

MARIJA DRNDIC

HOME ADDRESS

2200 Arch St. #504
Philadelphia, PA 19103
(215) 609-4327

OFFICE ADDRESS

Department of Physics and Astronomy
University of Pennsylvania
209 S. 33rd St., Philadelphia, PA 19104
drndic@physics.upenn.edu; (215) 898-5810
Webpage: <http://www.physics.upenn.edu/~drndic>

EDUCATION

HARVARD UNIVERSITY, Cambridge, Massachusetts:

Ph.D., Physics, June 2000.

A.M., Physics, June 1997.

UNIVERSITY OF CAMBRIDGE, England:

M.Phil., Physics, September 1995.

HARVARD UNIVERSITY

A.B., Physics and Mathematics, June 1994. *Summa Cum Laude, Phi Beta Kappa.*

RESEARCH EXPERIENCE

Associate Professor, Department of Physics and Astronomy, UNIVERSITY OF PENNSYLVANIA (July 2009 - present)

Assistant Professor, Department of Physics and Astronomy, UNIVERSITY OF PENNSYLVANIA (September 2003 – July 2009)

Research topics: electronic transport in nanoscale structures, quantum dots and low-dimensional systems, nanocrystals, nanofabrication, protein and DNA analysis, nanoparticle manipulation, scanning-probe microscopy, single-molecule fluorescence microscopy, biomaterials, nanopores.

Group website: <http://www.physics.upenn.edu/~drndic/group>.

Post-Doctoral (Ph.D.) Research, MASSACHUSETTS INSTITUTE OF TECHNOLOGY (2000-2003)

- Studies of chemically-synthesized nanocrystals, electronic transport in CdSe nanocrystals. Development of a new scanning-probe microscopy technique to image the charge in CdSe nanocrystal arrays. Collaboration with Prof. Marc Kastner in the Physics Department and Prof. Mounqi Bawendi in the Chemistry Department (November 2000 – July 2003). Scanning-probe microscopy also in collaboration with Prof. Tinkham's group at Harvard University (August 2001 – July 2003).
- Developing the techniques to study and manipulate phospholipid vesicles decorated with magnetic nanoparticles using magnetic fields produced by microelectromagnets. Collaboration with Prof. Robert Westervelt at Harvard University.

Marija Drndic, April 13, 12, 2011

- Realization of one-dimensional Bose-Einstein condensates in Prof. Wolfgang Ketterle's group. (August 2000 – November 2000).

Doctoral (Ph.D.) Research, HARVARD UNIVERSITY (1996- 2000)

Adviser: Prof. Robert M. Westervelt

Developed microelectromagnets consisting of micron-scale wires to reflect, guide and trap cold nanoparticles in vacuum on a chip and performed cold-atom experiments.

Masters (M. Phil.) Research, Cavendish Laboratory, UNIVERSITY OF CAMBRIDGE, (1994-1995).

Adviser: Prof. David A. Ritchie (Prof. Michael Pepper's Group)

Studied quantum transport in coupled gases of two-dimensional electrons and two-dimensional holes in InAs/GaSb/AlSb heterostructures. Developed technique for successful top-gating of these structures.

Research Assistant, Undergraduate Laboratory Work, HARVARD UNIVERSITY, (1993-1994)

Adviser: Prof. Gerald Gabrielse

Built liquid nitrogen level meters for magnets used in low temperature experiments.

Research Assistant, Center for Particle Astrophysics, BERKELEY UNIVERSITY, (1993).

Adviser: Prof. Buford Price

Developed an atomic-force microscope technique to image and study the cone-shaped particle tracks in glass (BP-1 detector) from heavy-ion experiments.

Research Assistant, IAESTE (International Association for the Exchange of Students for Technical Experience), research position in Nuclear Physics, HAHN-MEITNER INSTITUTE, Berlin, Germany (1992).

Adviser: Dr. Hermann Rossner

Made a computer code in Fortran to analyze data in projects: mass-spectroscopy of light nuclei and refractive scattering.

AWARDS AND HONORS

- World Technology Network Award Nomination, 2011.
- DARPA Young Faculty Award, 2008.
- Edmund J. and Louise W. Kahn Award for Distinguished Teaching by an Assistant Professor, University of Pennsylvania, 2008.
- Presidential Career Award for Science and Engineering (PECASE) Award 2005 (nomination by ONR in 2004, and by NSF in 2005).
- Alfred P. Sloan Research Fellowship, 2005-2007.
- Nomination by the University of Pennsylvania for the Packard Fellowship, 2005. Fellowship declined.
- NSF Career Award, 2005-2010.
- Outstanding ONR Young Investigator Award, 2004-2009.
- Pappalardo Fellow, Massachusetts Institute of Technology, Sept. 2000- July 2003;

Marija Drndic, April 13, 12, 2011

- Nomination for Harvard Merit Fellow – two nominations per department (1998).
- Robbins Prize, Harvard Physics Department (1997).
- Harold T. White Prize for Excellence in Teaching, Harvard Physics Department (1997).
- Clare Booth Luce Fellow (1995-1997).
- Harvard Herchel Smith Fellow – three science fellowships awarded for studies in Cambridge, England (1994-1995).
- *Phi Beta Kappa*, elected member, Harvard University (1994).
- Harvard College Scholarship (1992-1994).
- First place at the physics entrance examination, Faculty of Physics, Belgrade Univ., Former Yugoslavia (1989).

MEMBERSHIP

- Institute of Physics (IOP) Member (United Kingdom), (1994-).
- American Physical Society (APS) Member, (1997-).
- American Chemical Society (ACS) Member, (2003-).

FUNDING:

- NIH NHGRI R21 grant (National Human Genome Research Institute), “*DNA sequencing using single-layer graphene nanoribbons with nanopores*”, 2011-2014, \$1.5M.
- Science Center QED grant, “*Nanopore box for rapid electronic detection of microRNAs*”, 2011-2012, \$200,000.
- NIH NHGRI NIH NHGRI R21 grant (National Human Genome Research Institute), “*DNA sequencing using nanopore-nanoelectrode devices for sensing and manipulation*”, 2008-2011, \$820,000.
- NIH NHGRI (National Human Genome Research Institute) ARRA Supplement for R21 grant, 2009-2011, \$280,000.
- DOD, “*Dual-probe near-field scanning optical microscope/atomic-force microscope for study of optical metamaterials and nanocircuits*”, co-PI with Nader Engheta, \$273,000, 2009-2010.
- NSF, “*Acquisition of a multifunctional nanoprobe microscope with a tunable ultrafast laser source for interdisciplinary research and training*”, co-PI with Nader Engheta, Robert Carpick and Ritesh Agarwal, \$630,000, 2009-2010.
- DARPA Young Investigator Award, “*Electrical multiple-exciton-generation (MEG) detection in semiconductor nanocrystals and the development of efficient and tunable single-nanocrystal photodetectors*”, 2008-2009, \$150,000.
- PGFI (Penn Genomics Frontiers Institute) and Pennsylvania Department of Health, “*Real-time sizing/mass measurement and multi-channel detection of protein molecules extracted from electroporated live cells*”, 2008-2010, \$120,000 (no overhead).
- ONR (Office of Naval Research) Outstanding Young Investigator Award, “*Semiconducting-nanocrystal transistors for quantum electronics*”, 2004-2009, \$550,000 (25 awards given in all branches of science and engineering).
- NSF (National Science Foundation) Career Award, DMR, “*Controlled assembly and*

Marija Drndic, April 13, 12, 2011

charge transport in nanocrystal structures", 2005- 2010, \$500.000.

- ONR (Office of Naval Research) DURIP award, "*Luminescence imaging of nanocrystals within optoelectronic devices*", 2005-2006 – Equipment grant, \$203.000.
- NSF Nanoscale Exploratory Research, Division of Computing and Communication Foundations (CCF). "*Microscopic traps for electrons in vacuum*", 2005-2007, \$100.000.
- ACS (American Chemical Society) Petroleum Research Fund (PRF), "*Imaging the electrical transport in nanostructure-based devices*", 2004-2006, \$35.000 (no overhead).
- Alfred P. Sloan Research Fellowship, "*Electrical and optical studies of mesoscopic structures and their device applications*", 2005-2007, \$45.000 (no overhead).
- NSF MRSEC, Penn, 2003-present, ~50K per year.
- NSF NSEC, Nano-Bio Center, Penn, 2005- present, ~\$50K per year.
- University Research Fund (URF), "*Nanoparticle manipulation with microelectromagnets*", 2008, \$43.000 (no overhead).
- University Research Fund (URF), "*Development of Nanocrystal-based Solar Cells*", 2006, \$31.000 (no overhead).
- University Research Fund (URF), "*Nanoparticle manipulation with microelectromagnets*", 2004, \$21.000 (no overhead).

TEACHING

University of Pennsylvania

- Spring 2011, Fall 2011, Spring 2012, Physics 101 "Introduction to Mechanics", 150 students.
- Fall 2008, Physics 411 "Introduction to Quantum Mechanics I".
- Spring 2008, Physics 412 "Introduction to Quantum Mechanics II".
- Fall 2007, Physics 411 "Introduction to Quantum Mechanics I".
- Spring 2007, Physics 412 "Introduction to Quantum Mechanics II".
- Fall 2006, Physics 411 "Introduction to Quantum Mechanics I".
- Fall 2003-2008, Physics 501: Gave research seminars to first year graduate students.
- Physics 295 (with Paul Heiney and other professors; given 3 lectures about mesoscopic physics and nanoscience), 18 students.
- Spring 2005, Physics 151 "Principles II" (Electricity and Magnetism), 77 students; Instructor quality: 3.5/4.0.
- Spring 2004, Physics 151, "Principles II" (Electricity and Magnetism), 56 students. Instructor quality: 3.4/4.0.

Marija Drndic, April 13, 12, 2011

- Fall 2003, Physics 150 “Principles I” (Mechanics), 80 students. Student Evaluations: Instructor quality: 3.2/4.0.

Harvard University Teaching Fellow

Physics 15 a (“Mechanics and Special Relativity”). Number of students: approx. 100
Science A-20 (“From Alchemy to Quarks”). (1996–1998). Number of students: approx. 15
Recipient of a Harold T. White award for teaching modern physics for nonscientists (Science A-20).

University of Cambridge Teaching Fellow:

Electronics (1994-1995). Number of students: approx. 40

Tutor for the Bureau of Study Council, Harvard University (1993-1994), Tutored math and physics to fellow students one-on-one. Taught courses: Physics 11, a, b; 15a, b, c (mechanics, thermodynamics, electromagnetism), Math 21 a, b (analysis, algebra, trigonometry), French.

DISSERTATIONS SUPERVISED

I have supervised research of 9 graduate students and 9 postdoctoral fellows, and about 15 undergraduates over the years. Group members have left our group for successful careers in academia (assistant professors), industry (senior research scientists), wall street, government agencies in Washington, D.C. etc. Undergraduates are now in top physics graduate programs (Harvard, UC Santa Barbara, Cornell, Stanford, UChicago) (please see our group page for more information on group alumni and their current positions).

SELECTED ACTIVITIES

(Review panels, committees and administrative assignments)

- NIH review panels on bio-nanoscience topics, Washington, DC, 2010, 2011.
- Review Panel: National Science Foundation (NSF) NIRT (Nanoscale interdisciplinary research team) Fundamental Physics Panel DMR4SP2, January 25-26, 2004, Washington, DC.
- Review Panel: National Science Foundation (NSF) Condensed Matter Physics – Materials World Network (CMP-MWN), January 31- February 1, 2005, Washington, DC.
- Review Panel: Princeton MRSEC renewal, Panel V061218, Spring 2006.
- Reviewer for Nano Letters, Applied Physics Letters, Science, Science, Nature, Nature Materials, Nature Nanotechnology, and many others, and for grant agencies (NSF, ACS NIH, and others), 2003 – present.
- 2003/2004 and 2004/2005, Graduate Admissions Committee, Dept. of Physics and Astronomy.
- 2006-present Chair of Department’s webpage committee

Marija Drndic, April 13, 12, 2011

- 2004/2005 Faculty Forum – SAS Forum discussing changes in undergraduate education.
- 2007/2008 Chemistry Department search committee
- 2008-present Co-leader (with Prof. Chris Murray) of a MRSEC group
- 2008, 2010, 2011, Physics Department search committee for a biophysics position.

INVITED TALKS, CONFERENCES AND SYMPOSIA
(Past and Scheduled)

- Physics Colloquium, Brown University, Providence, RI, Fall 2012.
- CECAM workshop on “DNA detection and analysis with nanopores”, Pisa, Italy, June 2012.
- Graphene Week 2012, Delft, Netherlands, June 2012.
- NHGRI Advanced Sequencing Technology Development Meeting, San Diego, California, April 2012.
- Physics Colloquium, University of Michigan, Ann Arbor, MI, March 2012.
- Nanopores Conference 2012, Lanzarote, Spain, February 2012.
- Gene, Genomes and Pediatric Disease (GGPD) seminar series, Children’s Hospital of Philadelphia, February 2012.
- Physics Colloquium, Arizona State University, Tempe, AZ, January 2012.
- International Symposium on Clusters and Nanostructures (ISCAN), Richmond, Virginia, November 2011.
- Nano Day at UPenn, Symposium on Scanning Probe Microscopy, October 2011.
- Workshop on the “Many Interfaces of Physics”, Institute of Science and Technology (IST) Austria, Vienna, Austria, September 2011.
- Telluride Workshop on Single-Molecule Dynamics, Telluride, Colorado, June/July 2011.
- Partnership for Research & Education in Materials (PREM), 5th Annual Symposium, Universidad de Puerto Rico en Humacao, Puerto Rico, May 2011.
- American Association for Clinical Chemistry (AACC) Annual Forum for Emerging Clinical Diagnostic Technologies, 43rd Annual Oak Ridge Conference,

Baltimore, April 2011.

- NHGRI Advanced Sequencing Technology Development Meeting, San Diego, California, April 2011.
- IWEPNM, Kirchberg, Austria, Winter School on Novel Nanomaterials, February 2011.
- 2011 Frontiers in Nanoscale Science and Technology Workshop, RIKEN Wako Campus, Wako, Saitama, Japan, January 5-7, 2011.
- Villanova University, Physics Colloquium, Department of Physics, October 2010.
- Rutgers University, Physics Colloquium, Department of Physics, September 2010.
- Clarkson University, Joint Seminar in Physics and Electrical & Computer Engineering, September 2010.
- University of Chicago, Workshop on Electronic Transport in Nanoengineered Materials, September 16-18, 2010.
- Gordon Research Conference on Nanostructure Fabrication, Tilton, New Hampshire, July 18-23, 2010. Conference Program
- Harvard University, Physical Chemistry Lectures, The Woodward Lecture Series in Chemical Sciences, Department of Chemistry & Chemical Biology, October 2009.
- University of Delaware, Material Science and Engineering Seminar, October 2009.
- Frontiers in Nanoscale Science and Technology Workshop, Nanoelectronics & Nanophotonics, Spintronics & Quantum Information, Harvard University, May 2009.
- University of California, Irvine, Condensed Matter Seminar, April 2009.
- University of Notre Dame, Physics Colloquium, Department of Physics, April 2009.
- Columbia University, Nanoscale Science and Engineering Center (NSEC) Seminar, January 2009.
- University of Arizona, Physics Colloquium, Department of Physics, November 2008.
- National Academy of Sciences, Kavli Frontiers of Science Symposium, California, November 2008.
- Yale University, Condensed Matter Seminar, October 2008.

Marija Drndic, April 13, 12, 2011

- Harvard University, SEAS Applied Physics Colloquium, October 2008.
- University of Notre Dame, Condensed Matter Seminar, Department of Physics, April 2008.
- Arizona State University, Physics Colloquium/Biodesign Seminar Series, April 2008.
- American Physical Society (APS) March Meeting, “TEBAL: Nanosculpting devices with electrons in a transmission electron microscope”, New Orleans, March 2008.
- Cornell University, Applied Physics Seminar, February 2007.
- University of Pennsylvania, Physical Chemistry Seminar, Department of Chemistry, February 2007.
- Quantum Dots, 2007, Fort Lauderdale, Florida, December 2007.
- Drexel University, MEMS/NEMS Seminar, November 2007.
- University of Central Florida, Colloquium, Department of Physics, October 2007.
- Los Alamos National Laboratory, ESP 2007 Workshop: “Excited State Processes in Electronic and Bio Nanomaterials”, Center for Nonlinear Studies Conference, Sante Fe, NM, October 2007.
- XVII Symposium on Condensed Matter Physics, Vrsac, Serbia, September 2007.
- DuPont Central Research and Development, 2007 Discovery Chemistry Seminar Series, June 2007.
- International Conference on Coherent and Nonlinear Optics (ICONO-2007), Minsk, Belarus, May 2007.
- Materials Research Society (MRS) Spring Meeting, Symposium: Low-dimensional materials – Synthesis, Assembly, Property Scaling, and Modeling; Title: “Nanoparticle Electronics: nanocrystal assembly and high-resolution device fabrication using transmission electron beams”, San Francisco, CA, April 2007.
- Notre Dame Workshop: “Fluorescence Intermittency in single molecules, quantum dots and quantum wires”, University of Notre Dame, April 2007.
- American Physical Society (APS) March Meeting, March 2007, Denver, Colorado, Symposium on balancing career and family.
- Grenoble’s International Meeting in Molecular Electronics ElecMol’06, Grenoble, December 2006 (talk given by Claudia Querner).

Marija Drndic, April 13, 12, 2011

- Cornell University, Center for Nanoscale Systems Seminar, October 2006.
- ICYS-ICMR Summer School 2006 on Nanomaterials, Tsukuba, Japan, July 2006 (talk given by Claudia Querner).
- American Physical Society (APS) March Meeting, Title: “Controlled assembly and electronics in semiconductor nanocrystal-based devices”, Session: Nanoscale Crystals. Baltimore, March 2006.
- Nanax 2 Conference: “Nanoscience with Nanocrystals”, Grenoble, France, January 2006.
- National Academy of Sciences, 9th Annual Chinese-American Frontiers of Science Symposium, sponsored by the Chinese-Academy of Sciences and the U.S. National Academy of Sciences. Xiamen, China, November 2005.
- National Academy of Engineering, Eleventh Annual U.S. Frontiers of Engineering Symposium, GE Global Research Center, Albany, NY, September 2005.
- Brookhaven National Laboratory, Condensed Matter Seminar, April 2005.
- University of Michigan, Condensed Matter Seminar, February 2005.
- Johns Hopkins University, Condensed Matter Seminar, September 2004.
- XVI Symposium of the Condensed Matter Division (SFKM'04), Serbian Physical Society, Serbia and Montenegro, September 2004.
- University of Delaware, Condensed Matter Seminar, May 2004.
- Princeton University, Condensed Matter Seminar, November 2003.
- Temple University, Departmental Colloquium, October 2003.
- McGill University, Departmental Colloquium, March 2003.
- UC Berkeley, Condensed Matter Seminar, March 2003.
- Harvard University, Condensed Matter Seminar, February 2003.
- University of Delaware, Material Science Seminar, February 2003.
- University of Florida, Condensed Matter Seminar, February 2003.
- Dartmouth College, Departmental Colloquium, February 2003.

Marija Drndic, April 13, 12, 2011

- University of Pennsylvania, Condensed Matter Seminar, January 2003.
- University of Oregon, Condensed Matter Seminar, January 2003.
- University of Maryland, Condensed Matter Seminar, “Exploring the world of CdSe nanocrystals”, November 2002.
- NTT, Atsugi, Japan, Condensed Matter Seminar, “Transport in CdSe nanocrystal solids”, August 2002.
- 15th Symposium of the Condensed Matter Division (SFKM’01), Serbian Physical Society, Serbia and Montenegro, “Electronic transport in CdSe nanocrystal arrays”, October 2001.
- Massachusetts Institute of Technology, Microsystems Technology Laboratory, “Microelectromagnets for particle manipulation”, February 2000.
- Brandeis University, Condensed Matter Seminar, “Microelectromagnets for particle manipulation”, February 2000.
- Harvard University, Quantum Coherence Seminar, Institute for Theoretical Atomic and Molecular Physics, “Advances in atom manipulation using microtraps and guides”, October 1999.
- Centennial Celebration and Meeting of the American Physical Society, Atlanta, Georgia, “Microelectromagnets for particle manipulation”. March 1999.
- Temple University, Physics Department Colloquium, Philadelphia, Pennsylvania, “Microelectromagnets for atom manipulation”, November 1998.
- VIIIth International Conference on High Magnetic Fields, Tallahassee, Florida, “Electrical and thermal properties of microelectromagnets for atom manipulation”. October 1998.

REFERRED PUBLICATIONS:

REFERRED PUBLICATIONS FROM UPENN:

*Note: Corresponding author(s) indicated by *.
Equal contribution by students/postdocs denoted by #.*

1. J. Rosenstein, M. Wanunu, C. Merchant, M. Drndic, K. L. Shepard, “A high-bandwidth integrated platform for nanopore sensing”, **Nature Methods**, advanced online publication, 2012, doi:10.1038/nmeth.1932.

2. K.K. Saha, M. Drndic, B. Nikolic, “DNA nucleotide-specific modulation of microA transverse edge currents through a metallic graphene nanoribbon with a nanopore”, submitted to **Nano Letters**, 12 (1), 50-55, 2012.
3. M. Wanunu, S. Bhattacharya, Y. Xie, Y. Tor, A. Aksimentiev, M. Drndic, “Nanopore analysis of individual RNA/antibiotic complexes”, **ACS Nano**, 5 (12), 9345-9353, 2011.
4. Y. Lu, C. Merchant, M. Drndic*, A.T. Johnson*, “In-situ characterization of graphene nanoconstrictions fabricated in a transmission electron microscope”, **Nano Letters**, in press, 2011.
5. G. Grigoryan, Y.H. Kim, R. Acharya, K. Axelrod, R. M. Jain, L. Willis, M. Drndic, J.M. Kikkawa, W.F. DeGrado, “Computational design of virus-like protein assemblies on carbon nanotube surfaces”, **Science**, 332, 6033, 1071-1076, 2011.
6. S. Wang, C. Querner, T. Dadosh, C.H. Crouch, D.S. Novikov, M. Drndic*, “Collective fluorescence enhancement in nanoparticle clusters”, **Nature Communications**, 2:364, 2011.
7. M. Wanunu, D. Cohen-Karni, R. Johnson, L. Fields, J. Benner, N. Peterman, Y. Zheng, M. Klein, M. Drndic*, “Discrimination of methylcytosine from hydroxymethylcytosine in DNA molecules”, **J. Am. Chem. Soc.**, 133 (3), 486-492, 2011.
8. M. Wanunu#, T. Dadosh#, V. Ray, J. Jin, L. McReynolds, M. Drndic*, “Rapid electronic detection of probe-specific MicroRNAs using thin nanopore sensors”, **Nature Nanotechnology**, 5, 807, 814, 2010. (appeared as journal cover art)
9. J. A. Fairfield, T. Dadosh, M. Drndic*, “Characterization of memory and measurement history in photoconductivity of nanocrystal arrays”, **Applied Physics Letters**, 97, 143112, 2010.
10. C. Merchant, K. Healy, M. Wanunu, V. Ray, N. Peterman, J. Bartel, M. Fischbein, K. Venta, Z. Luo, A.T. C. Johnson, M. Drndic*, “DNA translocation through graphene nanopores”, **Nano Letters** 10 (8), 2915-2921, 2010.
11. M. Fischbein, M. Puster, M. Drndic*, “Monolayer suppression of transport imaged in annealed PbSe nanocrystal arrays”, **Nano Letters** 10 (6), 2155-2161, 2010.
12. C. H. Crouch, O. Sauter, X. Wu, R. Purcell, C. Querner, M. Drndic, M. Pelton*, “Facts and artifacts in the blinking statistics of semiconductor nanocrystals”, **Nano Letters** 10 (6), 1692-1698, 2010.
13. L. J. Willis#, J. A. Fairfield#, T. Dadosh#, M. Fischbein, M. Drndic*, “Controlling nanogap quantum dot photoconductivity through optoelectronic trap manipulation”, **Nano Letters** 9 (12), 4191-4197, 2009.

14. C. H. Crouch*, R. Mohr, T. Emmons, S. Wang, M. Drndic*, "Excitation energy dependence of fluorescence intermittency in CdSe/ZnS core-shell nanocrystals", **Journal of Phys. Chem. C**, 113 (28), 12059-12066, 2009.
15. S. Wang, C. Querner, M. Fischbein, L. Willis, D. Novikov, C. Crouch, M. Drndic*, "Blinking statistics correlated with nanoparticle number", **Nano Letters** 8 (1), p. 4020-4026, 2008.
16. C. Querner, S. Wang, K. Healy, J. Fairfield, M. D. Fischbein, M. Drndic*, "Fluorescence dynamics of semiconductor nanorod clusters studied by correlated atomic-force, transmission-electron and fluorescence microscopy", submitted to **Journal of Physical Chemistry C** 112 (50), p. 19945-19956, 2008.
17. M. D. Fischbein and M. Drndic*, "Electron beam nanosculpting of suspended graphene sheets", **Applied Physics Letters** 93, p. 113107-1 to 113107-3, 2008.
18. C. Querner, M. D. Fischbein, P. A. Heiney, M. Drndic*, "Milimeter-scale assembly of CdSe nanorods into smectic superstructures by solvent drying kinetics", **Advanced Materials** 20 (12), p. 2308 - 2314, 2008.
19. M. D. Fischbein and M. Drndic*, "Sub-10 nm device fabrication in a transmission electron microscope", **Nano Letters**, 7, p. 1329-1337, 2007.
20. S. Wang, C. Querner, T. Emmons, M. Drndic*, C.H. Crouch*, "Fluorescence blinking statistics from CdSe core and core-shell nanorods", **Journal of Physical Chemistry B** 110 (46), p. 23221-23227, 2006.
21. Z. Hu#, M. D. Fischbein#, C. Querner, M. Drndic*. "Electric-field-driven accumulation and alignment of CdSe and CdTe nanorods in nanoscale devices", **Nano Letters** 6 (11), p. 2585-2591, 2006.
22. D. R. Strachan*, D. E. Smith, M. D. Fischbein, D.E. Johnston, B.S. Guiton, M. Drndic, D.A. Bonnell, A.T. Johnson*, "Clean electromigrated nanogaps imaged by transmission electron microscopy", **Nano Letters** 6 (3), p. 441- 444, 2006.
23. M. D. Fischbein and M. Drndic*, "Nanogaps by direct lithography for high-resolution imaging and electronic characterization of nanostructures", **Applied Physics Letters**, 88 (6), p. 063116-1 to 063116-3, 2006.
24. Qi. D, M.D. Fischbein, M.Drndic, S. Selmic*, "Efficient polymer-nanocrystal quantum-dot photodetectors", **Applied Physics Letters** 86 (8), p. 093103-1 to 093103-3, 2005.
25. M.D. Fischbein and M. Drndic* "CdSe nanocrystal quantum-dot memory", **Applied Physics Letters** 86 (19), p. 193106-1 to 193106-3, 2005.
26. H.E. Romero and M. Drndic* "Coulomb blockade and hopping conductivity in PbSe quantum dots", **Physical Review Letters** 96, p. 156801-1 to p. 156801-4, 2005.

27. Z. Hu, M.D. Fischbein and M. Drndic*, "Local charge transport in two-dimensional PbSe nanocrystal arrays studied by electrostatic force microscopy", **Nano Letters** 5 (7), p. 1463 - 1468, 2005.

REFERRED PUBLICATIONS FROM OTHER INSTITUTIONS:

28. Novikov D.S., Drndic M., Levitov L.S., Kastner M.A., Jarosz M.V., Bawendi M.G., "Levy statistics and anomalous transport in quantum dot arrays", **Physical Review B** 72, p. 075309-1 to 075309-7, 2005.
29. (Invited Paper) Novikov D.S., Drndic M., Levitov L.S., Kastner M.A., Jarosz M.V., Bawendi M.G., "Anomalous transport and memory in quantum-dot arrays", **Proc. SPIE** Vol. 5843, p. 141-146, Fluctuations and Noise in Materials II; Peter Svedlinth, Dragana Popovic, Michael B. Weissman, Eds., 2005.
30. Drndic M., Markov R., Jarosz M. V., Bawendi M.G., Kastner M.A., Markovic N., Tinkham M., "Imaging the charge transport in CdSe nanocrystal arrays", **Applied Physics Letters**, 83 (19), p. 4008 - 4010, 2003.
31. Jarosz M. V., Scott N., Drndic M., Morgan N.Y., Bawendi M.G., Kastner M.A., "Observation of bimolecular carrier recombination dynamics in close-packed films of colloidal CdSe nanocrystals", **Journal of Physical Chemistry B** 107 (46), p. 12585-12588, 2003.
32. Drndic M., Jarosz M. V., Morgan N.Y., Kastner M.A., Bawendi M.G., "Transport properties of annealed CdSe colloidal nanocrystal solids", **Journal of Applied Physics** 92 (12), p. 7498-7503, 2002.
33. Morgan N.Y., Leatherdale C.A., Drndic M., Jarosz M. V., Bawendi M.G., Kastner M.A., "Electronic transport in arrays of colloidal CdSe nanocrystals", **Physical Review B** 66, p.075339-1 to 075339-9, 2002.
34. Drndic M., Lee C.S., Westervelt R.M., "Three-dimensional microelectromagnets for neutral and charged particles", **Physical Review B** 63 (8), p. 085321-1 to 085321-4, 2001.
35. Dekker N.H., Lee C.S., Lorent V., Thywissen J.H., Drndic M., Westervelt R.M., Prentiss M., "Guiding neutral atoms on a chip", **Physical Review Letters** 84, p. 1124-1127, 2000.
36. Featonby PD, Savalli V, Cagnet L, Helmerson K, Westbrook N, Westbrook CI, Phillips WD, Aspect A, Zibow G, Drndic M, Lee C, Westervelt RM, Prentiss M, "Bouncing cold atom on a magnetic mirror", **Journal de Physique IV**, 10, p. 139-140, 2000.

37. Cagnet L., Savalli V., Featonby P., Helmerson K., Westbrook N., Westbrook C.I., Phillips W.D., Aspect A., Zabow G., Drndic M., Lee C., Prentiss M., Westervelt R.M., "Smoothing a current-carrying mirror", **Europhysics Letters** 47, p.538-544, 1999.
38. Drndic M., Zabow G., Lee C., Thywissen J.H., Johnson K.S., Prentiss M., Westervelt R.M., Featonby P., Savalli V., Cagnet L., Helmerson K., Westbrook N., Westbrook C.I., Phillips W.D., Aspect A., "Properties of microelectromagnet mirrors as reflectors of cold Rb atoms", **Physical Review A** 60 (5), p.4012-4015, 1999.
39. Thywissen J.H., Olshanni M., Zabow G., Drndic M., Johnson KS, Prentiss M., Westervelt R.M., "Microfabricated magnetic guides for neutral atoms", **European Journal of Physics D** 7(3), p.361-367, 1999.
40. Zabow G., Drndic M., Thywissen J.H., Johnson K.S., Prentiss M., Westervelt R.M., "Improving the specularly of magnetic mirrors for atoms", **European Journal of Physics D** 7 (3), p.351-359, 1999.
41. Drndic M, Johnson KS, Thywissen JH, et al., "Micro-electromagnets for atom manipulation", **Applied Physics Letters** 72 (22), p. 2906-2908, 1998.
42. Johnson K.S., Drndic M., Thywissen J.H., Zabow G., Prentiss M., Westervelt R.M., "Atomic deflection using an adaptive microelectromagnet mirror", **Physical Review Letters** 81(6), p.1137-1141, 1998.
43. Drndic M., Grimshaw M.P., Cooper L.J., Ritchie D. A., Patel N., "Tunable electron-hole gases in gated InAs/GaSb/AlSb systems", **Applied Physics Letters** 70, p.481-483, 1997.
44. Drndic M., He Y.D., Price P.B., SnowdenIfft D.P., Westphal A.J., "Atomic-Force-Microscopic study of etched nuclear tracks at extremely short-distance scale", **Nuclear Instruments and Methods B** 93, p.52-56, 1994.

SELECTED PATENTS:

1. Polymer-nanocrystal quantum dot composites and optoelectronic devices, M. Drndic, D. Qi, S. Semic, Patent Awarded, 11/348039, 2006.
2. Nanocrystal quantum dot memory devices, M. Fischbein and M. Drndic, Pending, Application number 11/329471, 2006.
3. Nanogaps: methods and devices containing the same, M. Fischbein and M. Drndic, Patent Awarded, Application number PCT/US06/10157, 2006.
4. Beam Ablation Lithography, M. Fischbein and M. Drndic, Pending, UPN0087, 2006.
5. Nanostructure Assemblies, methods and devices thereof, M. Fischbein and M. Drndic, Pending, Application number 60/715720, 2005.

6. High-resolution analysis devices and related methods, UPN-1041/W5451, Pending, Meni Wanunu, Tali Dadosh, M. Drndic, 2010.

7. Several other patent disclosures in progress on graphene.