

**2007  
INTERNATIONAL  
SEMICONDUCTOR CONFERENCE**

**30<sup>th</sup> Edition  
October 15-17, Sinaia, Romania**

**CAS 2007 PROCEEDINGS**

**VOLUME 1**

- ◆ *Plenary Session*
- ◆ *Nanoelectronics*
- ◆ *RF MEMS*
- ◆ *Microphotonics*
- ◆ *Microsystems Technology*
- ◆ *Advanced Microwave Devices and Circuits*
- ◆ *RF MEMS, Microwave Devices and Circuits*

IEEE Catalog Number: 07TH8934  
ISBN: 1-4244-0847-4  
ISSN: 1545-827X

## CONTENTS

### PLENARY SESSION 1

INVITED PAPER	<i>HOW MANY GATES DO WE NEED IN A TRANSISTOR ?, S. Cristoloveanu, CNRS-INPG-UJF, Grenoble, France.....</i>	3
INVITED PAPER	<i>FROM GATE-ALL-AROUND TO NANOWIRE MOSFETS, J.-P. Colinge, Tyndall National Inst., Cork, Ireland.....</i>	11

### PLENARY SESSION 2

INVITED PAPER	<i>TCADMEMS OVERVIEW, D. Peyrou, I. Achkar, F. Pennec, F .Coccetti, M. Al Ahmad, P. Pons, R. Plana, LAAS-CNRS, Univ. of Toulouse, France.....</i>	21
INVITED PAPER	<i>HIGH FREQUENCY CARBON NANOSTRUCTURES THAT SMELL, WEIGHT, HARVEST AND HANDLE, M. Dragoman, IMT-Bucharest, Romania.....</i>	25

### Session N: NANOELECTRONICS Oral presentations

INVITED PAPER	<i>QUASI BALLISTIC TRANSPORT IN ADVANCED MOSFET DEVICES, R. Clerc, P. Palestri*, Q. Rafhay, M. Ferrier*, G. Pananakakis, G. Ghibaudo, L. Selmi*, IMEP, Minatec, Grenoble, France, *DIEGM, Univ. Udine, Italy.....</i>	35
N.1	<i>WHY THE ENERGY LEVELS OBSERVED IN ELECTRICAL TRANSPORT, PHOTOTRANSPORT AND PHOTOLUMINESCENCE ARE DIFFERENT ?, M.L. Ciurea, V. Iancu*, INCDFM, "Politehnica" Univ. of Bucharest, Romania.....</i>	41
N.2	<i>SINGLE DEVICE LOGIC USING 3D GATING OF SCREEN GRID FIELD EFFECT TRANSISTORS, Y. Shadrokh, K. Fobelets, J.W. Velazquez-Perez*, Imperial College London, UK, *Univ. of Salamanca, Spain.....</i>	45
N.3	<i>MANUFACTURABILITY ISSUES OF REDUNDANT NANOGATES, F. Martorell, S.D. Cotofana*, A. Rubio, Polytechnical Univ. of Catalonia, Spain, *TU Delft, The Netherlands.....</i>	49
N.4	<i>HIGH FREQUENCY DEVICES BASED ON GRAPHENE, M. Dragoman<sup>1</sup>, D. Dragoman<sup>2</sup>, A.A. Muller<sup>3</sup>, <sup>1</sup>IMT-Bucharest, <sup>2</sup>Univ. Bucharest, Romania, <sup>3</sup>Technische Univ. Munchen, Germany.....</i>	53

### Session MT1: MICROSYSTEM TECHNOLOGY 1 Oral presentations

INVITED PAPER	<i>SENSING AND TRANSDUCTION IN SEMICONDUCTING MOX GAS SENSORS; PHENOMENOLOGICAL AND SPECTROSCOPIC INVESTIGATIONS, N. Barsan, D. Koziej, U. Weimar, Inst. of Physical and Theoretical Chemistry, Tubingen, Germany.....</i>	59
INVITED PAPER	<i>MANIPULATION OF BIOLOGICAL SAMPLES USING ELECTRIC FIELD, C. Iliescu<sup>1</sup>, G.L. Xu<sup>1</sup>, P.L. Ong<sup>1</sup>, L. Yu<sup>2</sup>, F.E.H. Tay<sup>1,2</sup>, F.S. Iliescu<sup>3</sup>, G. Tresset<sup>1</sup>, <sup>1</sup>Inst. of Bioengineering and Nanotechnology, Singapore, <sup>2</sup>National Univ. of Singapore, <sup>3</sup>Republic Polytechnic, Singapore.....</i>	67

<b>MT1.1</b>	<i>MODELLING AND SIMULATION OF A PNEUMATICALLY ACTUATED MICROPUMP,</i> O.T. Nedelcu <sup>1</sup> , J.-L. Morelle <sup>2</sup> , C. Tibeica <sup>1</sup> , S. Voccia <sup>2</sup> , I. Codreanu <sup>1</sup> , S. Dahms <sup>3</sup> , <sup>1</sup> IMT-Bucharest, Romania, <sup>2</sup> Trasis SA, Liege, Belgium, <sup>3</sup> Bartels GmbH, Dortmund, Germany...	77
<b>MT1.2</b>	<i>EXPERIMENTAL STUDY CONCERNING THE INFLUENCE OF THE BASE FLUID PROPERTIES ON THE THERMAL CONDUCTIVITY OF NANOFUIDS,</i> C. Codreanu, R. Gavrila, I. Morjan*, IMT-Bucharest, *INFLPR, Bucharest, Romania.....	81

**Session MT2: MICROSYSTEM TECHNOLOGY 2**  
**Poster presentations**

<b>MT2.1</b>	<i>DIFFERENTIAL PIEZORESISTIVE PRESSURE SENSOR,</i> B. Firtat, C. Moldovan, R. Iosub, D. Necula, M. Nisulescu, IMT-Bucharest, Romania.....	87
<b>MT2.2</b>	<i>PLASMA SURFACE MODIFICATION OF POLYMER SUBSTRATES FOR SELECTIVE HYDROPHOBIC CONTROL,</i> M. Avram, M.A. Avram, A. Bragaru, A. Ghie, C. Iliescu*, IMT-Bucharest, Romania, *Inst. of Bioengineering and Nanotechnology, Singapore.....	91
<b>MT2.3</b>	<i>SIMULATION OF MOISTURE DIFFUSION IN SEALING LAYERS BY USING ANALOGOUS THERMAL SIMULATION,</i> C. Tibeica, R. Voicu, V. Moagar-Poladian, IMT-Bucharest, Romania.....	95
<b>MT2.4</b>	<i>INVESTIGATION OF THE PIEZOELECTRIC PROPERTIES OF THE THIN FILMS BY AFM,</i> F. Craciunoiu, M. Miu, R. Gavrila, A. Dinescu, E. Hamciuc*, IMT-Bucharest, *Inst. of Macromolecular Chemistry, Iasi, Romania.....	99
<b>MT2.5</b>	<i>RELIABILITY ACCELERATED TESTING OF MEMS ACCELEROMETERS,</i> M. Bazu, L. Galateanu, V.E. Ilian, J. Loicq*, S. Habraken*, J.P. Colette*, IMT-Bucharest, Romania, *Univ. de Liege, Belgium.....	103
<b>MT2.6</b>	<i>TECHNOLOGICAL METHODS FOR LOW TEMPERATURE MICROFLUIDIC DEVICES MICROFABRICATION,</i> A. Coraci, C. Podaru, E. Manea, E. Iancu, A. Ciuciumis, A. Popescu, O. Corici*, IMT-Bucharest, *Oilfield Schlumberger, Bucharest, Romania.....	107
<b>MT2.7</b>	<i>ROBUST ASSEMBLING SYSTEM FOR PHOTOSYNTHESIS-BASED MICROBIOSENSORS,</i> L. Galateanu, N. Cimpoca, M. Bazu, V. Ilian, A. Dinescu, IMT-Bucharest, Romania.....	111
<b>MT2.8</b>	<i>CHARACTERISATION OF SOL-GEL HYBRID THIN FILMS FOR SWITCHING DEVICES,</i> A. Dima <sup>1</sup> , I. Rendina <sup>2</sup> , F. Della Corte <sup>2</sup> , M. Dima <sup>3</sup> , <sup>1</sup> Univ. of Liverpool, UK, <sup>2</sup> Inst. per la Microelettronica e Microsistemi, Napoli, Italy, <sup>3</sup> Inst. for Nuclear Physics, Bucharest, Romania..	115
<b>MT2.9</b>	<i>A GRAY-TONS DERIVED LITHOGRAPHY METHOD FOR SILICON MICROMACHINING,</i> F. Craciunoiu, IMT-Bucharest, Romania.....	119
<b>MT2.10</b>	<i>PROFILED METAL – CERAMIC MATRICES FOR MEMS APPLICATION,</i> C. Anton <sup>1</sup> , J.P. Lecompte <sup>2</sup> , M. Muntean <sup>3</sup> , <sup>1</sup> IMT-Bucharest, Romania, <sup>1</sup> Univ. de Limoges, ENSIL, France, <sup>3</sup> "Politehnica" Univ. of Bucharest, Romania.....	123
<b>MT2.11</b>	<i>SOLAR PANEL ENERGETIC EFFICIENCY OPTIMIZATION METHOD, BASED ON AN SPECIFIC DETECTOR AND ORIENTATION MICROSYSTEM,</i> O. Oltu, P.L. Milea, M. Dragulinescu, E. Franti*, "Politehnica" Univ. of Bucharest, *IMT-Bucharest, Romania....	127
<b>MT2.12</b>	<i>BIOMEMS MICROPROBE FOR ELECTRICAL ACTIVITY RECORDING OF LIVING CELLS,</i> C. Moldovan <sup>1</sup> , R. Iosub <sup>1</sup> , C.P. Lungu <sup>2</sup> , A.M. Lungu <sup>2</sup> , B. Firtat <sup>1</sup> , C. Roman <sup>1</sup> , R. Albulescu <sup>3</sup> , IMT-Bucharest, *INFLPR, Bucharest, Nat. Inst. for Chemical- Pharmaceutical R&D, Bucharest, Romania.....	131

<b>MT2.13</b>	<i>SURFACE FUNCTIONALIZATION FOR PROTEIN MICROARRAY</i> , M. Simion, L. Ruta*, I. Kleps, C. Mihailescu*, T. Ignat, D. Stan*, F. Craciunoiu, M. Miu, A. Bragaru, IMT-Bucharest, *DDS Diagnostic, Bucharest, Romania.....	135
<b>MT2.14</b>	<i>LOW STRESS PECVD SiNx PROCESS FOR BIOMEDICAL APPLICATION</i> , C. Iliescu, J. Wei, P.L. Ong, B. Chen, Inst. of Bioengineering and Nanotechnology, Singapore.....	139
<b>MT2.15</b>	<i>SIMULATION AND DESIGN OF A MICROCANTILEVER FOR BIOSENSING APPLICATION</i> , M. Ion, C. Pachiu, C. Moldovan, IMT-Bucharest, Romania.....	143
<b>MT2.16</b>	<i>APTS BIO-FUNCTIONALIZATION OF POROUS SILICON NANOSTRUCTURATED SURFACE</i> , A. Bragaru, M. Simion, M. Miu, T. Ignat, I. Kleps, V. Schiopu, M.A. Avram, F. Craciunoiu, IMT-Bucharest, Romania.....	147
<b>MT2.17</b>	<i>INVESTIGATION OF LIPOSOME BASED CHONDROITIN SULPHATE EFFECTS ON HUMAN CHONDROCYTES</i> , M. Trif <sup>1</sup> , L. Moldovan <sup>2</sup> , O. Zarnescu <sup>3</sup> , <sup>1</sup> Inst. of Biochemistry, <sup>2</sup> National Inst. R&D for Biological Sciences, <sup>3</sup> Univ. of Bucharest, Bucharest, Romania.....	151
<b>MT2.18</b>	<i>ADVANCED LASER MICROPROCESSING FOR SUBSTRATES MICROPROCESSING OF MICROSYSTEMS AND OPTOELECTRONICS DEVICES APPLICATIONS</i> , D. Ieru <sup>1</sup> , A. Tantau <sup>2</sup> , E. Ulieru <sup>2</sup> , Cernica <sup>3</sup> , A. Matei <sup>3</sup> , V. Schiopu <sup>3</sup> , F. Pistratu <sup>3</sup> , <sup>1</sup> ROMES SA, <sup>2</sup> SITEX 45 SRL, <sup>3</sup> IMT-Bucharest, Romania.....	155
<b>MT2.19</b>	<i>DESIGN AND FINITE ELEMENT SIMULATION OF MEMS FOR FATIGUE TEST</i> , G. De Pasquale, A. Soma, Politecnico di Torino, Italy.....	159

#### Session O1: MICROPHTONICS 1

Oral presentations

<b>INVITED PAPER</b>	<i>HIGH-PERFORMANCE 1.3 <math>\mu</math>m DILUTE-NITRIDE EDGE-EMITTING LASERS</i> , M. Dumitrescu <sup>1</sup> , A. Larsson <sup>2</sup> , Y. Wei <sup>2</sup> , E. Larkins <sup>3</sup> , P. Uusimaa <sup>4</sup> , K. Schulz <sup>5</sup> , M. Pessa <sup>1</sup> , <sup>1</sup> Tampere Univ. of Technology, Finland, <sup>2</sup> Chalmers Univ. of Technology, Sweden, <sup>3</sup> Univ. of Nottingham, UK, <sup>4</sup> Modulight Inc., Finland, <sup>5</sup> MergeOptics GmbH, Germany.....	165
<b>INVITED PAPER</b>	<i>SILICON PHOTONICS AT UNIVERSITY OF TRENTO</i> , E.O. Anopchenko, P. Bettotti, M. Cazzanelli, N. Daldosso, L. Ferraioli, R. Guider, S. M. Hossain, D. Navarro-Urrios, A. Pitanti, S. Prezioso, R. Spano, M. Wang, L. Pavesi, Univ. of Trento, Italy.....	175
<b>O1.1</b>	<i>TERAHERTZ EFFECTIVE MAGNETIC ACTIVITY IN MICROSTRUCTURED TiO<sub>2</sub>: A NUMERICAL STUDY</i> , C. Kusko, M. Kusko, IMT-Bucharest, Romania.....	181

#### Session O2: MICROPHTONICS 2

Poster presentations

<b>O2.1</b>	<i>REPLICATION TECHNIQUES FOR MICRO-OPTICS</i> , P. Obreja, D. Cristea, A. Dinescu, E. Manea, IMT-Bucharest, Romania.....	187
<b>O2.2</b>	<i>FRONT SURFACE TEXTURING PROCESSES FOR SILICON SOLAR CELLS</i> , E. Manea, E. Budianu, M. Purica, C. Podaru, A. Popescu, C. Parvulescu, A. Dinescu, A. Coraci, I. Cernica, F. Babarada*, IMT-Bucharest, **“Politehnica” Univ. of Bucharest, Romania.....	191

# Student Paper

O2.3	<i>OPTIMIZATION STUDIES OF SINGLE-TRANSVERSE-MODE 980-nm RIDGE-WAVEGUIDE LASERS</i> , A. Laakso, M. Dumitrescu, M. Suominen, P. Pietila, P. Leinonen, P. Tuomisto, C. Reith, M. Pessa, Tampere Univ. of Technology, Finland.....	195
O2.4	<i>COMPARATIVE CHARACTERIZATION OF PbS MACRO- AND NANO-CRYSTALLINE PHOTORESISTIVE DETECTORS</i> , G. Iordache, M. Buda, V. Stancu, T. Botila, INCDFM, Bucharest, Romania.....	199
O2.5	<i>SIMULATION EXPERIMENT ON 4H-SiC MILLIMETER-WAVE PHOTO-ILLUMINATED HIGH POWER IMPATT OSCILLATOR</i> , M. Mukherjee, N. Mazumder, K. Goswami*, Visva Bharati Univ., *Jadavpur Univ., Kolkata, India.....	203
O2.6	<i>DESIGN OF A THERMOOPTICAL MODULATOR BASED ON SOI WAVEGUIDES</i> , M. Kusko, F. Comanescu, C. Tibeica, D. Cristea, IMT-Bucharest, Romania.....	207
O2.7	<i>PROPOSED TECHNOLOGICAL FLOW OF AN Y-SPLITTER WAVEGUIDE GRATING # SENSOR</i> , R. Rebigan, M. Kusko, A. Avram, D. Cristea, IMT-Bucharest, Romania.....	211
O2.8	<i>SiO<sub>2</sub>-TiO<sub>2</sub> UNDOPED OR (Er<sup>3+</sup>) DOPED THIN LAYERS FOR INTEGRATE OPTICS PREPARED BY SOL-GEL METHOD</i> , M. Zaharescu, D. Cristea*, P. Obreja*, L. Predoana, M. Gartner, M. Anastasescu, Inst. of Physical Chemistry "Ilie Murgulescu", Bucharest, IMT-Bucharest, Romania.....	215
O2.9	<i>NEGATIVE PHOTOCONDUCTIVITY OF AMORPHOUS Sb<sub>2</sub>Se<sub>3</sub> AND Sb<sub>2</sub>Se<sub>3</sub>:Sn FILMS</i> , M.S. Iovu, I.A. Vasilev, E.P. Colomeico, Inst. of Applied Physics, Chisinau, Moldova.....	219
O2.10	<i>STRUCTURAL AND ELECTRO-OPTICAL PROPERTIES OF ZnO THIN FILMS</i> , F. Iacomi, C. Baban, R. Apetrei, D. Luca, „Al.I. Cuza” Univ., Iasi, Romania.....	223
O2.11	<i>THE EDFA MODEL BASED ON BDI PROCESSES</i> , F. Vasile, P. Schiopu*, Alcatel-Lucent Romania, Bucharest, *„Politehnica” Univ. of Bucharest, Romania.....	227

**Session M1: ADVANCED MICROWAVE DEVICES & CIRCUITS**  
**Oral presentations**

M1.1	<i>COMPACT LOAD-COUPLING NETWORK FOR MICROWAVE CURRENT MODE CLASS-D POWER AMPLIFIERS</i> , P. Aflaki, R. Negra, F.M. Ghannouchi, Univ. of Calgary, AB, Canada.....	233
M1.2	<i>STUDY OF RECONFIGURABLE MOSTLY DIGITAL RADIO FOR MANET</i> , A. Lecointre, D. Dragomirescu, R. Plana, LAAS-CNRS, Univ. of Toulouse, France.....	237
M1.3	<i>SILICON SUPPORTED MICROWAVE DIRECTIONAL COUPLER METAMATERIAL APPROACH</i> , G. Sajin <sup>1</sup> , S. Simion <sup>1</sup> , R. Marcelli <sup>2</sup> , F. Craciunoiu <sup>1</sup> , G. Bartolucci <sup>3</sup> , <sup>1</sup> IMT-Bucharest, Romania, <sup>2</sup> CNR, Inst. for Microelectronics and Microsystems, <sup>3</sup> Univ. of Roma “Tor Vergata”, Roma, Italy.....	241
M1.4	<i>160 GHz ON-CHIP DIPOLE ANTENNA STRUCTURE IN SILICON TECHNOLOGY</i> , D. Neculoiu <sup>1,2</sup> , A. Muller <sup>1</sup> , K. Tang <sup>3</sup> , E. Laskin <sup>3</sup> , S.P. Voinigescu <sup>3</sup> , <sup>1</sup> IMT-Bucharest, <sup>2</sup> “Politehnica” Univ. of Bucharest, Romania, <sup>3</sup> Univ. of Toronto, Canada.....	245
M1.5	<i>THE FABRICATION PROCESS OF RF INDUCTOR STRUCTURES IN THE LTCC TECHNOLOGY</i> , G. Radosavljevic, A. Maric, G. Stojanovic, Lj. Zivanov, W. Smetana*, M. Unger*, H. Homolka*, Univ. of Novi Sad, Serbia, *Technical Univ. Vienna, Austria.....	249

# Student Paper

**Session M2: RF MEMS****Oral presentations**

M2.1	<i>WIDE BAND GAP SEMICONDUCTOR SAW TYPE DEVICES FOR GHz APPLICATIONS, MANUFACTURED USING NANO-LITHOGRAPHIC TECHNIQUES</i> , A. Muller <sup>1</sup> , A. Dinescu <sup>1</sup> , G. Konstantinidis <sup>2</sup> , D. Vasilache <sup>1</sup> , M. Dragoman <sup>1</sup> , C. Morosanu <sup>3</sup> , G. Sajin <sup>1</sup> , D. Neculoiu <sup>1</sup> , <sup>1</sup> IMT-Bucharest, Romania, <sup>2</sup> FORTH IESL Heraklion, Crete, Greece, <sup>3</sup> National Inst. of Material Physics (NIMP), Bucharest, Romania.....	255
M2.2	<i>RF MEMS SWITCHES SUPPORTED BY POLYMERIC STRUCTURES</i> , A. Lucibello, E. Proietti, S. Catoni, L. Frenguelli, R. Marcelli, *G. Bartolucci, CNR-IMM, Roma, *Univ. of Roma "Tor Vergata", Italy.....	259
M2.3	<i>TECNOLOGICAL AND DESIGN IMPROVEMENTS FOR RF MEMS SHUNT SWITCHES</i> , F. Giacomo <sup>1</sup> , C. Calaza <sup>1</sup> , S. Colpo <sup>1</sup> , V. Mulloni <sup>1</sup> , A. Collini <sup>1</sup> , B. Margesin <sup>1</sup> , P. Farinelli <sup>2</sup> , F. Casini <sup>2</sup> , R. Marcelli <sup>3</sup> , G. Mannocchi <sup>4</sup> , L. Vietzorreck <sup>5</sup> , <sup>1</sup> MEMS Group, FBK-irst, Trento, <sup>2</sup> Univ. of Perugia, <sup>3</sup> CNR-IMM Roma, <sup>4</sup> Thales Alenia Space, Roma, Italy, <sup>5</sup> Technical Univ. Munchen, Germany.....	263
M2.4	<i>WHICH ARCHITECTURE TO CHOOSE FOR ROBUST RF-MEMS PHASE SHIFTERS?</i> , V. Puyal, D. Dubuc, K. Grenier, C. Bordas, O. Vendier*, J.-L. Cazaux*, LAAS-CNRS, *Alcatel Alenia Space, Toulouse, France.....	267
M2.5	<i>LOW DESIGN OF MICROMACHINED COPLANAR GROUNDED WAVE-GUIDES</i> , G. De Angelis, A. Lucibello, E. Proietti, S. Catoni, R. Marcelli, CNR-IMM Roma, Italy.....	271
M2.6	<i>DIELECTRIC RESONATORS FOR MICROWAVE AND MILLIMETER WAVE APPLICATIONS</i> , L. Nedelcu, M.I. Toacsan, M.G. Banciu, A. Ioachim, INCD-FM, Bucharest, Romania.....	275

**Session M3: RF MEMS, MICROWAVE DEVICES & CIRCUITS****Poster presentations**

M3.1	<i>EFFICIENT HYBRID MODE ANALYSIS OF SHIELDING EFFECT IN ASYMMETRIC COPLANAR STRUCTURE FOR MICROWAVE APPLICATIONS</i> , A. Khodja <sup>1</sup> , H. Baudrand <sup>2</sup> , R. Touhami <sup>1</sup> , M.C.E. Yagoub <sup>3</sup> , <sup>1</sup> USTHB Univ., Algiers, Algeria, <sup>2</sup> ENSEEIHT, Toulouse, France, <sup>3</sup> Univ. of Ottawa, Ontario, Canada.....	281
M3.2	<i>HYBRID-MODE ANALYSIS OF THREE-LEVEL MICROWAVE COUPLERS</i> , C. Boularak, M.L. Tounsi, R. Touhami, M.C.E. Yagoub*, USTHB Univ., Algiers, Algeria, *Univ. of Ottawa, Ontario, Canada.....	285
M3.3	<i>ANTENNAS WITH PREFRACTAL GEOMETRY FOR WIRELESS COMMUNICATIONS</i> , G. Goga, A. Hongu, I. Nicolaescu, M.G. Banciu*, A. Ioachim*, Military Technical Academy, *INCD-FM, Bucharest, Romania.....	289
M3.4	<i>MEMBRANE SUPPORTED ALN FBAR STRUCTURES OBTAINED BY MICROMACHINING OF HIGH RESISTIVITY SILICON</i> , D. Neculoiu <sup>1,4</sup> , D. Vasilache <sup>1</sup> , G. Konstantinidis <sup>2</sup> , C. Morosanu <sup>3</sup> , A. Stavrinidis <sup>2</sup> , A. Kostopoulos <sup>2</sup> , A. Cismaru <sup>1</sup> , C. Buiculescu <sup>1</sup> , I. Petrini <sup>1</sup> , A. Muller <sup>1</sup> , <sup>1</sup> IMT-Bucharest, Romania, <sup>2</sup> FORTH-IESL-MRG Heraklion, Crete, Greece, <sup>3</sup> National Inst. of Material Physics, Bucharest, <sup>4</sup> "Politehnica" Univ. of Bucharest, Romania.....	293
M3.5	<i>AN INNOVATIVE AND VERSATILE TOPOLOGY FOR TUNABLE BANDPASS FILTER</i> , A. Takacs <sup>1,3</sup> , D. Neculoiu <sup>1</sup> , D. Vasilache <sup>1</sup> , A. Muller <sup>1</sup> , P. Pons <sup>2</sup> , H. Aubert <sup>2</sup> , R. Plana <sup>3</sup> , <sup>1</sup> IMT-Bucharest, Romania, <sup>2</sup> LAAS-CNRS, Toulouse, France, <sup>3</sup> ATM Bucharest, Romania.....	297

**Session AM: ADVANCED MATERIALS****Oral presentations**

<b>AM.1</b>	<i>OPTICAL AND MICROSTRUCTURAL PROPERTIES OF SOL-GEL <math>TiO_xN_y</math> THIN FILMS</i> , Chr. Trapalis, T. Giannakopoulou, N. Todorova, C. Anastasescu*, M. Anastasescu*, M. Gartner*, NCSR “Demokritos”, Athens, Greece, *“Ilie Murgulescu” Inst. of Physical Chemistry, Bucharest, Romania.....	303
<b>AM.2</b>	<i>PREPARATION AND MAGNETIC PROPERTIES OF Fe-W AND Ni-W COMPOSITE COATINGS</i> , H. Chiriac <sup>1</sup> , A.E. Moga <sup>1</sup> , C. Gherasim <sup>1,2</sup> , N. Lupu <sup>1</sup> , *National Inst. of Research & Development for Technical Physics, **“Al. I. Cuza” Univ., Iasi, Romania.....	307
<b>AM.3</b>	<i>SINTERING DISTORSION PRODUCED BY DIFFERENCES IN GREEN DENSITY AND SAMPLE SHAPE OF PZT COMPACTED POWDERS</i> , C. Miclea, C. Tanasoiu, I. Spanulescu*, C.F. Miclea, A. Gheorghiu*, L. Amarande, M. Cioangher, L. Trupina, C.T. Miclea*, C. David*, INCD-FM, *Hyperion Univ., Bucharest, Romania.....	311
<b>AM.4</b>	<i>COPRECIPITATION SYNTHESIS OF Ag-DOPED ZnO NANOPOWDERS</i> , A.O. Cadar, C. Roman, L. Gagea, B.A. Matei*, I. Cernica*, Research Inst. for Analytical Instrumentation (ICIA), Cluj-Napoca, *IMT-Bucharest, Romania.....	315
<b>AM.5</b>	<i>SOME CONTRIBUTIONS TO THE UNDERSTANDING OF THE PUZZLE OF PHYSICAL PROCESSES OF DEGRADATION IN IRRADIATED SILICON</i> , S. Lazanu, I. Lazanu*, M.L. Ciurea, *INCD-FM, *Univ. of Bucharest, Romania.....	319
<b>AM.6</b>	<i>SYNTHESIS AND CHARACTERIZATION OF SOME FUNCTIONAL POLYIMIDES</i> , C. Hulubei, E. Hamciuc, M. Bruma, A. Muller*, “Petru Poni” Inst. of Macromolecular Chemistry, Iasi, *IMT- Bucharest, Romania.....	323
<b>AM.7</b>	<i>ZnO MICRO/NANO STRUCTURES BY MOCVD AND VAPOUR TRANSPORT TECHNIQUE : GROWTH AND CHARACTERIZATION</i> , E. Rusu <sup>1</sup> , A. Burlacu <sup>1</sup> , V. Ursaki <sup>1</sup> , G. Stratan <sup>1</sup> , M. Purica <sup>2</sup> , E. Budianu <sup>2</sup> , E. Monaico <sup>3</sup> , <sup>1</sup> Inst. of Applied Physics, Chisinau, Moldova, <sup>2</sup> IMT-Bucharest, Romania, <sup>3</sup> Technical Univ. of Moldova, Chisinau, Moldova.....	327

**Session M&N: MATERIALS FOR MICRO AND NANO SCALE****Poster presentations**

<b>M&amp;N.1</b>	<i>GAS-SENSING BY POLYMER-IRON NANOCOMPOSITE MATERIALS</i> , A. Tomescu, C.E. Simion, R. Alexandrescu*, I. Morjan*, M. Scarisoreanu*, National Inst. of Materials Physics, *INFLPR, Bucharest, Romania.....	333
<b>M&amp;N.2</b>	<i>THE INFLUENCE OF THE WETTING LAYER MORPHOLOGY ON THE NUCLEATION AND THE EVOLUTION OF InAs/GaAs (001) QUANTUM DOTS</i> , O. Bute, Gh.V. Cimpoca, E. Placidi*, F. Arciprete*, F. Patella*, M. Fanfoni*, A. Balzarotti*, “Valahia” Univ. of Targoviste, Romania, *Univ. of Roma “Tor Vergata”, Roma, Italy.....	337
<b>M&amp;N.3</b>	<i>INVESTIGATION OF ZnO NANOSTRUCTURES PREPARED BY CHEMICAL DEPOSITION AND RAPID PHOTO-THERMAL PROCESSING TECHNOLOGY</i> , O. Lupan <sup>1,2</sup> , S. Shishyanu <sup>1</sup> , L. Chow <sup>2</sup> , T. Shishyanu <sup>1</sup> , V. Sontea <sup>1</sup> , E. Monaico <sup>3</sup> , A. Schulte <sup>2</sup> , S. Park <sup>2</sup> , <sup>1</sup> Department of Microelectronics and Semiconductor Devices, Technical Univ. of Moldova, <sup>2</sup> Univ. of Central Florida, Orlando, FL, USA, <sup>3</sup> National Center for Materials Study and Testing, Technical Univ. of Moldova, Chisinau, Moldova.....	341
<b>M&amp;N.4</b>	<i>NANOSTRUCTURED SILICON FOR OPTICAL BIOSENSORS</i> , M. Miu, I. Kleps, L. Pavese*, F. Craciunoiu, T. Ignat, A. Dinescu, M. Simion, IMT-Bucharest, Bucharest, Romania,*Univ. of Trento, Povo, Italy.....	345

M&N.5	EFFECT OF Sn DOPANT ON THE PROPERTIES OF ZnO NANOROD ARRAYS, O. Lupan <sup>1,2</sup> , L. Chow <sup>2</sup> , V. Ursaki <sup>3</sup> , E. Monaico <sup>4</sup> , I. Tiginyanu <sup>3</sup> , S. Shishiyaru <sup>1</sup> , T. Shishiyaru <sup>1</sup> , S. Park <sup>2</sup> , A. Schulte <sup>2</sup> , <sup>1</sup> Department of Microelectronics and Semiconductor Devices, Technical Univ. of Moldova, <sup>2</sup> Univ. of Central Florida, Orlando, FL, USA. <sup>3</sup> Inst. of Applied Physics, <sup>4</sup> National Center for Materials Study and Testing, Technical Univ. of Moldova, Chisinau, Moldova.....	349
M&N.6	AN XPS STUDY ON N DOPED TiO <sub>2</sub> SOL-GEL THIN FILMS, P. Osiceanu, M. Anastasescu, C. Anastasescu, C. Trapalis*, T. Giannakopoulou*, N. Todorova*, "Ilie Murgulescu" Inst. of Physical Chemistry, Bucharest, Romania, *NCSR "Demokritos", Athens, Greece.....	353
M&N.7	AROMATIC POLYIMIDES CONTAINING CYANO SUBSTITUENTS FOR HIGH PERFORMANCE APPLICATIONS, E. Hamciuc, I. Bacosa, M. Bruma, M. Ignat*, "Petru Poni" Inst. of Macromolecular Chemistry, Iasi, *INCDIE ICPE-CA, Bucharest, Romania.....	357
M&N.8	FLUORINATED HETEROCYCLIC POLYIMIDES FOR POTENTIAL USE IN RF MEMS DEVICES, M. Bruma, I. Sava, E. Hamciuc, C. Hamciuc, C. Buiculescu*, "Petru Poni" Inst. of Macromolecular Chemistry, Iasi, *IMT-Bucharest, Romania.....	361
M&N.9	HYDROXY - FUNCTIONALIZED POLYIMIDES AS MATERIALS FOR ADVANCED APPLICATIONS, E. Hamciuc <sup>1</sup> , M. Bruma <sup>1</sup> , B. Schulz <sup>2</sup> , M. Szczesztay <sup>3</sup> , G. Telipan <sup>4</sup> , <sup>1</sup> "Petru Poni" Inst. of Macromolecular Chemistry, Iasi, Romania, <sup>2</sup> Inst. for Thin Film Technology and Microsensors, Teltow, Germany, <sup>3</sup> Chemical Research Center, Budapest, Hungary, <sup>4</sup> INCDIE ICPE-CA, Bucharest, Romania.....	365
M&N.10	PHOTOCROMIC BEHAVIOR OF NEW AZO-POLYIMIDES, I. Sava, A.-M. Rezmerita*, N. Hurduț*, "Petru Poni" Inst. of Macromolecular Chemistry, *Technical Univ. "Gh. Asachi", Iasi, Romania.....	369
M&N.11	THE DEVELOPMENT OF CRYSTALLINE Sb <sub>2</sub> S <sub>3</sub> THIN FILMS AS BUFFER LAYER OR AS ABSORBER MATERIAL FOR THREE-DIMENSIONAL (3D) SOLAR CELLS, S.A. Manolache, A. Duta, Transilvania Univ. of Brasov, Romania.....	373
M&N.12	X-RAY LUMINESCENCE IN ZnIn <sub>2</sub> S <sub>4</sub> , CdGa <sub>2</sub> S <sub>4</sub> AND Zn <sub>2</sub> In <sub>2</sub> S <sub>6</sub> , A. Machuga <sup>1</sup> , R. Radu <sup>1</sup> , V. Pintea <sup>1</sup> , E. Arama <sup>2</sup> , V. Zhitar <sup>3</sup> , T. Shemyakova <sup>3</sup> , <sup>1</sup> Technical Univ. of Moldova, <sup>2</sup> "N. Testemitsu" Medical Univ. of Moldova, <sup>3</sup> Inst. of Applied Physics, Chisinau, Moldova.....	377
M&N.13	NANO-METROLOGY BETWEEN NECESSITY AND REALITY, D. Apostol, P.C. Logofatu, R. Müller*, INFPLR, Bucharest, *IMT-Bucharest, Romania.....	381

#### Session D: ADVANCED DEVICES AND STRUCTURES

##### Oral presentations

INVITED PAPER	VERTICAL MOSFETs FOR HIGH PERFORMANCE, LOW COST CMOS, S. Hall, L. Tan, O. Buiu, M.M. Hakim*, T. Uchino*, P. Ashburn*, W. Redman-White*, Univ. of Liverpool, *Univ. of Southampton, UK.....	387
INVITED PAPER	SMALL SLOPE MICRO/NANO-ELECTRONIC SWITCHES, A. M. Ionescu, K. Boucart, K.E. Moselund, V. Pott, D. Tsamados, Ecole Polytechnique Fédérale de Lausanne, Switzerland.....	397
D.1	ONE DIMENSIONAL MODEL FOR THE DURATION OF THE HIGH BREAKDOWN PHASE IN DEEP DEPLETION POWER DEVICES, E. Napoli, Univ. of Napoli Federico II, Italy.....	403
D.2	A SINGLE POLY CMOS PROCESS EVALUATION FOR FLOATING GATE APPLICATIONS, M. Badila, T. Dunca, P. Cosmin, Catalyst Semiconductor Inc., CA, USA.....	407
D.3	FABRICATION OF DIAMOND BASED SCHOTTKY BARRIER DIODES WITH OXIDE RAMP TERMINATION, G. Brezeanu <sup>1</sup> , M. Avram <sup>2</sup> , M. Brezeanu <sup>3</sup> , C. Boianceanu <sup>1</sup> , F. Udrea <sup>3</sup> , G.A.J. Amaralunga <sup>3</sup> , <sup>1</sup> "Politehnica" Univ. of Bucharest, <sup>2</sup> IMT-Bucharest, Romania, <sup>3</sup> Univ. of Cambridge, UK.....	411

D.4	<i>Si DIODE TEMPERATURE SENSOR BEYOND 300°C</i> , S. Santra, P.K. Guha, M.S. Haque, S.Z. Ali, F. Udrea, Univ. of Cambridge, UK.....	415
D.5 #	<i>ENSEMBLE MONTE CARLO SIMULATION OF A PSEUDOMORPHIC HEMT STRUCTURE</i> , C. Amza, I. Cimpian*, M.D. Profirescu*, ATC ROM S.R.L., Bucharest, **"Politehnica" Univ. of Bucharest, Romania.....	419

**Session IC1: LOW POWER, HIGH SPEED ANALOG ICs 1**

**Oral presentations**

IC1.1	<i>ARCHITECTURE CONSIDERATIONS FOR 60 GHz PULSE TRANSCEIVER FRONT-ENDS</i> , M. Kraemer <sup>1,2</sup> , A. Lecointre <sup>1,2</sup> , D. Dragomirescu <sup>1,2</sup> , R. Plana <sup>1</sup> , <sup>1</sup> LAAS-CNRS, Univ. of Toulouse, <sup>2</sup> INSA Toulouse, France.....	425
IC1.2	<i>TECHNIQUES OF TEMPERATURE COMPENSATION IN A RC OSCILLATOR</i> , M. Sararoiu, J. Fehle*, Infineon Technologies Romania, Bucharest, Romania, *Infineon Technologies, Villach, Austria.....	429
IC1.3	<i>LOW POWER CURRENT MODE POLY-SILICON TFT DIGITAL CIRCUIT DESIGN METHOD FOR HIGH SPEED SOP COMPONENTS</i> , J.-C. Lee, M.-P. Hong*, J.Y. Jeong*, Mixed IC Design Div., SELOCO Inc., Seoul, *Univ. of Suwon, Kyongki, Korea.....	433
IC1.4	<i>1.5A DDR2 TERMINATION REGULATOR</i> , C. Stanescu, G. Aungurenci*, F. Franc*, G. Voicu*, Catalyst Semiconductor Romania SRL, Bucharest, Romania, *Catalyst Semiconductor Inc., Sunnyvale, USA.....	437
IC1.5	<i>AREA EFFICIENT CHARGE PUMP DESIGN WITH CONSTANT OUTPUT POWER OVER THE WHOLE SUPPLY RANGE</i> , D. Dinu, H. Gietler*, Infineon Technologies Romania, Bucharest, Romania, *Infineon Technologies Austria, Villach, Austria.....	441

**Session IC2: LOW POWER, HIGH SPEED ANALOG ICs 2**

**Oral presentations**

IC2.1	<i>VOLTAGE FEEDBACK OPERATIONAL AMPLIFIER DC OPEN LOOP GAIN NONLINEARITY MEASUREMENTS SPICE SET-UP</i> , C. Neacsu, V. Chesaru, C. Dan*, M. Bodea*, O2 Micro Romania, Bucharest, **"Politehnica" Univ. of Bucharest, Romania.....	447
IC2.2	<i>HIGH FREQUENCY PROGRAMMABLE WIDE-BAND FREQUENCY DIVIDER DESIGN FOR CMOS SOFTWARE DEFINED RADIO TRANSCIVERS</i> , S. Spiridon, F. Agavriolea, M. Serban, AsicAhead International SRL, Bucharest, Romania.....	451
IC2.3	<i>BEHAVIOR MODELLING APPLICATION FOR AUTOMOTIVE INDUSTRY</i> , C. Dolea, A. Mocanu*, Infineon Technologies Romania, Bucharest, **"G. Asachi" Technical Univ., Iasi, Romania.....	455
IC2.4	<i>OPTIMAL HARDWARE IMPLEMENTATION OF A FEEDFORWARD NEURAL NETWORK TOPOLOGY USING A GENETIC ALGORITHM FOR PRUNNING</i> , C.I. Vizitiu, A. Radu, T. Oroian, C. Molder, Military Technical Academy, Bucharest, Romania.....	459
IC2.5	<i>BURST MODE SWITCHING MECHANISM FOR AN INDUCTORLESS DC-DC CONVERTER</i> , M. Budaes, L. Goras, „Gh. Asachi” Technical Univ. Iasi, Romania.....	463
IC2.6	<i>A 10GHz UWB CMOS LNA</i> , C.M. Pavaluta, Infineon Technologies Romania, Bucharest, Romania.....	467

# Student Paper

**Session D&IC: DEVICES AND ICs**  
**Poster presentations**

<b>D&amp;IC.1</b>	<i>LASER TRIMMING MODELING OF THIN FILM INTEGRATED RESISTORS, A. Manolescu, A.M. Manolescu, "Politehnica" Univ. of Bucharest, Romania.....</i>	473
<b>D&amp;IC.2</b>	<i>MODIFIED SOI-MOSFET STRUCTURE WITH SHALLOWS DIFFUSIONS, C. Ravariu, A. Rusu, F. Ravariu*, "Politehnica" Univ. of Bucharest, *IMT-Bucharest, Romania.....</i>	477
<b>D&amp;IC.3</b>	<i>CALCULATION OF THE DEPLETION REGION WIDTH AND BARRIER CAPACITANCE OF DIFFUSED SEMICONDUCTOR JUNCTIONS WITH APPLICATION TO REACH-THROUGH BREAKDOWN VOLTAGE OF SEMICONDUCTOR DEVICES WITH DIFFUSED BASE, M.J. Cristea, "Politehnica" Univ. of Bucharest, Romania.....</i>	481
<b>D&amp;IC.4</b>	<i>THE VOLTAGE DEPENDENCE OF REVERSE CURRENT OF SEMICONDUCTOR PN JUNCTIONS AND ITS DISTRIBUTION OVER THE DEVICE AREA, V.V.N. Obreja, IMT-Bucharest, Romania.....</i>	485
<b>D&amp;IC.5</b>	<i>ON THE TUNING POSSIBILITIES OF AN RF BANDPASS FILTER WITH SIMULATED # INDUCTOR, C. Andriesei, L. Goras, Faculty of Electronics and Telecommunications, Iasi, Romania.....</i>	489
<b>D&amp;IC.6</b>	<i>ELECTRO-THERMAL SIMULATION ENVIRONMENT FOR DIGITAL ICs, V. Moleavin, # M.D. Profirescu*, Microchip Developoment Romania, Bucharest, *“Politehnica” Univ. of Bucharest, Romania.....</i>	493
<b>D&amp;IC.7</b>	<i>A PROCEDURE BASED ON THE ANOVA METHOD FOR ESTIMATING THE MAXIMUM # NUMBER OF GENERATIONS FOR OPTIMIZATION GENETIC ALGORITHMS, I. Codreanu, IMT-Bucharest, Romania.....</i>	497
<b>D&amp;IC.8</b>	<i>STACKS OR FILE-REGISTERS IN CELLULAR COMPUTING ?, M. Stoian, G. Stefan, "Politehnica" Univ. of Bucharest, Romania.....</i>	501
<b>D&amp;IC.9</b>	<i>DESIGN ASPECTS FOR GATE DRIVER OF POWER SWITCH, C. Ionascu, Infineon Technologies Romania SCS, Bucharest, Romania.....</i>	505
<b>D&amp;IC.10</b>	<i>VLSI IMPLEMENTATION OF HIGH-SPEED CELLULAR AUTOMATA ENCRYPTION ALGORITHM, P. Anghelescu, E. Sofron, S. Ionita, Univ. of Pitesti, Romania.....</i>	509
<b>D&amp;IC.11</b>	<i>PROTECTION FUNCTIONS IN INTEGRATED LOW SIDE SWITCHES, A. Danchiv, Infineon Technologies Romania, Bucharest, Romania.....</i>	513
<b>D&amp;IC.12</b>	<i>CMOS DIFFERENTIAL STRUCTURE WITH IMPROVED LINEARITY AND INCREASED FREQUENCY RESPONSE, C. Popa, A.M. Manolescu, "Politehnica" Univ. of Bucharest, Romania.....</i>	517
<b>D&amp;IC.13</b>	<i>TWO BEAMS MODIFIED LEMNISCATE UNDULATOR, S. Miclos<sup>1</sup>, M.I. Rusu<sup>1</sup>, D. Tenciu<sup>1</sup>, V. Savu<sup>1</sup>, L. Giurgiu<sup>2</sup>, F. Scarlat<sup>3</sup>, V.I.R. Niculescu<sup>3</sup>, <sup>1</sup>National Inst. of R&amp;D for Optoelectronics INOE-2000, <sup>2</sup>Univ. of Bucharest, <sup>3</sup>INFPLR, Bucharest, Romania.....</i>	521
<b>D&amp;IC.14</b>	<i>SOFTWARE SIMULATION AND PERFORMANCE ANALYSIS FOR TURBO ENCODING/DECODING CHIP COMPONENTS FOR MAGNETIC RECORDING CHANNELS, P.M. Putinica, St. Stancescu, "Politehnica" Univ. of Bucharest, Romania.....</i>	525
<b>D&amp;IC.15</b>	<i>APPLICATION OF A NEW BODY CONTACT TO SOI LD莫斯FET DEVICES, THREE-DIMENSIONAL SIMULATION, A. Daghighi, M.A. Osman*, Islamic Azad Univ. Isfahan, Iran, *Washington State Univ., Pullman, WA, USA.....</i>	529
<b>D&amp;IC.16</b>	<i>A SELF-CONSISTENT MODELING OF 4H-SiC SCHOTTKY BARRIER DIODES, M.B. Tayel, A.M. El-Shawarby, Alexandria Univ., Egypt.....</i>	533
<b>D&amp;IC.17</b>	<i>LOW-POWER CARRY LOOK-AHEAD ADDER WITH MULTI-THRESHOLD VOLTAGE CMOS TECHNOLOGY, J.B. Kim, D.W. Kim*, Kangwon National Univ., *Samsung SDI Co., Ltd, Korea.....</i>	537

# Student Paper

**Session S: STUDENTS PAPER**

**Oral presentations**

S.1	<i>MHz OSCILLATOR BASED ON VIBRATING GATE MOS TRANSISTOR</i> , Al. Rusu, M. Mazza*, Y.S. Chauhan*, A.M. Ionescu*, "Politehnica" Univ. of Bucharest, Romania, *Ecole Polytechnique Federale de Lausanne, Switzerland.....	543
S.2	<i>AN AVERAGING SMALL-SIGNAL MODEL FOR A DC-DC SWITCHED CONVERTER</i> , M. Budaes, L. Goras, „Gh. Asachi” Technical Univ., Iasi, Romania.....	547
S.3	<i>EXPERIMENTAL VALIDATION OF A SIMPLE ANALYTICAL MODEL FOR THE ELECTRICAL BEHAVIOUR OF NANOSCALE MOSFETS</i> , A. Sevcenco, G. Brezeanu, M. Badila*, F. Draghici, I. Rusu, A Visoreanu, “Politehnica” Univ. of Bucharest, Romania, *Catalyst Semiconductor, Santa Clara, CA, USA.....	551
S.4	<i>NON INVERTING DIFFERENTIAL ASYMMETRICAL CMOS COMPARATOR WITH INTRINSIC HYSTERESIS AND ADJUSTABLE ASYMMETRY</i> , R. Ionescu, O. Mita, F. Vladoiyanu*, G. Brezeanu, “Politehnica” Univ. of Bucharest, *Atmel Romania S.R.L., Bucharest, Romania.....	555
S.5	<i>DESIGN AND FABRICATION OF NEW MICROFLUIDIC VALVES</i> , M.A. Avram, M. Avram, IMT-Bucharest, Romania.....	559
S.6	<i>NOISE IN CMOS LDOS</i> , O. Profirescu <sup>2</sup> , C. Dinca <sup>1</sup> , C. Stanescu <sup>1</sup> , <sup>1</sup> Catalyst Semiconductor Romania S.R.L., Bucharest, <sup>2</sup> “Politehnica” Univ. of Bucharest, Romania.....	563
S.7	<i>ANALYSIS OF DISPLACEMENTS OF A POLYMERIC MICROGRIPPER</i> , R. Voicu, C. Tibeica, L. Eftime, R. Muller, IMT-Bucharest, Romania.....	567
S.8	<i>AN ANALYSIS ON DIGITAL MODULATION TECHNIQUES FOR SOFTWARE DEFINED RADIO APPLICATIONS</i> , A. Tarniceriu, B. Iordache, S. Spiridon*, “Politehnica” Univ. of Bucharest, *AsicAhead International SRL, Bucharest, Romania.....	571
S.9	<i>PERCOLATION PHENOMENA IN SILICON – BASED NANOCRYSTALLINE SYSTEMS</i> , A.M. Lepadatu, E. Rusnac, I. Stavarache, INCDFM, Bucharest, Romania.....	575