



Strasbourg (France)

E-MRS Spring Meeting 2004  
May 24-28, 2004

## SYMPOSIUM A1

Si-based photonics:  
towards true monolithic integration

### Symposium Organizers:

Richard Rizk, SIFCOM, ENSICAEN, Caen, France

Philippe M. Fauchet, University of Rochester, USA

Donald S. Gardner, INTEL Corporation, USA

Francesco Priolo, University of Catania, Italy

Papers will be published in Optical Materials

# E-MRS 2004 SPRING MEETING

## SYMPOSIUM A1

Tuesday, May 25, 2004

Morning

Session I : Active Si-based devices

Session Chair: R. Rizk and N. Dalosso

	8:50		Opening address
<b>A1-I.1</b>	9:00	-Invited-	<b>MANIPULATING LIGHT ON A Si CHIP</b> <b>Michal Lipson</b> , School of Electrical and Computer Engineering, Cornell University, Ithaca NY, USA
<b>A1-I.2</b>	9:30		<b>ROOM TEMPERATURE LASER OPERATION OF STRAINED InGaAs/GaAs QW STRUCTURE MONOLITHICALLY GROWN BY MOCVD ON LE-PECVD Ge/Si VIRTUAL SUBSTRATE</b> <u>L. Sagnes</u> (a), Y. Chriqui(a), G. Saint-Girons(a), G. Isella(b), H. von Kaenel(b), S. Boucoule(a), (a)Laboratoire de Photonique et de Nanostructures L.P.N., CNRS UPR20, Route de Nozay, 91460 Marcoussis, France, (b)INFN and L-NESS, Dipartimento di Fisica del Politecnico di Milano Via Anzani 52, 22100 Como, Italy
<b>A1-I.3</b>	9:50		<b>DEVICE DESIGN AND FABRICATION FOR A Si/SiGe TERAHERTZ QUANTUM CASCADE LASER</b> <u>R.W. Kelsall</u> (a), Z. Ikonc(a), P. Harrison(a), S.A. Lynch(b), P. Townsend(b), D.J. Paul(b), D.J. Norris(c), S.L. Liew(c), A.G. Cullis(c), J. Zhang(d) and H.S. Gamble(e), (a)Institute of Microwaves and Photonics, The University of Leeds, (b)Cavendish Laboratory, The University of Cambridge, (c)Dept. of Electronic & Electrical Eng., The University of Sheffield, (d)Dept. of Physics, Imperial College, (e)School of Electrical and Electronic Eng., Queens University, Belfast, U.K.
<b>A1-I.4</b>	10:10		<b>STATUS OF OPTICAL GAIN WITH SILICON NANOCRYSTALS</b> <u>P.M. Fauchet</u> , J. Ruan and H. Chen, University of Rochester, USA, L. Pavesi, M. Cazzanelli and L. Dal Negro, University of Trento, Italy, R.G. Elliman, N. Smith, M. Samoc and B. Luther-Davies, Australian National University, Canberra, Australia
<b>A1-I.5</b>	10:30		<b>OPTICAL GAIN IN NANOCRYSTALLINE SILICON: COMPARISON OF PLANAR WAVEGUIDE GEOMETRY WITH A NON-WAVEGUIDING ENSEMBLE OF NANOCRYSTALS</b> <u>K. Luterova</u> , I. Pelant, and K. Dohnalova, Institute of Physics, Cukrovarnicka 10, 162 53 Praha 6, Czech Republic, J. Valenta, Charles University, Ke Karlovu 3, 121 16 Praha 2, Czech Republic, M. Cazzanelli and L. Pavesi, Università di Trento, Via Sommarive 14, 38050 Povo, Italy, J.-P. Likforman, P. Gilliot, B. Hönerlage and T. Ostatnický, IPCMS, B.P. 43, 23 rue du Loess, 67034 Strasbourg Cedex 2, France, S. Cheylan, Australian National University, Canberra ACT 0200, Australia
	10:50		<b>BREAK</b>

Session II : Light modulation and infrared photodetection

Session Chair: D. Gardner, P. Boucaud

<b>A1-II.1</b>	11:10	-Invited-	<b>MATERIALS CHALLENGES IN DESIGN OF A GIGAHERTZ SILICON OPTICAL MODULATOR BASED ON A METAL-OXIDE-SEMICONDUCTOR CAPACITOR</b> <b>Dean Samara-Rubio</b> , Ling Liao, Ansheng Liu, Richard Jones, Mike Morse, Intel Corporation, 2200 Mission College Blvd, CHP3-109, Santa Clara CA 95054, USA, and Doron Rubin, Oded Cohen, Intel Corporation, S.B.I. Park Har Hotzvim, Jerusalem, 91031, Israel
<b>A1-II.2</b>	11:40		<b>MID/FAR-INFRARED DETECTION USING A MESFET WITH MODULATION DOPED Ge-DOT/SiGe-WELL MULTIPLE STACKS IN THE CHANNEL REGION</b> B. Adnane, E. Dawi, M. Zhao, A. Elfving, B. Magnusson, G. Hansson and <u>W.-X. Ni</u> , Dept. of Physics, Linköping University, 581 83 Linköping, Sweden
<b>A1-II.3</b>	12:00		<b>MODULATION OF SENSITIZED ERBIUM EMISSION IN SI OPTICAL NANOCRYSTAL MEMORIES</b> <u>Robert J. Walters</u> (a), Harry A. Atwater(a), Albert Polman(a,b), George I. Bourianoff(c), (a)Caltech, Pasadena CA, USA, (b)FOM-AMOLF, Amsterdam, The Netherlands, (c)Intel Corporation, Portland OR, USA
<b>A1-II.4</b>	12:20		<b>Ge-QUANTUM DOT/SiGe-QUANTUM WELL SUPERLATTICE FOR NEAR INFRARED PHOTO-DETECTION</b> <u>A. Elfving</u> , G.V. Hansson and W.-X. Ni, Dept. of Physics, Linköping University, -581 83 Linköping, Sweden
	12:40		<b>LUNCH</b>

Tuesday, May 25, 2004

Afternoon

Session III : Er-Si coupling

Session Chair: T. Gregorkiewicz and F. Priolo

- A1-III.1** 14:00 -Invited- PHOTOLUMINESCENCE PROPERTIES OF RARE-EARTH IONS AND/OR SHALLOW IMPURITIES DOPED SILICON NANOCRYSTALS  
**Minoru Fujii**, Yuji Takase, Kenji Imakita, Yasuhiro Yamaguchi, and Shinji Hayashi, Department of Electrical & Electronics Engineering, Faculty of Engineering, Kobe University, Rokkodai, Nada, Kobe 657-8501, Japan
- A1-III.2** 14:30 -Invited- FABRICATION AND OPTICAL PROPERTIES OF UNDOPED AND Er-DOPED MULTILAYERS Si-rich SiO<sub>2</sub>/SiO<sub>2</sub>: SIZE CONTROL, OPTIMUM Er-Si COUPLING AND INTERACTION DISTANCE MONITORING  
**F. Gourbilleau**, C. Dufour, R. Rizk. SIFCOM, UMR CNRS 6176, ENSICAEN, 6 Bd MI-Juin, 14050 Caen Cedex, France
- A1-III.3** 15:00 ERBIUM-SILICON-OXIDE CRYSTALLINE FILMS PREPARED BY MOMBE  
**H. Isshiki**, K. Masaki, and T. Kimura, Department of Electronic Engineering, Univ. of Electro-Communications, Tokyo 182-8585, Japan
- A1-III.4** 15:20 TIME DEPENDENCE AND EXCITATION SPECTRA OF THE PHOTOLUMINESCENCE EMISSION AT 1.5 MICRON IN Si-NC AND Er CO-DOPED GLASSES  
**M. Falconieri**, ENEA, C.R Casaccia, via Anguillarese 301, 00060 Roma, Italy, E. Borsella, ENEA, C.R. Frascati via E. Fermi 45, 00044 Frascati (Roma), Italy, F. Enrichi, INFN, Dip. Fisica Univ. Padova, via Marzolo 8, 35131 Padova, Italy, G. Franzò, F. Priolo, INFN, Dip. Fisica e Astronomia Univ. Catania, via S. Sofia 64, 95123 Catania, Italy, F. Gourbilleau, R. Rizk, ENSICAEN, SIFCOM UMR-CNRS 6176, 6 Bd Marechal Juin, 14050 Caen, France, F. Iacona, CNR-IMM, Stradale Primosole 50, 95121 Catania, Italy
- A1-III.5** 15:40 ULTRA-LOW-THRESHOLD ERBIUM-IMPLANTED TOROIDAL MICROLASER ON SILICON  
**T.J. Kippenberg**(a), B. Min(a), J. Kalkman(b), and K.J. Vahala(a) and A. Polman(a,b), (a)Caltech, Pasadena, USA, (b)AMOLF, Amsterdam, The Netherlands
- 16:00 **BREAK**

Session IV : Monolithic integration

Session Chair: U. Gösele and M. Lipson

- A1-IV.1** 16:20 -Invited- Ge ISLANDS AND PHOTONIC CRYSTALS FOR SI-BASED PHOTONICS  
**P. Boucaud**, M. El Kurdi, S. David, C. Kammerer, X. Li, S. Sauvage, V. Le Thanh, D. Bouchier, J.-M. Lourtioz, Institut d'Electronique Fondamentale, Université Paris XI, 91405 Orsay, France, O. Kermarrec, Y. Campidelli, D. Bensahel STMicroelectronics, 850 Rue Jean Monnet, 38926 Crolles Cedex, France
- A1-IV.2** 16:50 ELEMENTARY DEVICES, CIRCUITS AND PROCESSES FOR A MONOLITHIC Si/ III-V-N OEIC  
**H. Yonezu**, Y. Furukawa, H. Abe, Y. Yoshikawa, S.-Y. Moon, A. Utsumi, Y. Yoshizumi, Toyohashi University of Technology, 1-1 Hibarigaoka, Tempaku-cho, Toyohashi, Aichi 441-8580, Japan and M. Ohtani, Nara National College of Technology, 22 Yada-cho, Yamatokohriyama, Nara 639-1080, Japan
- A1-IV.3** 17:10 MICRORING AND MICRODISK RESONATORS USING SILICON AND ERBIUM PREPARED USING SILICON TECHNOLOGY  
**Donald S. Gardner**, Circuits Research, Microprocessor Technology Labs, Intel Corp., Santa Clara CA 95052, and **Mark L. Brongersma**, Materials Science, Stanford University, Stanford CA 94305, USA
- A1-IV.4** 17:30 INTEGRATED MICROLENS REFLECTOR AND LIGHT COUPLER  
**M. Nathan**, School of Electrical Engineering, Department of Physical Electronics, Tel Aviv University, Tel Aviv 69978, Israel
- A1-IV.5** 17:50 MICROARRAYS OF SILICON-BASED LIGHT EMITTERS FOR NOVEL BIOSENSOR AND LAB-ON-A-CHIP APPLICATIONS  
**L. Rebohle**, **T. Gebel**, R.A. Yankov, W. Skorupa, Nanoparc GmbH, Bautzner Landstr. 45, 01454 Dresden-Rossendorf, Germany and Institute of Ion Beam Physics and Materials Research, FZ Rossendorf, POB 510119, 01314 Dresden, Germany
- 18:10 – 20:00 **Poster Session I**

- A1-PI.1** ENHANCEMENT OF PHOTORESPONSE PROPERTIES OF BETA-FeSi<sub>2</sub>/Si HETEROJUNCTIONS BY Al DOPING  
Yoshihito Maeda(a) and Yosikazu Terai(b), (a)Department of Energy Science and Technology, Kyoto University, (b)Department of Materials Sciences, Osaka Prefecture University, Japan
- A1-PI.2** TWO- AND MULTI-TERMINAL CMOS/BICMOS Si LED'S  
M. du Plessis, H. Aharoni\* and L.W. Snyman\*\*, Carl and Emily Fuchs Institute for Microelectronics, CEFIM, University of Pretoria, Pretoria, South Africa, \*Visiting professor from the Ben Gurion University of the Negev, Beer Sheba, Israel, \*\*Currently at the Dept. of Electronic Engineering, Tshwane University of Technology, Pretoria, South Africa
- A1-PI.3** OSIP: OPTICAL SIGNAL AND IMAGE PROCESSING DEVICE OPTIMIZED FOR OPTICAL READOUT  
M. Vieira, M. Fernandes, P. Louro, C. Mendes, A. Fantoni, R. Schwarz, Electronics Telecommunications and Computer Dept, ISEL, Lisbon, Portugal, Yuriy Vygranenko, Univ. Waterloo, Canada
- A1-PI.4** FLEXIBLE IMAGING DEVICES  
P. Louro, A. Fantoni, M. Fernandes, C. Mendes, R. Schwarz, M. Vieira, Electronics Telecommunications and Computer Dept, ISEL, Lisbon, Portugal, M. Schubert, Institut für Physikalische Elektronik, Universität Stuttgart, Pfaffenwaldring 47, 70569, Stuttgart, Germany
- A1-PI.5** PHOTOLUMINESCENCE ENHANCEMENT IN IMPURITY DOPED BETA-FeSi<sub>2</sub>  
Yosikazu Terai(a), Yoshihito Maeda(b), (a)Department of Materials Sciences, Osaka prefecture University, Japan, (b)Department of Energy Science and Technology, Kyoto University, Japan
- A1-PI.6** NANOSTRUCTURING SI MATERIALS THROUGH COMPUTATION  
R.Q. Zhang, Center Of Super-Diamond and Advanced Films (COSDAF) & Department of Physics and Materials Science, City University of Hong Kong, Hong Kong S.A.R., China
- A1-PI.7** ROOM TEMPERATURE PHOTO- AND ELECTRO-LUMINESCENCE FROM SI/GE MULTILAYER STRUCTURE DOPED BY SB.  
N. Zakharov, V. Talalaev, P. Werner, Max-Planck-Institut für Mikrostrukturphysik, Weinberg 2, 06120 Halle(Saale), Germany and G.E. Cirlin, A. Tonkikh, A.F.Ioffe Physico-Technical Institute RAS, Polytechnicheskaya 26, 194021 St.Petersburg, Russia
- A1-PI.8** MATERIAL AND OPTICAL PROPERTIES OF GaAs GROWN ON (001) Ge/Si PSEUDO-SUBSTRATE FOR THE MONOLITHIC INTEGRATION OF LIGHT EMITTING DEVICES ON SILICON.  
Y. Chriqui(a), L. Largeau(a), G. Patriarche(a), G. Saint-Girons(a), S. Bouchoule(a), D. Bensahel(b), Y. Campidelli(b), O. Kermairec(b), I. Sagnes(a), (a) Laboratoire de Photonique et Nanostructures, LPN-CNRS / UPR 20, Route de Nozay, 91460 Marcoussis France, (b) STMicroelectronics, 850 Rue Jean Monnet, 38926 Crolles Cedex, France
- A1-PI.9** THE PUZZLING QUESTION OF THE EXCITATION TRANSFER MECHANISM IN ERBIUM-DOPED SILICON NANOCRYSTALS  
A.J. Kenyon and F. Lucarz, Department of Electronic & Electrical Engineering, University College London, Torrington Place, London WC1E 7JE, U.K.
- A1-PI.10** LUMINESCENCE AND CHARGE STORAGE CHARACTERISTICS OF Ge NANOCRYSTALS EMBEDDED IN SiO<sub>2</sub> MATRIX  
S.K. Ray, K. Das and A. Dhar, Department of Physics & Meteorology IIT Kharagpur 721 302, India
- A1-PI.11** OPTICAL AND ACOUSTIC PHONON MODES IN SiGe QD's SUPERLATTICES: EXPERIMENTAL AND THEORETICAL STUDY  
M.Ya. Valakh, V.M. Dzhagan, V.P. Klado, A.M. Yaremko, V.O. Yuhymchuk, Lashkaryov Institute of Semiconductor Physics, NAS of Ukraine, Prospekt Nauki 45, 03028 Kyiv, Ukraine, A.G. Milekhin, Institute of Semiconductor Physics, RAS, 630090 Novosibirsk, Russia, N. Mestres, Institut de Ciencia de Materials de Barcelona, CSIC, 08193 Bellaterra, Spain, J. Pascual, Departament de Física, Universitat Autònoma de Barcelona, 08193 Bellaterra, Spain
- A1-PI.12** EFFECT OF BUFFER LAYERS ON THE OPTICAL PROPERTIES OF SILICON NANOCRYSTAL SUPERLATTICES  
M. Glover and A. Meldrum, Department of Physics, University of Alberta, Edmonton, AB, T6G 2J1 Canada
- A1-PI.13** OPTICAL PROPERTIES OF ER/YB-DOPED GEO<sub>2</sub>  
Hideyuki Yamaguchi, Nobuhiro Onouchi, Atsushi Shinbori, Takamichi Sumitomo, Satoru Matsumoto, Keio University, Yokohama, Japan
- A1-PI.14** STUDY OF THE PHOTOLUMINESCENCE OF AMORPHOUS AND CRYSTALLINE Si CLUSTERS IN SiO<sub>x</sub> AND SiN<sub>x</sub> THIN FILMS  
M. Molinari, Laboratoire de Microscopies pour l'Etude des Nanostructures (E.A. CNRS 2061), Université de Reims Champagne Ardennes, BP 138, 51685 Reims Cedex 2, H. Rinnert, O. Jambois, M. Vergnat, Laboratoire de Physique des Matériaux, (U.M.R. CNRS 7556), Université Henri Poincaré Nancy 1, B.P. 239, 54506 Vandœuvre-lès-Nancy Cedex, France
- A1-PI.15** PHOTOLUMINESCENCE AND ELECTROLUMINESCENCE OF AMORPHOUS SiO<sub>x</sub> FILMS PREPARED BY REACTIVE EVAPORATION OF SILICON WITH OXYGEN.  
O. Jambois, M. Molinari\*, H. Rinnert, M. Vergnat, Laboratoire de Physique des Matériaux, (U.M.R. CNRS 7556), Université Henri Poincaré Nancy 1, BP 239, 54506 Vandœuvre-lès-Nancy Cedex, France, \*Laboratoire de Microscopies pour l'Etude des Nanostructures (E.A. CNRS 2061), Université de Reims Champagne Ardennes, BP 138, 51685 Reims Cedex 2, France

- A1-PI.16** SOLAR CELL TECHNOLOGY FOR FABRICATION OF SILICON LIGHT-EMITTING DIODES  
M.S. Bresler, O.B. Gusev, and E.I. Terukov, A.F. Ioffe Physico-Technical Institute, Politekhnikeskaya 26, 194021 St. Petersburg, Russia
- A1-PI.17** I-V CHARACTERISTICS OF STRUCTURES WITH POROUS SILICON IN ELECTROLYTE  
Z.H. Mkhitarian, A.A. Shatveryan, A.Z. Adamyan, V.M. Aroutiounian, Dept. Physics of semiconductors and microelectronics, YSU, 1 Manookian Str., 375025 Yerevan, Armenia
- A1-PI.18** LUMINESCENCE OF POLYMORPHOUS SILICON CARBON ALLOYS  
V. Suendo and P. Roca i Cabarrocas, Laboratoire de Physique des Interfaces et des Couches Minces UMR 7647 CNRS, Ecole Polytechnique, 91128 Palaiseau CEDEX, France
- A1-PI.19** MONOLITHIC AND HYBRID NEAR INFRARED DETECTION AND IMAGING BASED ON POLY-GE PHOTODIODE ARRAYS  
G. Masini, L. Colace, G. Assanto, NOOEL, INFN and University Roma Tre, Via Vasca Navale, 84, 00146 Roma, Italy, V. Cencelli, F. De Notaristefani, INFN Sez RM3, Via della Vasca Navale 84, 00146 Roma, Italy
- A1-PI.20** STUDIES OF Ga DIFFUSION AND THE ELIMINATION OF PINHOLES IN Ga-DOPED b-FeSi<sub>2</sub> FILMS PREPARED BY MBE  
R. Kuroda, Y. Hoshino, Nippon Institute of Technology, Saitama 345-8501, Japan, Z.X. Liu, Y. Suzuki, M. Osamura, T. Ootsuka, T. Mise, System Eng. Co., Ltd., Kanagawa 242-0001, Japan, Y. Fukuzawa, S.N. Wang, N. Otagawa, Y. Nakayama, Kankyo Semiconductors. Co., Ltd., AIST Tsukuba West, Ibaraki 305-8569, Japan, H. Tanoue, Y. Makita, National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba Central 2, Ibaraki 305-8568, Japan
- A1-PI.21** GALLIUM DOPING FOR BETA IRON-DISILICIDE FILMS PREPARED BY MBE  
Y. Fukuzawa, S.N. Wang, N. Otagawa, Y. Nakayama, Kankyo semiconductors Co. Ltd., W1-1306, AIST Tsukuba West, Onogawa 16-1, Tsukuba, Ibaraki 305-8569, Japan, Y. Suzuki, Z.X. Liu, M. Osamura, T. Ootsuka, T. Mise, SYSTEM ENGINEERS' Co., Ltd., Yamato, Kanagawa 242-0001, Japan, R. Kuroda, H. Tanoue, Y. Makita, National Institute of Advanced Industrial Science and Technology (AIST), AIST Tsukuba Central 2, Umezono 1-1-1, Tsukuba, Ibaraki 305-8568, Japan
- A1-PI.22** ON THE RELATIONSHIP BETWEEN ELECTROLUMINESCENCE AND PHOTOLUMINESCENCE IN Er DOPED SILICON DIOXIDE CONTAINING SILICON NANOCLUSTERS  
J.M. Sun and W. Skorupa, Institute of Ion Beam Physics and Materials Research Forschungszentrum Rossendorf, Dresden, Germany, A.N. Nazarov, Institute of Semiconductor Physics, NASU, Kyiv, Ukraine
- A1-PI.23** GROWTH AND PROPERTIES OF SIGE/SI(001) SELF-ASSEMBLED ISLANDS GROWN ON SIGE SEED LAYER  
D.N. Lobanov, A.V. Novikov, N.V. Vostokov, Z.F. Krasilnik, A.N. Yablonskiy, Institute for Physics of Microstructures RAS, 603950, Nizhny Novgorod, GSP-105, Russia
- A1-PI.24** DOPING OF b-FeSi<sub>2</sub> FILMS WITH BORON AND ARSENIC BY SPUTTERING AND ITS APPLICATION FOR PHOTOELECTRONIC DEVICES  
Z.X. Liu, M. Osamura, T. Ootsuka, Y. Suzuki, T. Mise, System Engineers' Co., Ltd., Yamato 242-0001, Japan, Y. Makita, R. Kuroda and H. Tanoue, National Institute of Advanced Industrial Science and Technology (AIST), AIST Tsukuba Central 2, Tsukuba 305-8568, Japan, S.N. Wang, Y. Fukuzawa, N. Otagawa, Y. Nakayama, Kankyo Semiconductors Co., Ltd., AIST Tsukuba West, Tsukuba 305-8569, Japan
- A1-PI.25** SILICON BASED NEAR INFRARED TUNABLE FILTERS BASED ON LIQUID CRYSTALS  
G. Pucker, M. Crivellari, C. Kompocholis, P. Bellutti, A. Lui, Istituto Trentino di Cultura, Centro per la Ricerca Scientifica e Tecnologica, Microsystem Division, Via Sommarive 18, 38050 Povo (Trento), Italy, N. Daldosso, F. Riboli, M. Saiani, Z. Gaburro, L. Pavesi, INFN and Department of Physics, Università di Trento, Via Sommarive 14, 38050 Povo (Trento), Italy
- A1-PI.26** EFFECT OF Si NANOCLUSTERS ON CHARGE TRAPPING AND LIGHT EMISSION IN Er DOPED SiO<sub>2</sub>  
A.N. Nazarov\*, J. Sun, and W. Skorupa, Institute of Ion Beam Physics and Materials Research Forschungszentrum Rossendorf, Dresden, Germany, I.N. Osiyuk, I.P. Tjagulskii and V.S. Lysenko, Institute of Semiconductor Physics, NASU, Kyiv, Ukraine, L. Rebohle, R.A. Yankov and T. Gebel nanoparc GmbH, Dresden, Germany  
\*currently with the Kyiv group
- A1-PI.27** RECENT PROGRESS IN INTEGRATED WAVEGUIDES BASED ON OXIDIZED POROUS SILICON  
M. Balucani, A. Ferrari, INFN unit E6 Università di Roma "La Sapienza", Via Eudossiana 18, 00184 Roma, Italy and V.P. Bondarenko, A.A. Klusko, Belarussian State University of Informatics and Radioelectronics, P.Brovka Street 6, 220013 Minsk, Belarus
- A1-PI.28** PHOTOLUMINESCENCE FROM ERBIUM INCORPORATED IN OXIDIZED POROUS SILICON  
V.P. Bondarenko, N.M. Kazuchits, Belarussian State University of Informatics and Radioelectronics, P.Brovka Street 6, 220013 Minsk, Belarus and M. Balucani, A. Ferrari, INFN unit E6 Università di Roma "La Sapienza", Via Eudossiana 18, 00184 Rome, Italy
- A1-PI.29** UHV-CVD GROWTH AND ANNEALING OF THIN FULLY RELAXED GE FILMS ON SI(001)  
M. Halbax, M. Rouviere, D. Debarre, Lam H. Nguyen, V. Yam, E. Cassan, S. Laval, D. Bouchier, Institut d'Electronique Fondamentale, Bât 220, Université Paris-Sud, CNRS UMR 8622, 91405 Orsay Cedex, France, Y.Zeng, Laboratoire de Minéralogie-Cristallographie, Universités Paris VI et Paris VII, CNRS UMR 7590, 4 place Jussieu, 75252 Paris Cedex 05, France, C.Clerc, Centre de Spectrométrie Nucléaire et Spectrométrie de masse, Bât 108, Université Paris-Sud, 91405 Orsay Cedex, France

- A1-PL30** COMPARATIVE STUDIES OF SILICON NANOCRYSTALS PROCESSED BY LASER ABLATION AND SPARK DISCHARGE  
J. Aguilar-Hernández, A. Medina-Torres, M. Cárdenas-García, G. Contreras-Puente, Escuela Superior de Física y Matemáticas, Instituto Politécnico Nacional, Edificio No. 9. U.P.A.L.M. Lindavista, C.P.07738 México D.F., México
- A1-PL31** LUMINESCENCE PROPERTIES OF Si NANOCRYSTALLINE THIN FILMS ON VARIOUS SUBSTRATES  
Kyung Ah Jeon, Jong Hoon Kim, Gun Hee Kim and Sang Yeol Lee, Department of Electrical and Electronic Engineering, Yonsei University, 134, Shinchon-dong, Seodaemooon-ku, 120-749, Seoul, Korea
- A1-PL32** FORMATION MECHANISM OF SILICON NANOCRYSTALS FABRICATED BY PULSED LASER DEPOSITION  
Jong Hoon Kim, Kyung Ah Jeon, Gun Hee Kim and Sang Yeol Lee, Department of Electrical and Electronic Engineering, Yonsei University, 134 Shinchondong, Seodaemunku, Seoul, 120-749, Korea
- A1-PL33** PHOTSENSITIZATION OF ORGANIC MOLECULES BY SILICON NANOCRYSTALS  
Minoru Fujii, Motofumi Usui and Shinji Hayashi, Department of Electrical & Electronics Engineering, Faculty of Engineering, Kobe University, Rokkodai, Nada, Kobe 657-8501, Japan, and Egon Gross, Dmitri Kovalev, Nicolei Kuenzner and Joachim Diener, Technische Universitaet Muenchen, Physik-Department E16, 85747 Garching, Germany
- A1-PL34** WITHDRAW
- A1-PL35** INFLUENCE OF EXCESS SILICON ON CLUSTERING OF ER AND YB ATOMS AND EXCITATION OF ER<sup>3+</sup> IONS IN SILICON OXIDE  
D. Kuritsyn, and A. Kozanecki, Institute of Physics, Polish Academy of Sciences, Al. Lotników 32/46, 02-668 Warsaw, Poland
- A1-PL36** ELECTRON HOLE LIQUID IN SINGLE SILICON QUANTUM WELLS  
N. Pauc, V. Calvo, J. Eymery, N. Magnea, CEA Grenoble, DRFMC/SP2M, 17 avenue des martyrs, 38054 Grenoble Cedex 9, France, F. Fournel CEA Grenoble, LETI/DTS, 17 avenue des martyrs, 38054 Grenoble Cedex 9, France
- A1-PL37** PHOTOLUMINESCENCE OF NANOMETRIC SINGLE SILICON QUANTUM WELLS  
N. Pauc, V. Calvo, J. Eymery, N. Magnea, CEA Grenoble, DRFMC/SP2M, 17 avenue des martyrs, 38054 Grenoble Cedex 9, France, F. Fournel, CEA Grenoble, LETI/DTS, 17 avenue des martyrs, 38054 Grenoble Cedex 9, France
- A1-PL38** WITHDRAW
- A1-PL39** PREPARATION AND OPTICAL PROPERTIES OF RARE EARTH DOPED MIXOXIDES FROM (1-X) GeO<sub>2</sub> -XSiO<sub>2</sub>  
Tran Thu Huong, Tran Kim Anh, Charles Barthou\* and Le Quoc Minh, Lab. Photochem and Optronics, Ins. Materials Science, NCST of Vietnam, 18 Hoang Quoc Viet Hanoi, Vietnam, \*Laboratoire d'optique des solides, UMR 7601, Uni. Pierre& Marie Curie, Paris, France
- A1-PL40** IRON DISILICIDE FOMED IN a-Si: Fe THIN FILMS BY MAGNETRON CO-SPUTTERING  
V.Kh. Kudoyarova, E.I. Terukov, O.I. Konkov, O.B. Gusev, V.Yu. Davidov, G.N. Mosina, Ioffe Physicotechnical Institute, Russian Academy of Sciences, 194021 St.Petersburg, Russia
- A1-PL41** POROUS SILICON OPTICAL DEVICES FOR DNA SENSING APLICATIONS  
V. Torres-Costa(a), F. Agulló-Rueda(b), R.J. Martín-Palma(a), J.M. Martínez-Duart(a), (a)Departamento de Física Aplicada, Universidad Autónoma de Madrid, Cantoblanco, 28049 Madrid, Spain, (b)Instituto de Ciencia de Materiales de Madrid - CSIC, Cantoblanco, 28049 Madrid, Spain
- A1-PL42** OPTICAL AND MICRO STRUCTURAL CHARACTERISATION OF LEPECVD GROWN GERMANIUM VIRTUAL SUBSTRATES FOR CMOS AND OPTICAL DEVICE INGRATION  
R. Ginige, M. Modreanu and B. O'Looney, NMRC, University College Cork, Lee Maltings Prospect Row, Cork, Ireland
- A1-PL43** PHOTOLUMINESCENCE AT 1.5 mk FROM SINGLE-CRYSTAL SILICON LAYERS SUBJECTED TO MECHANICAL TREATMENT  
R.I. Batalov, R.M. Bayazitov, Zavoiski Physicotechnical Institute, Kazan Scientific Center, Sibirski trakt 10/7, Kazan 29, 420029 Tatarstan, Russia, B.A. Andreev, D.I. Kryzhkov, Institute for Physics of Microstructures, Nizhni Novgorod, 603950 Russia, E.I. Terukov, and V. Kh. Kudoyarova, Ioffe Physicotechnical Institute, Politekhnicheskaya ul. 26, St. Petersburg, 194021 Russia
- A1-PL44** SILICON NANOCRYSTALS PREPARED EX-SITU OF THE HOST SiO<sub>2</sub> MATRIX  
V. Švrček(a), J.L. Rehspringer(b), E. Gaffet(c), A. Slaoui(a), J.C. Muller(a), (a)CNRS-PHASE, 23 rue du Loess, 67037 Strasbourg, France, (b)IPCMS, 23 rue du Loess, 67037 Strasbourg, France, NanoMaterials Research Group, (c)NRG/UMR CNRS 5060, Site de Sévenans, 90010 Belfort, France

- A1-PL45** PHOTOLUMINESCENCE FROM AN ACTIVE PLANAR OPTICAL WAVEGUIDE MADE OF SILICON NANOCRYSTALS: DOMINANCE OF LEAKY SUBSTRATE MODES IN DISSIPATIVE STRUCTURES  
T. Ostatnický(a,b), J. Valenta(a), I. Pelant(c), K. Luterová(c), R.G. Elliman(d), S. Cheylan(e), and B. Hönerlage(b), (a)Department of Chemical Physics & Optics, Faculty of Mathematics & Physics, Charles University, Prague, Czech Republic, (b)IPCMS, Groupe d'Optique Nonlinéaire et d'Optoélectronique, UMR 7504 CNRS-ULP, Strasbourg, France, (c)Institute of Physics, Academy of Sciences of the Czech Republic, Prague, Czech Republic, (d)Electronic Materials Engineering Department, Research School of Physical Sciences and Engineering, Australian National University, Canberra, Australia, (e)Institut de Ciències Fòniques, Barcelona, Spain
- A1-PL46** WAVELENGTH TUNABLE FILTER WITH POLY-SI/SIO<sub>2</sub> MULTI-LAYER BY THERMO-OPTIC EFFECT  
Hun-Yong Park(a), Chong-Hun Park(a), Byung-Chul(a) Hwang, Seung-Gol Lee(a), Beom-Hoan O(a), El-Hang Lee(a), Doo-Sun Choi(b) and Se-Geun(a), (a)Park m-PARC, School of Information & Communication Engineering, Inha University, Incheon 402-751, Korea, (b)Nano Process Laboratory, Intelligence & Precision Machine Department, Korea Institute of Machinery and Materials 171 Jang-Dong, Yusong-Gu, Daejeon, Korea
- A1-PL47** BLUE EMISSION IN MESOPOROUS SILICA EXCITED BY SYNCHROTRON RADIATION  
A. Anedda, C.M. Carbonaro, F. Clemente, R. Corpino and P.C. Ricci, Dipartimento di Fisica, Università of Cagliari, and INFN, UdR-Ca, s.p. n°8, Km 0.7, 09042 Monserrato, Cagliari, Italy
- A1-PL48** SUPER LINEAR POSITION SENSITIVE DETECTORS USING MIS STRUCTURES  
H. Águas, L. Pereira, F. Soares, D. Costa, E. Fortunato, R. Martins, Departamento de Ciência dos Materiais/CENIMAT, Faculdade de Ciências e Tecnologia, Universidade Nova de Lisboa, and CEMOP / UNINOVA, Campus da Caparica, 2829-516 Caparica, Portugal
- A1-PL49** SIMULTANEOUS OBSERVATION OF "SELF TRAPPED EXCITON" AND Q-CONFINED EXCITON LUMINESCENCE EMISSION IN SILICON NANOCRYSTALS  
J. De La Torre, A. Souifi, G. Bremond, G. Guillot, Laboratoire de Physique de la Matière, UMR-CNRS 5511, INSA de Lyon, France, N. Buffet, P. Mur, CEA-LETI, 38054 Grenoble, France
- A1-PL50** THEORETICAL MODELLING OF FUNCTIONALITY OF SIO<sub>2</sub>:Er WITH SILICON NANOCCLUSERS  
I.N. Yassievich, A.C. Moskalenko, M.S. Bresler and O.B. Gusev, Ioffe Physico-Technical Institute, St.Peterburg, Russia

Wednesday, May 26, 2004

Afternoon

Session V : Light emitting devices

Session Chair : W. Skorupa and E. Borsella

- A1-V.1** 13:30 -Invited- STRUCTURAL CHARACTERIZATION OF Si NANOCCLUSERS AND THEIR APPLICATIONS IN LIGHT EMITTING DEVICES  
**F. Iacona**, A. Irrera, C. Bongiorno and C. Spinella, CNR-IMM, Sezione di Catania, Stradale Primosole 50, 95121 Catania, Italy, G. Franzò, D. Pacifici, S. Boninelli, M. Miritello and F. Priolo, INFN-MATIS and Dipartimento di Fisica e Astronomia, Università di Catania, Via S. Sofia 64, 95123 Catania, Italy, D. Sanfilippo, G. Di Stefano and P.G. Fallica, STMicroelectronics, Stradale Primosole 50, 95121 Catania, Italy
- A1-V.2** 14:00 EFFICIENT SILICON LIGHT EMITTING DIODES BY BORON IMPLANTATION: THE MECHANISM  
**J.M. Sun**, T. Dekorsy, W. Skorupa, A. Mücklich, B. Schmidt and M. Helm, Institute of Ion Beam Physics and Materials Research, Forschungszentrum Rossendorf, Dresden, Germany
- A1-V.3** 14:20 SILICON-BASED LIGHT EMISSION AFTER ION IMPLANTATION  
**M. Kittler**(a), T. Arguirov(b), W. Seifert(a), (a)IHP microelectronics, Im Technologiepark 25, 15236 Frankfurt (Oder), Germany, (b)BTU Cottbus, Experimentalphysik II, Universitätsplatz 3-4, 03044 Cottbus, Germany, IHP/BTU Joint Lab, Universitätsplatz 3-4, 03044 Cottbus, Germany
- A1-V.4** 14:40 WAVELENGTH TUNABLE SIGE-BASED LIGHT EMITTING DEVICE  
N. Yasuhara(a) and **S. Fukatsu**(a,b), (a)Graduate School of Arts and Sciences, The University of Tokyo, Komaba, Meguro, Tokyo 153-8902, Japan, (b)PRESTO, Japan Science and Technology Corporation, Japan
- A1-V.5** 15:00 SILICON NANOCRYSTALS IN COLLOIDAL SOLUTIONS: FROM SINGLE NANOCRYSTALS TO PHOTONIC STRUCTURES  
**J. Valenta** and P. Janda, Department of Chemical Physics and Optics, Charles University, Prague, Czechia, K. Dohnalová, Institute of Physics, Academy of Sciences of the Czech Republic, Prague, Czechia, D. Nižcanský, Department of Inorganic Chemistry, Charles University, Prague, Czechia, F. Vácha, Institute of Physical Biology, University of South Bohemia, Budweis, Czechia, J. Linnros, Department of Microelectronics and Information Technology, Royal Institute of Technology, Kista, Sweden
- A1-V.6** 15:20 STUDY ON BLUE-GREEN LIGHT EMISSION FROM A-SIC:H-BASED FABRY-PEROT MICROCAVITIES  
Yongzhao Yao, **Yan Wang**, Ruifeng Yue, Litian Liu, Institute of Microelectronics, Tsinghua University, Beijing 100084, P.R. China
- A1-V.7** 15:40 BANDSTRUCTURE ANALYSIS OF STRAIN COMPENSATED Si/SiGe QUANTUM CASCADE STRUCTURES  
**H. Sigg**, A. Borak, S. Tsujino, C. Falub, M. Scheinert, E. Müller, D. Grützmacher, Laboratory for Micro- and Nanotstructures, Paul Scherrer Institute, 5232 Villigen-PSI, Switzerland, M. Meduna, T. Fromherz, G. Bauer, Institute for Semiconductor and Solid State Physics, University of Linz, Altenbergerstr. 69, 4040 Linz, Austria, O. Kermerrec, STMicroelectronics, 38926 Crolles-Cedex, France
- 16:00 **BREAK**

## Session VI: Spectroscopy and devices

Session Chair : M. Brongersma and H. Sigg

- A1-VL1** 16:20 SINGLE DOT OPTICAL SPECTROSCOPY OF SILICON NANOCRYSTALS: HOMOGENEOUS LINEWIDTH AND THE K-CONSERVATION RULE BREAKDOWN.  
I. Sychugov, R. Juhasz, J. Valenta and J. Linnros, Dept. of Microelectronics and Information Technology, Royal Institute of Technology, Electrum 229, 164 40 Kista-Stockholm, Sweden
- A1-VL2** 16:40 TWO-DIMENSIONALLY-PATTERNED SILICON NANOCRYSTAL ARRAYS  
A. Meldrum, K.S. Buchanan, C.A. Ryan, and A. Hryciw, Department of Physics, University of Alberta, Edmonton, AB, T6G 2J1, Canada
- A1-VL3** 16:50 COMPARISON OF STRIP AND RIB SOI MICROWAVEGUIDES FOR INTRA-CHIP LIGHT DISTRIBUTION  
L. Vivien, F. Grillot, E. Cassan, D. Pascal, S. Lardenois, A. Lupu, S. Laval, IEF, CNRS UMR 8622, Université Paris Sud, 91405 Orsay Cedex, France, and M. Heitzmann, J-M. Fédéli, CEA-LETI, Avenue des Martyrs 38054 Grenoble Cedex 9, France
- A1-VL4** 17:10 EXCITATION SPECTROSCOPY OF ERBIUM PL IN EPITAXIALLY GROWN Si:Er AND SiGe:Er STRUCTURES  
B.A. Andreev, Z.F. Krasilnik, V.P. Kuznetsov, A.N. Yablonskiy, Institute for Physics of Microstructures RAS, Nizhny Novgorod, Russia, T. Gregorkiewicz, M.A.J. Klik, Van der Waals-Zeeman Institute, University of Amsterdam, The Netherlands
- A1-VL5** 17:30 FREE-ELECTRON LASER SPECTROSCOPY OF EXCITATION AND RECOMBINATION PROCESSES IN Si:Er  
M. Forcales, M.A.J. Klik and T. Gregorkiewicz, Van der Waals—Zeeman Institute, University of Amsterdam, The Netherlands
- A1-VL6** 17:50 STRUCTURAL RELAXATION AND OXIDATION: INFLUENCE ON THE OPTICAL AND ELECTRONIC PROPERTIES OF SILICON NANOCRYSTALS  
Hans-Christian Weissker, Luis Ramos, Jürgen Furthmüller, Friedhelm Bechstedt, Institut für Festkörperteorie und Theoretische Optik, Friedrich-Schiller-Universität, Max-Wien-Platz 1, 07743 Jena, Germany
- A1-VL7** 18:10 OPTICAL BIREFRINGENCE IN MONO-DISPERSED SILICON NANOCRYSTALS PLANAR WAVEGUIDES  
D. Navarro-Urrios, F. Riboli, N. Daldosso, L. Pavesi, INFN-Dipartimento di Fisica, Università di Trento, via Sommarive 14, 38050 Povo (Trento), Italy, C. Oton, Departamento de Fisica Basica, University of La Laguna, Avda. Astrofisica Fco. Sanchez s/n, 38204 La Laguna, Spain, L.X. Yi, R. Scholz, and M. Zacharias, Institute of Microstructure Physics, Max Planck Institute, Weinberg 2, 06120 Halle, Germany
- A1-VL8** 18:30 TUNABLE PHOTONIC BANDGAP STRUCTURES FOR OPTICAL INTERCONNECTS  
S.M. Weiss, M. Haurylau, M. Molinari and P.M. Fauchet, Department of Electrical and Computer Engineering and The Institute of Optics, University of Rochester, Rochester NY, USA

Thursday, May 27, 2004

Morning

Joint Session Symposium A1, A2: Silicon-based nanophotonics

Session Chair : P. Fauchet and A. Polman

- A1-A2/01** 08:30 -Invited- NANOENERGETICS, NANOMATERIALS, NANODEVICES, NANOCOMPUTING - PUTTING THE PIECES TOGETHER  
**G. Bourianoff**, Intel Corporation, USA
- A1-A2/02** 09:00 -Invited- TOWARDS CMOS COMPATIBLE NANOPHOTONICS  
**M.L. Brongersma**, Stanford University, Geballe Laboratory for Advanced Materials, 476 Lomita Mall, Stanford CA 94305, USA
- A1-A2/03** 09:30 -Invited- PHOTONIC CRYSTALS BASED ON MACROPOROUS SILICON  
**U. Gösele**, S. Matthias and F. Müller, Max-Planck-Institut für Mikrostrukturphysik, Experimentelle Abteilung II, Weinberg 2, 06120 Halle/Saale, Germany
- A1-A2/04** 10:00 -Invited- SI-BASED NANOPHOTONICS  
**S. Coffa**, ST Microelectronics, Catania, Italy

Thursday, May 27, 2004

Afternoon

17:00-19:00

Poster Session II

- A1-PII.1** SI BASED PHOTOLUMINESCENT MATERIALS FOR HIGH QUALITY FACTOR EMITTERS  
F. Mazen, J. Verbert, P. Noe, V. Calvo, E. Picard, E. Hadji, CEA/DSM/DRFMC/SP2M/SiNaPS, 17 avenue des martyrs, 38054 Grenoble cedex 9, France
- A1-PII.2** THE FEATURES OF ER ELECTROLUMINESCENCE KINETICS IN SILICON STRUCTURES WITH ACTIVE LAYER POSITIONED RELATIVE TO SPACE-CHARGE REGION  
B. Andreev, Z. Krasil'nik, D. Kryzhkov, V. Kuznetsov, Institute for Physics of Microstructures RAS, N. Novgorod 603950, Russia, W. Jantsch, Institut für Halbleiter- und Festkörperphysik, Johannes Kepler Universität, Linz, Austria
- A1-PII.3** STRIPES OF 2D PHOTONIC CRYSTAL OBTAINED FROM MACROPOROUS SILICON  
E.V. Astrova, T. Borovinskaya, V.A. Tolmachev, Ioffe Physico-Technical Institute, St.Petersburg 194021, Russia, T.S. Perova, R.A. Moore, University of Dublin, Trinity College, Dublin 2, Ireland
- A1-PII.4** SI COMPATIBLE WAVEGUIDES FOR OPTICAL INTERCONNECTS  
Sebania Libertino(a), Antonella Sciuto(a), Roberto Oliveri(b), Gaetano Di Marco(c), Concetto Puglisi(d), Daniele Vitalini(d), (a)CNR – IMM sez. Catania, Stradale Primosole 50, 95121 Catania, Italy, (b)Dept. of Physics, Univ. of Palermo, Via Archirafi 36, 90123 Palermo, Italy, (c)CNR – IPCF sez. Messina, Via La Farina 237, 98123 Messina, Italy, (d)CNR – ITCP sez. Catania, Piazza Roma 2, 95125 Catania, Italy
- A1-PII.5** ELECTRICAL CONDUCTION MECHANISM IN ER-DOPED SRO FILMS FOR LED APPLICATIONS  
Monaco Mariantonietta, Salvatore Coffa, Maria Eloisa Castagna, STMicroelectronics, Si optoelectronics and post-Si technology, Corporate R&D, Stradale Primosole 50, 95121, Catania, Ital
- A1-PII.6** THE ELECTRONIC AND OPTICAL PROPERTIES OF SILICON NANOCCLUSERS: ABSORPTION AND EMISSION  
Eleonora Luppi(a), Elena Degoli(b), G. Cantele(c), Stefano Ossicini(b), Rita Magri(a), D. Ninno(c), O. Bisi(b), O. Pulci(d), G. Onida(e), M. Gatti(e), A. Incze(e), R. Del Sole(d), (a)INFM-Research Center for nanoStructures and bioSystems at Surfaces(S3), Dipartimento di Fisica, Universita' di Modena e Reggio Emilia, via Campi 213/A, 41100 Modena, Italy, (b)INFM- Research Center for nanoStructures and bioSystems at Surfaces(S 3), Dipartimento di Scienze e Metodi dell'Ingegneria, Università di Modena e Reggio Emilia, via Allegrì 13, 42100 Reggio Emilia, Italy, (c)INFM and Dipartimento di Scienze Fisiche, Università di Napoli "Federico II", Compl. Univ. M. S. Angelo, Via Cintia, 80126 Napoli, Italy, (d)INFM, Dipartimento di Fisica dell'Universita' di Roma Tor Vergata, Via della Ricerca Scientifica, 00133 Roma, Italy, (e)INFM, Dipartimento di Fisica dell'Universita' di Milano, via Celoria 16, 20133 Milano, Italy
- A1-PII.7** COMPARISON OF GE NANOCRYSTALS IN SIO2 PRODUCED BY CVD AND MAGNETRON SPUTTERING  
Tom Leervad Pedersen, Jesper Skov Jensen, Pia Bomholt, Jacques Chevalier, John Lundsgaard Hansen, Arne Nylandsted Larsen, Brian Bech Nielsen, Rui Pereira, Institute of Physics and Astronomy, University of Aarhus, 8000 Aarhus C, Denmark and Ole Hansen, MIC- Department of Micro and Nanotechnology, DTU, 2800 Kgs. Lyngby Denmark
- A1-PII.8** SITE OF ER IONS IN ER-IMPLANTED SILICA CONTAINING SI NANOCRYSTALS.  
C. Maurizio(a), F. D'Acapito(a), F. Priolo(b), G. Franzò(b), F. Iacona(c), E. Borsella(d), S. Padovani(e), P. Mazzoldi(e), (a)INFM-OGG European Synchrotron Radiation Facility, BP 220, 38043 Grenoble-Cedex, France, (b)INFM-Dipartimento di Fisica e Astronomia, Università di Catania, via S. Sofia 64, 95123 Catania, Italy, (c)CNR-IMM Catania, Italy, (d)UTS FIS-ENEA, Via E. Fermi 45, 00044 Frascati (Roma), Italy, (e)INFM and Dipartimento di Fisica, Università di Padova, via Marzolo 8, 35131 Padova, Italy
- A1-PII.9** PHOTOLUMINESCENCE SPECTRA OF Si NANOSTRUCTURE FORMED ON THE (111) ORIENTED SILICON WAFER BY THE ION IMPLANTATION AND CHEMICAL ETCHING  
Z. Swiatek, E. Beltowska-Lehman, W. Baliga, Institute of Metallurgy and Materials Science, Polish Academy of Sciences, 30-059 Krakow, 25 Reymonta Str., Poland, I.M. Fodchuk, V.P. Makhniy, Chernivtsi State Univeristy, 274012 Chernivtsi, 2 Kotsyubynsky Str., Ukraine, A. Bonchuk, Institute of Applied Problems of Mechanics and Mathematics, 3B Naukova Str., 79060 Lviv, Ukraine
- A1-PII.10** QUASI-MONOSIZED Si NANOCRYSTAL ARRAYS: QUANTUM CONFINEMENT AND DOPING  
J. Heitmann, V. Talalaev, T. Lu, R. Scholz, and M. Zacharias, Max Planck Institute of Microstructure Physics, Halle, Germany
- A1-PII.11** TOWARDS CONTROLLABLE OPTICAL PROPERTIES OF SILICON BASED NANOPARTICLES FOR APPLICATIONS IN OPTO-ELECTRONICS  
E. Trave, V. Bello, F. Enrichi, G. Mattei, INF, Dipartimento di Fisica, Università di Padova, Via Marzolo 8, 35131 Padova, Italy, E. Borsella, M. Carpanese, C.R. ENEA di Frascati, Via E. Fermi 45, 00044 Frascati (Roma), Italy, M. Falconieri, C.R. ENEA di Casaccia, Via Anguillarese 301,00060 Roma, Italy, C. Abate, Dipartimento di Scienze e Tecnologie Chimiche, Università di Roma "Tor Vergata", Via O. Raimondo 18, 00173 Roma, Italy, N. Herlin-Boime, K. Jursiokova, Laboratoire Francis Perrin (CEA-CNRS URA 2453), Services des Photons, Atome et Molécules, DSM, CEA Saclay, 91191 Gif sur Yvette Cedex, France, F. Costa, L. Costa, L. Gini, Novara Technology S.r.l., Via G. Fauser 4, 28100 Novara, Italy
- A1-PII.12** ON-CHIP POROUS SILICON HOLLOW OMNIGUIDE STRUCTURES  
J. Volk, N. Nagy, É. Vázsonyi, A. Hámori and I. Bársony, Research Institute for Technical Physics and Materials Science MFA, Hungarian Academy of Sciences, Konkoly-Thege 29-33, 1121 Budapest, Hungary

- A1-P11.13** DETERMINATION OF EFFECTIVE ABSORPTION CROSS SECTION OF ERBIUM IN SiO<sub>2</sub> FILMS CONTAINING nc-Si  
C.-C. Kao, L. Bigot, A.-M. Jurdyc, B. Jacquier, B. Gallas, S. Fisson, G. Vuye, J. Rivory, Laboratoire d'optique des solides, Université Paris 6, CNRS-UMR 7601, 4 Place Jussieu, 75252 Paris Cedex 05, France
- A1-P11.14** A SILICON BURIED WAVEGUIDE FOR PLANAR OPTOELECTRONIC DEVICES  
Giuseppe Coppola, Mario Iodice, Cristian Rocco Zaccuri, Ivo Rendina, Istituto per la Microelettronica e Microsistemi Consiglio Nazionale delle Ricerche, Via P.Castellino 111, 80131 Napoli, Italy
- A1-P11.15** 1D PHOTONIC CRYSTAL FABRICATED BY WET ETCHING OF SILICON  
V.A. Tolmachev, E.V. Astrova J.A Pilyugina, Ioffe Physico-Technical Institute, St.-Petersburg, Russia, T.S. Perova, R.A. Moore and J.K. Vij, University of Dublin, Trinity College, Dublin 2, Ireland
- A1-P11.16** OPTICAL GAIN AND STIMULATED EMISSION IN SI-BASED QUANTUM DOTS  
M. Jo(a), N.Yasuhara(a), and K. Kawamoto(a) and S. Fukatsu(a,b), (a)Graduate School of Arts and Sciences, The University of Tokyo, Komaba, Meguro, Tokyo 153-8902, Japan, (b)PRESTO, Japan Science and Technology Corporation (JST), Kawaguchi, Saitama 332-0012, Japan
- A1-P11.17** ERBIUM-SILICON-OXIDE NANO-CRYSTALLITE WAVEGUIDE FORMATION BASED ON NANO-POROUS SILICON  
T. Kimura, K. Ueda, R. Saito, K. Masaki and H. Isshiki, Department of Electronic Engineering, Univ. of Electro-Communications, Tokyo 182-8585, Japan
- A1-P11.18** NEAR BAND GAP ABSORPTION OF Si NANOCRYSTALS IN SiO<sub>2</sub> INVESTIGATED BY SPECTROSCOPIC ELLIPSOMETRY AND PHOTOTHERMAL DEFLECTION SPECTROSCOPY  
L. Siozade, I. Stenger, B. Gallas, C.C. Kao, S. Fisson, G. Vuye, J.Rivory, Laboratoire d'optique des solides, Université Paris 6, CNRS-UMR 7601, 4 Place Jussieu, 75252 Paris Cedex 05, France
- A1-P11.19** CHARACTERISATION OF ROOM TEMPERATURE BLUE EMMITING Si/SiO<sub>2</sub> MULTILAYERS  
M. Modreanu, NMRC, Lee Maltings, Prospect Row, Cork, Ireland, E.Aperathitis, M. Androulidaki, IESL-FORTH, Heraklion, Crete, Greece, M. Audier, O. Chaix, LMPG-INPG, Grenoble, France
- A1-P11.20** AGING PROCESSES OF Si-RICH/SiO<sub>x</sub> SYSTEMS  
M. Baran(a), N. Korsunsk(a), L. Khomenkova(a), Y. Goldstein(b), E. Savir(b), J. Jedrzejewski(b), (a)Institute of Semiconductor Physics, National Academy of Sciences of Ukraine, 45 Prospect Nauky, Kyiv 03028, Ukraine, (b)Racah Institute of Physics at Hebrew University Givat Ram, 91904 Jerusalem, Israel
- A1-P11.21** OPTICAL GAIN IN a-SiN<sub>x</sub>:H<Nd>  
Leandro R. Tessler and Daniel Biggemann, IFGW, Unicamp, Campinas, Brazil
- A1-P11.22** TIME-RESOLVED PHOTOLUMINESCENCE IN a-SiN<sub>x</sub>:H<Nd> PLANAR WAVEGUIDES: EVIDENCE FOR STIMULATED EMISSION  
Daniel Biggemann and Leandro R. Tessler, IFGW, Unicamp, Campinas, Brazil
- A1-P11.23** GROWTH AND STRUCTURAL CHARACTERISATION OF Si/SiGe HETEROSTRUCTURES FOR OPTOELECTRONIC APPLICATIONS  
X.B. Li(a), J.H. Neave(a), D.J. Norris(b), D.J. Paul(c), R.W. Kelsall(d) and J. Zhang(a), (a)Department of Physics, Imperial College London, U.K., (b)Dept. of Electronic & Electrical Eng., University of Sheffield, U.K., (c)Cavendish Lab., University of Cambridge, U.K., (d)Institute of Microwaves and Photonics, University of Leeds, U.K.
- A1-P11.24** PHOTOLUMINESCENCE YIELD OF Si-rich-SiO<sub>2</sub>/SiO<sub>2</sub> MULTILAYERS FABRICATED BY REACTIVE MAGNETRON SPUTTERING  
F. Gourbilleau, C. Ternon, C. Dufour, R. Rizk, SIFCOM, UMR CNRS 6176, Ensicaen, 6 Bd Maréchal Juin, 14050 Caen Cedex, France, O. Guillois, C. Reynaud, Service des Photons et Molécules, CEA- Saclay, 91191 Gif/Yvette Cedex, France
- A1-P11.25** INFLUENCE OF TEMPERATURE AND HYDROGEN RATE ON SILICON INCORPORATION IN SILICA FILMS OBTAINED BY REACTIVE MAGNETRON CO-SPUTTERING  
S. Chausserie, N. Khalfaoui, C. Dufour, R. Rizk and F. Gourbilleau, SIFCOM-ENSICAEN 6 Bd maréchal JUIN, 14050 Caen, France
- A1-P11.26** OPTICAL PROPERTIES OF POLY(VINYL-ALCOHOL) BASED THIN FILMS FOR MICROPHOTONICS  
Paula Obreja(a), Alexandru Obreja(b), Dana Cristea(a), Elena Budianu(a), (a)National Institute for Research and Development in Microtechnologies, Bucharest, Romania, (b)Policolor, Bucharest, Romania
- A1-P11.27** LOW LOSS SILICA WAVEGUIDES CONTAINING SI NANOCRYSTALS  
C. Garcia, B. Garrido, P. Pellegrino, J.A. Moreno, M. López, J.R. Morante, EME, Departament d'Electrònica, Universitat de Barcelona, Martí i Franquès 1, 08028 Barcelona, Spain, N. Daldosso, M. Melchiorri, L. Pavesi, INFN and Department of Physics, Università di Trento, Via Sommarive 14, 38050 Povo (Trento), Italy, E. Scheid, G. Sarrabayrouse, Laboratory for Analysis and Architecture of Systems of CNRS, 7 Avenue du Colonel Roche, 31077 Toulouse, France, N. Cherkashin\*, C. Bonafos, CEMES/CNRS, 29 rue J. Marvig, 31055 Toulouse Cedex 04, France, P. Marie, F. Gourbilleau, R. Rizk, LERMAT-ISMRA, 6 Boulevard Maréchal Juin, 14050 Caen, France  
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- A1-P11.28** STUDY OF THE ENERGY TRANSFER MECHANISM IN AN ALUMINOSILICATE GLASS CO-DOPED WITH SI NANOAGGREGATES AND ER<sup>3+</sup> IONS  
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- A1-P11.29** WAVE FUNCTION ENGINEERING IN W DESIGNED STRAINED-COMPENSATED Si/Si<sub>1-x</sub>Gex/Si TYPE II QUANTUM WELLS FOR 1.55  $\mu$ m OPTICAL PROPERTIES  
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- A1-P11.30** ROSE'S LAW IN IRRADIATED AMORPHOUS SILICON FILM DETECTORS  
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- A1-P11.31** LUMINESCENT PROPERTIES OF Er AND Si CO-IMPLANTED SILICATES  
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- A1-P11.32** INFLUENCE OF Er CONCENTRATION ON THE EMISSION PROPERTIES OF Er-DOPED SRSO FILMS OBTAINED BY REACTIVE MAGNETRON CO-SPUTTERING  
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- A1-P11.33** THE COMPETITION OF DIFFERENT RADIATIVE CHANNELS IN Si NANOSTRUCTURES  
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- A1-P11.34** PHOTOLUMINESCENCE STUDIES OF Sn QUANTUM DOTS IN Si  
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- A1-P11.35** EXCESS CARRIER DYNAMICS IN SILICON NANOCRYSTAL RICH P-DOPED SiO<sub>2</sub> MATRICES  
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- A1-P11.36** SURFACE PLASMON RESONANCE SENSING IN SILICON-BASED SCHEMES  
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- A1-P11.37** GE DOT MID-INFRARED PHOTODETECTORS  
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- A1-P11.38** PHOTOCONDUCTIVE GAIN OF SiGe/Si QUANTUM WELL PHOTODETECTOR  
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- A1-P11.39** ELECTROLUMINESCENCE FROM THIN n-Si:Er LAYER AT THE BREAKDOWN MODE OF p+/n(Si:Er)/n+ LIGHT EMITTING DIODE  
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- A1-P11.40** GAIN ANALYSIS AND LUMINESCENT STUDIES OF Si/Si<sub>1-x</sub>Gex:Er HETEROSTRUCTURES PRODUCED BY THE METHOD OF SUBLIMATION MBE IN GAS ATMOSPHERE  
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- A1-P11.41** LIGHT EMISSION IN COUPLED AND CORRELATED GE ISLANDS  
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**A1-PII.42**

REALISATION OF SILICON-BASED MODULATORS FOR OPTICAL INTERCONNECTS

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**A1-PII.43**

1D AND 2D PHOTONIC BANDGAP STRUCTURES REALIZED ON SILICON ON INSULATOR: EFFECT OF LIGHT EXTRACTION.

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