

# SBMicro2009

## TECHNICAL PROGRAM

### **SESSION 1 (Tuesday 09h00 – 10h30, Room Cedro 1): Optoelectronics, Optronics and Photonics I**

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#### **INVITED: Solution Processing of Polymer Photovoltaic Solar Cells in Air or Under Inert Atmosphere.**

M. Dang, G. Wantz, L. Hirsch and J. Parneix

#### **Stadium Cavity Optical Resonator Fabricated by Focused Ion Beam**

Adenir daSilva Filho, Luis Barea, Alfredo Vaz and Newton Frateschi

#### **Fabrication and Characterization of Active Pixel Sensors (APS) Using Simple Metal Gate nMOS Technology**

André Santos de Oliveira Furtado, José Alexandre Diniz and Davies William de Lima Monteiro

### **SESSION 2 (Tuesday 11h00 – 12h30, Room Cedro 1): Modeling and Characterization I**

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#### **INVITED: Thermal Effects in Fully-Depleted SOI Devices.**

Dragica Vasileska, Katerina Raleva and Stephen M. Goodnick

#### **The Effect of Microstructure on Electromigration-Induced Failure Development**

Roberto Lacerda de Orio, Hajdin Ceric, Johann Cervenka and Siegfried Selberherr

#### **Extraction of MOSFET Model Parameters from the Measured Source-to-drain Resistance**

Francisco J. García-Sánchez, Juan Muci, Denise C. Lugo Muñoz, Alvaro D. Latorre Rey, Adelmo Ortiz-Conde, Ching Ho and Juin J. Liou

**SESSION 3 (Tuesday 11h00 – 12h30, Room Cedro 6):  
Optoelectronics, Optronics and Photonics II**

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**INVITED: Artificial electromagnetic materials - new twist of light,**

M.Yu.Barabanenkov and V.V.Kazmiruk

**Wavefront sensor using double-efficiency quad-cells for the measurement of high-order ocular aberrations**

Luciana P. Salles, Otávio Gomes de Oliveira, Davies W. de Lima Monteiro

**Phase-Shift Photomask Designed by Scalar Diffraction Theory**

Giuseppe Cirino, Ronaldo Mansano, Patrick Verdonck, Lucila Cescato, Euclides Marega Jr., Luiz Neto

**SESSION 4 (Tuesday 14h00 – 16h00, Room Cedro 1):  
Optoelectronics, Optronics and Photonics III**

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**Porous Silicon Heterostructures for Refractometer Device Application**

Danilo Roque Huanca and Walter Jaimes Salcedo

**Fabrication and characterization of GeO<sub>2</sub>-PbO optical waveguides**

Vanessa Cacho and Luciana Kassab

**Computational Intelligence Optimization Method for AlGaAs/GaAs Quantum Well Solar Cells**

Anderson Singulani, Patrícia Souza, Maurício Pires and Marco Pacheco

**Superposition of Positive and Negative Contributions to the Photocurrent Spectrum of InAs/InAlGaAs/InP Quantum Dot Infrared Photodetectors**

Thomas Gebhard, Deborah Alvarenga, Mauricio Pires, Karl Unterrainer, Paolo Sergio Guimares and Patricia Lustoza de Souza

**Smart Solar Cluster: a Self-reconfigurable Photovoltaic Approach**

Ágata Miranda Carvalho and Davies W. de Lima Monteiro

**Intrinsically Self-Amplified CMOS Image Sensor**

Patrick Santos and Davies W. de Lima Monteiro

## **Session 5 (Tuesday 14h00 – 16h00, Room Cedro 6): Process Technology I**

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### **INVITED: Composite Electronic Materials for Supercapacitor Applications,**

Mariem R. Rosario-Canales, Pravas Deria, Michael J. Therien, and Jorge J. Santiago-Aviles

### **Characterization of High-k Al<sub>2</sub>O<sub>3</sub> Gate Dielectrics Prepared by Oxidation of Aluminum Thin Films**

Giuliano Gozzi, Veronica Christiano, Stephanie Conceição, Victor Sonnenberg and Sebastião dos Santos Filho

### **Laser annealing of self-aligned As<sup>+</sup> implants in contact windows for ultrashallow junction formation**

Cleber Biasotto, Viktor Gonda, Lis K. Nanver, Johan van der Cingel and Vladimir Jovanovic

### **Sensitivity Analysis of Pd-MOS Structure for Hydrogenated Gases by Scanning Light Pulse Technique**

Mauro Sergio Braga, Keth Rousbergue Maciel de Matos, Daniela de Souza Santos, Francisco Javier Ramirez-Fernandez and Walter Jaimes Salcedo

### **Structural Characterization of Arsenic Implanted SOI**

Roana de Oliveira, Mateus Dalponte and Henri Boudinov

## **Session 6 (Tuesday 16h30 – 18h30, Room Cedro 1): Process Technology II**

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### **INVITED: Optimization of e-beam Systems for Wafer Defect Inspection and for Die-to-Database Verification ,**

V.V.Kazmiruk and M.Yu.Barabanenkov

### **Study of Variations of the Electrospinning Process**

Rogério Furlan, Stefanie V. Arroyo, Ramon Torres, Joel A. M. Rosado and Ana N. R. da Silva

### **Three-Dimensional Plasma Etching Simulation using Advanced Ray Tracing and Level Set Techniques**

Otmar Ertl and Siegfried Selberherr

## **Characterization of Gold-Formaldehyde Baths for Electrochemical Deposition**

Juliana Lopes Cardoso and Sebastião Gomes dos Santos Filho

## **Electrodeposition of p-Cu<sub>2</sub>O Layers on Co/p-Si Planar Structures**

Rafael Gallina Delatorre, Vagner Stenger, Vinicius Claudio Zoldan, Douglas Langie da Silva, Sebastião Gomes dos Santos and Andre Avelino Pasa

## **Session 7 (Wednesday 08h30 – 10h00, Room Cedro 1): FinFETs and Multiple-Gate FETs I**

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### **Analysis of the interface trap density in SOI FinFETs with different TiN gate electrode thickness through charge pumping technique**

Michele Rodrigues, Moon Ju Cho, Joao Antonio Martino, Nadine Collaert, Abdelkarim Mercha, Eddy Simoen and Cor Claeys

### **Influence of Fin Width and Channel Length on the Performance of Buffers Implemented with Standard and Strained Triple-Gate nFinFETs**

Marcelo Pavanello, Joao Martino, Eddy Simoen, Rita Rooyackers, Nadine Collaert and Cor Claeys

### **Analysis of the Total Resistance in Standard and Strained FinFET Devices With and Without the Use of SEG**

Talitha Nicoletti, João Martino, Eddy Simoen and Cor Claeys

### **Back-Gate Influence on the Mobility Behavior in Ultrathin FD SOI Devices**

Carolina Santos, Sorin Cristoloveanu, Loan Pham Nguyen, Claire Fenouillet-Beranger and João Antonio Martino

## **Session 8 (Wednesday 11h00 – 12h30, Room Cedro 1): Devices and Systems I**

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### **INVITED: Biomimetics: Learning From Nature To Make Better Sensors,**

P.J. French, D.H.B. Wicaksono

### **INVITED: Nanoparticle Floating Gate Flash Memorie**

S. K. Banerjee, F. Ferdousi, H. Liu and D. Ferrer

### **Sensitive Continuous Monitoring of pH thanks to Matrix of several Suspended Gate Field Effect Transistors**

Bruno da Silva Rodrigues, Olivier De Sagazan, Samuel Crand, France LeBihan, Olivier Bonnaud, Tayeb Mohammed-Brahim and Nilton Itiro Morimoto

## **Session 9 (Wednesday 11h00 – 12h30, Room Cedro 6): FinFETs and Multiple-Gate FETs II**

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### **DIBL Study Using Triple Gate Unstrained and Uniaxial/Biaxial Strained FinFETs**

Sara Dereste dos Santos, João Antonio Martino, Eddy Simoen and Cor Claeys

### **Application of the Symmetric Doped Double-Gate Model in Circuit Simulation Containing Double-Gate Graded-Channel Transistors**

Esteban Contreras, Antonio Cerdeira, Joaquin Alvarado and Marcelo Antonio Pavanello

### **Low Temperature and Silicon Thickness Influences on the Threshold Voltage of Double-Gate MOSFETs Considering a Charge Based Extraction Procedure**

Renan Trevisoli Doria and Marcelo Antonio Pavanello

### **Fin Width Influence on The Harmonic Distortion of Standard and Strained FinFETs Operating in Saturation**

Rodrigo Trevisoli Doria, Antonio Cerdeira, João Antonio Martino, Eddy Simoen, Cor Claeys and Marcelo Antonio Pavanello

## **Session 10 (Wednesday 14h00 – 15h30, Room Cedro 1): Modeling and Characterization II**

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### **A Novel Overlapping Circular-Gate Transistor and its Application to Power MOSFETs**

Jader A De Lima and Salvador P Gimenez

### **The Influence of Poly-Si/SiGe Gate in Threshold, Sub-Threshold Parameters and Low Frequency Noise in p-MOSFETs**

Hugo Ricardo Jiménez Grados, Leandro T. Manera, Márcia Rautemberg Finardi, José Alexandre Diniz, Peter Jurgen Tatsch, Hugo Enrique Figueroa, Jacobus W. Swart and Ioshiaki Doi

### **Using Cynthia SOI MOSFET to Improve Voltage Gain of Analog Integrated Circuits**

Denis Rodrigo Oliveira and Salvador Pinillos Gimenez

### **Impact of Confinement and Stress on the Subband Parameters in Ultra-Thin Silicon Films**

Viktor Sverdlov, Oskar Baumgartner, Thomas Windbacher, Franz Schanovsky and Siegfried Selberherr

## **Session 11 (Thursday 08h30 – 10h30, Room Cedro 1): Poster Flash Presentations**

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### **Electrodeposition of Au-Sn Alloys from a Modified Non-Cyanide Bath**

Juliana Lopes Cardoso and Sebastião Gomes dos Santos Filho

### **Customized Polynomial Contact Lenses via Wet Etching**

Rodolfo F. de Oliveira Costa, Thiago B. Teixeira, Marco Antonio Souza Jardim, Beijamim R. de Souza and Davies W. de Lima Monteiro

### **Study of TiOxNy MOS Capacitors**

Katia Albertin, Takuya Niwa, Bruno Nobaro, Denise Souza, Alejandro Zuñiga and Inés Pereyra

### **Comparative Study of MDMO-PPV Thin-Film Transistors Using Thermal SiO<sub>2</sub> and PECVD Silicon Oxynitride as Insulator**

Marco Roberto Cavallari, Katia Franklin Albertin, Gerson dos Santos, Carlos Alberto Santos Ramos, Inés Pereyra, Fernando Josepetti Fonseca and Adnei Melges de Andrade

### **CdS-Decorated Multi-Walled Carbon Nanotubes as a Material for New Devices**

Marcos Flávio Silva, Wagner Rodrigues, Luiz Orlando Ladeira, Douglas Rodrigues and Carlos Basílio Pinheiro

### **Study of a-Si<sub>1</sub>-XCX:H Thin Films Obtained by PECVD in Temperatures Lower than 250 °C Aiming Applications in Optics, Thin Films Devices on Polymeric Substrate and MEMS**

Marcus Pelegrini and Inés Pereyra

### **Deposition of Carbon Nanotubes on Silicon for Field Emission Application**

Michel Dantas, Elisabete Galeazzo, Henrique Peres, Francisco Ramirez-Fernandez, Eric Diniz and Ricardo Castro

### **Influence of Electronegative Gas on the Efficiency of Conventional and Hollow Cathode Magnetron Sputtering Systems**

Diego Duarte, Marcos Massi, Argemiro Sobrinho, Leandro Tezani, Luis Fontana and Homero Maciel

### **Electrical Characterization of Undoped, N- and P-Type Thermal Annealed PECVD SiC Films Deposited on Transparent Insulator Substrates**

Alessandro Ricardo de Oliveira, Inés Pereyra and Marcelo Nelson Páes Carreño

### **Highly Effective Etching via Excimer Irradiation and Gradually Module Tool**

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### **Characterization of Cu/Cu<sub>0,4</sub>Ni<sub>0,4</sub>P<sub>0,2</sub> Thermocouples Fabricated on Silicon Surfaces Using Electroless Deposition**

Fernando Parra, Sebastião Santos Filho, Angelo Marques and Sandro Martini

### **Ni-P, Ni-B and SiO<sub>2</sub> as Materials for Hard Mask in Deep Silicon Etching for MEMS Fabrication using ICP reactor**

Alcinei Nunes, Stanislav Moshkalev, Clovis Fischer, Peter Tatsch and Alexander Flacker

### **OPTICAL DIAGNOSTICS OF SF<sub>6</sub> LOW PRESSURE PLASMA JET APPLIED TO SILICON ETCHING**

Rodrigo Sávio Pessoa, Leandro Tezani, Shirley Wakavaichi, Homero Santiago Maciel and Gilberto Petraconi

### **Semiconductor microcavity: an intrinsic optical transistor.**

Eduardo Cotta

### **A possible Organic Solar Cell Based on Buriti Oil**

Elizete Silva, Artemis Ceschin

### **Design of a Compact CPW Antenna using MTM-MEMS**

Georgina Rosas, Roberto Murphy and Alonso Corona

## **Ladder Type SAW Filters Using Quasi-Synchronous Resonators with Thinned Density of Randomly Distributed "Hot" Electrodes**

Che-Uk Kim, Serguei Balashov, Victor Plessky, C. W. Nam and L. K. Chul

## **Performance analysis of single-electron NAND gates**

Lorena Silva and Janaina Guimaraes

## **PDMS (Polydimethylsiloxane) Microfluidic Chip Molding for Love Wave Biosensor**

Hakim Tarbague, Jean-Luc Lachaud, Serge Destor, Luc Vellutini, Jean-Paul Pillot, Bernard Bennetau, Daniel Moynet, Dominique Rebière and Corinne Dejos

## **A Study of the Geometrical Correction Factor on the Sensitivity of the Transversal Piezoresistive Sensors**

Guilherme de Oliveira Coraucci, Rafael Vitor Degani de Oliveira and Fabiano Fruett

## **A new fabrication technique of planar metallic microstructures on alumina substrate**

Juvenil Severino Junior Costa, Alexandre Flacker and Fabiano Fruett

## **CNTFET Modelling to Design Analog and Digital Circuits**

Roberto Marani and Anna Gina Perri

## **The Impact of CMOS Logic Gate Topologies on Performance Variability**

Digeorgia da Silva, André Reis and Renato Ribas

## **Session 12 (Thursday 14h00 – 16h00, Room Cedro 1): Devices and Systems II**

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## **Multiwall Carbon Nanotubes Decorated with Metal Oxide Nanoparticles for Gas Sensing Applications**

Rogério Gelamo, Carla Verissimo, Alireza Abbaspourrad, Alfredo Vaz, Francisco Rouxinol, Oswaldo Alves and Stanislav Moshkalev

## **Feasibility Study of Analog and Digital Temperature Sensors in Nanoscale Technologies**

Max Geljon, Frank Sill and Davies William de Lima Monteiro

## **Development of Optimal Symmetric Focused SAW Atomizers for Nanoliter Single Droplet Atomization**



Serguei Balashov, Olga Balashova, Aristides Pavani Filho and Maria das Graças Almeida

### **Session 13 (Thursday 16h30 – 18h30, Room Cedro 1): Devices and Systems III**

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#### **INVITED: Metallization Technologies and Strategies for Plastic Based Biochips, Sensors and Actuators for Healthcare and Medical Applications,**

Yosi Shacham-Diamand, Slava Krylov, Gil Rosenman, Tsvi Shmilovich, Rakefet Ofek Almog , Nicolai Fishelson and Yelen Sverdlov

#### **Radiation Effects on SOI Microrelays for Space Applications**

Alex Lozano, Felix Palumbo and Martín Alurralde

#### **Electrochemical Migration on Lead-Free Soldering of PCBs**

Luiz Tadeu Freire Mendes, Valtemar Fernandes Cardoso and Ana Neilde Rodrigues da Silva

#### **Fabrication Process of Ag/AgCl Reference Pseudo-Electrode Based on Electrodeposition of Au on Pt Surfaces from Formaldehyde Baths: Chemical Stability and Adherence**

Fernando L. de Almeida, Sebastião G. dos Santos Filho, Juliana L. Cardoso, Massaki O. Igarashi, Cecilia Jiménez-Jorquera and Marcelo B. Andrade Fontes

#### **Flow-injection Analysis technique used to electrochemically measure nitrite through a gold working electrode modified with 1-2 diaminobenzene (DAB).**

Fernando L. de Almeida, Sebastião G. dos Santos Filho and Marcelo B. Andrade Fontes

### **Session 14 (Thursday 16h30 – 18h30, Room Cedro 6): Modeling and Characterization III**

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#### **On the Performance of Thin-Film Lateral SOI PIN Diodes as Thermal Sensors in a Wide Temperature Range**

Michelly de Souza, Bertrand Rue, Denis Flandre and Marcelo Pavanello

#### **Transformation Between Power-law and Polynomial Thin-Film Transistor Models**

Adelmo Ortiz-Conde, Francisco J. García Sánchez and Juan Muci

## **Reduction in on-resistance of LDMOS transistor for improved RF performance**

Ahsan Kashif, Christer Svensson and Qamar Wahab

## **Equivalent Circuit for NBTI Evaluation in CMOS Logic Gates**

Nivea Schuch, Vinicius Dal Bem, André Inácio Reis and Renato Perez Ribas