SYMPOSIUM F
Nanocrystalline Semiconductor Materials and Devices
December 2 – 5, 2002

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SESSION F1: Si, NANOCRYSTALS AND nc-Si SUPERLATTICES
Monday, December 2, 2002
Room 311 (Hyenas)

8:30 AM ◆F1.1
PHOTOLUMINESCENCE WITHIN CRYSTALLINE-Si/SiO2 SINGLE QUANTUM WELLS. D.J. Lockwood, M.W.C. Dhillon-Ward, W.M.C. Dhillon, National Research Council, Institute for Microstructural Sciences, Ottawa, ON, CANADA; X. Lu, D. Groen, 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/p-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, ON, CANADA; G.F. Grem, Agere Systems, Allentown, PA; and L. Tsybeskov, Department of Electrical and Computer Engineering, New Jersey Institute of Technology, Newark, NJ.

9:15 AM ◆F1.3

9:30 AM ◆F1.4

9:45 AM ◆F1.5
MECHANISMS OF VISIBLE PHOTOLUMINESCENCE FROM SIZE-CONTROLLED SILICON NANO PARTICLES. Tsukasa Makino, Nobuyasu Suzuki, Yukin Yamada, and Takahito Yoshimi, Maruhana Electric Industrial Co., Ltd., Advanced Technology Research Lab, Kawasaki, JAPAN; Isao Umezu, Akira Sagimura, Konan Univ, Dept of Physics, Kobe, JAPAN.

10:00 AM BREAK

10:30 AM ◆F1.6
SILICON CONTROL AND OPTICAL CHARACTERIZATION OF Si NANOCRYSTALS FABRICATED BY SO/SiO2 SUPERLATTICES. J. Heitmann, R. Scholz, M. Schmidt, L. Yi, M. Zschiesche, MPI fur Mikrostrukturphysik, Halle, GERMANY; D. Kronke, Technische Universitat, Munich, Dept of Physics, Erlangen, 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 ALKY Terminated SILICON NANOPARTICLES. Katherine A. Pettigrew, Philip P. Power, Susan M. Knutheich, 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. Trezzi, T. Baronti, J. M. Hernando, M. N. Serna, G. Gremion, F. Lampert, CEA-LETI, DIT, DIT, Grenoble, FRANCE.

11:45 AM ◆F1.10
SYNTHESSES OF CRYSTALLINE SILICON NANOPARTICLES IN LOW-PRESSURE INDUCTIVE PLASMAS. Ayse Baydogan, Uwe Korstagens, Mechanical Engineering, University of Minnesota, Minneapolis, MN; Stephen Campbell, Electrical and Computer Engineering, University of Minnesota, Minneapolis, MN.

SESSION F2: SiGe NANO STRUCTURES
Monday, December 2, 2002
Room 311 (Hyenas)

1:30 PM ◆F2.1
SELF-ASSEMBLED SiGe QUANTUM DOT STRUCTURES FOR NOVEL DEVICE APPLICATIONS. K. Brouder, M. Bourdet, M. Herbst, and G. Abstreicher, Schottky Institute, TU Munich, Garching, GERMANY.

2:00 PM ◆F2.2
PHOTOLUMINESCENCE IN Ge(Si) QUANTUM DOTS. B. V. Kasmez, L. Tsybeskov, Department of Electrical and Computer Engineering, New Jersey Institute of Technology, Newark, NJ; J. M. Boreland, D. J. Lockwood, Institute for Microstructural Sciences, National Research Council, Ottawa, CANADA; and T. Kamin, 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. Termierlo, Lawrence Livermore National Lab, CA; T. Moller, Huyb. des Doy, GERMANY.

2:30 PM ◆F2.4
EFFECT OF PHOSPHORUS ON Ge/Si(100) ISLAND FORMATION. T. L. Koning, G. Medeiros-Ribeiro1, D.A. Odberg, and R. Stanley Williams, Quantum Science Research, Hewlett-Packard Laboratories, Palo Alto CA; 1Aiko Laboratorio Nacional de Luz Senertron 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. Malavich, R. Magillies-Pavone, Depto. de Fisica, ICTP, Universidad Federal de Minas Gerais, Belo Horizonte, MG, BRAZIL; G. Medeiros-Ribeiro, Laboratorio Nacional de Luz Senertron, Campinas, SP, BRAZIL, and Hewlett-Packard Labs, Palo Alto, CA; S. Kisi, Laboratorio Nacional de Luz Senertron, Campinas, SP, BRAZIL; T. L. Koning 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 STRANSLKRAYSTANOW GROWTH IN Ge/Si(100) AND Ge/Si(111). Peter Hess, Andrei Osipov, Florian Schmitt, Unite of Heidelberg, Inst of Physical Chemistry, Heidelberg, GERMANY.
4:15 PM P.2.7

4:30 PM P.2.8
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. Flores, Sandia National Laboratories, Albuquerque, NM.

4:45 PM P.2.9
LOCAL MORPHOLOGY OF 3D SiGe ISLANDS GROWN ON Si[100] STRAINED USING MEMS TECHNOLOGY. P. Rugeheimer, 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., Hae Cheol Choi, Alexander E. Ruble, J.M. Schmelzer, and Jillian M. Burris, Department of Chemistry, Purdue University, West Lafayette, IN.

F3.3
PERFECT BARITE TITANE FINE PARTICLES PREPARED USING A REFORM HYDROTHERMAL METHOD. LiHong Su, HongChang Ning, ShengQu Qiao, Hoi Wu, Ping Wang, Department of Chemical Engineering, Northwestern Polytechnical University, Xi'an, Shaanxi prov., CHINA.

F3.4 PREPARATION AND CHARACTERIZATION OF FINE BARIUM CARBONATE PAPILLES. LiHong Su, Jian Xiao, ShengQu Qiao, Department of Chemical Engineering, Northwestern Polytechnical University, Xi'an, Shaanxi Prov., CHINA.

F3.5
NANOCLUSTER MEMORY STRUCTURES PREPARED BY MAGNETRON SPITTERING - OPTICAL AND ELECTRICAL INVESTIGATIONS. Jan Uwe Schmidt, Bernd Schmidt, Research Centre Rosendorf, 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. Lihysia Pérez, Marjorie Flores, Daniel Melendez, Javier Ayns, Universidad Metropolitana, Dept of Science, Technology and Health, San Juan, PR; Lidia SanMiguel, Oscar Resto, Luis Fornace, Dept of Physics, University of Puerto Rico, San Juan, PR.

F3.7
PREPARATION AND PHOTOCHEMICAL CHARACTERIZATION OF TUBE-SHAPED ALDOPED ZnO CERAMICS. Takahiko Fujishiro, Masahiko 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. Jiu-Yin Cheng, NEC Research Institute, Inc., Princeton, NJ; J.M. Gibson, P.M. Biolo and D.J. Kestel, Argonne National Laboratory, Argonne, IL.

F3.9
THE EFFECT OF CHEMICAL TREATMENT ON POROUS SILICON: THE ROLE OF ALCOHOL. Miki Kurematsu, Mei Honda, Yumiko Kodama, Hiroshi Tsunetomi, YuGuo Tsutsumi, Akashi College of Technology, Akashi, Hyogo, JAPAN.

F3.10
LONG-TERM 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; H.T. Sun and N.B. Wong, COSDAF & Department of Biology and Chemistry, The City University of Hong Kong, Hong Kong, SAR, CHINA; Bocun K. Teo, Department of Chemistry, University of Illinois at Chicago, IL; N. Weng, 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-MOSSEOTTI APPROXIMATION FOR NONLINEAR COMPOSITES WITH COATED ELLIPSOIDAL PARTICLES. Anotoliy Pichuk, I. Physikalischches Institut, R.W.T. Achen, Achen, GERMANY.

F3.13
PATTERNED GROWTH OF HIGHLY ALIGNED CARBON NANOTUBES ON SOL-GEL PREPARED SUBSTRATES. Zhiangwei Pan, Huaquo Zhu, Zongqiao Zhang, Sheng Dua, David B. Borch, 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 GaBASED NANOWIRES. Wu-Ming Lin*, Stephen B. Cronin*, Oded Rubin*, Jucki Y. Ying*, and M.S. Dresselhaus**. "Department of Electrical Engineering and Computer Science, Department of Physics, Department of Chemical Engineering, Massachusetts Institute of Technology, Cambridge, MA.

F3.15
NANOSTRUCTURE IN OXIDATION OF SiGe ALLOYS. Weig Huang, Shiyin Ji, Physics Department of Guizhou Educational College, CHINA; Shuxiong Cui, Chuyong Long, Physics Department of Guizhou University, CHINA.

F3.16
DIFFUSIONAL COATING OF NANOPISTICLES. James P. Liwine, Eastman Kodak Company, Rochester, NY.

F3.17
GROWTH AND CHARACTERIZATION OF SILICON NANOCLUSTERS IN ANNEALED SiHx 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 MULTIWAIlL NANOTUBES. Shin Guo Cho, Mickei Dresselhaus, Department of Chemistry, Massachusetts Institute of Technology, Cambridge, MA; Elen Humphreys, Sung-Yoon Chang, John Vander Sande and Yee-Ming Chiang, Department of Materials 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. Suhmlo, 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 MICRO- SIZED SILICON. Andrew Verba, Kiev National Univ, Dept of Radiophysics, Kiev, UKRAINE.

F3.21
OPTICAL GAIN IN NANOCRYSTALLINE SILICON SUPERLATTICES. J. Ringe, 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 NANO-CRYSTALLINE SILICON IN SOG, NANORODS USING HOT-WIRE CVD METHOD. Ts-Chi Wong, Chi-Chung Yu, and Jhi-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 8-SILICH SINGLE-LAYER. Xiaowei Wang, Leyi Zhu, Feng Qiao, Wei Li, Xifan Huang, Kunji Chen, Nanjing Univ, National Lab. of Solid State Microstructures and Dept of Physics, Nanjing, CHINA.

F3.25
NEW SILICON-NANOCRYSTALLINE Si FLOATING GATE STRUCTURE FOR NONVOLATILE MEMORY APPLICATION. J.J. Shi, L.C. Wu, K.J. Chang, 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

F3.27
PERIODIC TWO-DIMENSIONAL ARRAYS OF SILICON QUANTUM DOTS FOR NANOSCALE DEVICE APPLICATIONS. Christopher C. Stierer, Rashidkhond Khirani, Leonard Tzvetkov, Philippe M. Fauchet, Univ of Rochester, Dept. of Electrical and Computer Engineering, Rochester, NY, Tsinghua University, Beijing, China.

F3.28
TAILORING OF ELECTRICAL BEHAVIOR OF PE-NANOCOMPOSITES THROUGH INTERFACE CONTROL. Dongling Ma, Jung-il Hong, Linda S. Schatz, Richard W. Siegel, Materials Science and Engineering Department and Rensselaer Nanotechnology Center, Rensselaer Polytechnic Institute, Troy, NY, Eva Martensson, ABB Group Services Center AB, Corporate Research, Vasteras, SWEDEN.

F3.29
SiC'S LINKAGE IN ULTRABRIGHT Si29 NANOPARTICLES. S. Ruo, E. Rogachenko, P. Braun, M.H. Nayfeh, Univ of Illinois, Dept of Physics/Chemical Engineering, University of Illinois, Urbana-Champaign, IL, E.L. Wagner, L. Mita, North Carolina State Univ, Dept of Physics, Raleigh, NC.

F3.30
ESTIMATION OF SILICON NANOCRYSTALLINE SIZES FROM PHOTOLUMINESCENCE MEASUREMENTS OF RF-CO-SPUTTERED Si/So3 Films. A. Ramirez-Pomar, Centro de Investigación en Ciencia e Ingeniería de Materiales and Facultad de Física, Universidad de Costa Rica, San Pedro, COSTA RICA, L.F. Fonseca, Department of Physics, University of Puerto Rico, Rio Piedras, PR.

F3.31
FABRICATION OF SiGe COMPOUNDS NANOWIRES BY FZ MELTING VAPOR METHOD. Quanli Hu, Hiroshi Araki, Hiroshi Suzuki, Nobuhito Ishikawa, Wen Yang, Tetsuji Noda, National Institute for Materials Science, Nanoimemtals Laboratory, Tsukuba, JAPAN.

F3.32
ELECTRICAL PROPERTIES OF THE UNDOPED AND NITROGEN-DOPED ULTRANANOCRYSTALLINE DIAMOND FILMS. V.I. Polyakov, A.I. Rukovishnikov, N.M. Rosanukviy, Institute of Radio Engineering & Electronics, RAS, Moscow, RUSSIA; S.M. Pimenov, V.G. Pereveznev, General Physics Institute, Moscow, RUSSIA; J.A. Carlisle, D.M. Green, Argonne National Laboratory, Argonne, IL.

F3.33
LOW-TEMPERATURE SYNTHESIS OF GALLIUM NITRIDE NANOWIRES. Koi-Chang Shu, Chau-Chung Liu, Jhi-Jen Wu, Dept of Chemical Engineering, National Cheng Kung University, Tainan, TAIWAN.

F3.34
NANOMECHANICAL PROBING ON SINGLE NANOBELT OF SEMICONDUCTING ZN OXIDES. Scott Mo, Minhua Zhao, Univ of Pittsburgh, Dept of Mechanical Engineering, Pittsburgh, PA; Zhigeng Wang, School of Materials Science & Engineering, Georgia Institute of Technology, Atlanta, GA.

F3.35
SOL-GEL DERIVED SiOx-Ge1-x Films and Its Structural Characterization. R.E. Moge, J.W. Torner, A. Hidaka, University of Puerto Rico, Physics Department, Mayaguez, PR; R.S. Knight, University of Puerto Rico, Physics Department, San Juan, PR.

F3.36
SILICON NANOCRYSTALLITES PREPARED BY SOL-GEL METHOD FROM THIETHOXYSILANE. Jerome Rougier, Monique Pauthe, Bernard Gil, Laboratoire de Physico- chimie de la Matiere Condensee, 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. Teddergren, 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 NANO-CRYSTALLINE SILICON TFT'S. Li-Hong Teng and Wayne A. Anderson, University at Buffalo, State University of New York, Dept of Electrical Engineering, Buffalo, NY.

F3.39
SIGNATURE PHASE AND ROOM-TEMPERATURE PHOTOLUMINESCENCE OF LOW-K SiOx FILMS. Valerii Lagitshev, Tenerring Kim Shun Woon, R. Rusli, School of Electrical and Electronic Engineering, Nanyang Technological University, SINGAPORE; Ken Ostrivok, SPCES, The Flinders University of South Australia, Adelaide, AUSTRALIA.

F3.40
FORMATION AND CATHODOLUMINESCENCE OF SILICON NANOCUSTERS IN SILICA. Maria V. Zmeych, Vladimir I. Sokolov, Joel Physical Technical Institute, St. Petersburg, RUSSIA.

F3.41
NANO-SCALE MORPHOLOGY AND ELECTRON SPECTRUM OF DEFECT STATES OF LOW-K SiOx FILMS. Valerii Lagitshev, Tenerring Kim Shun Woon, R. Rusli, School of Electrical and Electronic Engineering, Nanyang Technological University, SINGAPORE.

F3.42
AlxGa1-x AND AIN NANOPARTICLE-EMBEDDED CARBON NITRIDE NANO-COMPOSITE FILMS. N. Jiang, Shuyan Xu, Ken Ostrivok, Advanced Materials and Nanostructures Laboratory, Natural Sciences, Nanyang Technological University, SINGAPORE; Valeri Lagitshev, School of Electrical and Electronic Engineering, Nanyang Technological University, SINGAPORE.

F3.43
POLARIZATION ANISOTROPY IN ELECTROREFLECTANCE SPECTRUM OF POROUS SILICON. Toshikiyo Toyama, Yasuharu Nishi, Kouji Morishita, Hiroshi 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. Sanguinetti, and A. Karini, Faculty of Base Science (FSBIPMC), Swiss Federal Institute of Technology (EPFL), Lausanne, SWITZERLAND.

F3.45
Avella, P. Martin, J. Jimenez, E.T. S.I.E., Universidad de Valldolid, Valldolid, SPAIN.

**F3.46**
SPECTROSCOPIC STUDY OF RARE EARTHS-DOPED NANOCRYSTALLINE SILICON IN SILICON DIOXIDE FILMS. Carlos Roso, Luis F. Foncea, Oscar Resto and S. Zvi Weisz, University of Puerto Rico, Dept of Physics, San Juan, PR.

**F3.47**
CHARACTERIZATION OF NANOGRAFITE AND CARBON NANOFLAKES BY POLARIZATION DEPENDENT OPTICAL SPECTROSCOPY. A. Gómez, 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 of Physics, Universidade Federal de Minas Gerais, Belo Horizonte, BRAZIL; A.G. Souza-Filho, Dept of Physico, Universidade Federal, 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 NANOCLUSTER NUCLEATION IN SUPER SATURATED SOLID SOLUTION UNDER CONTINUOUS GENERATION OF A SOLVENT COMPONENT. Alexander E. Volkov, Russian Research Center Kurchatov Inst, Moscow, RUSSIA.

**F3.49**
Abstract Withdrawn

**F3.50**

**F3.51**
EFFECT OF SURFACE TREATMENTS IN NANOCRYSTALLINE SILICON. N.P. Meenakshi, S. Dey and S.C. Agarwal, Department of Physics, Indian Institute of Technology Kanpur, INDIA.

**F3.52**
HEBT SEMICONDUCTOR QUANTUM DOTS-POLYMER COMPOSITES FOR HYBRID WHITE LIGHT EMITTING DEVICES. Hongjoo Song and Seongchon 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. Lung-Yih Chen and Franklin Chou-Nan Hong, National Cheng Kung University, Dept of Chemical Engineering, Tainan, TAIWAN.

**F3.54**
OPTICAL PROPERTIES OF SILICON NANOPARTICLES IN SILICA GEL MONOLITHS. Yury Pasun, Lidia Sam Miguel, Luis F. Foncea, Oscar Resto, S. Zvi Weisz, Univ of Puerto Rico, Dept of Physics, San Juan, PR.

**F3.55**

**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. Jeffrey L. Coffey, Puyehuo M. J. Lee, Texas Christian University, Fort Worth, TX; Leigh T. Churh, PSI Medica Ltd., Malvern, UNITED KINGDOM.

**9:00 AM **F4.2**
POROUS SILICON ELECTRICAL BIOSENSORS. M. Avrith and P.M. Fauchet, Center for Future Health and Departments of Biomedical Engineering and Electrical and Computer Engineering, University of Rochester, Rochester NY.
SESSION F6: SEMICONDUCTOR NANOWIRES AND NANOTUBES - I

Wednesday, Morning, 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: Zhongxi Zhou, Deli Wang, Yi Cui, Charles M. Lieber, Harvard University, Department of Chemistry and Chemical Biology, Cambridge, MA.

2:15 PM #F7.3
INTEGRATED NANOWIRE BASED NONVOLATILE RANDOM ACCESS MEMORY: Deli Wang, Zhongxi Zhou, 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: Li Jun, Song Chun Yi, Pohang University of Science and Technology (POSTECH), Dept. of Materials Science and Engineering, Pohang, KOREA.

2:45 PM #F7.5

3:00 PM BREAK

3:30 PM #F7.6
ELECTRICAL SEMICONDUCTOR SUPERLATTICE NANOWIRES: Peizhang 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 ANTITELLURIUM NANOWIRES: Marc R. Black, Y.M. Lin,
OPTICAL AND STRUCTURAL PROPERTIES OF SILICON NANO-DOTS EMBEDDED IN THIN FILMS BY PLD.

Sung Hyo-Soo Kim, Nao-Man Park, Gun Yong Sung, Electronics and Telecommunications Research Institute, Basic Research Lab, Daegon, KOREA.

NUMERICAL ADVANCES IN CHARACTERIZATION OF CARBON NANOTUBES BY RAMAN SPECTROSCOPY.

Ge-G. Samarin, MIT, Dept. of Electrical Engineering, Cambridge, MA; A. Grinshpun, R. Suto, University of Electro-Communications, Dept. of Electronic Engineering, Tokyo, JAPAN; A. Jorio, M. A. Pimenta, Universidade Federal de Minas Gerais, Departamento de Fisica, Belo Horizonte, BRAZIL; A. G. Souza Filho, Universidade Federal do Ceara, Departamento de Fisica, Fortaleza, BRAZIL; G. Dresselhaus, MIT; Francis Bitner Magne Lab, Cambridge, MA; M.S. Dresselhaus, MIT, Dept. of Electrical Engineering and Dept. of Physics, Cambridge, MA.

MICROSTRUCTURE OF THE SILICON FILM NEAR THE PHASE TRANSITION REGIME FROM AMORPHOUS TO NANOCRYSTALLINE.

Shihan Zhang, Xiangbo Lin, Yanmei Xu, Zhihun Hu, Xiangbo Zeng, Hongwei Diao, and Gunglin Kong, Institute of Semiconductors, Chinese Academy of Sciences, Beijing, CHINA.

EFFECTS OF RAPID THERMAL ANNEALING ON ELECTRICAL PROPERTIES OF PI, PE, AND PE-SICLIDES.


SYNTHESIS OF NICKEL OXIDE NANO PARTICLES BY LASER ABLATION.

Leszek Zbrzniec, Takashi Shuki, Nozumi Koshitaki, Nanocrystal Research Center, National Institute of Advanced Science and Technology, Tsukuba, JAPAN.

INFLUENCE OF DIFFERENT ATMOSPHERES ON THE LIFE TIME OF POROUS SILICON LIGHT-EMITTING DEVICES.

B.R. Jumapev, H.L. Tan and K.W. Cheah, Department of Physics, Hong Kong Baptist University, Kowloon Tong, Hong Kong, CHINA.

SYSTEMATIC ANALYSIS OF PHOTOVOLTAIC AND PHOTODETECTOR DEVICES BASED ON THIN FILMS OF ORGANIC-NANOCRYSTAL BLENDS.

Noam Rappaport, Nir Toledano, Technion-Israel Institute of Technology, Dept. of Electrical Engineering, Haifa, ISRAEL; Tarek Mokari, Uri Basini, Hebrew Univ, Dept. of Physical Chemistry, Jerusalem, ISRAEL.

INFLUENCE OF THE COOLING RATE ON THE ELECTRICAL CONDUCTIVITY OF UNDOPED MICROCRYSTALLINE SILICON.

N.H. Nickel and M. Bäkel, Hahn-Meitner-Institut Berlin, Berlin, GERMANY.

SILICON NANOCRYSTALLITES IN AMORPHOUS SILICON MATRIX.

PROPERTIES MEASURED ON NANOSCALES.


INVESTIGATION ON PROCESS DEPENDENCE OF SELF-ASSEMBLED METAL NANOCRYSTALS.

Changhe Lee, Zengnian Liu, Edwin C. Kan, Cornell University, School of Electrical and Computer Engineering, Ithaca, NY.

SILICON NANOCRYSTALS IN A MAGNETIC FIELD.

Boucht Sabrakis, Laboratoire des Propriétés Optiques des Matériaux et Applications, Université d’Angers, FRANCE; Kustiainen J. Puchniki, Military University of Technology, Warsaw, POLAND; J. Etoh, Laboratoire des Propriétés Optiques des Matériaux et Applications, Université d’Angers, FRANCE; Ivan V. Kryk, Institute of Physics, Ped. University, Czestochowa, POLAND.
F8. 20 TEM AND PL. STUDY OF HIGH TEMPERATURE STABLE FeSi 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. Shin, 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 Chun-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. McGinley, P. Sines, B. Das, Line 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. Suji Ogata, Yamaguchi Univ, Dept of Applied Sciences, Ube, JAPAN; Raladin Belkaid, ACT-JST, Yamaguchi Univ, Dept. of Applied Sciences, Ube, JAPAN.

F8. 24 POROUS POLY-SiGe NANOSTRUCTURES FORMED BY ELECTROCHEMICAL PROCESSES. T. Del Coro, 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. Sugrader, A. Rodriguez, T. Rodriguez, Dept. Tecnologia Electronica, ETI Telecommunication, 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 Minak, Institute of Electronic Technology, Warsaw, POLAND; Matthias Voelkl, Wolfgang Skorupa, Institute of Ion Beam Physics and Materials Research, Research Center Rosendorf, Dresden, GERMANY.

F8. 27 A SOL-GEL APPROACH TO COPPER-SILICA THIN FILMS. Lidia Armecho, ISTM-CNRS and INSTM, Department of Chemistry, University of Padova, ITALY; Gregorio Bottaro, Manuel Bertspelk, Eugenio Tondello, Department of Inorganic, Metallographic and Analytical Chemistry and INSTM, University of Padova, ITALY; Cinzia Sada, Department of Physics and INFN, University of Padova, ITALY.

F8. 28 Zn-SILICA NANOCOMPOSITE FILMS USING A VERSATILE SOL-GEL ROUTE. Lidia Armecho, Silvia Gross, A. Veno, R. Seraglin, ISTM-CNRS 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 HETEROEPIXTAL ZnO/ZnMgO QUANTUM STRUCTURE NANORODS. W.I. Piek, 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 SILICONE SURFACE USING A NOVEL MICROCALORIMETRIC METHOD. J. Salonen, K. Vilhik-Kiicki, V-P. Lehto, E. Laine, Department of Physics, University of Turku, Turku, FINLAND; L. Niinik, Laboratory of Inorganic and Analytical Chemistry, Helsinki University of Technology, FINLAND.

F8. 32 NON-CATALYTIC SYNTHESIS OF GaN NANOWIRES USING METALORGANIC 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. 35 THE MICROSTRUCTURE OF Co NANOPARTICLES DIRECTLY DEPOSITED ON Si (100) SUBSTRATES USING SPUTTERING TECHNIQUES. Bing-Xian Chang, Chun-Pu Liu, Department of Materials Science and Engineering, National Cheng-Kung University, Tainan, TAIWAN; Jian-Nan Chen, Department of Electrical Engineering, Fortune Institute of Technology, Kaohsiung, TAIWAN.


F8. 38 ELECTROCHEMICAL NOLITHOGRAPHY ON SEMICONDUCTOR SURFACES. Patrick T. Hurley, Alexander E. Ribbe, and Jillian M. Burik, Department of Chemistry, Purdue University, West Lafayette, IN.


F8. 41 SOLUTION REDUCTION SYNTHESIS AND CHARACTERIZATION OF PASSIVATED SILICON NANOPARTICLES. Richard K. Baldwin, Katherine A. Pettigrew, Evon Rata, Susan M. Kaufmann, and Matthew P. Augustine, Department of Chemistry, University of California, Davis, CA.

F8. 42 LASER-GROWN SILICON NANOCOLUMNS AND THEIR FIELD EMISSION CHARACTERISTICS. Y.F. Guan, A.J. Pedram, 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. Buxcel, Oak Ridge National Laboratory, Oak Ridge, TN.

F8. 43 METAL-ZnO HETEROSTRUCTURE NANORODS. S.W. Jung, W.I.
SESSION F10: THEORETICAL STUDIES AND NUMERICAL SIMULATION IN Si/SiGe NANOSTRUCTURES
Thursday Morning, December 5, 2002
Room 311 (Hydes)

10:30 AM *F10.1
EFFECTIVE AND UNUSUAL INTRABAND OPTICAL TRANSITIONS IN SILICON NANOCRYSTALS. G. Allen and C. Delerue, ENS, Dept. ISEN, Villeneuve d’Ascq, FRANCE.

11:00 AM F10.2
COMPUTATIONAL SCIENCE FOR SILICON-BASED NANOTECHNOLOGY. R.Q. Zheng and S.T. Lee, City University of Hong Kong, Center of Super-Thin Film and Advanced Films (COSDAF) & Department of Physics and Materials Science, Hong Kong SAR, CHINA.

11:15 AM F10.3
KINETICS OF FORE GROWTH DURING SIMULATED ANNEALING OF AMORPHOUS SILICA. V.M. Barlakov, G.A. Briggs, A.P. Sutton, Department of Materials, University of Oxford, Oxford, UNITED KINGDOM.

11:45 AM F10.5
OXYGEN ROLE ON THE STRUCTURAL AND OPTOELECTRONIC PROPERTIES OF SILICON NANODOTS. Marcello Lippi, INFN-S7 and Dipartimento di Fisica, Universita di Modena e Reggio Emilia, Modena, ITALY; Elena Degoli and Stefano Usaiini, INFN-S7 and DISMI, Universita di Modena e Reggio Emilia, Reggio Emilia, ITALY.

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

1:30 PM *F11.1
SILICON NANOCRYSTAL MEMORY DEVICES. B. Murakishi, B. White, M. Sald, R. Rau, B. Steindl, B. Hradsky, M. Raman, S. Strach, S. Bagchi, L. Matthew, APHDL, Motorola, Austin, TX.

2:00 PM F11.2

2:15 PM F11.3
OBSERVATION OF QUANTUM CONFINEMENT EFFECT IN NANOCRYSTALLINE SILICON DOT FLOATING GATE SINGLE ELECTRON MEMORY DEVICES. Shin'ya Hwang, Souzi Banerjee, and Shunji Oda, Research Center for Quantum Effect Electronics, Tokyo Institute of Technology, Tokyo, JAPAN.
2:30 P.M. #F11.4
THE ROLE OF NANOSCALE SILICON IN OPTICAL INTERCONNECTS. Philippe Fanchet, Dept of Electrical and Computer Engineering, University of Rochester, Rochester, NY.

3:00 P.M. BREAK

3:30 P.M. #F11.5
PHOTON, ELECTRON AND ULTRASONIC EMISSION FROM NANOCRYSTALLINE POROUS SILICON DEVICES. N. Koshiba, B. Gelisz, A. Koijima, T. Miya, Y. Nakajima, Tokyo Univ. of A&T, Dept of Electrical and Electronic Engineering, Tokyo, JAPAN; T. Ishikawa, Y. Watanabe, T. Komoda, Matsushita Electric Works Ltd., Advanced Technology Research Laboratory, Osaka, JAPAN.

4:00 P.M. F11.6
TUNNEL SPECTROSCOPY, CURRENT OSCILLATIONS, AND NEGATIVE DIFFERENTIAL CONDUCTIVITY IN NANOCRYSTALLINE SILICON – SILICON DIOXIDE SUPERLATTICES. B.V. Komsne, Department of Electrical and Computer Engineering, New Jersey Institute of Technology, Newark, NJ; B. Lifshits, 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 Tayzhnov, Department of Electrical and Computer Engineering, New Jersey Institute of Technology, Newark, NJ.

4:15 P.M. 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. Boulourisoff, Intel Corporation, Portland, OR.

4:30 P.M. F11.8
HIGH-DENSITY UNIFORMLY ALIGNED SILICON NANOTIP ARRAYS AND THEIR ENHANCED FIELD EMISSION CHARACTERISTICS. Xiaofeng 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 P.M. F11.9