

SYMPOSIUM F

Nanocrystalline Semiconductor Materials and Devices

December 2 – 5, 2002

Chairs

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* Invited paper

♣ Also in conjunction with Symposium NN

SESSION F1: Si NANOCRYSTALS AND nc-Si SUPERLATTICES

Monday Morning, December 2, 2002
Room 311 (Hynes)

8:30 AM *F1.1

PHOTOLUMINESCENCE WITHIN CRYSTALLINE-Si/SiO₂
SINGLE QUANTUM WELLS. D.J. Lockwood, M.W.C.
Dharma-wardana, National Research Council, Institute for
Microstructural Sciences, Ottawa, ON, CANADA; Z.H. Lu, D.
Groza, University of Toronto, Department of Materials Science and
Engineering, Toronto, ON, CANADA; P. Carrier, L.J. Lewis,
University of Montreal, Department of Physics, Montreal, QC,
CANADA.

9:00 AM F1.2

SOLID-PHASE CRYSTALLIZATION, RAMAN SCATTERING AND
MODULATION SPECTROSCOPY IN nc-Si/a-SiO₂
SUPERLATTICES. R. Krishnan, Department of Electrical and
Computer Engineering, University of Rochester, Rochester, NY; D.J.
Lockwood, Institute for Microstructural Sciences, National Research
Council, Ottawa, CANADA; G.F. Grom, Agere Systems, Alhambra,
CA; and L. Tsybeskov, Department of Electrical and Computer
Engineering, New Jersey Institute of Technology, Newark, NJ.

9:15 AM F1.3

LATERAL CHARGE TRANSPORT IN NANOCRYSTALLINE
SILICON LAYERS PREPARED BY THERMAL CRYSTAL-
LIZATION. R. Krishnan, T.D. Krauss^a, P.M. Fauchet, Univ of
Rochester, Dept of Electrical and Computer Engineering, Rochester,
NY; ^aUniv of Rochester, Dept of Chemistry, Rochester, NY.

9:30 AM F1.4

SPECTROSCOPIC ELLIPSOMETRY STUDIES OF
NANOCRYSTALLINE SILICON IN THIN-FILM SILICON
DIOXIDE. G.E. Jellison Jr., C.M. Rouleau, S.P. Withrow, C.W.
White, Oak Ridge National Laboratory, Oak Ridge, TN, and C.O.
Griffiths, Hinds Instruments, Inc., Hillsboro, OR.

9:45 AM F1.5

MECHANISMS OF VISIBLE PHOTOLUMINESCENCE FROM
SIZE-CONTROLLED SILICON NANOPARTICLES.
Toshiharu Makino, Nobuyasu Suzuki, Yuka Yamada, and Takehito
Yoshida, Matsushita Electric Industrial Co., Ltd., Advanced
Technology Research Lab, Kawasaki, JAPAN; Ikurou Umezu, Akira
Sugimura, Konan Univ, Dept of Physics, Kobe, JAPAN.

10:00 AM BREAK

10:30 AM *F1.6

SIZE-CONTROL AND OPTICAL CHARACTERIZATION OF Si
NANOCRYSTALS FABRICATED BY SiO/SiO₂ SUPERLATTICES.
J. Heitmann, R. Scholz, M. Schmidt, L. Yi, M. Zacharias, MPI für
Mikrostrukturphysik, Halle, GERMANY; D. Kovalev, Technische
Universität München, Physik Department E16, Garching,
GERMANY.

11:00 AM F1.7

QUANTITATIVE CHARGE IMAGING OF SILICON
NANOCRYSTALS BY ATOMIC FORCE MICROSCOPY. Tao Feng,
Elizabeth Boer, Harry A. Atwater, California Institute of Technology,
Dept of Applied Physics, Pasadena, CA.

11:15 AM F1.8

OXIDATION ROUTE FOR SOLUTION SYNTHESIS AND
CHARACTERIZATION OF ALKYL TERMINATED SILICON
NANOPARTICLES. Katherine A. Pettigrew, Philip P. Power, Susan
M. Kauzlarich, University of California, Davis, Department of
Chemistry, Davis, CA.

11:30 AM F1.9

CONTROL OF SILICON QUANTUM DOTS NUCLEATION AND
GROWTH BY LPCVD. F. Mazen^a, T. Baron^b, J.M. Hartmann^c,
M.N. Semeria^c, G. Gremond^a; ^aLPM-INSA-Lyon, UMR 5511,
Villeurbanne, FRANCE; ^bLTM-CNRS, Grenoble, FRANCE;
^cCEA-DRT-LETI/DTS-CEA-GRE, Grenoble, FRANCE.

11:45 AM F1.10

SYNTHESIS OF CRYSTALLINE SILICON NANOPARTICLES IN
LOW-PRESSURE INDUCTIVE PLASMAS. Ameya Bapat,
Uwe Kortshagen, Mechanical Engineering, University of Minnesota,
Minneapolis, MN; Stephen Campbell, Electrical and Computer
Engineering, University of Minnesota, Minneapolis, MN.

SESSION F2: SiGe NANOSTRUCTURES

Monday Afternoon, December 2, 2002
Room 311 (Hynes)

1:30 PM *F2.1

SELF-ASSEMBLED Si/Ge QUANTUM DOT STRUCTURES FOR
NOVEL DEVICE APPLICATIONS. K. Brunner, D. Bougeard, M.
Herbst, and G. Abstreiter, Walter Schottky Institute, TU Munich,
Garching, GERMANY.

2:00 PM F2.2

PHOTOLUMINESCENCE IN Ge(SiGe) QUANTUM DOTS.
B.V. Kameney, L. Tsybeskov, Department of Electrical and Computer
Engineering, New Jersey Institute of Technology, Newark, NJ; J.-M.
Baribeau, D.J. Lockwood, Institute for Microstructural Sciences,
National Research Council, Ottawa, CANADA; and T. Kamins,
Hewlett-Packard Laboratories, Palo Alto, CA.

2:15 PM F2.3

ELECTRONIC STRUCTURE AND SURFACE PASSIVATION
EFFECTS OF GERMANIUM NANOCRYSTAL FILMS. C. Bostedt,
T. van Buuren, T.M. Willey, L.J. Terminello, Lawrence Livermore
National Lab, CA; T. Moller, Hasylab at Desy, GERMANY.

2:30 PM *F2.4

EFFECT OF PHOSPHORUS ON Ge/Si(001) ISLAND
FORMATION. T.I. Kamins, G. Medeiros-Ribeiro[†], D.A.A. Ohlberg,
and R. Stanley Williams, Quantum Science Research,
Hewlett-Packard Laboratories, Palo Alto CA; [†]Also Laboratório
Nacional de Luz Síncrotron, Campinas, SP, BRAZIL.

3:00 PM BREAK

3:30 PM *F2.5

ANOMALOUS X-RAY SCATTERING ON SELF-ASSEMBLED
ISLANDS: DIRECT EVALUATION OF COMPOSITION PROFILE,
STRAIN RELAXATION, AND ELASTIC ENERGY. A. Malachias,
R. Magalhães-Paniago, Depto. de Física, ICEx, Universidade Federal
de Minas Gerais, Belo Horizonte, MG, BRAZIL; G. Medeiros-Ribeiro,
Laboratório Nacional de Luz Síncrotron, Campinas, SP, BRAZIL, and
Hewlett-Packard Labs, Palo Alto, CA; S. Kycia, Laboratório Nacional
de Luz Síncrotron, Campinas, SP, BRAZIL; T.I. Kamins and R.
Stanley Williams, Hewlett-Packard Labs, Palo Alto, CA.

4:00 PM F2.6

REAL-TIME DETECTION AND THEORETICAL DESCRIPTION
OF THE KINETICS OF STRANSKI-KRASTANOW GROWTH IN
Ge/Si(100) AND Ge/Si(111). Peter Hess, Andrey Osipov, Florian
Schmitt, Univ of Heidelberg, Inst of Physical Chemistry, Heidelberg,
GERMANY.

4:15 PM F2.7

ELECTRICAL PROPERTIES OF SiGe QUANTUM DOTS AND WIRES ON ULTRATHIN SUBSTRATES. Emma Tevaarwerk, O.M. Castellini, D.G. Keppel, P. Rugheimer, D.E. Savage, M.G. Lagally, M.A. Eriksson, University of Wisconsin-Madison, Madison, WI.

4:30 PM F2.8

USING STRAIN-INDUCED COOPERATIVE NUCLEATION TO TAILOR QUANTUM WIRES AND DOTS. J.L. Gray and R. Hull, University of Virginia, Dept. of Materials Science and Engineering, Charlottesville, VA; J.A. Floro, Sandia National Laboratories, Albuquerque, NM.

4:45 PM F2.9

LOCAL MORPHOLOGY OF 3D Si-Ge ISLANDS GROWN ON Si(001) STRAINED USING MEMS TECHNOLOGY. P. Rugheimer, C.H. Lee, A. Lal, and M.G. Lagally, University of Wisconsin-Madison, Madison, WI.

SESSION F3: POSTER SESSION
Monday Evening, December 2, 2002
8:00 PM
Exhibition Hall D (Hynes)

F3.1

Abstract Withdrawn

F3.2

NEW PAIRS OF INKS AND PAPERS FOR PHOTOLITHOGRAPHY, MICROCONTACT PRINTING, AND SCANNING PROBE NANOLITHOGRAPHY. Lon A. Porter Jr., Hee Cheul Choi, Alexander E. Ribbe, J.M. Schmeltzer, and Jillian M. Buriak, Department of Chemistry, Purdue University, West Lafayette, IN.

F3.3

PERFECT BARIUM TITANATE FINE PARTICLES PREPARED USING A REFORM HYDROTHERMAL METHODS. Lihong Su, Rongchang Ning, Shengru Qiao, Hao Wu, Ping Wang, Department of Chemical Engineering, Northwestern Polytechnical University, Xi'an Shaanxi prov. CHINA.

F3.4

PREPARATION AND CHARACTERIZATION OF FINE BARIUM CARBONATE PARTICLES. Lihong Su, Jun Xiao, Shengru Qiao, Department of Chemical Engineering, Northwestern Polytechnical University, Xi'an, Shaanxi Prov., CHINA.

F3.5

Si-NANOCUSTER MEMORY STRUCTURES PREPARED BY MAGNETRON SPUTTERING - OPTICAL AND ELECTRICAL INVESTIGATIONS. Jan Uwe Schmidt, Bernd Schmidt, Research Centre Rossendorf, Institute of Ion Beam Physics and Materials Research, Dresden, GERMANY.

F3.6

COMPARATIVE STUDY OF THE GROWTH CURVES OF B. SUBTILIS, K. PNEUMONIAE, C. XEROSIS AND E. COLI BACTERIA IN MEDIUM CONTAINING NANOMETRIC SILICON PARTICLES. Lilyanna Pérez, Marjorie Flores, Daniel Melendez, Javier Avalos, Universidad Metropolitana, Dept of Science, Technology and Health, San Juan, PR; Lidaris SanMiguel, Oscar Resto, Luis Fonseca, Dept of Physics, University of Puerto Rico, San Juan, PR.

F3.7

PREPARATION AND PHOTOACTIVE CHARACTERIZATION OF TUBE-SHAPED Al-DOPED ZnO CERAMICS. Yoshinobu Fujishiro, Masanobu Awano, Synergy Materials Research Center, National Institute of Advanced Industrial Science and Technology (AIST), Nagoya, JAPAN.

F3.8

PARACRYSTALLINITY OF AMORPHOUS SILICON PRODUCED BY ION IMPLANTATION. Ju-Yin Cheng, NEC Research Institute, Inc., Princeton, NJ; J.M. Gibson, P.M. Baldo and B.J. Kestel, Argonne National Laboratory, Argonne, IL.

F3.9

THE EFFECT OF CHEMICAL TREATMENT ON POROUS SILICON: THE ROLE OF ALCOHOL. Masato Ohmukai, Mei Honda, Yumiko Kodama, Hiroshi Tsunekuni, Yasuo Tsutsumi, Akashi College of Technology, Akashi, Hyogo, JAPAN.

F3.10

LUTTINGER LIQUID COLLECTIVE MODES IN CARBON NANOTUBES AT GHZ FREQUENCIES. Peter J. Burke, Integrated Nanosystems Research Facility, Department of Electrical and Computer Engineering, University of California, Irvine, CA.

F3.11

METALLIZATION OF SILICON NANO-WIRES. C.P. Li, F.C.K. Au, C.S. Lee and S.T. Lee, Center of Super-Diamond & Advanced Film (COSDAF) and Department of Physics and Materials Science, The City University of Hong Kong, Hong Kong, SAR, CHINA; X.H. Sun and N.B. Wong, COSDAF & Department of Biology and Chemistry, The City University of Hong Kong, Hong Kong, SAR, CHINA; Boon K. Teo, Department of Chemistry, University of Illinois at Chicago, IL; N. Wang, Department of Physics, The Hong Kong University of Science and Technology, Hong Kong, SAR, CHINA; S.P. Wong, Department of Electronic Engineering, The Chinese University of Hong Kong, Hong Kong, SAR, CHINA.

F3.12

CLAUSIUS-MOSSOTTI APPROXIMATION FOR NONLINEAR COMPOSITES WITH COATED ELLIPSOIDAL PARTICLES. Anatoliy Pinchuk, I. Physikalisches Institut, R.W.T.H. Aachen, Aachen, GERMANY.

F3.13

PATTERNED GROWTH OF HIGHLY ALIGNED CARBON NANOTUBES ON SOL-GEL PREPARED SUBSTRATES. Zhengwei Pan, Haoguo Zhu, Zongtao Zhang, Sheng Dai, David B. Beach, Chemical Sciences Division, Oak Ridge National Laboratory, Oak Ridge, TN; Douglas H. Lowndes, Solid State Division, Oak Ridge National Laboratory, Oak Ridge, TN.

F3.14

TRANSPORT PROPERTIES AND OBSERVATION OF SEMIMETAL SEMICONDUCTOR TRANSITION IN Bi-BASED NANOWIRES. Yu-Ming Lin^a, Stephen B. Cronin^b, Oded Rabin^c, Jackie Y. Ying^d, and M.S. Dresselhaus^{a,b}; ^aDepartment of Electrical Engineering and Computer Science, ^bDepartment of Physics, ^cDepartment of Chemistry, ^dDepartment of Chemical Engineering, Massachusetts Institute of Technology, Cambridge, MA.

F3.15

NANOSTRUCTURE IN OXIDATION OF SiGe ALLOYS. Weiqi Huang, Shiyin Ji, Physics Department of Guizhou Educational College, CHINA; Shaohong Cai, Chaoyu Long, Physics Department of Guizhou University, CHINA.

F3.16

DIFFUSIONAL COATING OF NANOPARTICLES. James P. Lavine, Eastman Kodak Company, Rochester, NY.

F3.17

GROWTH AND CHARACTERIZATION OF SILICON NANOCRYSTALS IN ANNEALED a-Si:H FILMS. Sandeep Kohli, Department of Chemistry, Colorado State University, Fort Collins, CO; J.A. Theil, Agilent Technologies, Santa Clara, CA; R.D. Snyder, Agilent Technologies, Fort Collins, CO; C.D. Rithner, P.K. Dorhout, Department of Chemistry, Colorado State University, Fort Collins, CO.

F3.18

RAMAN STUDIES OF CATALYST-FREE MULTIWALL NANOTUBES. Shin Grace Chou, Mildred Dresselhaus, Department of Chemistry, Massachusetts Institute of Technology, Cambridge, MA; Department of Physics, Massachusetts Institute of Technology, Cambridge, MA; Elen Humphreys, Sung-Yoon Chung, John Vander Sande and Yet-Ming Chiang, Department of Material Science and Engineering, Massachusetts Institute of Technology, Cambridge, MA.

F3.19

TWO-DIMENSIONAL EPITAXIAL GROWTH OF STRAINED InGaAs ON GaAs (100). Hong Wen, Zhiming Wang, and G.J. Salamo, MRSEC and Microelectronics-Photonics, University of Arkansas, Fayetteville, AR.

F3.20

THE CORRELATION BETWEEN STRUCTURAL PROPERTIES OF NANOCRYSTALLINE SILICON PREPARED BY PECVD AND ELECTROCHEMICALLY ETCHED POROUS SILICON. Andrew Verba, Kiev National Univ, Dept of Radiophysics, Kiev, UKRAINE.

F3.21

OPTICAL GAIN IN NANOCRYSTALLINE SILICON SUPERLATTICES. J. Ruan, H. Chen, Dept. of Physics and

Astronomy, University of Rochester, Rochester, NY; R. Krishnan, P.M. Fauchet, Dept. of Electrical and Computer Engineering, University of Rochester, Rochester, NY.

F3.22

LOW-TEMPERATURE SYNTHESIS OF NANOCRYSTALLINE SILICON IN SiO_x NANORODS USING HOT-WIRE CVD METHOD. Te-Chi Wong, Chi-Chung Yu, and Jih-Jen Wu, National Cheng Kung University, Department of Chemical Engineering, Tainan, TAIWAN.

F3.23

SEMICONDUCTOR OXIDE NANOTUBES FROM GALLIUM AND INDIUM. Bin Cheng, Edward T. Samulski, Department of Chemistry, University of North Carolina at Chapel Hill, Chapel Hill, NC.

F3.24

PATTERNED STRUCTURES OF SILICON NANOCRYSTALS PREPARED BY PULSED LASER INTERFERENCE CRYSTALLIZATION OF ULTRA-THIN a-Si:H SINGLE-LAYER. Xiaowei Wang, Leyi Zhu, Feng Qiao, Wei Li, Xinfan Huang, Kunji Chen, Nanjing Univ, National Lab. of Solid State Microstructures and Dept of Physics, Nanjing, CHINA.

F3.25

NEW NANOCRYSTALLINE Si FLOATING GATE STRUCTURE FOR NONVOLATILE MEMORY APPLICATION. J.J. Shi, L.C. Wu, K.J.Chen, J. Xu, W. Li, Z.Y. Ma, D. Wu, A.D. Li, X.F. Huang, Nanjing Univ, National Lab of Solid State Microstructures and Dept of Physics, Nanjing, CHINA.

F3.26

ORGANIC NLO CORONAS ON SEMICONDUCTOR AND METALLIC NANOPARTICLES. Fatma Vatansever, Rachel Jakubiak, Ramamurthi Kannan, Loon-Seng Tan, Richard A. Vaia, Air Force Research Laboratory, Materials and Manufacturing Directorate, WPAFB, OH; He Guang, K.-S. Kim, Paras Prasad, Institute of Lasers, Photonics & Biophotonics, University of Buffalo, Buffalo, NY.

F3.27

PERIODIC TWO-DIMENSIONAL ARRAYS OF SILICON QUANTUM DOTS FOR NANOSCALE DEVICE APPLICATIONS. Christopher C. Striemer, Rishikesh Krishnan, Leonid Tsybeskov, Philippe M. Fauchet, Univ of Rochester, Dept. of Electrical and Computer Engineering, Rochester, NY; Qianghua Xie, Process and Material Characterization Laboratory, Semiconductor Product Sector, Mesa, AZ.

F3.28

TAILORING OF ELECTRICAL BEHAVIOR OF PE-NANOCOMPOSITES THROUGH INTERFACE CONTROL. Dongling Ma, Jung-II Hong, Linda S. Schadler, Richard W. Siegel, Materials Science and Engineering Department and Rensselaer Nanotechnology Center, Rensselaer Polytechnic Institute, Troy, NY; Eva Mårtensson, ABB Group Services Center AB, Corporate Research, Västerås, SWEDEN.

F3.29

Si-R-S LINKAGE IN ULTRABRIGHT Si₂₉ NANOPARTICLES. S. Rao, E. Rogozhina, P. Braun, M.H. Nayfeh, Univ of Illinois, Dept of Physics, Urbana, IL; L. Wagner, L. Mitas, North Carolina State Univ, Dept of Physics, Raleigh, NC.

F3.30

ESTIMATION OF SILICON NANOCRYSTALLINE SIZES FROM PHOTOLUMINESCENCE MEASUREMENTS OF RF CO-SPUTTERED Si/SiO₂ FILMS. A. Ramirez-Porras, Centro de Investigación en Ciencia e Ingeniería de Materiales and Escuela de Física, Universidad de Costa Rica, San Pedro, COSTA RICA; L.F. Fonseca, Department of Physics, University of Puerto Rico, Río Piedras, PR.

F3.31

FABRICATION OF Si-Ge COMPOUNDS NANOWIRES BY FZ MELTING VAPOR METHOD. Quanli Hu, Hiroshi Araki, Hiroshi Suzuki, Nobuhiro Ishikawa, Wen Yang, Tetsuji Noda, National Institute for Materials Science, Nanomaterials Laboratory, Tsukuba, JAPAN.

F3.32

ELECTRICAL PROPERTIES OF THE UNDOPED AND NITROGEN-DOPED ULTRANANOCRYSTALLINE DIAMOND FILMS. V.I. Polyakov, A.I. Rukovishnikov, N.M. Rossukanyi, Institute of Radio Engineering & Electronics, RAS, Moscow, RUSSIA; S.M. Pimenov, V.G. Pereverzev, General Physics Institute, Moscow, RUSSIA; J.A. Carlisle, D.M. Gruen, Argonne National Laboratory, Argonne, IL.

F3.33

LOW-TEMPERATURE SYNTHESIS OF GALLIUM NITRIDE NANOWIRES. Ko-Wei Chang, Sai-Chang Liu, Jih-Jen Wu, Dept of Chemical Engineering, National Cheng Kung University, Tainan, TAIWAN.

F3.34

NANOMECHANICAL PROBING ON SINGLE NANOBELT OF SEMICONDUCTING ZINC OXIDES. Scott Mao, Minhua Zhao, Univ of Pittsburgh, Dept of Mechanical Engineering, Pittsburgh, PA; ZhongLin Wang, School of Materials Science & Engineering, Georgia Institute of Technology, Atlanta, GA.

F3.35

SOL-GEL DERIVED Bi_{4-x}Nd_xTi₃O₁₂ THIN FILMS AND ITS STRUCTURAL CHARACTERIZATION. R.E. Melgarejo, M.S. Tomar, A. Hidalgo, University of Puerto Rico, Physics Department, Mayaguez, PR; R.S. Katiyar, University of Puerto Rico, Physics Department, San Juan, PR.

F3.36

SILICON NANOCRYSTALLITES PREPARED BY SOL-GEL METHOD FROM TRIETHOXYSILANE. Jerome Rouquette, Monique Pauthe, Bernard Gil, Laboratoire de Physico-chimie de la Matière Condensée, Univ. Montpellier II, Montpellier, FRANCE; Kevin P. O'Donnell, Dept of Physics, Univ. Strathclyde, Glasgow, SCOTLAND.

F3.37

FORMATION OF GaAs NANOCRYSTALLINE FILMS BY FEMTOSECOND PULSED LASER DEPOSITION. T.W. Trelenberg, L.N. Dinh, M. Balooch, Lawrence Livermore National Laboratory, Chemistry and Materials Science Department, Livermore, CA.

F3.38

EFFECT OF HYDROGEN DILUTION ON THE PERFORMANCE OF NANOCRYSTALLINE SILICON TFT'S. Lihong Teng and Wayne A. Anderson, University at Buffalo, State University of New York, Dept. of Electrical Engineering, Buffalo, NY.

F3.39

SiC-LIKE PHASE AND ROOM-TEMPERATURE PHOTO-LUMINESCENCE OF LOW-K SiOCH FILMS. Valeri Ligatchev, Terence Kin Shun Wong, Bo Liu, M. Rusli, School of Electrical and Electronic Engineering, Nanyang Technological University, SINGAPORE; Ken Ostrikov, SOCPES, The Flinders University of South Australia, Adelaide, AUSTRALIA.

F3.40

FORMATION AND CATHODOLUMINESCENCE OF SILICON NANOCCLUSERS IN SILICA. Maria V. Zamoryanskaya, Vladimir I. Sokolov, Ioffe Physical Technical Institute, St. Petersburg, RUSSIA.

F3.41

NANO-SCALE MORPHOLOGY AND ELECTRON SPECTRUM OF DEFECT STATES OF LOW-K SiOCH FILMS. Valeri Ligatchev, Terence Kin Shun Wong, Bo Liu, Rusli, Ken Ostrikov, School of Electrical and Electronic Engineering, Nanyang Technological University, SINGAPORE.

F3.42

Al₃C₄ AND AlN NANOPARTICLE-EMBEDDED CARBON NITRIDE NANO-COMPOSITE FILMS. N. Jiang, Shuyan Xu, Ken Ostrikov, Advanced Materials and Nanostructures Laboratory, Natural Sciences, Nanyang Technological University, SINGAPORE; Valeri Ligatchev, School of Electrical and Electronic Engineering, Nanyang Technological University, SINGAPORE.

F3.43

POLARIZATION ANISOTROPY IN ELECTROREFLECTANCE SPECTRUM OF POROUS SILICON. Toshihiko Toyama, Yasuharu Nakai, Kouji Moriguchi, Hiroaki Okamoto, Osaka Univ, Dept Physical Science, Graduate School of Engineering Science, Toyonaka, JAPAN.

F3.44

CARBON NANOTUBES GROWN ON METALLIC WIRES BY COLD PLASMA TECHNIQUE. D. Sarangi, and A. Karimi, Faculty of Base Science (FSB-IPMC), Swiss Federal Institute of Technology (EPFL), Lausanne, SWITZERLAND.

F3.45

FORMATION OF SiGe NANOPARTICLES BY DRY AND STEAM THERMAL OXIDATION OF THIN POLYCRYSTALLINE LAYERS. M.I. Ortiz, C. Ballesteros, E.P.S., Universidad Carlos III, Leganes, Madrid, SPAIN; J. Sangrador, A. Rodriguez, T. Rodriguez, E.T.S.I.T., Universidad Politecnica de Madrid, Madrid, SPAIN; M.

Avella, P. Martin, J. Jimenez, E.T.S.I.I., Universidad de Valladolid, Valladolid, SPAIN.

F3.46

SPECTROSCOPIC STUDY OF RARE EARTHS-DOPED NANOCRYSTALLINE SILICON IN SILICON DIOXIDE FILMS. Carlos Rozo, Luis F. Fonseca, Oscar Resto and S. Zvi Weisz, University of Puerto Rico, Dept of Physics, San Juan, PR.

F3.47

CHARACTERIZATION OF NANOGRAPHITE AND CARBON NANOTUBES BY POLARIZATION DEPENDENT OPTICAL SPECTROSCOPY. A. Grüneis, R. Saito, Dept of Electronic-Engineering, University of Electro-Communications, Tokyo, JAPAN; Ge.G. Samsonidze, Dept of Electrical Engineering, MIT, Cambridge, MA; M.A. Pimenta, A. Jorio, Dept de Física, Universidade Federal de Minas Gerais, Belo Horizonte, BRAZIL; A.G. Souza Filho, Dept de Física, Universidade Ceara, Fortaleza, BRAZIL; G. Dresselhaus, Dept of Physics, Francis Bitter Magnet Laboratory, MIT; M.S. Dresselhaus, Dept of Electrical Engineering and Dept of Physics, MIT.

F3.48

MODEL OF NANOCUSTER NUCLEATION IN SUPER-SATURATED SOLID SOLUTION UNDER CONTINUOUS GENERATION OF A SOLVENT COMPONENT. Alexander E. Volkov, Russian Research Centre Kurchatov Inst, Moscow, RUSSIA.

F3.49

Abstract Withdrawn

F3.50

TUNABLE POROUS SILICON MIRRORS FOR OPTOELECTRONIC APPLICATIONS. Sharon M. Weiss^a, Mikhail Haurylau^b, and Philippe M. Fauchet^{a,b}; ^aThe Institute of Optics, University of Rochester, Rochester, NY; ^bDepartment of Electrical and Computer Engineering, University of Rochester, Rochester, NY.

F3.51

EFFECT OF SURFACE TREATMENTS IN NANOCRYSTALLINE SILICON. N.P. Mandal, S. Dey and S.C. Agarwal, Department of Physics, Indian Institute of Technology Kanpur, INDIA.

F3.52

II-VI SEMICONDUCTOR QUANTUM DOTS-POLYMER COMPOSITES FOR HYBRID WHITE LIGHT EMITTING DEVICES. Hongjoo Song and Seonghoon Lee, Kwangju Institute of Science and Technology, Dept. of Materials Science and Engineering, Kwangju, KOREA.

F3.53

THE DEPOSITION OF Si NANOPARTICLE COMPOSITE FILMS FOR LIGHT EMISSION. Liang-Yih Chen and Franklin Chau-Nan Hong, National Cheng Kung University, Dept. of Chemical Engineering, Tainan, TAIWAN.

F3.54

OPTICAL PROPERTIES OF SILICON NANOPARTICLES IN SILICA GEL MONOLITHS. Yury Posada, Lidaris San Miguel, Luis F. Fonseca, Oscar Resto, S. Zvi Weisz, Univ of Puerto Rico, Dept of Physics, San Juan, PR.

F3.55

SYNTHESIS OF Ge-DOPED SiO_x NANOSTRUCTURES. J.Y. Lao, J.G. Wen, D.Z. Wang, Z.F. Ren, Boston College, Dept of Physics, Chestnut Hill, MA.

SESSION F4: BIOACTIVE NANOSTRUCTURES AND SURFACE CHEMISTRY
Tuesday Morning, December 3, 2002
Room 311 (Hynes)

8:30 AM *F4.1

BIOACTIVE NANOCRYSTALLINE SILICON/POLYMER COMPOSITES: FABRICATION INTO FUNCTIONAL STRUCTURES. Jeffery L. Coffer, Priyabrata Mukherjee, Texas Christian University, Fort Worth, TX; Leigh T. Canham, PSi Medica Ltd., Malvern, UNITED KINGDOM.

9:00 AM F4.2

POROUS SILICON ELECTRICAL BIOSENSORS. M. Archer and P.M. Fauchet, Center for Future Health and Departments of Biomedical Engineering and Electrical and Computer Engineering, University of Rochester, Rochester NY.

9:15 AM F4.3

OPTICAL BIOSENSORS USING AN ASYMMETRIC POROUS SILICON MICROCAVITY. Huimin Ouyang^a, Joseph Pero^b, Benjamin L. Miller^b and Philippe M. Fauchet^a; ^aCenter for Future Health & Department of Electrical and Computer Engineering, University of Rochester, Rochester, NY; ^bCenter for Future Health & Department of Chemistry, University of Rochester, Rochester NY.

9:30 AM F4.4

ATTACHMENT AND HYBRIDIZATION OF DNA AT NANOCRYSTALLINE DIAMOND FILMS. Wensha Yang, James Butler, John Carlisle, Dieter Gruen, Tanya Knickerbocker, John N. Russell, Lloyd M. Smith, and Robert J. Hamers.

9:45 AM F4.5

FUNCTIONALIZATION OF POROUS SILICON WITH ALKENES AND ALKYNES VIA CARBOCATION-MEDIATED HYDROSILYLATION. J.M. Schmeltzer, Lon A. Porter Jr., Michael P. Stewart, Carmen M. López, and Jillian M. Buriak, Department of Chemistry, Purdue University, West Lafayette, IN.

10:00 AM BREAK

10:30 AM *F4.6

COVALENT LINKING AND HYBRIDIZATION OF DNA AT SINGLE-WALLED CARBON NANOTUBES. Sarah Baker, Wei Cai, Tami Lasseter, Kevin Weidkamp, and Robert J. Hamers, Dept. of Chemistry, University of Wisconsin, Madison, WI. ♣

11:00 AM F4.7

ELECTROLESS DEPOSITION AND PATTERNING OF MORPHOLOGICALLY COMPLEX PRECIOUS METAL FILMS ON SEMICONDUCTOR SURFACES. Lon A. Porter Jr., Hee Cheul Choi, Alexander E. Ribbe, and Jillian M. Buriak, Department of Chemistry, Purdue University, West Lafayette, IN.

11:15 AM F4.8

CHARACTERIZATION OF SELF-ASSEMBLED MONOLAYERS ON SILICON FOR MEMORY APPLICATIONS. Qiliang Li, Guru Mathur, Mais Homs, Shyam Surthi and Veena Misra, Department of Electrical and Computer Engineering, North Carolina State University, Raleigh, NC; Vladimir Malinovskii, Karl-Heinz Schweikart, Lianhe Yu and Jonathan S. Lindsey, Department of Chemistry, North Carolina State University, Raleigh, NC; Zhiming Liu, Rajeev B. Dabke, Amir Yasser, David F. Bocian and Werner G. Kuhr, Department of Chemistry, University of California, Riverside, CA. ♣

11:30 AM F4.9

EFFECTS OF AMORPHOUS CARBON FILMS ON THE PERFORMANCE OF POROUS SILICON ELECTROLUMINESCENCE. Bernard Geloz, Nobuyoshi Koshida, Tokyo Univ of A&T, Dept Electronic and Electrical Eng, Tokyo, JAPAN.

11:45 AM F4.10

NANOSCALE PATTERNING OF ORGANIC AND INORGANIC STRUCTURES ON SILICON SURFACES. Jillian M. Buriak, Patrick Hurley, Lon A. Porter Jr., Purdue University, West Lafayette, IN. ♣

SESSION F5: NOVEL LITHOGRAPHIC TECHNIQUES AND LATERAL NANOPATTERNING
Tuesday Afternoon, December 3, 2002
Room 311 (Hynes)

1:30 PM *F5.1

LATERAL CONTROL OF SELF-ASSEMBLED STRUCTURES USING FOCUSED ION BEAM PATTERNING. F.M. Ross, IBM Research Division, T.J. Watson Research Center, Yorktown Heights, NY; and M. Kammler and R. Hull, Department of Materials Science and Engineering, University of Virginia, Charlottesville, VA.

2:00 PM F5.2

CAPILLARY FORCE LITHOGRAPHY. Kahp Y. Suh, D.C. Suh, P.S. Hong, P. Yoo, Hong H. Lee, Seoul National University, School of Chemical Engineering, Seoul, KOREA.

2:15 PM F5.3

FABRICATION OF PERIODIC SURFACE FEATURES WITH SPACINGS DOWN TO 10 NM BY ETCHING OF DISLOCATIONS IN TWIST-BONDED BICRYSTALS. Fang Mei, Cornell Univ, Dept of Materials Science and Engineering, Ithaca, NY; Rikard A. Wind, Melissa A. Hines, Cornell Univ, Dept. of Chemistry and Chemical Biology, Ithaca, NY; Christopher K. Ober and Stephen L. Sass, Dept of Materials Science and Engineering, Ithaca, NY.

2:30 PM *F5.4

NANOSCALE ORGANIC ELECTRONIC DEVICES FORMED BY PRINTING AND LAMINATION. Yueh-Lin Loo, Robert Willett, Jana Zaumseil, Vikram Sundar, Takao Someya and John A. Rogers, Bell Laboratories, Murray Hill, NJ. ♣

3:00 PM BREAK**3:30 PM *F5.5**

ELECTRODEPOSITION OF PATTERNED NANOCRYSTAL FILMS USING THERMALLY CHARGED NANOCRYSTALS. Mohammad A. Islam^a, Yuqi Xia^b, Ming Yin^a, Stephen P. O'Brien^a, and Irving P. Herman^a; Materials Research Science and Engineering Center, ^aDepartment of Applied Physics and Applied Mathematics, ^bColumbia College, Columbia University, New York, NY.

4:00 PM F5.6

CATHODIC ELECTROGRAFTING NANOLITHOGRAPHY OF TERMINAL ALKYNES ON SEMICONDUCTOR SURFACES. Patrick T. Hurley, Alexander E. Ribbe, and Jillian M. Buriak, Department of Chemistry, Purdue University, West Lafayette, IN. ♣

4:15 PM F5.7

LASER-INDUCED NANOPARTICLE FORMATION AND ALIGNMENT. J.D. Fowlkes, A.J. Pedraza, The University of Tennessee, Department of Materials Science and Engineering, Knoxville, TN; D.A. Blom, H.M. Meyer III, Oak Ridge National Laboratory, High Temperature Materials Laboratory, Oak Ridge, TN.

4:30 PM *F5.8

NANO-STRUCTURING OF POLYMER FILMS BY FEMTOSECOND LASER SPATIALLY CONFINED BY CANTILEVERED NEAR FIELD SCANNING OPTICAL MICROSCOPE TIP. David Jen Hwang, Taeyul Choi, Costas P. Grigoropoulos, Univ of California Berkeley, Dept of Mechanical Engineering, Berkeley, CA.

SESSION F6: SEMICONDUCTOR NANOWIRES AND NANOTUBES - I

Wednesday Morning, December 4, 2002
Room 311 (Hynes)

8:30 AM *F6.1

HIGH TEMPERATURE SOLUTION-PHASE SYNTHESIS OF SILICON AND GERMANIUM NANOCRYSTALS AND NANOWIRES. Lindsay E. Pell, Tobias Hanrath, Brian A. Korgel, Dept. of Chemical Engineering, Texas Materials Institute, Center for Nano- and Molecular Science and Technology, University of Texas, Austin, TX.

9:00 AM F6.2

DIRECT SYNTHESIS OF SILICON NANOWIRES USING SILANE AND MOLTEN GALLIUM. Shashank Sharma, Mahendra K. Sunkara, University of Louisville, Department of Chemical Engineering, Louisville, KY; Elizabeth C. Dickey, Pennsylvania State University, Department of Materials Science and Engineering, University Park, PA.

9:15 AM F6.3

IN-SITU SYNTHESIS AND OXIDATION OF Si NANOWIRES. Guangwen Zhou, Judith C. Yang, Materials Science and Engineering Dept., University of Pittsburgh, Pittsburgh, PA.

9:30 AM F6.4

SELF-ASSEMBLED ARRAYS OF RARE EARTH SILICIDE NANOWIRES ON Si(001). Regina Ragan, Yong Chen, Douglas A.A. Ohlberg, and R. Stanley Williams, Hewlett-Packard Laboratories, Quantum Science Research, Palo Alto, CA; Gilberto Medeiros-Ribeiro, Laboratório Nacional de Luz Síncrotron, Sao Paulo, BRAZIL.

9:45 AM F6.5

INTENTIONAL P-TYPE DOPING OF SILICON NANOWIRES USING TRIMETHYLBORON BY TEMPLATE-DIRECTED VAPOR-LIQUID-SOLID GROWTH. Kok-Keong Lew, Altaf H. Carim, Joan M. Redwing, The Pennsylvania State University, Dept of Materials Science and Engineering, University Park, PA; Marco A. Cabassi, Eric A. Krall, Theresa S. Mayer, The Pennsylvania State University, Dept of Electrical Engineering, University Park, PA. ♣

10:00 AM BREAK**10:30 AM *F6.6**

SEMICONDUCTOR NANOWIRES — SYNTHESIS, CHARACTERIZATION, AND NOVEL PROPERTIES. S.T. Lee, Center of

Super-Diamond and Advanced Films (COSDAF) & Department of Physics and Materials Science City University of Hong Kong, Hong Kong SAR, CHINA. ♣

11:00 AM F6.7

SILICON-GERMANIUM EPITAXIAL CORE-SHELL NANOWIRE HETEROSTRUCTURE DEVICES. Lincoln J. Lauhon, Mark S. Gudiksen, Charles M. Lieber, Harvard Univ, Dept of Chemistry and Chemical Biology, Cambridge, MA.

11:15 AM F6.8

IMAGING, STRUCTURAL AND CHEMICAL ANALYSIS OF PLV-GROWN SILICON NANOWIRES. R. Barsotti Jr., J.E. Fischer, C.H. Lee, J. Mahmood, Univ. Penna, Dept. of Materials Science and Engineering, Philadelphia PA; C. Adu, P.C. Eklund, Penn State U., Dept. of Physics, University Park, PA.

11:30 AM F6.9

Ti-ISLAND-CATALYZED Si NANOWIRE: GROWTH ON (112) SUBSTRATE AND BEHAVIOR OF ITS VERTICAL MOS STRUCTURE. Qiang Tang, Xian Liu, Stanford University, Stanford, CA; Theodore I. Kamins, Hewlett-Packard Laboratories, Palo Alto, CA; Glenn S. Solomon, James S. Harris, Stanford University, Stanford, CA.

11:45 AM F6.10

LARGE-SCALE SYNTHESIS OF ORIENTED AMORPHOUS SILICON OXIDE NANOWIRES. Shen Jin, Xintai Zhou, Joseph Shinar^a, Chunsing Lee, Shuittong Lee Center of Super-Diamond and Advanced Films, City University of Hong Kong, HONG KONG; ^aDepartment of Physics and Astronomy, Iowa State University, IA.

SESSION F7: SEMICONDUCTOR NANOWIRES AND NANOTUBES - II

Wednesday Afternoon, December 4, 2002
Room 311 (Hynes)

1:30 PM *F7.1**MRS MEDAL AWARD TALK PRESENTATION**

NANOWIRES AS BUILDING BLOCKS FOR NANOSCALE SCIENCE AND TECHNOLOGY—BUILDING A BIG FUTURE FROM SMALL THINGS. Charles M. Lieber, Department of Chemistry and Chemical Biology, Division of Engineering and Applied Sciences, Harvard University, Cambridge, MA. ♣

2:00 PM F7.2

ASSEMBLY OF NANOWIRE TRANSISTOR BASED DECODER ARRAYS. Zhaohui Zhong, Deli Wang, Yi Cui, Charles M. Lieber, Harvard Univ, Dept of Chemistry and Chemical Biology, Cambridge, MA.

2:15 PM F7.3

INTEGRATED NANOWIRE BASED NONVOLATILE RANDOM ACCESS MEMORY. Deli Wang, Zhaohui Zhong, Yi Cui, Charles M. Lieber, Harvard University, Department of Chemistry and Chemical Biology, Cambridge, MA.

2:30 PM F7.4

ZnO NANONEEDLES VERTICALLY GROWN ON Si SUBSTRATES BY NONCATALYTIC CHEMICAL VAPOR DEPOSITION. W.I. Park, Y.H. Jun, Gyu-Chul Yi, Pohang University of Science and Technology (POSTECH), Dept of Materials Science and Engineering, Pohang, KOREA; M.Y. Kim, Samsung Advanced Institute of Science and Technology, Suwon, KOREA.

2:45 PM F7.5

SEMICONDUCTOR NANOWIRE SUPERLATTICES AS BUILDING BLOCKS FOR NANOTECHNOLOGY. Mark S. Gudiksen, Lincoln J. Lauhon, Carl Barrelet, and Charles M. Lieber, Harvard Univ, Cambridge, MA.

3:00 PM BREAK**3:30 PM *F7.6**

ELEMENTAL SEMICONDUCTOR SUPERLATTICE NANOWIRES. Peidong Yang, Department of Chemistry, University of California, Berkeley, CA. ♣

4:00 PM F7.7

EFFECTS OF TWO DIMENSIONAL QUANTUM CONFINEMENT ON THE OPTICAL PROPERTIES OF SELF-ASSEMBLED ARRAYS OF BISMUTH NANOWIRES. Marcie R. Black, Y.M. Lin,

MIT, Department of Electrical Engineering and Computer Science, Cambridge, MA; Steve Cronin, MIT, Department of Physics, Cambridge, MA; M.S. Dresselhaus, MIT, Department of Electrical Engineering and Computer Science and Department of Physics, Cambridge, MA.

4:15 PM F7.8

METAL SILICIDE/SILICON NANOWIRES AND NANOCONTACTS. Soham Dey, Suzanne E. Mohny, Ahmad M. Mohammad, Kok-Keong Lew, Joan M. Redwing, The Pennsylvania State University, Dept of Materials Science and Engineering, University Park, PA; Theresa S. Mayer, Marco A. Cabassi, The Pennsylvania State University, Dept of Electrical Engineering, University Park, PA.

4:30 PM F7.9

PERIODIC ARRAY OF INTRAMOLECULAR JUNCTIONS OF SILICON NANOWIRES. Duoduo Ma, Shuitong Lee, City Univ of Hong Kong, Center of Super Diamond and Advanced Films and Dept of Physics and Materials Science, Hong Kong SAR, CHINA.

4:45 PM F7.10

PREDICTION OF STRESS-INDUCED Si-RICH AND Ge-RICH NANOWIRES BY MISFIT DISLOCATIONS IN PSEUDOMORPHIC SiGe FILMS. A. Marzeggali, P. Raiteri, L. Martinelli, F. Montalenti and Leo Miglio, INFN and Dipartimento di Scienza dei Materiali, Università degli Studi di Milano-Bicocca, Milano, ITALY.

SESSION F8: POSTER SESSION
Wednesday Evening, December 4, 2002
8:00 PM
Exhibition Hall D (Hynes)

F8.1

THE PILE-UPS OF ALUMINUM AND BORON IN THE SiGe(C). Hong-Jyh Li, Larry Larsen, International SEMATECH, Austin, TX; David Onsongo, Taras, Kirichenko, Puneet Kohli and Sanjay Banerjee, Electrical and Computer Engineering, University of Texas at Austin, Austin, TX.

F8.2

EVIDENCE OF TITANIUM-RELATED INCLUSIONS IN AN ALUMINUM ALLOY INTERCONNECTING LAYER OF A NANOMETER 256MBIT DRAM SEMICONDUCTOR DEVICE CHARACTERIZED BY TEM, STEM, EELS ELEMENTAL MAPPING, AND XEDS LINESCAN. Wei (Wayne) Zhao, Steve Graca, Infineon Technologies Richmond, Department of Technology Transfer, Sandston, VA.

F8.3

Si NANOCRYSTALS BY METAL INDUCED GROWTH USING DIFFERENT CATALYZING METALS. Chunhai Ji and Wayne A. Anderson, University at Buffalo, The State University of New York, Dept of Electrical Engineering, Buffalo, NY.

F8.4

EXCITED MAGNETOEXCITON STATES IN GaAs-AlGaAs DOUBLE QUANTUM WELLS. Carlos Leonardo Beltrán Ríos, and N. Porrás-Montenegro, Universidad del Valle, Cali, COLOMBIA.

F8.5

EXPLOITING SILICON POROSITY GRADIENTS FOR SUPERIOR ANTIREFLECTIVE FILMS. Christopher C. Striemer and Philippe M. Fauchet, Univ of Rochester, Dept. of Electrical and Computer Engineering, Rochester, NY.

F8.6

N-TYPE ULTRANANOCRYSTALLINE DIAMOND AS A NOVEL ELECTRONIC MATERIAL. J.E. Gerbi, O. Auciello, James Birrell, J.A. Carlisle, D.M. Gruen, X. Xiao, Argonne National Laboratory, Argonne, IL; B.W. Alphenaar, University of Louisville, Louisville, KY.

F8.7

STRUCTURAL PROPERTIES OF POLY-SiNWS SYNTHESIZED BY PLASMA-ENHANCED CHEMICAL VAPOR DEPOSITION. X.B. Zeng, X.B. Liao, Z.H. Hu, H.W. Diao, Y.Y. Xu, C.Y. Chen, S.B. Zhang, and G.L. Kong, State Key Laboratory for Surface Physics, Institute of Semiconductors, Chinese Academy of Science, Beijing, CHINA.

F8.8

CONTRIBUTION OF NANOCRYSTAL LIGAND LOSS TO INTERDOT COUPLING IN FILMS OF SMALL CdSe/1-THIOGLYCEROL NANOCRYSTALS. Dae I. Kim^a, Mohammad A. Islam^a, Luis A. Avila^b, and Irving P. Herman^a;

Materials Research Science and Engineering Center, ^aDepartment of Applied Physics and Applied Mathematics, ^bDepartment of Chemistry, Columbia University, New York, NY.

F8.9

OPTICAL AND STRUCTURAL PROPERTIES OF SILICON NANO-DOTS EMBEDDED SiC THIN FILMS BY PLD. Sang Hyeob Kim, Nae-Man Park, Gun Yong Sung, Electronics and Telecommunications Research Institute, Basic Research Lab, Daejeon, KOREA.

F8.10

NUMERICAL ADVANCES IN CHARACTERIZATION OF CARBON NANOTUBES BY RAMAN SPECTROSCOPY. Ge. G. Samsonidze, MIT, Dept of Electrical Engineering, Cambridge, MA; A. Grüneis, R. Saito, University of Electro-Communications, Dept of Electronic Engineering, Tokyo, JAPAN; A. Jorio, M.A. Pimenta, Universidade Federal de Minas Gerais, Departamento de Física, Belo Horizonte, BRAZIL; A.G. Souza Filho, Universidade Federal do Ceará, Departamento de Física, Fortaleza, BRAZIL; G. Dresselhaus, MIT, Francis Bitter Magnet Lab, Cambridge, MA; M.S. Dresselhaus, MIT, Dept of Electrical Engineering and Dept of Physics, Cambridge, MA.

F8.11

MICROSTRUCTURE OF THE SILICON FILM NEAR THE PHASE TRANSITION REGIME FROM AMORPHOUS TO NANOCRYSTALLINE. Shibin Zhang, Xianbo Liao, Yanyue Xu, Zhihua Hu, Xiangbo Zeng, Hongwei Diao, and Guanglin Kong, Institute of Semiconductors, Chinese Academy of Sciences, Beijing, CHINA.

F8.12

EFFECTS OF RAPID THERMAL ANNEAL TREATMENTS ON ELECTRICAL PROPERTIES OF Pd, Pt AND Ir SILICIDES. Woo-Seok Cheong, Won-ju Cho, Moon-gyu Jang, Seong-jae Lee, and Kyung-wan Park, Nanoelectronic Devices Team, Electronics and Telecommunications Research Institute, Daejeon, KOREA.

F8.13

SYNTHESIS OF NICKEL OXIDE NANOPARTICLES BY LASER ABLATION. Leszek Zbroniec, Takeshi Sasaki, Naoto Koshizaki, Nanoarchitectonics Research Center, National Institute of Advanced Science and Technology, Tsukuba, JAPAN.

F8.14

INFLUENCE OF DIFFERENT ATMOSPHERES ON THE LIFE TIME OF POROUS SILICON LIGHT-EMITTING DEVICES. B.R. Jumayev, H.L. Tam and K.W. Cheah, Department of Physics, Hong Kong Baptist University, Kowloon Tong, Hong Kong, CHINA.

F8.15

SYSTEMATIC ANALYSIS OF PHOTOVOLTAIC AND PHOTODETECTOR DEVICES BASED ON THIN FILMS OF ORGANIC-NANOCRYSTAL BLENDS. Noam Rappaport, Nir Tessler, Technion Israel Institute of Technology, Dept of Electrical Engineering, Haifa, ISRAEL; Taleb Mokari, Uri Banin, Hebrew Univ, Dept of Physical Chemistry, Jerusalem, ISRAEL.

F8.16

INFLUENCE OF THE COOLING RATE ON THE ELECTRICAL CONDUCTIVITY OF UNDOPED MICROCRYSTALLINE SILICON. N.H. Nickel and M. Rakel, Hahn-Meitner-Institut Berlin, Berlin, GERMANY.

F8.17

SILICON NANOCRYSTALLITES IN AMORPHOUS SILICON MATRIX: PROPERTIES MEASURED ON NANOSCALE. S.B. Aldabergenova, M. Albrecht, G. Frank, M. Nerdling, M. Becker and H.P. Strunk, Erlangen-Nürnberg Univ, Inst. of Material Science, Erlangen, GERMANY.

F8.18

INVESTIGATION ON PROCESS DEPENDENCE OF SELF-ASSEMBLED METAL NANOCRYSTALS. Chungho Lee, Zengtao Liu, Edwin C. Kan, Cornell University, School of Electrical and Computer Engineering, Ithaca, NY.

F8.19

SiON NANOCRYSTALS IN A MAGNETIC FIELD. Bouchta Sahraoui, Laboratoire des Propriétés Optiques des Matériaux et Applications, Université d'Angers, FRANCE; Kazimierz J. Plucinski, Military University of Technology, Warsaw, POLAND; J. Ebothe, Laboratoire des Propriétés Optiques des Matériaux et Applications, Université d'Angers, FRANCE; Ivan V. Kityk, Institute of Physics, Ped. University, Czestochowa, POLAND.

F8.20

TEM AND PL STUDY OF HIGH TEMPERATURE STABLE γ -FeSi₂ PRECIPITATES FORMED IN Si BY IRON IMPLANTATION USING A METAL VAPOR VACUUM ARC ION SOURCE. Y. Gao, W.Y. Cheung, S.P. Wong, Dept of Electronic Engineering and Materials Science and Technology Research Centre, The Chinese Univ of Hong Kong, Hong Kong, CHINA; G. Shao, School of Engineering, Univ of Surrey, Guildford, Surrey, UNITED KINGDOM; K.P. Homewood, School of Electronics Engineering, Computer and Mathematics, Univ of Surrey, Guildford, Surrey, UNITED KINGDOM.

F8.21

CHARACTERIZATION OF COBALT-CATALYZED MULTIWALLED CARBON NANOTUBES BY HIGH-RESOLUTION TRANSMISSION ELECTRON MICROSCOPY. Chih-Chin Wang and Chuan-Pu Liu, Department of Materials Science and Engineering, National Cheng-Kung University, TAIWAN.

F8.22

AN IMAGE-REVERSED PATTERN TRANSFER TECHNIQUE FOR THE FABRICATION OF SEMICONDUCTOR PILLARS. S.P. McGinnis, P. Sines, B. Das, Lane Department of Computer Science and Electrical Engineering, West Virginia University, Morgantown, WV; M. Crouse and A.E. Miller, Department of Chemical Engineering, University of Notre Dame, Notre Dame, IN.

F8.23

MOISTURE EFFECTS ON CRACK INITIATION IN NANOCRYSTALLINE SILICON AND ALUMINA: A HYBRID DENSITY-FUNCTIONAL-THEORY/MOLECULAR-DYNAMICS STUDY. Shuji Ogata, Yamaguchi Univ, Dept. of Applied Sciences, Ube, JAPAN; Rachid Belkada, ACT-JST, Yamaguchi Univ, Dept. of Applied Sciences, Ube, JAPAN.

F8.24

POROUS POLY-SiGe NANOSTRUCTURES FORMED BY ELECTROCHEMICAL PROCESSES. T. Del Cano, M. Avella, J. Jimenez, Dept. Fisica de la Materia Condensada, Universidad de Valladolid, Valladolid, SPAIN; V. Torres-Costa, R.J. Martin-Palma, J.M. Martinez-Duart, Dept. de Fisica Aplicada, Universidad Autonoma de Madrid, Madrid, SPAIN; J. Sangrador, A. Rodriguez, T. Rodriguez, Dept. Tecnologia Electronica, ETSI Telecomunicacion, Universidad Politecnica de Madrid, Madrid, SPAIN.

F8.25

Abstract Withdrawn

F8.26

TWO KINDS OF GERMANIUM NANOCRYSTALS FORMED UNDER CONDITIONS OF HIGH-PRESSURE ANNEALING OF Ge-ION IMPLANTED SILICON DIOXIDE FILMS. Ida Tyschenko, Aleksander Talochkin, Aleksander Cherkov, Konstantin Zhuravlev, Institute of Semiconductor Physics, Novosibirsk, RUSSIA; Andrej Misiuk, Institute of Electron Technology, Warsaw, POLAND; Matthias Voelskow, Wolfgang Skorupa, Institute of Ion Beam Physics and Materials Research, Research Center Rossendorf, Dresden, GERMANY.

F8.27

A SOL-GEL APPROACH TO COPPER-SILICA THIN FILMS. Lidia Armelao, ISTM-CNR and INSTM, Department of Chemistry, University of Padova, ITALY; Gregorio Bottaro, Manuel Bertapelle, Eugenio Tondello, Department of Inorganic, Metallorganic and Analytical Chemistry and INSTM, University of Padova, ITALY; Cinzia Sada, Department of Physics and INFN, University of Padova, ITALY.

F8.28

ZnS - SILICA NANOCOMPOSITE FILMS USING A VERSATILE SOL-GEL ROUTE. Lidia Armelao, Silvia Gross, A. Venzo, R. Seraglia, ISTM-CNR and INSTM, Department of Chemistry, University of Padova, ITALY; G. Trimmel, INSTM, Department of Chemistry, University of Padova, ITALY; D. Angelova, E. Tondello, Department of Chemistry and INSTM, University of Padova, ITALY.

F8.29

EXPERIMENTAL INVESTIGATION OF NANOSIZED SILICON PARTICLE FORMATION IN AN INDUCTIVELY COUPLED PLASMA SYSTEM. Z. Shen, S.A. Campbell, Department of Electrical and Computer Engineering; T. Kim, U. Kortshagen, P.H. McMurry, Department of Mechanical Engineering, University of Minnesota, Minneapolis, MN.

F8.30

HETEROEPITAXIAL ZnO/ZnMgO QUANTUM STRUCTURE NANORODS. W.I. Park, Y.H. Jun, Gyu-Chul Yi, Pohang University

of Science and Technology (POSTECH), Dept of Materials Science and Engineering, Pohang, KOREA; M.Y. Kim, Samsung Advanced Institute of Science and Technology, Suwon, KOREA.

F8.31

DETERMINATION OF THE ADSORPTION ENERGY OF WATER MOLECULES ON THE TREATED POROUS SILICON SURFACE USING A NOVEL MICROCALORIMETRIC METHOD. J. Salonen, K. Vähä-Heikkilä, V-P. Lehto, E. Laine, Department of Physics, University of Turku, Turku, FINLAND; L. Niinistö, Laboratory of Inorganic and Analytical Chemistry, Helsinki University of Technology, FINLAND.

F8.32

NON-CATALYTIC SYNTHESIS OF GaN NANOWIRES USING METALORGANIC CHEMICAL VAPOR DEPOSITION. Dong-Hyuk Kim and Gyu-Chul Yi, Department of Materials Science and Engineering, Pohang University of Science and Technology (POSTECH), Pohang, KOREA.

F8.33

APPLICATION OF NANOCRYSTALLINE STRUCTURES TO PHOTOVOLTAIC CELLS. M.J. Colgan, G.K. Kiema, M.J. Brett, Department of Electrical and Computer Engineering, University of Alberta, Edmonton, AB, CANADA.

F8.34

GROWTH OF (100) DIAMOND USING DICARBON. Michael Sternberg, Peter Zapol, Larry A. Curtiss, John A. Carlisle, Dieter M. Gruen, Materials Science and Chemistry Divisions, Argonne National Laboratory, Argonne, IL.

F8.35

THE MICROSTRUCTURE OF Co NANOPARTICLES DIRECTLY DEPOSITED ON Si (001) SUBSTRATES USING SPUTTERING TECHNIQUES. Bing-Xian Chung, Chuan-Pu Liu, Department of Materials Science and Engineering, National Cheng-Kung University, Tainan, TAIWAN; Jiun-Nan Chen, Department of Electrical Engineering, Fortune Institute of Technology, Kaohsiung, TAIWAN.

F8.36

NOVEL ELECTROCHEMICAL DEPOSITION COATING PROCESS FOR SYNTHESIS OF NANOENCAPSULATED PHOSPHORS. Han Ho Choi, Michael Ollinger, Rajiv K. Singh, Univ of Florida, Dept of Materials Science and Engineering, Gainesville FL.

F8.37

Abstract Withdrawn

F8.38

ELECTROCHEMICAL NANOLITHOGRAPHY ON SEMICONDUCTOR SURFACES. Patrick T. Hurley, Alexander E. Ribbe, and Jillian M. Buriak, Department of Chemistry, Purdue University, West Lafayette, IN.

F8.39

THE GROWTH AND QUENCHING OF ZINC OXIDE NANOPARTICLES. Noshir S. Pesika, Johns Hopkins Univ., Chemical Engineering Dept., Baltimore, MD; Zeshan Hu, Johns Hopkins Univ., Materials Science and Engineering Dept., Baltimore, MD; Kathleen J. Stebe, Johns Hopkins Univ., Chemical Engineering Dept., Baltimore, MD; Peter C. Searson, Johns Hopkins Univ., Materials Science and Engineering Dept., Baltimore, MD.

F8.40

NMR CHARACTERIZATION OF DOPED SILICON NANOPARTICLES. Eva Ratai, Katherine A. Pettigrew, Richard K. Baldwin, Ray S. Carter, Susan M. Kauzlarich, and Matthew P. Augustine, University of California, Davis, CA.

F8.41

SOLUTION REDUCTION SYNTHESIS AND CHARACTERIZATION OF PASSIVATED SILICON NANOPARTICLES. Richard K. Baldwin, Katherine A. Pettigrew, Eva Ratai, Susan M. Kauzlarich, and Matthew P. Augustine, Department of Chemistry, University of California Davis, Davis, CA.

F8.42

LASER-GROWN SILICON NANOCOLUMNS AND THEIR FIELD EMISSION CHARACTERISTICS. Y.F. Guan, A.J. Pedraza, The University of Tennessee, Dept of Materials Science and Engineering, Knoxville, TN; E.D. Ellis, The University of Tennessee, Dept of Electrical Engineering, Knoxville, TN; and L.R. Baylor, Oak Ridge National Laboratory, Oak Ridge, TN.

F8.43

METAL-ZnO HETEROSTRUCTURE NANORODS. S.W. Jung, W.I.

Park, Y.H. Jun, and Gyu-Chul Yi, Department of Materials Science and Engineering, Pohang University of Science and Technology (POSTECH), Pohang, KOREA.

F8.44

LOW UV REFLECTANCE BEHAVIOR OF NANOSTRUCTURED Si/POLYMER FILMS. Kaan Kalkan, Stephen J. Fonash, The Pennsylvania State University, Nanofabrication Facility, University Park, PA.

F8.45

LOW-COST, LARGE-AREA NANOCRYSTALLINE TiO₂-POLYMER SOLAR CELLS ON FLEXIBLE PLASTICS. Krishna C. Mandal, Anton Smirnov, D. Peramunage, R. David Rauh, EIC Laboratories, Inc., Norwood, MA.

F8.46

ELECTRICAL CHARACTERISTICS OF NANOPORES np-Si:H/c-Si HETEROJUNCTIONS OBTAINED BY HIGH-DOSE HYDROGEN IMPLANTATION. V.P. Popov, O.V. Naumova, V.I. Obodnikov.

F8.47

MAGNETIC PROPERTIES OF SELF-ASSEMBLED NANOSCALE LCMO PARTICLES IN AN STO MATRIX. Walter M. Gilmore III, Steven A. Coleman, D. Kumar, Clinton B. Lee, and J. Sankar, Center for Advanced Materials and Smart Structures, North Carolina A&T State University, Greensboro, NC; Rajiv K. Singh, Department of Materials Science and Engineering, University of Florida, Gainesville, FL.

F8.48

GROWTH AND CHARACTERIZATION OF III-NITRIDE NANORODS BY HYDRIDE VAPOR PHASE EPITAXY. Hwa-Mok Kim, D.S. Kim, D.Y. Kim, T.W. Kang, Dongguk Univ, QSRC, Seoul, KOREA; Yong-Hoon Cho, Chungbuk Univ, Dept of Physics, Chungju, KOREA; K.S. Chung, Kyunghee Univ, Dept of Electronic Engineering, Yongin, KOREA.

F8.49

EFFECT OF MAGNETIC FIELD ON CRYSTALLIZATION PROCESS OF AMORPHOUS SILICON THIN FILMS USING METAL-INDUCED LATERAL CRYSTALLIZATION. Min Sun Kim, Gi Bum Kim, Yeo Geon Yoon, and Seung Ki Joo, Seoul National University, Seoul, KOREA.

F8.50

Abstract Withdrawn

F8.51

Abstract Withdrawn

F8.52

Er-Tm CO-DOPING OF Si NANOCRYSTALS FOR ULTRA-BROADBAND, SINGLE SOURCE PUMPING AMPLIFIER APPLICATIONS. Jung H. Shin and Se-Young Seo, Dept. of Physics, KAIST, Taejon, KOREA; Joanne Penninkhof and A. Polman, FOM-AMOLF, Amsterdam, THE NETHERLANDS.

F8.53

DETERMINATION OF THE CHARGE ATTACHED TO MICRO-SCALE DEVICES USED IN FLUIDIC SELF-ASSEMBLY PROCESSES. Eric Tkaczyk^a, Vandna Handa^a, Sangwoo Lee^a, Helen McNally^a, Lichuan Gui^c, Steve Wereley^c, Rashid Bashir^{a,b}; School of Electrical and Computer Engineering^a; Department of Biomedical Engineering^b; School of Mechanical Engineering^c; Purdue University, W. Lafayette, IN.

SESSION F9: METALLIC AND RARE EARTH
DOPED NANOPARTICLES
Thursday Morning, December 5, 2002
Room 311 (Hynes)

8:30 AM *F9.1

SYNTHESIS AND CHARACTERIZATION OF PbSe NANOCRYSTALS: QUANTUM DOTS, CUBES, RODS AND WIRES. K.S. Cho, IBM Corp and University of New Orleans, Advanced Materials Research Institute; C.B. Murray, IBM Corp, Yorktown Heights, NY.

9:00 AM F9.2

STIMULATED EMISSION IN Er-DOPED SILICON NANOSTRUCTURES. B.V. Kamenev, Department of Electrical and Computer Engineering, New Jersey Institute of Technology, Newark, NJ; V.Yu. Timoshenko, V.I. Emel'yanov, P.K. Kashkarov, Physics Department, M.V. Lomonosov Moscow State University, Moscow,

RUSSIA; V.Kh. Kudoyarova and E.I. Terukov, Ioffe Physico-Technical Institute, Russian Academy of Science, St. Petersburg, RUSSIA.

9:15 AM F9.3

RARE-EARTH DOPED Si NANOCRYSTALS: PHYSICAL PROPERTIES AND ELECTROLUMINESCENT DEVICES. Domenico Pacifici, Alessia Irrera, Maria Miritello, Giorgia Franzó, Francesco Priolo, INFN and Physics Dept, Catania, ITALY; Fabio Iacona, CNR-IMM, Catania, ITALY.

9:30 AM *F9.4

FROM ATOMS TO EMBEDDED NANOCRYSTALS: DIRECT OBSERVATION OF DEFECT-MEDIATED CLUSTER NUCLEATION. David A. Muller, Bell Labs, Lucent Technologies, Murray Hill, NJ; Ute Kaiser, Friedrich-Schiller Universität, Jena, GERMANY; A. Chuvilin, Boreskov Institute of Catalysis, Novosibirsk, RUSSIA.

10:00 AM BREAK

SESSION F10: THEORETICAL STUDIES AND
NUMERICAL SIMULATIONS IN Si/SiGe
NANOSTRUCTURES
Thursday Morning, December 5, 2002
Room 311 (Hynes)

10:30 AM *F10.1

EFFICIENT AND UNUSUAL INTRABAND OPTICAL TRANSITIONS IN SILICON NANOCRYSTALS. G. Allan and C. Delerue, IEMN, Dept. ISEN, Villeneuve d'Ascq, FRANCE.

11:00 AM F10.2

COMPUTATIONAL SCIENCE FOR SILICON-BASED NANOTECHNOLOGY. R.Q. Zhang and S.T. Lee, City University of Hong Kong, Center of Super-Diamond and Advanced Films (COSDAF) & Department of Physics and Materials Science, Hong Kong SAR, CHINA.

11:15 AM F10.3

KINETICS OF PORE GROWTH DURING SIMULATED ANNEALING OF AMORPHOUS SILICA. V.M. Burlakov, G.A.D. Briggs, A.P. Sutton, Department of Materials, University of Oxford, Oxford, UNITED KINGDOM.

11:30 AM F10.4

EQUILIBRIUM ANALYSIS AND COHERENCY LIMITS OF LATTICE-MISMATCHED NANOWIRE HETEROSTRUCTURES. Elif Ertekin, Timothy D. Sands, Daryl C. Chrzan, University of California, Dept of Materials Science and Engineering, Berkeley, CA.

11:45 AM F10.5

OXYGEN ROLE ON THE STRUCTURAL AND OPTOELECTRONIC PROPERTIES OF SILICON NANODOTS. Marcello Luppi, INFN-S³ and Dipartimento di Fisica, Universite di Modena e Reggio Emilia, Modena, ITALY; Elena Degoli and Stefano Ossicini, INFN-S³ and DISMI, Universite di Modena e Reggio Emilia, Reggio Emilia, ITALY.

SESSION F11: APPLICATIONS OF GROUP (IV)
NANOSCALE MATERIALS
Thursday Afternoon, December 5, 2002
Room 311 (Hynes)

1:30 PM *F11.1

SILICON NANOCRYSTAL MEMORY DEVICES. R. Muralidhar, B. White, M. Sadd, R. Rao, B. Steimle, B. Hradsky, M. Ramon, S. Straub, S. Bagchi, L. Matthew, APRDL, Motorola, Austin, TX.

2:00 PM F11.2

CHEMICAL VAPOR DEPOSITION OF Si NANOCRYSTALS FOR NON-VOLATILE MEMORIES. R. Rao, S. Straub, K. Scheer, R. Muralidhar, T. Merchant, X.-D. Wang, J. Hooker, S. Bagchi, J. Kulik, B.-Y. Nguyen, and B.E. White Jr., Advanced Process Development and External Research, Digital DNA Laboratories, Motorola SPS, Austin, TX; T. Kawashima, S. Mashiro, J. Sakai, ANELVA Corporation, Tokyo, JAPAN.

2:15 PM F11.3

OBSERVATION OF QUANTUM CONFINEMENT EFFECT IN NANOCRYSTALLINE SILICON DOT FLOATING GATE SINGLE ELECTRON MEMORY DEVICES. Shaoyun Huang, Souri Banerjee, and Shunri Oda, Research Center for Quantum Effect Electronics, Tokyo Institute of Technology, Tokyo, JAPAN.

2:30 PM *F11.4

THE ROLE OF NANOSCALE SILICON IN OPTICAL INTERCONNECTS. Philippe Fauchet, Dept of Electrical and Computer Engineering, University of Rochester, Rochester, NY.

3:00 PM BREAK

3:30 PM *F11.5

PHOTON, ELECTRON AND ULTRASONIC EMISSION FROM NANOCRYSTALLINE POROUS SILICON DEVICES. N. Koshida, B. Gelloz, A. Kojima, T. Migita, Y. Nakajima, Tokyo Univ. of A&T, Dept of Electrical and Electronic Engineering, Tokyo, JAPAN; T. Ichihara, Y. Watabe, T. Komoda, Matsushita Electric Works Ltd, Advanced Technology Research Laboratory, Osaka, JAPAN.

4:00 PM F11.6

TUNNEL SPECTROSCOPY, CURRENT OSCILLATIONS, AND NEGATIVE DIFFERENTIAL CONDUCTIVITY IN NANOCRYSTALLINE SILICON – SILICON DIOXIDE SUPERLATTICES. B.V. Kamenev, Department of Electrical and Computer Engineering, New Jersey Institute of Technology, Newark, NJ; B. Laikhtman, Racah Institute of Physics, Hebrew University, Jerusalem, ISRAEL; G.F. Grom, Agere Systems, Alhambra, CA; D.J. Lockwood, Institute for Microstructural Sciences, National Research Council, Ottawa, CANADA; and Leonid Tsybeskov, Department of Electrical and Computer Engineering, New Jersey Institute of Technology, Newark, NJ.

4:15 PM F11.7

SILICON NANOCRYSTAL OPTICAL MEMORY. Robert J. Walters, Julie D. Casperson, Pieter G. Kik, Dean Holunga, Richard C. Flagan, Harry A. Atwater, California Institute of Technology, Dept of Applied Physics, Pasadena, CA; Maria Giorgi, Robert Lindstedt, George I. Bourianoff, Intel Corporation, Portland, OR.

4:30 PM F11.8

HIGH-DENSITY UNIFORMLY ALIGNED SILICON NANOTIP ARRAYS AND THEIR ENHANCED FIELD EMISSION CHARACTERISTICS. Xuedong Bai, Georgia Tech, School of Materials Science and Engineering, Atlanta, GA, and International Center for Quantum Structures, Beijing, CHINA; Z.L. Wang, Georgia Tech, School of Materials Science and Engineering, Atlanta, GA; E.G. Wang, Institute of Physics, CAS, Beijing, CHINA.

4:45 PM F11.9

SILICON QUANTUM DOTS ELECTROLUMINESCENT DEVICES. F. Iacona, CNR-IMM, Catania, ITALY; A. Irrera, D. Pacifici, M. Miritello, G. Franzó, F. Priolo, INFN & Univ. Catania, Phys. Dept., Catania, ITALY; D. Sanfilippo, G. Di Stefano, G. Fallica, STMicroelectronics, Catania, ITALY.