated by intense Nd:Yag laser harmonics,** S. Orlanducci, M. L. Terranova, V. Sessa, Univ. degli Studi di Roma Tor Vergata (Italy); F. Tazzioli, C. Vicario, Instituto Nazionale di Fisica Nucleare (Italy); I. Boscolo, S. Cialdi, Univ. di Milano (Italy); M. Rossi, Univ. degli Studi di Roma La Sapienza (Italy) ..... [5838-39]

13.00: **Irradiation of supported gold and silver nanoparticles with continuous-wave, nanosecond and femtosecond laser light: a comparative study,** F. Hubenthal, N. Borg, M. Alschinger, D. Blázquez-Sánchez, C. Hendrich, Univ. Kassel (Germany); R. Freese, M. Bauer, M. Aeschliman, Univ. Kaiserslautern (Germany); F. Traeger, Univ. Kassel (Germany) ..... [5838-40]

Lunch Break ..... 13.20 to 15.00

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Bioengineered and Bioinspired Systems II

Conference Chairs: **Ricardo A. Carmona**, Univ. de Sevilla (Spain) and IMSE-CNM-CSIC (Spain); **Gustavo Liñán-Cembrano**, Univ. de Sevilla (Spain) and IMSE-CNM-CSIC (Spain)

Program Committee: **Paolo Arena**, Univ. di Catania (Italy); **Dávid Bálya**, Computer and Automation Research Institute (Hungary); **Radu Dogaru**, Univ. Politehnica Bucuresti (Romania); **Antoine Dupret**, Univ. Paris-Sud XI (France); **José Manuel Ferrández Vicente**, Univ. Politécnica de Cartagena (Spain); **Roman Genov**, Univ. of Toronto (Canada); **Jiri Homola**, Institute of Radio Engineering and Electronics (Czech Republic); **Giacomo Indiveri**, ETH Zurich (Switzerland); **Laura M. Lechuga**, Ctr. Nacional de Microelectrónica (Spain); **Shih-Chii Liu**, ETH/Univ. Zürich (Switzerland); **Ramon Ruiz-Merino**, Univ. Politécnica de Cartagena (Spain); **Josep Samitier-Marti**, Univ. de Barcelona (Spain); **Luis Serrano**, Univ. Publica de Navarra (Spain); **Bertram Shi**, Hong Kong Univ. of Science and Technology (Hong Kong China); **Tor Sverre Lande**, Univ. of Oslo (Norway); **Ronald Tetzlaff**, Johann Wolfgang Goethe-Univ. Frankfurt am Main (Germany); **Maurizio Valle**, Univ. degli studi di Genova (Italy); **Fernando Vidal Verdú**, Univ. de Malaga (Spain); **Mona E. Zaghloul**, George Washington Univ. (USA)

Monday 9 May

SESSION 1

Room: Giralda V . . . . . Mon. 09.30 to 10.50

Bioinspired VLSI Circuits

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

09.30: **Macromodeling for analog design and robustness boosting in bio-inspired computing models,** J. Cuadri Carvajo, G. Liñán Cembrano, E. Roca Moreno, Á. Rodríguez Vázquez, Instituto de Microelectrónica de Sevilla (Spain) . . . [5839-01]

09.50: **Bio-inspired analog circuitry model of insect photoreceptor cells,** E. L. Mah, D. C. O'Carroll, Univ. of Adelaide (Australia) . . . . . [5839-02]

10.10: **A bioinspired vision chip architecture for collision detection in automotive applications,** R. Laviana, Univ. de Sevilla (Spain) and Ctr. Nacional de Microelectrónica (Spain); G. Linan, E. Roca Moreno, Ctr. Nacional de Microelectrónica (Spain); A. Rodriguez-Vazquez, Ctr. Nacional de Microelectrónica (Spain) and Univ. de Sevilla (Spain) . . . . . [5839-03]

10.30: **A novel low-voltage low-power analogue VLSI implementation of neural networks with on-chip back-propagation learning,** M. Carrasco, P. Murillo, L. Serrano, Univ. Pública de Navarra (Spain) . . . . . [5839-04]

Coffee Break . . . . . 10.50 to 11.20

SESSION 2

Room: Giralda V . . . . . Mon. 11.20 to 13.20

Signal Processing in Biomedical Applications

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

Keynote Presentation

Room: Giralda V . . . . . 11.20 to 12.00

Intelligent implantable medical devices: the epilepsy problem *(Invited Paper),* R. Tetzlaff, Johann Wolfgang Goethe-Univ. Frankfurt am Main (Germany) . . [5839-05]

12.00: **Modeling gene regulatory systems by random Boolean networks,** E. Dubrova, Kungliga Tekniska högskolan (Sweden) . . . . . [5839-06]

12.20: **Advanced imaging of tumor-targeted nanoparticle drug delivery systems,** J. A. Dagata, A. E. Vladár, National Institute of Standards and Technology (USA); K. F. Pirollo, E. Chang, Georgetown Univ. (USA) . . . . . [5839-07]

12.40: **Wavelet-based analysis of multielectrode EEG-signals in epilepsy,** D. A. Hein, R. Tetzlaff, Johann Wolfgang Goethe-Univ. Frankfurt am Main (Germany) . . [5839-08]

13.00: **Sparse Gabor wavelets by local operations,** G. Cristobal, Consejo Superior de Investigaciones Científicas (Spain); S. Fischer, R. Redondo, Instituto de Optica (Spain) . . . . . [5839-09]

Lunch Break . . . . . 13.20 to 15.00

SESSION 3

Room: Giralda V . . . . . Mon. 15.00 to 16.20

Neural Information Processing Hardware

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

15.00: **Neuronal dynamics on FPGA: the Izhikevich model,** M. La Rosa, ST Microelectronics (Italy); E. Caruso, L. Fortuna, M. Frasca, Univ. degli Studi di Catania (Italy); L. Occhipinti, F. Rivoli, ST Microelectronics (Italy) . . . . . [5839-10]

15.20: **Spike-timing-dependent plasticity in spiking neuron networks for robot navigation control,** M. Frasca, P. Arena, F. Danieli, L. Fortuna, L. Patané, Univ. di Catania (Italy) . . . . . [5839-11]

15.40: **AER synthetic generation in hardware for bio-inspired spiking systems,** A. Linares-Barranco, Univ. de Sevilla (Spain); B. Linares-Barranco, Instituto de Microelectrónica de Sevilla (Spain); G. Jimenez-Moreno, A. Civit-Balcells, Univ. de Sevilla (Spain) . . . . . [5839-12]

16.00: **Time-recovering PCI-AER interface for bio-inspired spiking systems,** R. Paz-Vicente, A. Linares-Barranco, D. Cascado, S. Vicente, G. Jimenez, A. Civit, Univ. de Sevilla (Spain) . . . . . [5839-13]

Coffee Break . . . . . 16.20 to 16.40

SESSION 4

Room: Giralda V . . . . . Mon. 16.40 to 18.00

Biochemical Sensors

Chair: **Laura M. Lechuga**, Ctr. Nacional de Microelectrónica (Spain)

16.40: **Toward a biophotonic MEMS cell sensor,** R. Ghodssi, M. Powers, A. Schleunitz, H. Yi, C. Wu, G. Payne, W. E. Bentley, Univ. of Maryland/College Park (USA) [5839-14]

17.00: **Magneto-optic surface plasmon resonance biosensor,** B. Sepúlveda, G. Armelles, Ctr. Nacional de Microelectrónica (Spain); A. Calle, Ctr Nacional de Microelectrónica (Spain); L. Lechuga, Ctr. Nacional de Microelectrónica (Spain) . . . . . [5839-16]

17.20: **3D polymeric microfluidics networks for bioMOEMS applications,** F. J. Blanco, IKERLAN (Spain); L. M. Lechuga, Ctr. Nacional de Microelectrónica (Spain) . [5839-17]

17.40: **Manipulation of bio-particles by means of nonuniform AC electric fields,** A. González, A. Castellanos, A. Ramos, Univ. de Sevilla (Spain) . . . . . [5839-18]

Tuesday 10 May

SESSION 5

Room: Giralda V . . . . . Tues. 09.30 to 10.50

Bioinspired VLSI Architectures

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

09.30: **On-event generators for address event representation transmitters,** R. Serrano-Gotarredona, T. Serrano-Gotarredona, B. Linares-barranco, Instituto de Microelectrónica de Sevilla (Spain) . . . . . [5839-19]

09.50: **A digital pixel cell for address event representation image convolution processing,** L. Camuñas-Mesa, Instituto de Microelectrónica de Sevilla (Spain); A. Acosta-Jiménez, Instituto de Microelectronica de Sevilla (Spain); T. Serrano-Gotarredona, B. Linares-barranco, Instituto de Microelectrónica de Sevilla (Spain) . . . . . [5839-20]

10.10: **Mixed-mode simulation of optical-based systems: PSD application,** R. Doldan, Instituto de Microelectrónica de Sevilla IMSE (Spain); E. Peralias, IMSE (Spain); A. Yufera, Imstituto de Microelectronica de Sevilla IMSE (Spain); A. Rueda, IMSE (Spain) . . . . . [5839-21]

10.30: **Neural network architecture with electronic neurons and optical interconnections,** M. Ruiz-Llata, H. Lamela, Univ. Carlos III de Madrid (Spain); C. Warde, Massachusetts Institute of Technology (USA) . . . . . [5839-22]

Coffee Break . . . . . 10.50 to 11.20

SESSION 6

Room: Giralda V . . . . . Tues. 11.20 to 13.20

Biomedical Applications

Chair: **Laura M. Roa**, Univ. de Sevilla (Spain)

11.20: **A portable ECG monitor using Bluetooth,** J. C. Tejero-Calado, Univ. de Malaga (Spain); A. Bernal, Fundacion IMABIS (Spain); M. A. Lopez-Gomez, M. C. Lopez-Casado, Fundacion CITIC (Spain); J. Lorca-Gomez, G. Quesada, Hospital Carlos Haya (Spain) . . . . . [5839-23]

11.40: **Integrated low noise low power interface for neural bio-potentials recording and conditioning,** E. Bottino, S. Martinoia, M. Valle, Univ. degli Studi di Genova (Italy) . . . . . [5839-24]

12.00: **Prediction of epileptic seizures using multilayer delay-type discrete time cellular nonlinear networks (DTCNN): long-term studies,** C. Niederhoefer, R. Tetzlaff, Johann Wolfgang Goethe-Univ. Frankfurt am Main (Germany) . . . . . [5839-25]

12.20: **On the interpretation of the instantaneous frequency of a phono-cardiograph signal,** A. B. Rey, Univ. Politécnica de Cartagena (Spain) . . . . . [5839-26]

12.40: **Modeling brain electrical activity in epilepsy by reaction-diffusion cellular neural networks,** F. Gollas, R. Tetzlaff, Johann Wolfgang Goethe-Univ. Frankfurt am Main (Germany) . . . . . [5839-27]

13.00: **An ECG acquisition system integrated in a 0.35 μm CMOS technology,** L. Zhou, A. Bozier, J. Blonde, Lab. d' Electronique et de Physique des Systèmes Instrumentaux (France); M. Kreamer, Schiller Médicel SAS (France); J. Felblinger, Univ. Henri Poincaré (France); F. Braun, Lab. d' Electronique et de Physique des Systèmes Instrumentaux (France) . . . . . [5839-28]

Lunch Break . . . . . 13.20 to 15.00

SESSION 7

Room: Giralda V . . . . . Tues. 15.00 to 16.20

Neural Information Processing

Chair: **Marco Gilli**, Politecnico di Torino (Italy)

15.00: **A bioinspired collision detection algorithm for VLSI implementation,** J. Cuadri Carvajo, Instituto de Microelectronica de Sevilla (Spain); G. Liñán Cembrano, M. S. Keil, Instituto de Microelectrónica de Sevilla (Spain); R. Stafford, Univ. of Newcastle-Upon-Tyne (United Kingdom); E. Roca Moreno, Instituto de Microelectrónica de Sevilla (Spain) . . . . . [5839-29]

15.20: **Recent results for obstacle detection by CNN,** G. C. Geis, R. Tetzlaff, M. Reinisch, Johann Wolfgang Goethe-Univ. Frankfurt am Main (Germany) [5839-30]

15.40: **A smart sensor architecture based on emergent computation in an array of outer-totalistic cells,** R. Dogaru, Univ. Politehnica Bucuresti (Romania); I. Dogaru, B&C Microsystems S.R.L. (Romania); M. Glesner, Technische Univ. Darmstadt (Germany) . . . . . [5839-31]

16.00: **Hybrid Pseudo-Wigner Distribution and wavelet algorithm for multifocus fusion,** G. Cristobal, Consejo Superior de Investigaciones Científicas (Spain); S. Gabarda, F. Sroubek, R. Redondo, S. Fischer, Instituto de Optica (Spain) . . [5839-32]

✔ Posters-Tuesday

The following posters will be displayed on Tuesday in the Conference Area Hallway. A poster reception will be held Tuesday evening from 16.40 to 18.20 hrs., with authors present at their poster papers to answer questions. Light refreshments will be served. Poster authors may set up their posters on Tuesday from 10.00 for all-day previewing. It is the author's responsibility to remove their posters at the end of the session. Papers not removed will be considered unwanted and will be discarded. SPIE assumes no responsibility for posters left up after the end of the poster session.

✔ **A calibration scheme for subthreshold current mode circuits,** J. Costas-Santos, T. Serrano-Gotarredona, B. Linares-barranco, Instituto de Microelectrónica de Sevilla (Spain) . . . . . [5839-44]

✔ **Wireless biosensor connection based on bluetooth technology for medical applications,** J. A. Rabadan-Borges, R. Pérez-Jiménez, M. A. Bacallado-Marrero, Univ. de Las Palmas de Gran Canaria (Spain); F. A. Delgado-Rajo, S. T. Pérez-Suárez, Univ. de La Laguna (Spain) . . . . . [5839-45]

✔ **Dynamics of phase transitions and shaping processes in drying drops of serum,** T. A. Yakhno, V. G. Yakhno, A. G. Sanin, A. S. Pelyushenko, O. B. Shaposhnikova, Institute of Applied Physics (Russia) . . . . . [5839-46]

✔ **Efficient analysis of the history of recombination in phylogenetic networks,** E. Dubrova, Kungliga Tekniska högskolan (Sweden) . . . . . [5839-47]

✔ **Reconfigurable hardware for an augmented reality application,** J. Toledo-Moreo, J. J. Martínez-Alvarez, J. Garrigós-Guerrero, J. M. Ferrández-Vicente, Univ. Politecnica de Cartagena (Spain) . . . . . [5839-48]

✔ **Efficient method for events detection in phonocardiographic signals,** J. Martínez-Alajarín, R. Ruiz-Merino, Univ. Politécnica de Cartagena (Spain) . . . . . [5839-49]

✔ **Neuronal lithography with single cell resolution on chemically and topographically functionalised surfaces,** K. Winters, K. De Keersmaecker, IMEC v.z.w. (Belgium) and Katholieke Univ. Leuven (Belgium); C. Bartic, IMEC v.z.w. (Belgium); D. Braeken, IMEC v.z.w. (Belgium) and Katholieke Univ. Leuven (Belgium); B. De Strooper, Katholieke Univ. Leuven (Belgium); G. Borghs, IMEC v.z.w. (Belgium) . . . . . [5839-50]

✔ **Implementation on DSP of an active contour algorithm for endocardium tracking in echocardiographic images,** J. F. Zapata, R. Ruiz, Univ. Politécnica de Cartagena (Spain) . . . . . [5839-51]

✔ **Simulation and characterization of interdigitated microsensor electrodes for DNA immobilization and hybridization,** J. L. Sanchez-Rojas, J. M. Raya, J. Vazquez, Univ. de Castilla-La Mancha (Spain) . . . . . [5839-52]

✔ **L-glutamate detection using a poly-L-lysine coated ENFET,** D. Braeken, IMEC v.z.w. (Belgium) and Katholieke Univ. Leuven (Belgium); C. Zhou, C. Bartic, IMEC v.z.w. (Belgium); K. Winters, K. De Keersmaecker, IMEC v.z.w. (Belgium) and Katholieke Univ. Leuven (Belgium); G. Callewaert, Katholieke Univ. Leuven (Belgium); G. Borghs, IMEC v.z.w. (Belgium) . . . . . [5839-53]

✔ **Blind image deconvolution using an evolutionary algorithm and image fusion,** G. Cristobal, Consejo Superior de Investigaciones Científicas (Spain); S. Gabarda, Instituto de Optica (Spain) . . . . . [5839-54]

✔ **An elastic contour-based approach for mammograms registration,** R. Reig, P. Marti, M. Serra, Univ. de Vic (Spain) . . . . . [5839-56]

✔ **A bio-inspired CMOS vision chip for edge detection using an offset-free column readout circuit,** J. Shin, S. Suh, J. Kong, J. Kim, M. Lee, Kyungpook National Univ. (South Korea) . . . . . [5839-57]

Wednesday 11 May

SESSION 8

Room: Giralda V . . . . . Wed. 09.30 to 10.50

Biosensors/Actuators

Chair: **Ronald Tetzlaff**, Johann Wolfgang Goethe-Univ. Frankfurt am Main (Germany)

09.30: **Multifunctional and biomimicking electrochemical properties of conducting polymers,** T. F. Otero, Univ. Politécnica de Cartagena (Spain) . . . . . [5839-33]

09.50: **Tactile on-chip pre-processing with techniques from artificial retinas,** F. Vidal Verdú, Univ. de Málaga (Spain); R. Maldonado, G. Liñán, E. Roca, Á. Rodríguez-Vázquez, Instituto de Microelectrónica de Sevilla (Spain) . . . . . [5839-34]

10.10: **AC electrokinetic pumping of liquids using arrays of microelectrodes,** A. Ramos, Univ. de Sevilla (Spain); A. González, Univ. de Seville (Spain); P. García, A. Castellanos, Univ. de Sevilla (Spain); H. Morgan, N. G. Green, Univ. of Southampton (United Kingdom) . . . . . [5839-35]

10.30: **Self-feeding microfluidic structures on silicon and glass,** K. P. Kolari, J. Koponen, A. Hokkanen, I. Stuns, VTT Electronics (Finland) . . . . . [5839-36]

Coffee Break . . . . . 10.50 to 11.20

SESSION 9

Room: Giralda V . . . . . Wed. 11.20 to 13.40

Cellular Neural Networks

Chair: **Radu Dogaru**, Univ. Politehnica Bucuresti (Romania)

11.20: **FG-MOS neuron for binary CNN,** J. K. Flak, Helsinki Univ. of Technology (Finland); M. Laiho, Helsinki Univ. of Technology (Finland) and Univ. of Turku (Finland); K. Halonen, Helsinki Univ. of Technology (Finland) . . . . . [5839-37]

11.40: **Implementation of a discrete cellular neuron model (DT-CNN) architecture on FPGA,** J. J. Martinez-Alvarez, J. Toledo-Moreo, Univ. Politecnica de Cartagena (Spain); J. M. Ferrandez-Vicente, Univ. Politécnica de Cartagena (Spain) . . . . . [5839-38]

12.00: **Weakly connected oscillatory networks: for dynamic pattern recognition,** M. Gilli, M. Bonnin, F. Corinto, Politecnico di Torino (Italy) . . . . . [5839-39]

12.20: **ISO/OSI compliant network-on-chip implementation for CNN applications,** S. Malki, A. Hansson, L. Spaanenburg, B. Åkesson, Lund Univ. (Sweden) . . [5839-40]

12.40: **System identification by Cellular Neural Networks (CNN): linear interpolation of nonlinear weight functions,** M. Reinisch, G. C. Geis, R. Tetzlaff, Johann Wolfgang Goethe-Univ. Frankfurt am Main (Germany) . . . . . [5839-41]

Keynote Presentation

Room: Giralda V . . . . . 13.00 to 13.40

A bio-inspired auditory perception model for amplitude-frequency clustering *(Invited Paper),* P. Arena, L. Fortuna, M. Frasca, G. Ganci, L. Patané, Univ. di Catania (Italy) . . . . . [5839-42]

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Photonic Materials, Devices, and Applications

Conference Chair: **Gonçal Badenes**, ICFO-Institut de Ciències Fotòniques (Spain)

Cochairs: **Derek Abbott**, The Univ. of Adelaide (Australia); **Ali Serpengüzel**, Koç Univ. (Turkey)

Program Committee: **Michael J. Adams**, Univ. of Essex (United Kingdom); **Roel G. Baets**, Univ. Gent (Belgium); **Pascal A. Baldi**, Univ. de Nice (France); **Naci Balkan**, Univ. of Essex (United Kingdom); **Richard M. De La Rue**, Univ. of Glasgow (United Kingdom); **Sadik C. Esener**, Univ. of California/San Diego (USA); **Javier Garcia de Abajo**, Consejo Superior de Investigaciones Científicas (Spain); **Alexander J. Glass**, Consultant (USA); **Ahmet R. Kortan**, Koç Univ. (Turkey); **Gershon Kurizki**, Weizmann Institute of Science (Israel); **Isabelle N. Ledoux-Rak**, Ecole Normale Superieure de Cachan (France); **El-Hang Lee**, Inha Univ. (South Korea); **Pedram Leilabady**, Waveguide Solutions (USA); **Eric Mazur**, Harvard Univ. (USA); **Manuel Nieto-Vesperinas**, Consejo Superior de Investigaciones Cientificas (Spain); **Ekmel Özbay**, Bilkent Univ. (Turkey); **Lorenzo Pavesi**, Univ. degli Studi di Trento (Italy); **Valerio Pruneri**, Avanex Corp. (Italy); **Manijeh Razeghi**, Northwestern Univ. (USA); **John S. Roberts**, Univ. of Sheffield (United Kingdom); **Vahid Sandoghdar**, ETH Zurich (Switzerland); **Gustav Schweiger**, Ruhr-Univ. Bochum (Germany); **Alexander S. Shumovsky**, Bilkent Univ. (Turkey); **Selim Ünlü**, Boston Univ. (USA); **Niek F. van Hulst**, MESA+ Twente (Netherlands)

Monday 9 May

Session 1 runs concurrent with session 2

SESSION 1

Room: Prado ..... Mon. 09.30 to 10.50

Photonic Bandgap Structures

Chair: **William L. Barnes**, Univ. of Exeter (United Kingdom)

09.30: **Near-field imaging and manipulation of photonic crystal microcavities** *(Invited Paper),* V. Sandoghdar, F. Koenderink, B. Buchler, Swiss Federal Institute of Technology (Switzerland); M. Kafesaki, Research Ctr. of Crete (Greece) ... [5840-01]

9.50: **Tapered photonic crystal fibers: Part I** *(Invited Paper),* B. J. Eggleton, Univ. of Sydney (Australia) ..... [5840-10]

10.10: **Tapered photonic crystal fibers: Part II** *(Invited Paper),* B. J. Eggleton, Univ. of Sydney (Australia) ..... [5840-10]

10.30: **Numerical analysis of absorptive two-dimensional metallo-dielectric photonic crystals,** J. Ferre, L. F. Marsal, M. Ustyantsev, J. Pallares, Univ. Rovira i Virgili (Spain) ..... [5840-04]

Coffee Break ..... 10.50 to 11.20

SESSION 2

Room: Arenal II ..... Mon. 09.30 to 10.50

Semiconductor Lasers

Chair: **Michael J. Adams**, Univ. of Essex (United Kingdom)

09.30: **High-power continuous-wave mid-infrared quantum cascade lasers based on strain-balanced heterostructures** *(Invited Paper),* M. Razeghi, A. J. Evans, S. Slivken, J. S. Yu, Northwestern Univ. (USA) ..... [5840-05]

09.50: **Modeling spin-polarised VCSELs,** M. J. Adams, K. Yasin, A. Dyson, Univ. of Essex (United Kingdom) ..... [5840-06]

10.10: **Analysis of the room temperature performance of 1.3-1.45 micron GaInNAs/GaAs LDs grown by MBE,** A. Hierro, J. Ulloa, Univ. Politécnica de Madrid (Spain); B. Damilano, J. Barjon, M. Hugues, J. Duboz, J. Massies, Ctr. National de la Recherche Scientifique (France) ..... [5840-07]

10.30: **Influence of carrier localization on lasing characteristics of MBE grown GaInNAs/GaAs QW laser diodes,** J. M. Ulloa, A. Hierro, J. Miguel-Sánchez, Á. Guzmán, Univ. Politécnica de Madrid (Spain); A. Trampert, Paul-Drude-Institut für Festkoerperelektronik (Germany) ..... [5840-08]

Coffee Break ..... 10.50 to 11.20

Keynote Session I

Room: Prado ..... Mon. 11.20 to 12.00

Keynote Presentation

11.20: **Photonic crystal planar waveguide devices exploiting the thermo-optic effect** *(Invited Paper),* R. M. De La Rue, H. Chong, Univ. of Glasgow (United Kingdom); E. Camargo, Univ. of Glasgow (United Kingdom) and CTA (Brazil); C. Ciminelli, M. Armenise, Politecnico di Bari (Italy) ..... [5840-09]

Session 3 runs concurrent with session 4

SESSION 3

Room: Prado ..... Mon. 12.00 to 13.20

Light Propagation in Photonic Crystals

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

12.00: **MEMS-based tunable infrared sensors** *(Invited Paper),* L. Faraone, The Univ. of Western Australia (Australia) ..... [5840-135]

12.20: **Numerical analysis of propagation modes in disordered photonic crystal fibres,** F. R. Villatoro, Á. L. Sánchez-Berrocal, Univ. de Málaga (Spain) ..... [5840-11]

12.40: **Near-field optical microscopy of light propagation through photonic crystal waveguide tapers,** R. Wüest, B. Buchler, K. Rauscher, P. Strasser, F. Robin, D. Erni, V. Sandoghdar, H. Jäckel, Swiss Federal Institute of Technology (Switzerland) ..... [5840-12]

13.00: **Fabrication of high efficiency compact 90° bend waveguide by using a dielectric pillar 2D-PC structure,** T. Stomeo, R. Bergamo, L. Martiradonna, R. Cingolani, M. De Vittorio, Univ. degli Studi di Lecce (Italy); A. D'Orazio, V. Marrocco, Politecnico di Bari (Italy) ..... [5840-13]

Lunch Break ..... 13.20 to 15.20

SESSION 4

Room: Arenal II ..... Mon. 12.00 to 13.20

Organic Lasers and LEDs

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

12.00: **Advances in polymer based microcavity lasers** *(Invited Paper),* J. Zyss, A. Vella, M. Lebental, Ecole Normale Superieure de Cachan (France) ..... [5840-14]

12.20: **Highly efficient organic light emitting devices with combination of fluorescent and phosphorescent materials for color tunable diode fabricated by all-wet process,** Y. Ohmori, Y. Hino, H. Kajii, Osaka Univ. (Japan) ..... [5840-15]

12.40: **Photonic crystal lasers with organic gain materials,** R. Harbers, Swiss Federal Institute of Technology (Switzerland) and IBM Research GmbH (Switzerland); A. Jebali, Swiss Federal Institute of Technology (Switzerland); N. Moll, B. Offrein, R. F. Mahrt, IBM Research GmbH (Switzerland); D. Ernie, W. Baechthold, Swiss Federal Institute of Technology (Switzerland) ..... [5840-16]

13.00: **Blue emitting OLED with oxadiazole/carbazole containing active layer,** H. Neitzert, M. Ferrara, S. Bellone, S. Concilio, P. Iannelli, Univ. di Salerno (Italy); P. Vacca, A. Rubino, ENEA Portici (Italy); L. Ferrara, ENEA Portici (Italy) and Univ. degli Studi di Napoli Federico II (Italy) ..... [5840-17]

Lunch Break ..... 13.20 to 15.00

Session 5 runs concurrent with session 6

SESSION 5

Room: Prado ..... Mon. 15.20 to 16.20

Negative Refraction in Photonic Crystals

Chair: **Manuel Nieto-Vesperinas,**
Consejo Superior de Investigaciones Científicas (Spain)

15.20: **Negative refraction based on the superprism effect in a micromachined flexible photonic crystal,** J. Lee, M. Tinker, Univ. of Texas/Dallas (USA); W. Park, E. Schonbrun, Univ. of Colorado/Boulder (USA) ..... [5840-18]

15.40: **Refractive properties of two dimensional photonic crystal slabs,** W. Belhadj, F. AbdelMalek, National Institute for Applied Sciences and Technology (Tunisia); H. Bouchriha, Tunis Univ. (Tunisia) ..... [5840-19]

16.00: **Thickness dependence of negative refraction in photonic crystals,** V. Mocella, Istituto per la Microelettronica e Microsistemi (Italy) ..... [5840-20]

Coffee Break ..... 16.20 to 16.40

SESSION 6

Room: Arenal II ..... Mon. 15.00 to 16.20

Organic Devices and Materials

Chair: **Isabelle N. Ledoux-Rak,**
Ecole Normale Superieure de Cachan (France)

15.00: **Molecular orientation induced improvement of organic semiconducting polymer devices efficiency,** A. A. Apostoluk, L. Rocha, C. Fiorini-Debuisschert, C. Sentein, P. Raimond, CEA Saclay (France); J. Nunzi, Univ. d'Angers (France) ..... [5840-22]

15.20: **Tailoring of the emission spectrum of colloidal nanocrystals by means of lithographically imprinted hybrid vertical microcavities,** L. Martiradonna, L. Carbone, M. L. De Giorgi, T. Stomeo, M. T. Todaro, M. Anni, L. Manna, G. Gigli, R. Cingolani, M. De Vittorio, Univ. degli Studi di Lecce (Italy) ..... [5840-23]

15.40: **Monitoring the orientational distribution of nonlinear and luminescent chromophores in all-optically poled polymer thin films,** S. Bidault, S. Brasselet, J. Zyss, Ecole Normale Superieure de Cachan (France) ..... [5840-24]

16.00: **A laser induced local transfer for patterning of RGB-OLED-displays,** M. Kroeger, W. Kowalsky, Technische Univ. Braunschweig (Germany) ..... [5840-25]

Coffee Break ..... 16.20 to 16.40

Session 7, 8 and 9 run concurrently

SESSION 7

Room: Prado ..... Mon. 16.40 to 17.20

Emission Control and Non-Linear Effects in PBGs

Chair: **Maria Kafesaki,** Foundation for Research and Technology-Hellas (Greece)

16.40: **Nonlinear diffraction in enhanced second-harmonic generation from 3D opal-Si and opal-GaN photonic crystals,** A. A. Fedyanin, O. A. Aktsipetrov, Moscow State Univ. (Russia); D. Kurdyukov, V. G. Golubev, A.F. Ioffe Physico-Technical Institute (Russia); M. Inoue, Toyohashi Univ. of Technology (Japan) ..... [5840-26]

17.00: **Magnetization-induced second- and third-harmonic generation in magnetophotonic crystals,** O. A. Aktsipetrov, T. V. Murzina, A. A. Fedyanin, Moscow State Univ. (Russia); M. Inoue, Toyohashi Univ. of Technology (Japan) ..... [5840-29]

SESSION 8

Room: Arenal II ..... Mon. 16.40 to 18.00

Inorganic/Semiconductor LEDs

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

16.40: **High-density ultraviolet micro-array light-emitting diodes: advances and applications** *(Invited Paper),* M. D. Dawson, Univ. of Strathclyde (United Kingdom) ..... [5840-30]

17.00: **A simple blue light pulse generator with GaN/SiC light emitting diodes for the time response testing of PMTs,** P. Antoranz, F. Lucarelli, Univ. Complutense de Madrid (Spain); M. Asensio, Univ. Politécnica de Madrid (Spain); J. M. Miranda, M. V. Fonseca Gonzalez, Univ. Complutense de Madrid (Spain) ..... [5840-31]

17.20: **Metalorganic chemical vapor deposition and structural/optical characteristics of InGaN/GaN multiple quantum well light emitting diode wafers grown on sapphire,** Z. C. Feng, National Taiwan Univ. (Taiwan) ..... [5840-32]

17.40: **Optically pumped mid infrared emitters built using surface structured PbSe epitaxial layers,** J. Nurnus, U. Vetter, J. Koenig, R. Glatthaar, A. Lambrecht, Fraunhofer-Institut für Physikalische Messtechnik (Germany); F. Weik, J. W. Tomm, Max-Born-Institut für Nichtlineare Optik und Kurzzeitspektroskopie (Germany) ..... [5840-33]

SESSION 9

Room: Giralda III ..... Mon. 16.40 to 18.00

Imaging and Display Applications

Chair: **Alper Kiraz,** Koç Univ. (Turkey)

16.40: **TeraHertz characterisation of inhomogeous media,** W. Withayachumnankul, T. J. Rainsford, S. P. Mickan, D. Abbott, The Univ. of Adelaide (Australia) ..... [5840-131]

17.00: **Numerical aperture increasing lens microscopy for high resolution and high collection efficiency spectroscopy of single quantum dots,** A. Vamivakas, Z. Liu, B. Goldberg, S. Ünlü, Boston Univ. (USA) ..... [5840-34]

17.20: **Selective, simultaneous measurements of electromagnetic waves in the near-field,** R. Zia, M. L. Brongersma, Stanford Univ. (USA) ..... [5840-35]

17.40: **Liquid crystal materials with asymmetric switching for microdisplay applications,** V. Urruchi, I. Pérez, J. M. Sánchez Pena, J. C. Torres, R. Manzanares, Univ. Carlos III de Madrid (Spain); X. Quintana, J. M. Otón, Univ. Politecnica de Madrid (Spain) ..... [5840-36]

Tuesday 10 May

Session 10 runs concurrent with session 11

SESSION 10

Room: Prado ..... Tues. 09.30 to 10.50

Left-Handed Materials and Metamaterials

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

09.30: **Observation of negative refraction and negative phase velocity in true left-handed metamaterials** *(Invited Paper),* E. Ozbay, K. Aydin, K. Guven, Bilkent Univ. (Turkey) ..... [5840-37]

09.50: **Transmission studies of lossy negative left-handed media,** M. Nieto-Vesperinas, J. L. Garcia-Pomar, Consejo Superior de Investigaciones Cientificas (Spain) ..... [5840-38]

10.10: **Imaging properties of a photonic crystal superlens,** W. Belhadj, National Institute for Applied Sciences and Technology (Tunisia) and INSAT (Tunisia) and FST (Tunisia); F. AbdelMalek, National Institute for Applied Sciences and Technology (Tunisia); H. Bouchriha, FST (Tunisia) ..... [5840-39]

10.30: **Qualitative behavior of LHM and related meta-materials,** M. Kafesaki, Foundation for Research and Technology-Hellas (Greece) ..... [5840-40]

Coffee Break ..... 10.50 to 11.20

SESSION 11

Room: Arenal II ..... Tues. 09.30 to 10.50

Optical Sensing

Chair: **Gonçal Badenes**, Institut de Ciencies Fotòniques (Spain)

09.30: **Two-photon fluorescence spectroscopy based on grating waveguide structures,** A. Thayil, S. Soria, G. Badenes, Institut de Ciencies Fotoniques (Spain); T. Katchalski, A. A. Friesem, Weizmann Institute of Science (Israel) ..... [5840-41]

09.50: **Vertical-cavity semiconductor optical amplifiers (VCSOAs) as optical sensing elements,** A. P. González-Marcos, A. Hurtado, J. A. Martin-Pereda, Univ. Politécnica de Madrid (Spain) ..... [5840-42]

10.10: **Optical sensing based on localized surface plasmons,** R. Quidant, Institut de Ciencies Fotòniques (Spain); M. Kreuser, Consejo Superior de Investigaciones Científicas (Spain); S. Enoch, Institut Fresnel (France); G. Badenes, Institut de Ciencies Fotòniques (Spain) ..... [5840-43]

10.30: **Self-referencing intensity-encoded fibre-optic sensors using radio-frequency ring resonators,** J. Montalvo, C. Vázquez, Carlos III Univ. of Madrid (Spain) [5840-44]

Coffee Break ..... 10.50 to 11.20

Keynote Session II

Room: Giralda I ..... 11.20 to 12.00

Keynote Presentation

Nanophotonics: where nanometers and femtoseconds meet *(Invited Paper),* N. F. van Hulst, Univ. Twente (Netherlands) ..... [5840-45]

Sessions 12, 14 runs concurrent with sessions 13, 15

SESSION 12

Room: Prado ..... Tues. 12.00 to 13.20

Plasmonics and Optical Forces

Chair: **Vahid Sandoghdar**, École Polytechnique Fédérale de Lausanne (Switzerland)

12.00: **Unusually strong optical interactions between particles in a waveguide** *(Invited Paper),* J. J. Saenz, Univ. Autonoma de Madrid (Spain); R. Gomez-Medina, Donostia Internacional Physics Ctr. (Spain) ..... [5840-46]

12.20: **Radiation forces on a Rayleigh dielectric sphere in a patterned optical near-field,** R. Quidant, A. Zelenina, D. Petrov, G. Badenes, Institut de Ciencies Fotòniques (Spain) ..... [5840-47]

12.40: **Plasmon enhanced near field optical lithography,** B. Sefa-Ntiri, P. D. Prewett, Univ. of Birmingham (United Kingdom) ..... [5840-48]

13.00: **Magneto-optic effects of surface plasmon-polaritons in thin metallic layers,** B. Sepúlveda, Ctr. Nacional de Microelectrónica (Spain); G. Armelles, Ctr. Nacional de Microelectronica (Spain) ..... [5840-49]

Lunch Break ..... 13.20 to 15.00

SESSION 13

Room: Arenal II ..... Tues. 12.00 to 13.20

All-Optical Signal Processing I

Chair: **Michele Belmonte**, Avanex, Inc. (Italy)

12.00: **Applications of recirculating optical configurations on filters and lasers,** C. Vázquez, J. Montalvo, P. Contreras, J. M. Sánchez, Carlos III Univ. of Madrid (Spain) ..... [5840-50]

12.20: **Development of a 2x2 optical switch for plastic optical fiber using liquid crystal cells,** C. Vázquez, J. M. Sanchez-Pena, P. C. Lallana, M. Á. Pontes, Univ. Carlos III de Madrid (Spain) ..... [5840-51]

12.40: **Grating enhanced MOEMS: a novel class of beam steering devices,** J. Pradelles, Ecole Centrale de Lyon (France) and ATMEL Grenoble (France); M. Garrigues, J. Leclercq, P. Viktorovitch, Ecole Centrale de Lyon (France) .. [5840-52]

13.00: **Twin laser 2x1 MMI coupler,** M. L. de Pedraza Velasco, Univ. Complutense de Madrid (Spain) ..... [5840-53]

Lunch Break ..... 13.20 to 15.00

SESSION 14

Room: Prado ..... Tues. 15.00 to 16.20

Plasmon Optics

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

15.00: **The emission of light through thin metal films via surface plasmon polaritons** *(Invited Paper),* W. L. Barnes, G. Winter, Univ. of Exeter (United Kingdom) . [5840-54]

15.20: **Optical transport properties of magneto-plasmonic periodic structures,** A. Garcia-Martin, G. Armelles, Instituto de Microelectronica de Madrid (Spain) ..... [5840-55]

15.40: **Engineered plasmon focusing on functional gratings,** B. van den Bergen, H. L. Offerhaus, N. F. van Hulst, Univ. of Twente (Netherlands) ..... [5840-56]

16.00: **Plasmon-based nano-lenses,** P. Ghenuche, R. Quidant, G. Badenes, Institut de Ciencies Fotòniques (Spain) ..... [5840-57]

Coffee Break ..... 16.20 to 16.40

SESSION 15

Room: Arenal II ..... Tues. 15.00 to 16.20

All-Optical Signal Processing II

Chair: **Martin D. Dawson**, Univ. of Strathclyde (United Kingdom)

15.00: **Nano3 photonics** *(Invited Paper),* N. I. Zheludev, K. F. MacDonald, A. V. Krasavin, B. F. Soares, Univ. of Southampton (United Kingdom) ..... [5840-58]

15.20: **Low-power vertical-cavity NAND gate,** A. Hurtado, A. P. Gonzalez-Marcos, J. A. Martin-Pereda, Univ. Politécnica de Madrid (Spain) ..... [5840-59]

15.40: **Analysis of a semiconductor semimagnetic microcavity for optical amplification and wavelength conversion applications,** J. L. Arce-Diego, D. Pereda-Cubián, F. Fanjul-Vélez, Univ. de Cantabria (Spain); R. Frey, Ctr. Univ. Paris Sud (France); O. Romanov, A. Tolstik, O. A. Ormachea, Belarusian State Univ. (Belarus) ..... [5840-60]

16.00: **Variable optical attenuator based on organic electrochromic materials,** R. Vergaz, J. M. Sánchez-Pena, D. Barrios, C. Vazquez, Univ. Carlos III de Madrid (Spain); D. Mecerreyes, J. Pomposo, Ctr. de Investigaciones Electroquímicas (Spain) ..... [5840-61]

Coffee Break ..... 16.20 to 16.40

✔ Posters-Tuesday

The following posters will be displayed on Tuesday in the Conference Area Hallway. A poster reception will be held Tuesday evening from 16.40 to 18.20 hrs., with authors present at their poster papers to answer questions. Light refreshments will be served. Poster authors may set up their posters on Tuesday from 10.00 for all-day previewing. It is the author's responsibility to remove their posters at the end of the session. Papers not removed will be considered unwanted and will be discarded. SPIE assumes no responsibility for posters left up after the end of the poster session.

✔ **Tunable two dimensional photonic crystal based on liquid crystals,** L. Moretti, L. Sirleto, V. Mocella, G. Bonasso, I. Rendina, Consiglio Nazionale delle Ricerche (Italy) . . . . . [5840-99]

✔ **Analytical theory for optical higher order PMD compensation,** M. F. Ferreira, Univ. de Aveiro (Portugal) . . . . . [5840-100]

✔ **New methods for bandwidth enhancement of integrated high-sensitivity optical receivers,** H. Dietrich, C. Seidl, A. Nemecek, J. Knorr, R. Swoboda, H. Zimmermann, Technische Univ. Wien (Austria) . . . . . [5840-102]

✔ **Supercontinuum generation using continuous-wave pumps,** S. Martin-Lopez, Instituto de Fisica Aplicada (Spain); M. Gonzalez-Herraez, Instituto de Fisica Aplicada (Spain) and Univ. de Alcalá de Henares (Spain); P. Corredera, A. Carrasco-Sanz, M. L. Hernanz, Instituto de Fisica Aplicada (Spain) . . . . . [5840-103]

✔ **Comparative study of optical damage and photovoltaic currents in planar $LiNbO_3$ waveguides,** O. Caballero, Univ. Autonoma de Madrid (Spain); A. Alcazar, Univ. Politecnica de Madrid (Spain); J. Herreros-Cedrés, Univ. de la Laguna (Spain); J. Carnicero, C. Ong, M. Domenech, G. Lifante, Univ. Autonoma de Madrid (Spain); A. García-Cabañes, Univ. Autónoma de Madrid (Spain); J. M. Cabrera, M. Carrascosa, Univ. Autonoma de Madrid (Spain) . . . . . [5840-104]

✔ **Linearisation for analogue optical links,** F. Lin, Univ. of Cambridge (United Kingdom); D. M. Holburn, R. J. Mears, Univ of Cambridge (United Kingdom) . . . . . [5840-105]

✔ **Second- and third-harmonic generation in birefringent photonic crystals and microcavities based on anisotropic porous silicon,** I. V. Soboleva, E. M. Murchikova, A. A. Fedyanin, O. A. Aktsipetrov, Moscow State Univ. (Russia) . . . . . [5840-107]

✔ **Refractive index-enhanced vortex lattices,** O. E. Mustecaplioglu, Koç Univ. (Turkey); M. O. Oktel, Bilkent Univ. (Turkey) . . . . . [5840-108]

✔ **Quantum key distribution in a multi-user network at gigahertz clock rates,** V. Fernandez, K. J. Gordon, R. J. Collins, Heriot-Watt Univ. (United Kingdom); P. D. Townsend, National Univ. of Ireland/Cork (Ireland); S. D. Cova, I. Rech, Politecnico di Milano (Italy); G. S. Buller, Heriot-Watt Univ. (United Kingdom) . . . . . [5840-109]

✔ **Simultaneously enhanced second- and third-harmonic generation in coupled microcavities formed from porous silicon,** M. G. Martemyanov, E. M. Kim, T. V. Dolgova, A. A. Fedyanin, O. A. Aktsipetrov, Moscow State Univ. (Russia); G. Marowsky, Laser-Lab. Göttingen e.V. (Germany) . . . . . [5840-110]

✔ **Optical surface modes in finite photonic crystals based on porous silicon studied by third-harmonic spectroscopy,** D. G. Gusev, O. A. Aktsipetrov, Moscow State Univ. (Russia) . . . . . [5840-111]

✔ **Analysis of coaxial photonic crystal transmittance by Fourier transform,** M. d. M. Sánchez-López, J. Cos, Univ. Miguel Hernández (Spain); J. A. Davis, San Diego State Univ. (USA); I. Moreno, P. Velásquez, Univ. Miguel Hernández (Spain) . . . . . [5840-112]

✔ **Two-dimensional photonic crystals of rods with a dielectric cladding,** T. Trifonov, L. F. Marsal, Univ. Rovira i Virgili (Spain); A. Rodriguez, Univ. Politecnica de Cataluña (Spain); J. Pallares, Univ. Rovira i Virgili (Spain); R. Alcubilla, Univ. Politecnica de Cataluña (Spain) . . . . . [5840-115]

✔ **InGaPN epitaxy by metal-organic chemical vapor deposition,** C. Huang, Kun Shan Univ. of Technology (Taiwan) . . . . . [5840-117]

✔ **Spontaneous Raman scattering in porous silicon at 1.5 μm,** M. A. Ferrara, Jr., L. Moretti, Sr., L. Sirleto, Sr., Consiglio Nazionale delle Ricerche (Italy); A. Rossi, Sr., Istituto Elettrotecnico Nazionale Galileo Ferraris (Italy); E. Santamato, Sr., Univ. degli Studi di Napoli Federico II (Italy); I. Rendina, Sr., Consiglio Nazionale delle Ricerche (Italy) . . . . . [5840-118]

✔ **Effects of rapid thermal annealing on InGaAsN p-i-n diodes grown on misoriented (111)B GaAs,** J. Miguel-Sánchez, A. Guzmán, J. M. Ulloa, A. Hierro, Univ. Politécnica de Madrid (Spain); E. Muñoz, Univ. Politecnica de Madrid (Spain) . . . . [5840-120]

✔ **Continuously tunable single-frequency fiber laser based on novel hybrid solc filter,** B. Benkelfat, R. Hamdi, GET - Institut National des Télécommunications (France); M. Chikh-Bled, Univ. A. Belkaïd (Algeria) . . . . . [5840-121]

✔ **(Ga,In)(N,As)/GaAs quantum wells grown by molecular beam epitaxy for above 1.3 μm low threshold lasers,** B. Damilano, J. Barjon, M. Hugues, J. Duboz, J. Massies, Ctr. National de la Recherche Scientifique (France); A. Hierro, J. M. Ulloa, Univ. Politécnica de Madrid (Spain) . . . . . [5840-122]

✔ **Solution of the Boltzmann equation for the electronic Hall mobility in GaNAs,** M. P. Vaughan, B. K. Ridley, Univ. of Essex (United Kingdom) . . . . . [5840-123]

✔ **Row and column drivers for addressing full color and video rate antiferroelectric liquid crystal microdisplays,** J. M. Sanchez-Pena, J. I. Santos, R. Manzanares, I. Pérez, V. Urruchi, J. C. Torres, Univ. Carlos III de Madrid (Spain) . . . . [5840-124]

✔ **Design of the multiple-beam liquid crystal diffractive optical element,** H. Shih, C. Tsai, National Chung Hsing Univ. (Taiwan) . . . . . [5840-125]

✔ **LED panel displays: manufacturing uncertainties and global color performance,** J. M. López-Alonso, D. Vazquez, E. Bernabeu, Univ. Complutense de Madrid (Spain) . . . . . [5840-126]

✔ **Square lattice W1 waveguide photonic crystals lasers for telecommunications,** O. Gauthier-Lafaye, S. Bonnefont, D. Mulin, Ctr. Nacional de la Recerche Scientifique (France); F. Lozes-Dupuy, Ctr. National de la Recherche Scientifique (France) . . . . . [5840-128]

✔ **Spatial and angular field and intensity correlations of wave in disordered media,** L. S. Froufe-Pérez, Univ. Autónoma de Madrid (Spain); A. García-Martín, Consejo Superior de Investigaciones Científicas (Spain); G. Cwilich, Yeshiva Univ. (USA); J. J. Sáenz, Univ. Autonoma de Madrid (Spain) . . . . . [5840-129]

✔ **Optical fibre devices based on mode conversion in tilted SPFG and LPFG,** J. L. Arce-Diego, D. Pereda-Cubián, F. Fanjul-Vélez, Univ. de Cantabria (Spain) . . [5840-130]

✔ **Investigation on the high-speed modulation in (GaIn)(NAs)/GaAs lasers,** J. Pozo, J. M. Rorison, Univ. of Bristol (United Kingdom); M. J. Saarinen, Modulight, Inc. (Finland); T. Jouhti, M. Pessa, Tampereen Teknillinen Yliopisto (Finland) [5840-133]

✔ **Comparison between electroluminescent organic diodes based on new poli(2,7-fluorene phenylidene) derivatives and commercial polymers,** B. Arredondo, Univ. Rey Juan Carlos (Spain) . . . . . [5840-132]

✔ **Optoelectronic device for the measurement of the absolute linear position in the micrometric displacement range,** T. Morlanes, J. L. de la Pena, Fagor Automation S. Coop. (Spain); L. M. Sanchez-Brea, Univ. Complutense de Madrid (Spain); J. I. Alonso, Univ. Politécnica de Madrid (Spain); D. Crespo, Univ. Complutense de Madrid (Spain); J. B. Saez-Landete, Univ. de Alcala (Spain); E. Bernabeu, Univ. Complutense de Madrid (Spain) . . . . . [5840-136]

✔ **Optical autofocus for high resolution laser photoplotting,** J. Alonso, D. Crespo, I. Jiménez, E. Bernabeu, Univ. Complutense de Madrid (Spain) . . . . . [5840-137]

Wednesday 11 May

Session 16 runs concurrent with session 17

SESSION 16

Room: Prado ..... Wed. 09.50 to 10.50

Advanced Optical Fibres

Chair: **Andrea Fiore**, École Polytechnique Fédérale de Lausanne (Switzerland)

09.50: **Numerical analysis of the heat transfer within photonic crystal fibre preforms,** F. R. Villatoro, P. Udias, Univ. de Málaga (Spain) ..... [5840-62]

10.10: **Subwavelength-diameter silica wires for microscale optical components** *(Invited Paper),* E. Mazur, L. Tong, Harvard Univ. (USA) ..... [5840-134]

10.30: **A new modal method for arbitrary cross-section microstructured optical fibers,** E. Popov, Univ. Aix-Marseille I (France); P. Boyer, G. Renversez, Univ. Aix-Marseille III (France); M. Nevière, Univ. Aix-Marseille I (France) ..... [5840-64]

Coffee Break ..... 10.50 to 11.20

SESSION 17

Room: Arenal II ..... Wed. 09.30 to 10.50

Nanostructured Optical Materials I

Chair: **Niek F. van Hulst**, Univ. Twente (Netherlands)

09.30: **Bloch oscillations and resonant Zener tunneling of light** *(Invited Paper),* M. Ghulinyan, Z. Gaburro, L. Pavesi, Univ. of Trento (Italy); C. J. Oton, Univ. of La Laguna (Spain); R. Sapienza, P. Costantino, C. Toninelli, D. Wiersma, European Lab. for Nonlinear Spectroscopy (Italy) ..... [5840-65]

09.50: **Porous silicon-based notch filters and waveguides,** C. J. Oton, E. Lorenzo, N. E. Capuj, F. Lahoz, I. R. Martín, Univ. of La Laguna (Spain); D. Navarro-Urrios, M. Ghulinyan, F. Sbrana, Z. Gaburro, L. Pavesi, Univ. of Trento (Italy) ..... [5840-66]

10.10: **Organometallic self-organized nanomaterials for nonlinear optics,** W. E. Douglas, Univ. Montpellier II (France); L. Klapshina, I. Grigoriev, T. I. Lopatina, V. Semenov, G. A. Domrachev, G.A. Razuvaev Institute Metallo-Organic Chemistry (Russia); A. Y. Lukianov, Institute of Microstructure Physics (Russia); A. V. Afanasiev, Institute of Applied Physics (Russia); A. S. Kuzhelev, A. Dudelzak, Canadian Space Agency (Canada); A. I. Korytin, Institute of Applied Physics (Russia) ..... [5840-67]

10.30: **Photonic properties of strongly correlated colloidal liquids,** F. Scheffold, Univ. de Fribourg (Switzerland); J. J. Saenz, Univ. Autonoma de Madrid (Spain); L. F. Rojas-Ochoa, P. Schurtenberger, Univ. de Fribourg (Switzerland) ..... [5840-68]

Coffee Break ..... 10.50 to 11.20

Keynote Session III

Room: Giralda I ..... 11.20 to 12.00

Keynote Presentation

Silicon Raman laser, amplifier, switch and wavelength converter *(Invited Paper)*, B. Jalali, Univ. of California/Los Angeles (USA) ..... [5840-77]

Session 18 runs concurrent with session 19

SESSION 18

Room: Prado ..... Wed. 12.00 to 13.20

Lasers

Chair: **Valerio Pruneri**, Avanex, Inc. (Italy)

12.00: **Carrier dynamics in quantum dot lasers** *(Invited Paper),* A. Fiore, A. Markus, M. Rossetti, L. H. Li, Ecole Polytechnique Fédérale de Lausanne (Switzerland) ..... [5840-69]

12.20: **PDLC random laser action,** S. Gottardo, S. Cavalieri, Univ. degli Studi di Firenze (Italy); O. V. Yaroshchuk, Institute of Physics (Ukraine); D. S. Wiersma, Univ. degli Studi di Firenze (Italy) ..... [5840-70]

12.40: **Accurate determination of the optimal coupling strength under best side mode suppression for surface-grating DBR lasers,** H. H. Yee, H. D. Hsu, National Taipei Univ. of Technology (Taiwan) ..... [5840-71]

13.00: **Influence of structure and defects on the performance of dot-in-well laser structures,** M. Gutierrez-Peinado, H. Y. Liu, M. Hopkinson, Univ. of Sheffield (United Kingdom); M. Herrera, D. Gonzalez, R. Garcia, Univ. de Cadiz (Spain) ..... [5840-72]

Lunch Break ..... 13.20 to 15.00

SESSION 19

Room: Arenal II ..... Wed. 12.00 to 13.20

Nanostructured Optical Materials II

Chair: **Lorenzo Pavesi**, Univ. degli Studi di Trento (Italy)

12.00: **Laser-induced thermal effects on optical and light-emitting properties of free-standing silica films containing Si nanocrystals,** L. Khriachtchev, M. Räsänen, S. Novikov, Helsinki Univ. of Technology (Finland) ..... [5840-73]

12.20: **Visible light emission from macroporous silicon,** S. Cheylan, Institut de Ciencies Fotoniques (Spain); T. trifonov, Univ. de Rovira i Virgili (Spain); A. Rodriguez, Univ. Politécnica de Cataluña (Spain); L. Marsal, J. Pallares, Univ. de Rovira i Virgili (Spain); R. Alcubilla, Univ. Politécnica de Cataluña (Spain); G. Badenes, Institut de Ciències Fotòniques (Spain) ..... [5840-74]

12.40: **Light emitting devices based on nanostructured semiconductors,** D. E. Gallardo, C. Bertoni, S. C. Dunn, Cranfield Univ. (United Kingdom) ..... [5840-75]

13.00: **Near-field photochemical imaging of noble metallic nano-objects using an azo-dye polymer,** C. Hubert, S. Kostcheev, J. Grand, G. Lerondel, A. Vial, D. Barchiesi, R. Bachelot, P. Royer, Univ. de Technologie de Troyes (France); S. H. Chang, S. K. Gray, G. P. Wiederrecht, Argonne National Lab. (USA); G. C. Schatz, Northwestern Univ. (USA) ..... [5840-76]

Lunch Break ..... 13.20 to 15.00

Sessions 20, 21, and 22 run concurrently

SESSION 20

Room: Prado . . . . . Wed. 15.00 to 16.20

Photonic System Integration

Chair: **M. Selim Ünlü**, Boston Univ. (USA)

15.00: **Fabrication and integration of micro/nano-scale photonic devices and optical waveguide arrays for O-PCB and VLSI photonic applications** *(Invited Paper),* E. Lee, Inha Univ. (South Korea) . . . . . [5840-78]

15.20: **Integration of quantum well and quantum dot infrared photodetectors with a field-effect transistor,** V. Ryzhii, I. Khmyrova, M. Ryzhii, Univ. of Aizu (Japan); S. Lin, J. Y. Chi, Industrial Technology Research Institute (Taiwan) . . . . . [5840-79]

15.40: **Tunable optical filters for in-plane integration on INP MEMS platform,** R. Ghodssi, M. Datta, M. Pruessner, K. Amarnath, K. Subramanian, Univ. of Maryland/ College Park (USA) . . . . . [5840-80]

16.00: **Si-based waveguiding metal-semiconductor-metal photodetectors at 1.55 micron,** M. Casalino, L. Moretti, S. Libertino, L. Sirleto, I. Rendina, Consiglio Nazionale delle Ricerche (Italy) . . . . . [5840-81]

Coffee Break . . . . . 16.20 to 16.40

SESSION 21

Room: Arenal II . . . . . Wed. 15.00 to 16.20

Microcavities/Microresonators

Chair: **Giancarlo C. Righini**, Istituto di Fisica Applicata CNR (Italy)

15.00: **Coupling two nano-emitters via shared modes of a high-Q microsphere resonator** *(Invited Paper),* O. Benson, Humboldt-Univ. zu Berlin (Germany); S. Götzinger, Stanford Univ. (USA); L. d. S. Menezes, Univ. Federal de Pernambuco (Brazil); A. Mazzei, Humboldt-Univ. zu Berlin (Germany); V. Sandoghdar, Swiss Federal Institute of Technology (Switzerland) . . . . . [5840-82]

15.20: **Semiconductor and dielectric microspheres for optoelectronic applications** *(Invited Paper),* A. Serpengüzel, A. Demir, A. Kurt, Koç Univ. (Turkey) . . . . . [5840-83]

15.40: **Multivariate analysis of photonic crystal microcavities with fabrication defects,** J. M. Rico García, J. M. López-Alonso, J. Alda, Univ. Complutense de Madrid (Spain) . . . . . [5840-84]

16.00: **Coupled cavity modes in photonic molecules with semiconductor nanocrystals,** Y. P. Rakovich, Trinity College Dublin (Ireland); N. Gaponik, Univ. Hamburg (Germany); A. L. Rogach, Ludwig-Maximilians-Univ. München (Germany); M. Gerlach, L. Bradley, T. Connolly, J. J. Boland, J. F. Donegan, Trinity College Dublin (Ireland) . . . . . [5840-85]

Coffee Break . . . . . 16.20 to 16.40

SESSION 22

Room: Triana . . . . . Wed. 15.00 to 16.20

Single Photon Sources

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

15.00: **Experimental violation of the Bell inequality in a continuous-variable setting** *(Invited Paper),* A. I. Lvovsky, S. Babichev, J. Appel, Univ. of Calgary (Canada) . . . . . [5840-86]

15.20: **Zero-phonon-line emission of single molecules for applications in quantum information processing,** A. Kiraz, Koç Univ. (Turkey); M. Ehrl, Ludwig-Maximilians Univ. München (Germany); O. E. Mustecaplioglu, Koç Univ. (Turkey); T. Hellerer, C. R. Bräuchle, A. Zumbusch, Ludwig-Maximilians Univ. München (Germany)[5840-87]

15.40: **High performance guided-wave heralded single photon source at telecom wavelength,** O. Alibart, Univ. de Nice Sophia Antipolis (France); S. Tanzilli, Univ. de Genève (Switzerland) and LPMC (France); D. B. Ostrowsky, P. A. Baldi, Univ. de Nice Sophia Antipolis (France) . . . . . [5840-88]

16.00: **Technology CAD based design of semiconductor optical microcavities for single photon emitters,** M. Streiff, C. Zinoni, C. Monat, B. Alloing, A. Fiore, B. Witzigmann, Swiss Federal Institute of Technology (Switzerland) . . . . . [5840-89]

Coffee Break . . . . . 16.20 to 16.40

Sessions 23, 24, and 25 run concurrently

SESSION 23

Room: Prado . . . . . Wed. 16.40 to 17.40

Transmitters and Receivers for Telecom

Chair: **El-Hang Lee**, Inha Univ. (South Korea)

16.40: **Advanced optical transmitters** *(Invited Paper),* M. Belmonte, S. Balsamo, S. Pensa, D. Pircalaboiu, V. Pruneri, Avanex Corp. (Italy) . . . . . [5840-90]

17.00: **Design, modeling and testing of electro-optical transmitters,** M. Asensio, Univ. Politécnica de Madrid (Spain); F. Lucarelli, P. Antoranz, J. M. Miranda Pantoja, M. V. Fonseca Gonzalez, Univ. Complutense de Madrid (Spain) . . . . . [5840-91]

17.20: **High speed resonant cavity enhanced Ge photodetectors on Si reflecting substrates for 1550 nm operation,** O. I. Dosunmu, Boston Univ. (USA); D. D. Cannon, Massachusetts Institute of Technology (USA); M. K. Emsley, Boston Univ. (USA); L. C. Kimerling, Massachusetts Institute of Technology (USA); M. S. Ünlü, Boston Univ. (USA) . . . . . [5840-92]

SESSION 24

Room: Arenal II . . . . . Wed. 16.40 to 17.20

Laser-Induced Fabrication of Photonic Materials

Chair: **Oliver Benson**, Humboldt-Univ. zu Berlin (Germany)

16.40: **Assessment of laser ablation techniques in a-Si technologies for position-sensor development,** C. L. Molpeceres, S. Lauzurica, J. L. Ocana, Univ. Politécnica de Madrid (Spain); J. J. Gandia, L. Urbina, J. Carabe, CIEMAT (Spain) . . . . . [5840-93]

17.00: **Laser and ion implantation writing of integrated optical structures,** G. C. Righini, M. Ferrari, A. Chiasera, S. Berneschi, Consiglio Nazionale delle Ricerche (Italy); I. Banyasz, Institute of Solid State Physics and Optics (Hungary); S. Pelli, Consiglio Nazionale delle Ricerche (Italy); C. Tosello, Univ. degli Studi di Trento (Italy) . . . . . [5840-95]

SESSION 25

Room: Triana . . . . . Wed. 16.40 to 17.40

Photon Entanglement

Chair: **Pascal A. Baldi**, Univ. de Nice Sophia Antipolis (France)

16.40: **Laser-induced control of multiatom entanglement and decoherence** *(Invited Paper),* G. Kurizki, A. G. Kofman, G. Gordon, S. Pellegrin, Weizmann Institute of Science (Israel) . . . . . [5840-96]

17.00: **Photon-photon interaction and entanglement in coherently driven atomic media,** D. Petrosyan, Institute of Electronic Structure and Laser Foundation (Greece); G. Kurizki, Weizmann Institute of Science (Israel) . . . . . [5840-97]

17.20: **Generation of counterpropagating entangled photons out of continuous wave classical pump field,** A. Luks, V. Perinova, Palack_ Univ. (Czech Republic) . . . . . [5840-98]

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