

SYMPOSIUM E

Physics and Technology of Semiconductor Quantum Dots

December 2 – 5, 2002

Chairs

Alexander L. Efros Naval Research Laboratory
David J. Norris Univ of Minnesota
Pierre M. Petroff Univ of California-Santa Barbara
Artur Zrenner Univ of Paderborn

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* Invited paper

SESSION E1: QUANTUM DOT THEORY
Chairs: Alexander L. Efros and Pierre M. Petroff
Monday Morning, December 2, 2002
Room 310 (Hynes)

8:30 AM E1.1
THE DIELECTRIC SCREENING IN SEMICONDUCTOR
NANOSTRUCTURES REVISITED. C. Delerue, G. Allan, Dept.
ISEN, IEMN, Villeneuve d'Ascq, FRANCE; M. Lannoo, L2MP, ISEM,
Toulon, FRANCE.

8:45 AM E1.2
TUNNEL-COUPLED QUANTUM DOTS: ATOMISTIC THEORY
OF QUANTUM DOT MOLECULES AND ARRAYS.
Garnett W. Bryant, Javier Aizpuru, National Institute of Standards
and Technology, Gaithersburg, MD; W. Jaskolski, Michal Zielinski,
Nicholas Copernicus University, Institute of Physics, Torun,
POLAND.

9:00 AM E1.3
EXCITONS, BIEXCITONS, AND CHARGED EXCITONS IN
SEMICONDUCTOR QUANTUM DOTS. Alex Zunger, National
Renewable Energy Laboratory, Golden, CO.

9:15 AM E1.4
EFFECT OF SURFACE ON THE ELECTRON AND HOLE
ENERGY LEVELS IN SEMICONDUCTOR NANOCRYSTALS.
A.V. Rodina, Technical University of Berlin, GERMANY; Al. L.
Efros, Naval Research Laboratory, Washington, DC.

9:30 AM E1.5
Abstract Withdrawn

9:45 AM E1.6
OPTICAL SPECTRA OF QUANTUM DOT ARRAYS UNDER
INDENTATION BY A MICROSCOPE TIP. H.T. Johnson, R. Bose,
University of Illinois, Dept of Mechanical and Industrial Engineering,
Urbana, IL; B.B. Goldberg, Boston University, Depts of Physics and
Electrical and Computer Engineering, Boston, MA; H.D. Robinson,
University of California, Dept of Electrical Engineering, Los Angeles,
CA.

10:00 AM BREAK

SESSION E2: QUANTUM DOT GROWTH - I
Chairs: Alexander L. Efros and Pierre M. Petroff
Monday Morning, December 2, 2002
Room 310 (Hynes)

10:30 AM *E2.1
ATOMIC STRUCTURE OF InAs QUANTUM DOTS ON GaAs
SUBSTRATES. Karl Jacobi, FHI of Max Planck Society, Berlin,
GERMANY.

11:00 AM *E2.2
USING CRYSTAL GROWTH KINETICS TO TUNE THE
ELECTRONIC LEVELS OF VERTICALLY STACKED InAs/GaAs
QUANTUM DOTS. B.D. Gerardot, I. Shtrichman, D. Hebert, P.M.
Petroff, Materials Department, University of California, Santa
Barbara, CA.

11:30 AM E2.3
OCCURRENCE OF ACCIDENTAL InN QUANTUM DOTS IN
INDIUM GALLIUM NITRIDE/GALLIUM NITRIDE
HETEROSTRUCTURES. K.P. O'Donnell and R.W. Martin, Dept of
Physics, University of Strathclyde, Glasgow, UNITED KINGDOM;
J.F.W. Mosselmans, CLRC Daresbury Laboratories, Warrington,
UNITED KINGDOM; N. Grandjean, CRHEA-CNRS Valbonne,
FRANCE.

11:45 AM E2.4
1.6 MICRON EMISSION FROM InAs QUANTUM DOTS GROWN
ON A GaAs SUBSTRATE USING AN AlGaAsSb METAMORPHIC
BUFFER. G. Balakrishnan, L.R. Dawson, D.L. Huffaker Center for
High Technology Materials, University of New Mexico, Albuquerque,
NM.

SESSION E3: QUANTUM DOT GROWTH - II
Chairs: Gunther Springholz and Christopher B. Murray
Monday Afternoon, December 2, 2002
Room 310 (Hynes)

1:30 PM *E3.1
SEMICONDUCTOR NANOCRYSTAL (QUANTUM DOT)
SUPERLATTICES. K.S. Cho, IBM Corp and University of New
Orleans, Advanced Materials Research Institute; C.B. Murray, IBM
Corp; F.X. Redl, IBM Corp.

2:00 PM E3.2
POLYMER PACKAGING OF NANOCRYSTAL QUANTUM DOTS
USING POLYMERIZABLE PHOSPHINE OLIGOMERS.
Sungjee Kim, Neal K. Devaraj, Brent R. Fisher, Inhee Chung, Mounqi
G. Bawendi, MIT, Dept of Chemistry, Cambridge, MA; Jinwook Lee,
Klavs F. Jensen, MIT, Dept of Materials Science and Engineering,
Cambridge, MA.

2:15 PM E3.3
SYNTHESIS AND CHARACTERIZATION OF COLLOIDAL
MERCURY CHALCOGENIDE QUANTUM DOTS. M. Kuno,
K.A. Higginson, S.B. Qadri, M. Yousuf, and H. Mattoussi, Naval
Research Laboratory, Washington, DC; J.E. Bonevich, National
Institute of Standards and Technology, Gaithersburg, MD.

2:30 PM E3.4
TOWARD OPTIMIZATION OF FOERSTER ENERGY TRANSFER
IN NANOCRYSTAL QUANTUM-DOT ASSEMBLIES.
Jennifer Hollingsworth, Marc Achermann, Melissa Petruska, Los
Alamos National Laboratory, Chemistry Division, Los Alamos, NM;
Sergei Tretiak, Los Alamos National Laboratory, Theory Division, Los
Alamos, NM; Scott Crooker, Los Alamos National Laboratory,
National High Magnetic Field Laboratory, Los Alamos, NM; Victor
Klimov, Los Alamos National Laboratory, Chemistry Division, Los
Alamos, NM.

2:45 PM E3.5
ELECTRIC FIELD DIRECTED LATERAL PATTERNING OF
LAYER-BY-LAYER SELF-ASSEMBLED FILMS FOR
OPTOELECTRONIC APPLICATIONS. Eric Dulkeith, Mingyuan
Gao, Junqi Sun, Nicolai Gaponik, Uli Lemmer and Jochen Feldmann,
Photonics and Optoelectronics Group, Department of Physics and
CeNS, University of Munich, LMU, Munich, GERMANY.

3:00 PM BREAK

SESSION E4: QUANTUM DOT GROWTH - III
Chairs: Gunther Springholz and Christopher B. Murray
Monday Afternoon, December 2, 2002
Room 310 (Hynes)

3:30 PM *E4.1
RATIONAL SYNTHESIS OF HIGH-QUALITY SEMICONDUCTOR

NANOCRYSTALS. Xiaogang Peng, University of Arkansas, Dept of Chemistry & Biochemistry, Fayetteville, AR.

4:00 PM E4.2

PROGRESS TOWARDS THE APPLICATION OF NIR-EMITTING CdTe-BASED QUANTUM DOTS. Marc Schrier, Quantum Dot Corporation, Hayward, CA.

4:15 PM E4.3

SINGLE-STEP ROUTE TO CONTROL THE PHOTOLUMINESCENCE QUANTUM YIELDS OF NEARLY MONODISPERSE AND TUNABLE CdSe NANOCRYSTALS. C. de Mello Donegá, S. Hickey, S.F. Wuister, D. Vanmaekelbergh, A. Meijerink, Debye Institute, Physics and Chemistry of Condensed Matter, Utrecht University, Utrecht, THE NETHERLANDS.

4:30 PM E4.4

CdSe CLUSTER MOLECULES. SYNTHESIS, STRUCTURES AND OPTICAL PROPERTIES. Andreas Eichhoefer, Dieter Fenske, Forschungszentrum Karlsruhe, Institute of Nanotechnology, Karlsruhe, GERMANY; Assaf Aharoni, Uri Banin, Hebrew University, Dept of Physical Chemistry, Jerusalem, ISRAEL.

4:45 PM E4.5

QUANTUM DOT BASED SATURABLE ABSORBER MATERIALS FOR NON-LINEAR OPTICS. James E. Raynolds, State University of New York at Albany, School of NanoSciences and NanoEngineering, Albany, NY; Michael Locascio, Evident Technologies Inc., Troy, NY.

SESSION E5: QUANTUM DOT GROWTH - IV:
NARROW GAP SEMICONDUCTORS

Chairs: Karl Jacobi and Richard J. Warburton
Tuesday Morning, December 3, 2002
Room 310 (Hynes)

8:30 AM E5.1

THE PHASE DIAGRAM OF SELF-ORGANIZED VERTICAL AND LATERAL ORDERING IN PbSe QUANTUM DOT SUPERLATTICES. G. Springholz, A. Raab, R. Lechner, V. Holy, P. Mayer, and G. Bauer, Johannes Kepler University, Linz, AUSTRIA.

8:45 AM E5.2

SYNTHESIS AND CHARACTERIZATION OF SIZE-TUNABLE LUMINESCENT PBS SEMICONDUCTOR NANOCRYSTAL COLLOIDS. Margaret A. Hines, Kenneth A. Lopata, Gerasim Iliiev, Gregory D. Scholes, Univ of Toronto, Dept of Chemistry, Toronto, ON, CANADA; Edward H. Sargent, Univ of Toronto, Dept of Electrical and Computer Engineering, Toronto, ON, CANADA.

9:00 AM E5.3

Abstract Withdrawn

9:15 AM E5.4

OPTICAL AND ELECTRONIC PROPERTIES OF COLLOIDAL LEAD SELENIDE QUANTUM DOTS. Jeffrey M. Harbold, Frank W. Wise, Malcolm Thomas, John Silcox, Cornell University, Department of Applied Physics, Ithaca, NY; Hui Du, Chia-ling Chen, Todd D. Krauss, Department of Chemistry, University of Rochester, Rochester, NY.

9:30 AM E5.5

SELF-ASSEMBLED PbSe QUANTUM DOTS WITH ALMOST EQUAL SIZES GROWN BY MBE ON PbTe/Si(111). Karim Alchalabi, Dmitri Zimin, Hans Zogg, Thin Film Physics Group, Swiss Federal Institute of Technology, Zurich, SWITZERLAND.

9:45 AM E5.6

MID-INFRARED ABSORPTION OF HIGHLY ORDERED PbSe/PbEuTe QUANTUM DOT SUPERLATTICES IN A HIGH FINESSE MICROCAVITY. T. Schwarzl, W. Heiss and G. Springholz, Johannes Kepler University, Linz, AUSTRIA.

10:00 AM BREAK

SESSION E6: QUANTUM DOT OPTICS - I
Chairs: Karl Jacobi and Richard J. Warburton
Tuesday Morning, December 3, 2002
Room 310 (Hynes)

10:30 AM *E6.1

COHERENT LIGHT-MATTER INTERACTION IN InGaAs QUANTUM DOTS. P. Borri, W. Langbein, S. Schneider, U. Woggon,

Dortmund Univ, Dept of Physics, GERMANY; R.L. Sellin, D. Ouyang, D. Bimberg, Berlin Tech Univ, Dept of Physics, Berlin, GERMANY.

11:00 AM *E6.2

HIGH-EFFICIENCY, TRIGGERED PHOTONS USING SINGLE OPTICAL MODE COUPLING OF SINGLE QUANTUM DOT EMISSION. Glenn S. Solomon, Department of Electrical Engineering, Stanford University, Stanford, CA.

11:30 AM E6.3

A WAVELENGTH DOMAIN MEMORY BASED ON QUANTUM DOTS. Miro Kroutvar, Max Bichler, Gerhard Abstreiter, Walter Schottky Institut, TUM, Garching, GERMANY; Artur Zrenner, University Paderborn, Paderborn, GERMANY.

11:45 AM E6.4

COHERENT PROPERTIES OF A SINGLE QUANTUM DOT PHOTODIODE. Artur Zrenner, Stefan Stufler, University Paderborn, Paderborn, GERMANY; Evelin Beham, Frank Findeis, Max Bichler, Gerhard Abstreiter, Walter Schottky Institut, TUM, Garching, GERMANY.

SESSION E7: QUANTUM DOT OPTICS - II

Chairs: Ulrike K. Woggon and Todd D. Krauss
Tuesday Afternoon, December 3, 2002
Room 310 (Hynes)

1:30 PM *E7.1

NONLINEAR MAGNETO-PHOTONIC QUANTUM MICROCAVITIES. Robert Frey, Laboratoire Charles Fabry, Institut d'Optique, Orsay, FRANCE; Regis Andre, Laboratoire de Spectrometrie Physique, Universite de J. Fournier, Grenoble, FRANCE; Christos Flytzanis, Laboratoire de Physique de la Matiere Condensee, Ecole Normale Supérieure, Paris, FRANCE.

2:00 PM E7.2

ANISOTROPIC NANOCRYSTALLINE LIGHT EMITTERS IN PHOTONIC DOTS. B. Moller, M.V. Artemyev, and U. Woggon, Dep. Physik, University Dortmund, GERMANY; R. Wannemacher, Faculty of Physics and Earth Sciences, University Leipzig, GERMANY.

2:15 PM E7.3

OPTICAL PROPERTIES OF InAs/InP PLANAR QUANTUM DOT MICRO-CAVITIES. Dan Dalacu, Robin L. Williams, Philip J. Poole, Daniel Poitras, Geoff C. Aers, Jacques Lefebvre, National Research Council, Institute of Microstructural Sciences, Ottawa, CANADA; Jean-Francois Girard, University of Ottawa, Department of Physics, Ottawa, CANADA.

2:30 PM E7.4

LOCAL STRAIN EFFECTS IN NEAR-FIELD SPECTRA OF SINGLE SEMICONDUCTOR QUANTUM DOTS. A.M. Mintairov, Notre Dame Univ, Dept of Electrical Engineering, Notre Dame, IN; P.A. Blagnov, Ioffe Physico-Technical Institute, St. Petersburg, RUSSIA; C. Li, Notre Dame Univ, Dept of Aerospace and Mechanical Engineering, Notre Dame, IN; J.L. Merz, Notre Dame Univ, Dept of Electrical Engineering, Notre Dame, IN; S. Oktyabrsky, Albany Inst. for Materials University at Albany-SUNY, Albany, NY; I.S. Tarasov, Ioffe Physico-Technical Institute, St. Petersburg, RUSSIA; V. Tokranov, Albany Inst. for Materials University at Albany-SUNY, Albany, NY; A.S. Vlasov, Ioffe Physico-Technical Institute, St. Petersburg, RUSSIA; D.A. Vinokurov, Ioffe Physico-Technical Institute, St. Petersburg, RUSSIA.

2:45 PM BREAK

SESSION E8: QUANTUM DOT OPTICS - III

Chairs: Ulrike K. Woggon and Todd D. Krauss
Tuesday Afternoon, December 3, 2002
Room 310 (Hynes)

3:15 PM *E8.1

SEMICONDUCTOR NANOCRYSTALS IN THE LASING REGIME. Victor Klimov, Chemistry Division, Los Alamos National Laboratory, Los Alamos, NM.

3:45 PM *E8.2

INTRABAND SPECTROSCOPY AND DYNAMICS OF COLLOID QUANTUM DOTS. Philippe Guyot-Sionnest, James Franck Institute, The University of Chicago, Chicago, IL.

4:15 PM E8.3

CARRIER DYNAMICS IN QUANTUM DOTS AND QUANTUM DOT ARRAYS AND THEIR ROLE IN PHOTON CONVERSION. A.J. Nozik, O.I. Micic, R.J. Ellingson, J. Blackburn, P. Yu, M. Hanna, S. Ferrere, and G. Rumbles, Center for Basic Sciences National Renewable Energy Laboratory, Golden, CO.

4:30 PM E8.4

ZERO TO ONE DIMENSIONAL TRANSITION AND AUGER RECOMBINATION IN SEMICONDUCTOR NANORODS. H. Htoon, J.A. Hollingworth, A.V. Malko, M. Achermann, M.A. Petruska, V.I. Klimov, Chemistry Division, Los Alamos National Laboratory, Los Alamos, NM.

4:45 PM E8.5

1D EXCITONS IN SEMICONDUCTOR NANORODS. A. Shabaev, Al. L. Efros, Naval Research Laboratory, Washington, DC.

SESSION E9: QUANTUM DOT OPTICS - IV
Chairs: Victor I. Klimov and Glenn S. Solomon
Wednesday Morning, December 4, 2002
Room 310 (Hynes)

8:30 AM E9.1

OPTICAL PROPERTIES OF SEMIMAGNETIC QUANTUM DOTS. S. Mackowski, T.A. Nguyen, H.E. Jackson, L.M. Smith, Dept. of Physics, University of Cincinnati, Cincinnati, OH; J. Wrobel, K. Fronc, G. Karczewski, Institute of Physics, Polish Academy of Science, Warsaw, POLAND.

8:45 AM E9.2

PHOTOLUMINESCENCE EXCITATION SPECTROSCOPY OF CdSe/ZnSe AND CdTe/ZnTe SELF-ASSEMBLED QUANTUM DOTS. T.A. Nguyen, N. Mukolobwiz, S. Mackowski, H.E. Jackson, L.M. Smith, Dept. of Physics, Univ. of Cincinnati, Cincinnati, OH; S. Lee, M. Dobrowolska, J. Furdyna, Dept. of Physics, Univ. of Notre Dame, Notre Dame, IN; G. Karczewski, Inst. of Physics, Polish Academy of Science, Warsaw, POLAND.

9:00 AM E9.3

EFFECT OF InAlAs/InGaAs CAP LAYER ON OPTICAL PROPERTIES OF SELF ASSEMBLED InAs/GaAs QUANTUM DOTS. Z.Y. Zhang, Z.G. Wang, P. Jin, B. Xu, X.Q. Meng, Ch.M. Li, X.L. Ye, Key Laboratory of Semiconductor Materials Science, Institute of Semiconductors, Chinese Academy of Sciences, Beijing, PEOPLE REPUBLIC OF CHINA.

9:15 AM E9.4

TEMPERATURE DEPENDENCE OF INTRABAND DIPOLES OF InAs/GaAs QUANTUM DOT ENSEMBLES. Zhonghui Chen, Eui-Tae Kim, Anupam Madhukar, Departments of Materials Science and Physics, University of Southern California, Los Angeles, CA .

9:30 AM E9.5

OPTICAL PROPERTIES OF SELF-ASSEMBLED InAs QUANTUM DOTS GROWN ON InAlAs/InP(001). B. Salem, J. Olivares, G. Guillot and G. Bremond, INSA de Lyon, LPM (UMR 5511 CNRS), Villeurbanne, FRANCE; J. Brault and M. Gendry, Ecole Centrale de Lyon, LEOM (UMR 5512 CNRS), Ecully, FRANCE.

9:45 AM E9.6

Abstract Withdrawn

10:00 AM BREAK

SESSION E10: SINGLE QUANTUM DOT SPECTROSCOPY
Chairs: Victor I. Klimov and Glenn S. Solomon
Wednesday Morning, December 4, 2002
Room 310 (Hynes)

10:30 AM *E10.1

COHERENT NONLINEAR OPTICAL SPECTROSCOPY AND CONTROL OF SINGLE QUANTUM DOTS: TOWARDS QUANTUM LOGIC GATES. Xiaoqin Li, T.H. Stievater, Gang Chen, E.T. Batteh, M.V. Gurudev Dutt, Jun Cheng, Yanwen Wu and D.G. Steel, Univ. of Michigan, Dept of Physics, Ann Arbor, MI; D. Gammon, D.S. Katzer and D. Park, Naval Research Laboratory, Washington, DC; Pochung Chen, C. Piermarocchi, L.J. Sham, Dept of Physics, Univ. of California, San Diego, La Jolla, CA.

11:00 AM E10.2

INVESTIGATION OF PHOTOLUMINESCENCE DECAY OF

SINGLE QUANTUM DOTS. Brent Fisher, Hans Jurgen Eisler, Jean-Michel Caruge, Ken Shimizu, Mounji Bawendi, MIT Department of Chemistry, Cambridge, MA.

11:15 AM E10.3

NONLINEAR CARRIER RELAXATION IN A SINGLE GaAs SELF-ORGANIZED QUANTUM DOT. T. Kuroda^a, S. Sanguinetti^{b,c}, F. Minami^a, M. Gurioli^b, K. Watanabe^c, N. Koguchi^c; ^aDept of Physics, Tokyo Inst of Technology, Tokyo, JAPAN; ^bI.N.F.M. and Dip. di Scienza dei Materiali, Univ Milano Bicocca, Milano, ITALY; ^cNanomaterials Laboratory, National Institute for Material Science, Tsukuba, JAPAN.

11:30 AM E10.4

POLARIZED CARRIER COMPLEXES IN GaAs QUANTUM DOTS. Allan Bracker, Joseph Tischler, Morgan Ware, Dan Gammon, Naval Research Laboratory, Washington, DC; Vladimir Korenev, A.F. Ioffe Physico-Technical Institute, St. Petersburg, RUSSIA.

11:45 AM E10.5

FABRICATION OF NANOCRYSTAL QUANTUM DOT-BASED TITANIA COMPOSITES AND THEIR NONLINEAR OPTICAL AND LASING PROPERTIES. Melissa A. Petruska, Anton V. Malko, Han Htoon, Victor I. Klimov, Los Alamos National Laboratory, Los Alamos, NM.

SESSION E11: QUANTUM COMPUTING
Chairs: Christos Flytzanis and Artur Zrenner
Wednesday Afternoon, December 4, 2002
Room 310 (Hynes)

1:30 PM *E11.1

QUANTUM DOTS FOR QUANTUM COMPUTATION. David DiVincenzo, IBM T.J. Watson Research Center, Yorktown Heights, NY.

2:00 PM E11.2

ELECTRON CONFINEMENT AND CORRELATION IN ANISOTROPIC QUANTUM DOT STRUCTURES. Mark F. Gyure, Matt Borselli, HRL Laboratories, LLC; Russel Cafilisch, Dept. of Mathematics, UCLA; Eli Yablonovitch, Dept. of Electrical Engineering, UCLA.

2:15 PM E11.3

TOWARD SPIN BASED SILICON-GERMANIUM QUANTUM DOT QUBITS. K.A. Slinker, Mark Friesen, D.E. Savage, M.M. Roberts, M.G. Lagally, Robert Joynt, D.W. van der Weide, M.A. Eriksson, University of Wisconsin-Madison, Madison, WI.

2:30 PM E11.4

QUANTUM INFORMATION PROCESSING USING CHARGED STATES IN COUPLED QUANTUM DOTS. Filippo Troiani, Elisa Molinari, INFN National Research Center on NanoStructures and Biosystems at Surfaces (S3) and Dept. of Physics, University of Modena, ITALY; Ulrich Hohenester, Institut für Theoretische Physik, Karl Franzens Universität Graz, Graz, AUSTRIA.

2:45 PM E11.5

PSUEDO-DIGITAL QUANTUM BITS. Mark Friesen, Robert Joynt, and Mark A. Eriksson, Dept of Physics, University of Wisconsin, Madison, WI.

3:00 PM BREAK

SESSION E12: CHARGE AND SPIN
Chairs: Christos Flytzanis and Artur Zrenner
Wednesday Afternoon, December 4, 2002
Room 310 (Hynes)

3:30 PM *E12.1

NEW CHARGED EXCITONS IN SELF-ASSEMBLED QUANTUM DOTS. R.J. Warburton^a, B. Urbaszek^a, E.J. McGhee^a, C. Schulhauser^b, A. Högele^b, K. Karrai^b, A.O. Govorov^c, J.M. Garcia^d, B.D. Gerardot^e and P.M. Petroff^e; ^aDepartment of Physics, Heriot-Watt University, Edinburgh, UNITED KINGDOM; ^bSektion Physik, Ludwig-Maximilians-Universität, Munich, GERMANY; ^cDepartment of Physics and Astronomy, Ohio University, Athens, OH; ^dInstituto de Microelectrónica, Madrid, SPAIN; ^eMaterials Department, University of California, Santa Barbara, CA.

4:00 PM E12.2

SPIN PROPERTIES OF S-STATE ELECTRONS TRAPPED IN InAs QDs. G. Medeiros-Ribeiro, H. Westfahl and V.L. Pimentel, Laboratório Nacional de Luz Sincrotron, Campinas, SP, BRAZIL;

M.V.B. Pinheiro, Depto. de Física, ICEx, Universidade Federal de Minas Gerais, Belo Horizonte, MG, BRAZIL.

4:15 PM E12.3

SPIN QUANTUM BEATS IN SEMICONDUCTOR QUANTUM DOTS. Yasuaki Masumoto^a, I.V. Ignatiev^{a,b}, I.E. Kozin^b, K. Nishibayashi^a, T. Okuno^a and S.Yu. Verbin^{a,b}; ^aInstitute of Physics, University of Tsukuba, Tsukuba, JAPAN; ^bInstitute of Physics, St. Petersburg State University, St. Petersburg, RUSSIA.

4:30 PM E12.4

ORIGIN AND DYNAMICS OF EXTRA SPINS IN CHEMICALLY SYNTHESIZED ZnO NANOCRYSTALS STUDIED BY PULSED HIGH FREQUENCY EPR. D.M. Hofmann, H. Zhou, B.K. Meyer, Univ. of Giessen, GERMANY; S.B. Orlinskii, J. Schmidt, Univ. of Leiden, NETHERLANDS; P.G. Baranov, A.F. Ioffe Institute, St. Petersburg, RUSSIA.

4:45 PM E12.5

THEORY OF KONDO-EXCITONS IN SELF-ASSEMBLED QUANTUM DOTS. Alexander O. Govorov, Ohio University, Department of Physics and Astronomy, Athens, OH; Khaled Karrai, Center for NanoScience and Sektion Physik, Ludwig-Maximilians-Universität, Munich, GERMANY; Richard J. Warburton, Heriot-Watt University, Edinburgh, UNITED KINGDOM.

SESSION E13: POSTER SESSION

Chair: David J. Norris

Wednesday Evening, December 4, 2002

8:00 PM

Exhibition Hall D (Hynes)

E13.1

SUB-WETTING-LAYER CONTINUUM STATES IN THE SELF-ORGANIZED QUANTUM DOT SAMPLES. Karel Kral, Petr Zdenek, Institute of Physics, Academy of Sciences of Czech Republic, Prague, CZECH REPUBLIC.

E13.2

INFLUENCE OF CARBON ON Ge QUANTUM DOTS STRUCTURE GROWN BY MBE ON (001) Si SUBSTRATE. Nikolai Zakharov, Max-Planck Institute of Microstructure Physics, Halle, GERMANY; Leonid Sokolov, Institute of Semiconductor Physics, Novosibirsk, RUSSIA; Y. Wakayama, Super-Molecule Photonics Laboratory, Nagoya, JAPAN; Vadim Talalaev, St. Petersburg State University, St. Petersburg, RUSSIA; Peter Werner, Max-Planck Institute of Microstructure Physics, Halle, GERMANY.

E13.3

A NOVEL APPLICATION TO QUANTUM DOT TO THE ACTIVE REGION OF SUPERLUMINESCENT DIODES. Z.Y. Zhang, Ch.M. Li, Z.G. Wang, P. Jin, X.Q. Meng, S.C. Qu, B. Xu, X.L. Ye, Key Laboratory of Semiconductor Materials Science, Institute of Semiconductors, Chinese Academy of Sciences, Beijing, PEOPLES REPUBLIC OF CHINA.

E13.4

LATTICE CONTRACTION IN FREESTANDING COLLOIDAL CADMIUM SELENIDE NANOCRYSTALS. Jiayu Zhang, Xiaoyong Wang, Min Xiao, Department of Physics, University of Arkansas, Fayetteville, AR; Lianhua Qu, Xiaogang Peng, Department of Chemistry, University of Arkansas, Fayetteville, AR.

E13.5

Abstract Withdrawn

E13.6

DISLOCATION-INDUCED SPATIAL ALIGNMENT OF SELF-ASSEMBLED InAs/GaAs QUANTUM DOTS. Ho Seong Lee, Jeong Yong Lee, KAIST, Dept of Materials Science and Engineering, Daejeon, KOREA; Tae Whan Kim, Kwangwoon Univ, Dept of Physics, Seoul, KOREA; Young Ju Park, KIST, Nano Device Research Centre, Seoul, KOREA.

E13.7

RESONANT RAMAN SCATTERING BY STRAINED AND RELAXED Ge QUANTUM DOTS. Alexander Milekhin, Alexander Nikiforov, Oleg Pchelyakov, Dmitry Tenne, Institute of Semiconductor Physics, Novosibirsk, RUSSIA; Steffen Schulze, Dietrich Zahn, Institut für Physik, Technische Universität Chemnitz, Chemnitz, GERMANY.

E13.8

RAMAN SPECTROSCOPY OF SELF-ASSEMBLED InAs QUANTUM DOTS IN WIDE-BANDGAP MATRICES OF AlAs AND ALUMINIUM OXIDE. D.A. Tenne, A.G. Milekhin, A.K.

Bakarov, O.R. Bajutova, V.A. Haisler, A.I. Toropov, Institute of Semiconductor Physics, Novosibirsk, RUSSIA; D.R.T. Zahn, Institut für Physik, Technische Universität Chemnitz, Chemnitz, GERMANY.

E13.9

HYPER-RAYLEIGH SCATTERING AND FLUORESCENCE OF CdS-ZnS COMPOSITE NANOPARTICLES. Yu Zhang, Ling Xu, Yi Ma, Kunji Chen, Nanjing University, National Laboratory of Solid State Microstructures and Department of Physics, Nanjing, P.R. CHINA; Xin Wang, Ming Ma, Degang Fu, Haiqian Zhang, Ning Gu, Juzheng Liu, Zuhong Lu, Southeast University, National Laboratory of Molecular and Biomolecular Electronics, Nanjing, P.R. CHINA.

E13.10

GIANT EXCITON-LIGHT COUPLING IN LARGE SEMICONDUCTOR QUANTUM DOTS. Alexey Kavokin, Université Blaise Pascal, Aubiere, FRANCE; Bernard Gil, Université de Montpellier 2, Montpellier, FRANCE.

E13.11

REDUCED PRESSURE CHEMICAL VAPOR DEPOSITION OF Ge QUANTUM DOTS. J.M. Hartmann, G. Bremond^a, G. Rolland, F. Bertin and M.N. Semeria, CEA-DRT, LETI /DTS, CEA/GRE, Grenoble, FRANCE. ^aLPM-INSA, Lyon, FRANCE.

E13.12

UP-CONVERSION LUMINESCENCE IN COLLOIDAL CdTe NANOCRYSTALS. S.A. Filonovich, M.J.M. Gomes, Departamento de Física, Universidade do Minho, Braga, PORTUGAL; Yu.P. Rakovich, J.F. Donegan, Physics Department, Trinity College, Dublin, IRELAND; D.V. Talapin, N.P. Gaponik, A.L. Rogach, A. Eychmüller, Institute of Physical Chemistry, University of Hamburg, Hamburg, GERMANY.

E13.13

EFFECT OF P ION-BEAM DOPING ON PHOTOLUMINESCENCE OF Si NANOCRYSTALS. G.A. Kachurin, S.G. Yanovskaya, Institute of Semiconductor Physics SO RAN, Novosibirsk, RUSSIA; D.I. Tetelbaum, Physico-Technical Research Institute of Nizhniy Novgorod University, Nizhniy Novgorod, RUSSIA.

E13.14

WHISPERING GALLERY MODE LASING FROM A COMPOSITE SYSTEM OF CdTe NANOCRYSTALS AND A SPHERICAL MICROCAVITY. John F. Donegan, Yury Rakovich, Lisong Yang, Eithne M. McCabe, Semiconductor Photonics Group, Department of Physics, Trinity College, Dublin, IRELAND; Tania Perova, Alan Moore, Department of Electronic and Electrical Engineering, Trinity College, Dublin, IRELAND; Nikolai Gaponik, Andrey Rogach, Institute of Physical Chemistry, University of Hamburg, Hamburg, GERMANY.

E13.15

STACKED QUANTUM DOTS FOR USE IN HIGHER EFFICIENCY PHOTOVOLTAIC DEVICES. Yoshitaka Okada, Ryuji Oshima, Univ. of Tsukuba, Inst. of Applied Physics, Tsukuba, JAPAN.

E13.16

TIME-RESOLVED PHOTOLUMINESCENCE INVESTIGATIONS OF InGaAs EPILAYERS IN A GaAs MATRIX. LL. Krestnikov, H. Born, R. Heitz, N.N. Ledentsov, A. Hoffmann, Technische Universität Berlin, Institut für Festkörperphysik, Berlin, GERMANY; V.M. Ustinov, A.F. Ioffe Physico-Technical Institute, St. Petersburg, RUSSIA; J.L. Merz, Paul Drude Institut für Festkörperelektronik, Berlin, GERMANY, University of Notre Dame, Department of Electrical Engineering, Notre Dame, IN.

E13.17

MBE-GROWN InAs QUANTUM DOTS ON HIGH-INDEX GaAs{113} SUBSTRATES. Yevgeniy Temko, Takayuki Suzuki, Karl Jacobi, FHI of the Max Planck Society, Berlin, GERMANY.

E13.18

Abstract Withdrawn

E13.19

Abstract Withdrawn

E13.20

NUCLEATION OF NANOCUSTER ARRAYS CAUSED BY SWIFT HEAVY IONS IN SUPERSATURATED SOLID SOLUTIONS. Alexander E. Volkov and Denis N. Korolev, Institute of General and Nuclear Physics, Russian Research Centre Kurchatov Institute, Moscow, RUSSIA.

E13.21

Abstract Withdrawn

E13.22

COMPARING THE PHYSICAL SIZE DISTRIBUTION OF CdSe NANOCRYSTALS WITH THE INHOMOGENEOUS BROADENING OF THE OPTICAL ABSORPTION SPECTRUM.

Mayrose R. Salvador, Margaret A. Hines, Gregory D. Scholes, Lash-Miller Chemical Laboratories, University of Toronto, Toronto, ON, CANADA.

E13.23

LONG-LIFETIME NONLINEAR ABSORPTION OF PbS QUANTUM DOTS. Feiran Huang, A. Filin, R. Doremus, P. Rao, P.D. Persans, Rensselaer Polytechnic Institute, Troy, NY.

E13.24

SIZE AND TEMPERATURE DEPENDENCES OF THE EXCITON LIFETIMES OF NEARLY MONODISPERSE AND HIGHLY EFFICIENT CdSe NANOCRYSTALS. C. de Mello Donegá, C. Hickey, S.F. Wuister, D. Vanmaekelbergh, A. Meijerink, Debye Institute, Physics and Chemistry of Condensed Matter, Utrecht University, Utrecht, THE NETHERLANDS.

E13.25

THERMOPHYSICS OF CdSe NANOPARTICLE GROWTH IN GLASS. A. Filin, T.M. Hayes, P.D. Persans, Weixiao Huang, Department of Physics, Rensselaer Polytechnic Institute, Troy, NY.

E13.26

STATISTICAL ANALYSIS OF DOPANT NUMBER IN SEMICONDUCTOR QUANTUM DOTS FOR BOTH RANDOM AND ENGINEERED DOPING DISTRIBUTIONS: EFFECTIVENESS OF ATOMIC STEERING TECHNIQUES. A.B. Kamego, R.J. Cottier, T.D. Golding, and M. Monticino, Dept of Physics and Mathematics, University of North Texas, Denton, TX.

E13.27

CHEMICALLY FUNCTIONAL SEMICONDUCTOR NANOCRYSTALS: ELECTROCHEMISTRY AND PATTERNED SURFACE ARRAYS. Benjamin M. Hutchins, Andrew H. Latham, Mary Elizabeth Williams, The Pennsylvania State University, Department of Chemistry, University Park, PA.

E13.28

ORIGINS OF THE NONLINEAR RESPONSE OF QUANTUM DOTS: THE ROLES OF BIEXCITONS. Anne Colonna, Xiujuan Yang, Margaret A. Hines, Gregory D. Scholes, Lash-Miller Chemical Laboratories, University of Toronto, Toronto, Ontario, CANADA.

E13.29

MANIPULATION OF SEMICONDUCTOR NANOCRYSTAL DISTRIBUTION BY PHOTOINDUCED MASS TRANSFER TECHNIQUE OF AZOBENZENE POLYMER SYSTEM. Takashi Ubukata, Masahiko Hara, Frontier Research System, RIKEN, Wako, JAPAN; Harumi Asami, Itaru Kamiya, Mitsubishi Chemical Corporation, Yokohama, JAPAN; Takahiro Seki, Chemical Resources Laboratory, Tokyo Institute of Technology, Yokohama, JAPAN.

E13.30

DIMENSIONALITY ASPECTS IN ELECTROABSORPTION RESPONSE OF CdSe NANOCRYSTALS. Takashi Isoshima, Masahiko Hara, RIKEN, Frontier Research System, Wako, JAPAN; Harumi Asami, Itaru Kamiya, Mitsubishi Chemical Corporation, Yokohama, JAPAN.

E13.31

OPTICAL STUDY AND SURFACE STATE ANALYSIS OF PHOTOBRIGHTENING OF CdSe NANOCRYSTAL THIN FILMS. Harumi Asami^a, Yoshimi Abe^b, Takeshi Ohtsu^a, Tomohide Murase^a, Itaru Kamiya^a; ^aMitsubishi Chemical Corp, Yokohama, JAPAN; ^bCenter for Analytical Chemistry and Science, Inc, Yokohama, JAPAN.

E13.32

LUMINESCENCE PROPERTIES OF QUANTUM SIZED ZnO NANOCRYSTAL PREPARED BY A NOVEL NON-HYDROLYTIC APPROACH. Gabriella Leo, Mauro Lomascolo, Antonietta Taurino, Istituto per la Microelettronica ed i Microsistemi (IMM)-CNR, sez. Lecce, Lecce, ITALY; M. Lucia Curri, Marinella Striccoli, Angela Agostiano, CNR-Istituto per i Processi Chimico Fisici (IPCF), sez. Bari, Bari, ITALY; Davide Cozzoli, Dipartimento di Chimica, Università di Bari, Bari, ITALY.

E13.33

BIOLOGICAL LABELING AND BINDING ASSAY OF CARBOHYDRATE ENCAPSULATED GOLD NANOCRYSTALS AND NANORODS IN BACTERIAL SYSTEMS. Chia-Chun Jay Chen, Yi-Chun Yeh, Chan-Yi Yang, Chan-Long Chen, Gee-Fong

Chen, Chun-Cheng Lin, Yi-Chun Wu, Department of Chemistry, National Taiwan Normal University, Taipei, TAIWAN; Institute of Chemistry, Academia Sinica, Taipei, TAIWAN; Department of Zoology, National Taiwan Normal University, Taipei, TAIWAN.

E13.34

GaSb-BASED NANOCOMPOSITES AS IR-EMITTERS. Ludmila Bakueva, Sergei Musikhin, Edward H. Sargent, University of Toronto, Toronto, CANADA; Stephan Schulz, Institut für Anorganische Chemie der Universität Bonn, Bonn, GERMANY.

E13.35

OPTICAL PROPERTIES OF II-VI AND IV SEMICONDUCTOR NANOCCLUSERS FOR PHOSPHOR APPLICATIONS. Jess P. Wilcoxon, Nanostructures and Advanced Materials Chemistry Dept. 1122, Sandia National Labs, Albuquerque, NM.

E13.36

DIRECT OBSERVATION OF VOID-MEDIATED FORMATION OF Sn QUANTUM DOTS. Yuanyuan Lei, Peter Möck, Teya Topuria, Nigel Browning, University of Illinois at Chicago, Dept of Physics, Chicago, IL; Regina Ragan, Kyu Min, Harry Atwater, California Institute of Technology, Thomas J. Watson Laboratory of Applied Physics, Pasadena, CA.

E13.37

PROBING THE STRUCTURE-PROPERTY RELATIONSHIP OF CdSe NANOCRYSTALS BY CONTROLLED CHEMICAL ETCHING. Rongfu Li, Baocheng Yang, Jeunghoon Lee, Papadimitrakopoulos Fotis, Nanomaterials Optoelectronics Laboratory, Department of Chemistry, Polymer Program, Institute of Materials Science, University of Connecticut, Storrs, CT.

E13.38

INFLUENCE OF THE THICKNESS AND COMPOSITION OF CUP LAYER ON PHOTOELECTRONIC PROPERTIES OF THE InGaAs/GaAs QUANTUM DOT HETEROSTRUCTURES. I.A. Karpovich, B.N. Zvonkov, N.V. Baidov, S.B. Levichev, and D.O. Filatov, University of Nizhni Novgorod, Nizhny Novgorod, RUSSIA.

E13.39

SYNTHESIS AND CHARACTERIZATION OF COPPER-CONTAINING BINARY AND TERNARY SEMICONDUCTOR QUANTUM DOTS. Stephanie L. Castro, Ohio Aerospace Institute, Cleveland, OH; Sheila G. Bailey, Aloysius F. Hepp, NASA Glenn Research Center, Cleveland, OH; Ryne P. Raffaele, Thomas Gennett, Rochester Institute of Technology, Rochester, NY.

E13.40

INVESTIGATION OF THE SHAPE OF InGaAs/GaAs QUANTUM DOTS. Susan Y. Lehman, Alexana Roshko, Richard P. Mirin, National Institute of Standards and Technology, Optoelectronics Division, Boulder, CO; John E. Bonevich, National Institute of Standards and Technology, Metallurgy Division, Gaithersburg, MD.

E13.41

NANOSCALE TIME RESOLVED SPECTROSCOPY OF INDIVIDUAL QUANTUM DOTS. Z. Liu, S.B. Ippolito, B.B. Goldberg, S. Unlu, Boston University, Physics Department, ECE Department, Boston, MA; R. Mirin, National Institute of Standards and Technology, Boulder, CO.

E13.42

PREPARATION AND CHARACTERIZATION OF III-NITRIDE QUANTUM DOTS VIA A NEW COLLOIDAL APPROACH. Guiquan Pan, Meredith J. McMurdo, Frederic R. Lemke, P. Gregory Van Patten, Dept of Chemistry & Biochemistry, and Condensed Matter & Surface Science Program, Ohio University, Athens, OH.

E13.43

III-NITRIDE NANOPARTICLES EMBEDDED IN POLYMER THIN FILMS. Guiquan Pan, Meredith J. McMurdo, P. Gregory Van Patten, Department of Chemistry & Biochemistry, and Condensed Matter & Surface Science Program, Ohio University, Athens, OH.

E13.44

(In,Al)As ALLOYING WITHIN InAs QUANTUM DOTS EMBEDDED INTO AlAs/GaAs SHORT PERIOD SUPERLATTICE. Vadim Tokranov, Michael Yakimov, Alex Katsnelson, Katharine Dovidenko, Matthew Lamberti, and Serge Oktyabrsky, School of NanoSciences and NanoEngineering, University at Albany-SUNY, Albany, NY.

E13.45

COHERENT TO INCOHERENT TRANSITION OF SELF-ASSEMBLED GaN QUANTUM DOTS GROWTH BY

MOLECULAR BEAM EPITAXY. Chih-Jen Hsueh, Chuan-Pu Liu, Dept of Materials Science and Engineering, National Cheng-Kung University, Tainan, TAIWAN; Ming-Kai Hsu, Li-Wei Tu, Department of Physics, National Sun Yat-sen University, Kaohsiung, TAIWAN.

SESSION E14: Si/Ge QUANTUM DOT STRUCTURES

Chairs: Louis E. Brus and David J. Norris
Thursday Morning, December 5, 2002
Room 310 (Hynes)

8:30 AM *E14.1

SIZE-CONTROLLED Si NANOCRYSTALS AND ERBIUM DOPING. Margit Zacharias, Michael Schmidt, Johannes Heitmann, Lixin Yi, and Roland Scholz, Max-Planck-Institute of Microstructure Physics, Halle, GERMANY.

9:00 AM E14.2

ROOM TEMPERATURE PHOTOLUMINESCENCE FROM DEFECT-FREE Si/Ge QUANTUM DOT MULTILAYER STRUCTURES DOPED BY Sb. N.D. Zakharov, Max-Planck Institute of Microstructure Physics, Halle, GERMANY; G.E. Cirlin, A.F. Ioffe Physico-Technical Institute RAS, St. Petersburg, RUSSIA; V.G. Talalaev, St. Petersburg State University, St. Petersburg, RUSSIA; V.A. Egorov, Institute for Analytical Instrumentation RAS, St. Petersburg, RUSSIA; M. Zacharias, Max-Planck Institute of Microstructure Physics, Halle, GERMANY; P. Werner, Max-Planck Institute of Microstructure Physics, Halle, GERMANY.

9:15 AM E14.3

SPONTANEOUS ORDERING OF SELF-ASSEMBLED Ge/Si(100) ISLANDS. G. Capellini, M. De Seta, F. Evangelisti, INFN and Dipartimento di Fisica, E. Amaldi Università di Roma Tre, Roma, ITALY; C. Spinella, IMETEM-CNR, Catania, ITALY.

9:30 AM E14.4

Ge QUANTUM DOTS NUCLEATION ON NANOPATTERNED Si SUBSTRATES. N. Motta^{a,b}, A. Sgarlata^a, P.D. Szkutnik^a, S. Nufri^a, A. Balzarotti^a, F. Rosei^{a,c}, ^aINFN Dipartimento di Fisica, Università di Roma Tor Vergata, Roma, ITALY; ^bINFN Dipartimento di Fisica, Università di Roma Tre, Roma, ITALY; ^cINRS-EMT, Varennes (QC), CANADA.

9:45 AM E14.5

SILICON EPITAXIAL REGROWTH PASSIVATION OF SiGe NANOSTRUCTURES. Xiang-Zheng Bo, Leonid P. Rokhinson, J.C. Sturm, Center for Photonics and Optoelectronic Materials, Department of Electrical Engineering, Princeton University, Princeton, NJ.

10:00 AM BREAK

SESSION E15: BIO-QUANTUM DOTS
Chairs: Louis E. Brus and David J. Norris
Thursday Morning, December 5, 2002
Room 310 (Hynes)

10:30 AM *E15.1

BIOLOGICAL APPLICATIONS OF WATER-SOLUBLE QUANTUM DOTS. B. Dubertret, Rockefeller Univ, Center for Studies in Physics and Biology, New York, NY; P. Skourides, Rockefeller Univ, Laboratory of Molecular Embryology, New York, NY; D.J. Norris, Univ of Minnesota, Dept. of Chemical Engineering and Materials Science, Minneapolis, MN; V. Noireaux, Rockefeller Univ, Center for Studies in Physics and Biology, New York, NY; A.H. Brivanlou, Rockefeller Univ, Laboratory of Molecular Embryology, New York, NY; A. Libchaber, Rockefeller Univ, Center for Studies in Physics and Biology, New York, NY.

11:00 AM *E15.2

CHARACTERIZATION OF SEMICONDUCTOR QUANTUM DOTS FOR TWO-PHOTON MICROSCOPY. Stephen Clark, Daniel Larson, Warren Zipfel, Frank Wise, Watt Webb, Cornell University, Applied Physics Dept, Ithaca, NY; Marcel Bruchez, Quantum Dot Corporation, Hayward, CA.

11:30 AM E15.3

PRODUCTION OF SEMICONDUCTING NANOPARTICLES WITHIN PROTEIN TEMPLATES. K.K.W. Wong, A. Bewick, and E. Mayes, NanoMagnetics Ltd., Bristol, UNITED KINGDOM.

11:45 AM E15.4

PREPARATION AND CHARACTERIZATION OF A WATER SOLUBLE CdSe NANOCRYSTAL - POLYMERIC SURFACTANT

CONJUGATE. Jeunghoon Lee, Baocheng Yang, Rongfu Li, Fotios Papadimitrakopoulos, Nanomaterials Optoelectronics Laboratory, Department of Chemistry, Polymer Program, Institute of Materials Science, University of Connecticut, Storrs, CT.

SESSION E16: ELECTRIC FORCE MICROSCOPY AND CHARGE INJECTION

Chairs: Philippe M. Guyot-Sionnest and Uri Banin
Thursday Afternoon, December 5, 2002
Room 310 (Hynes)

1:30 PM *E16.1

POLARIZABILITY AND CHARGE OF SINGLE SEMICONDUCTOR NANOCRYSTALS AT INTERFACES. Louis Brus, Chemistry Department, Columbia University, New York, NY.

2:00 PM E16.2

OPTICAL DETECTION OF THE CHARGING OF InAs QUANTUM DOTS WITH DIFFERENT BACKGATE CONFIGURATIONS. B. Su, L. Karsten, C. Schüller, D. Heitmann, A.A. Zhukov, Ch. Heyn, W. Hansen, Institut für Angewandte Physik und Zentrum für Mikrostrukturforschung, Universität Hamburg, GERMANY.

2:15 PM E16.3

SINGLE NANOCRYSTAL QUANTUM DOT ELECTRO-CHEMISTRY. Congjun Wang, Dong Yu, Philippe Guyot-Sionnest, University of Chicago, James Franck Institute, Chicago, IL.

2:30 PM E16.4

CONTROLLED CHARGE INJECTION IN SEMICONDUCTOR NANOCRYSTALS. Thierry Mélin, Dominique Deresmes and Didier Stiévenard, Institut d'Electronique et de Microélectronique du Nord (IEMN-CNRS), Villeneuve d'Ascq, FRANCE.

2:45 PM E16.5

ELECTRIC FORCE MICROSCOPY OF CdSe QUANTUM RODS. Rishikesh Krishnan^a, Megan Hahn, Philippe M. Fauchet^a, Todd D. Krauss, Univ of Rochester, Dept of Chemistry, Rochester, NY; ^aUniv of Rochester, Dept of Electrical and Computer Engineering, Rochester, NY.

3:00 PM BREAK

SESSION E17: TRANSPORT
Chairs: Philippe M. Guyot-Sionnest and Uri Banin
Thursday Afternoon, December 5, 2002
Room 310 (Hynes)

3:15 PM *E17.1

SYNTHESIS AND OPTICAL AND ELECTRONIC PROPERTIES OF SEMICONDUCTOR QUANTUM RODS. Uri Banin, Institute of Chemistry and the Center for Nanoscience and Nanotechnology, The Hebrew University of Jerusalem, Jerusalem, ISRAEL.

3:45 PM *E17.2

SPIN EFFECTS IN HYDROGEN-MOLECULE LIKE QUANTUM DOT SYSTEMS. Seigo Tarucha, ERATO-JST, and Univ. of Tokyo, Dept of Physics, Tokyo, JAPAN.

4:15 PM E17.3

CURRENT-VOLTAGE CHARACTERISTICS OF SINGLE CdSe COLLOIDAL NANODOTS MEASURED BY CONDUCTIVE-TIP ATOMIC FORCE MICROSCOPY. Ichiro Tanaka, Eri Kawasaki, O. Ohtsuki, K. Uno, Wakayama Univ, Dept of Materials Sci & Chem, Wakayama, JAPAN; M. Hara, RIKEN Frontier, Wako, JAPAN; H. Asami, T. Murase, I. Kamiya, Mitsubishi Chemical Corp., Yokohama, JAPAN.

4:30 PM E17.4

NANOWIRE BASED RESONANT TUNNELING DIODES. M.T. Bjork, B.J. Ohlsson, C. Thelander, A.I. Persson, L. Samuelson, Lund University, Solid State Physics, Lund, SWEDEN; L.R. Wallenberg, Lund University, Materials Chemistry, Lund, SWEDEN.

4:45 PM E17.5

TRANSPORT PROPERTIES OF SUPERLATTICE NANOWIRES AND THEIR POTENTIAL FOR THERMOELECTRIC APPLICATIONS. Yu-Ming Lin^a, and M.S. Dresselhaus^{a,b}, ^aDepartment of Electrical Engineering and Computer Science, ^bDepartment of Physics, Massachusetts Institute of Technology, Cambridge, MA.