Curriculum Vitae

David J. Norris

Office Address: Department of Chemical Engineering and Materials Science
University of Minnesota
421 Washington Avenue, S.E.
Minneapolis, MN 55455 USA

voice: (612) 625-2043
fax: (612) 626-7246
email: dnorris@umn.edu

Personal Information

Born: 1968, St. Louis, Missouri USA.
Citizenship: U. S.
Marital Status: Married, three children.
Societies: Member of AAAS, ACS, APS, MRS, and Phi Beta Kappa.

Education

1990-1995 *Ph.D.*, Physical Chemistry, Massachusetts Institute of Technology, Cambridge, MA.
1986-1990 *B.S.*, Chemistry, The University of Chicago, Chicago, IL, GPA 3.98/4.00.

Professional Appointments

2006- Professor of Chemical Engineering and Materials Science, University of Minnesota, Minneapolis, MN.
2004- Director of Graduate Studies in Chemical Engineering, University of Minnesota, Minneapolis, MN.
2001-2006 Associate Professor of Chemical Engineering and Materials Science, University of Minnesota, Minneapolis, MN.
1997-2001 Research Scientist, NEC Research Institute, Princeton, NJ.
1995-1997 Postdoctoral Fellow under Prof. W. E. Moerner, University of California, San Diego, investigating "Single Molecules Coupled to Optical Microcavities."
1990-1995 Predoctoral Fellow under Prof. M. G. Bawendi, MIT, investigating the "Optical Properties of Semiconductor Nanocrystals (Quantum Dots)."

Honors and Awards

2006 Fellow of the American Physical Society.
2006-2007 Humboldt Research Fellowship.
1995-1997 National Science Foundation Postdoctoral Fellowship in Chemistry.
1994-1995 Arthur D. Little Graduate Student Fellowship in Chemistry.
1990-1993 National Science Foundation Predoctoral Fellowship in Chemistry.
1990 ICI Americas Summer Fellowship.
1986-1988 Illinois State Honor Scholarship.

Professional Activities

2007-2009 Chair (2009) and Vice-Chair (2007), Gordon Research Conference on "Clusters, Nanocrystals, and Nanostructures."
2007 Planning Group Member, "10th Annual Japanese American Kavli Frontiers of Science Symposium," sponsored by the Japan Society for the Promotion of Science and the U.S. National Academy of Sciences, December 2007; Kanagawa, Japan.
2006- Consultant, Mitsubishi Chemical Corporation, Yokohama, Japan.
2006 Co-Chair, "1st Workshop on the Doping of Nanostructures," January 2006; Naval Research Laboratory, Washington D.C.
2005- Scientific Advisory Board Member, Innovalight, Inc., St. Paul, MN.

2004-	External Advisory Board Member, the NSF-sponsored "Center for Biological and Environmental Nanotechnology (CBEN)" at Rice University, Houston, TX.
2003-	Advisory Board Member, the ACS Petroleum Research Fund (PRF), Washington, D.C.
2003-	Consultant, Science Museum of Minnesota, St. Paul, MN.
2003	Symposium Organizer, "Microphotonics, Nanophotonics, and Photonic Crystals," the Materials Research Society meeting, April 2003; San Francisco, CA.
2002-	Editorial Board Member, *Chemistry of Materials*.
2002-2005	Executive Committee Member, the Physical Chemistry Division of the American Chemical Society (ACS).
2002-2005	Editor, *Photonics and Nanostructures*.
2002-2004	Consultant, 3M Company, St. Paul, MN.
2002	Symposium Organizer, "Physics and Technology of Semiconductor Quantum Dots," the Materials Research Society (MRS) meeting, November 2002; Boston, MA.
2002	Sub-Committee Member, "Physics and Optical Diagnostics of Nanostructures," the International Conference on Quantum Electronics, June 2002; Moscow, Russia.
2002	Sub-Committee Member, "Fundamental Optics in Periodic and Random Media," the Quantum Electronics and Laser Science Conference (QELS), May 2002; Baltimore, MD.
2001-2002	Consultant, NEC Research Institute, Princeton, NJ.
2001	Sub-Committee Member, "Nano-Optics," the Quantum Electronics and Laser Science Conference (QELS), May 2001; Baltimore, MD.
2001	Symposium Organizer, "Chemical Approaches to Photonic Crystals," the American Chemical Society (ACS) meeting, April 2001; San Diego, CA.
2000-	Editorial Board Member, *Advanced Functional Materials.*

Ad Hoc Scientific Review Panels

2006	Site Review Panel Member, Science Foundation Ireland program on "Silicon Based Photonic Crystals" at the Tyndall National Institute, University College Cork, Ireland.
2006	Proposal Review Panel Member, National Science Foundation, Emerging Models and Technologies in Computation (EMT), "Nanoscience, Self-Assembly and Bimolecular Computation."
2005	Proposal Review Panel Member, Department of Energy, Office of Basic Energy Sciences, "Hydrogen Fuel Initiative."
2004	International Evaluation Panel Member, *Deutsche Forschungsgemeinschaft* (DFG), German priority program on "Photonic Crystals."
2004	Proposal Review Panel Member, National Science Foundation, Emerging Models and Technologies in Computation (EMT), "Nanoscience, Self-Assembly and Bimolecular Computation."
2003	Site Review Panel Member, National Science Foundation funded Integrative Education and Research Graduate Traineeship (IGERT) program on "Advanced Optical Materials" at the University of California at Santa Barbara.
2001	International Evaluation Panel Member, *Fundamenteel Onderzoek der Materie* (FOM), Dutch priority program on "Photon Physics in Optical Materials."

Research Interests

Colloids and optical materials. Prof. Norris is interested in understanding how structural parameters, such as size, shape, and periodicity, influence the optical properties of a material. When structured on a nanometer length scale, many common materials (*e.g.*, semiconductors, metals, *etc.*) can exhibit dramatically new optical behavior. The goal is to understand and control this behavior through the study of two materials: *photonic crystals* for examining the role of periodicity, and *quantum dots* for examining the role of size. To fabricate these materials, the Norris group utilizes colloidal chemistry and self-assembly techniques. The optical properties of the resulting materials are then probed using various spectroscopic methods.

Publications

1. "Materials Science: The Touch of a Modern Midas,"
   D. J. Norris; *Nature* (in press).

2. "Photonic Crystals: A View at the Future,"
   D. J. Norris; *Nature Mater.* (in press).

3. "Quantifying Stacking Faults and Vacancies in Thin Convectively Assembled Colloidal Crystals,"
   H. Wei, L. Meng, Y. Jun, and D. J. Norris; *Appl. Phys. Lett.* **89**, 241913 (2006).

4. "The Role of Thickness Transitions in Convective Assembly,"
   L. Meng, H. Wei, B. Wiley, A. Nagel, L. E. Scriven, and D. J. Norris; *Nano Lett.* **6**, 2249 (2006).

5. "Colloidal Crystal Layers of Hexagonal Nanoplates by Convective Assembly,"
   J. A. Lee, L. Meng, D. J. Norris, L. E. Scriven, and M. Tsapatsis; *Langmuir* **22**, 5217 (2006).

6. "The Impact of Ripening on Manganese-Doped ZnSe Nanocrystals,"
   L. Zu, D. J. Norris, T. A. Kennedy, S. C. Erwin, and Al. L. Efros; *Nano Lett.* **6**, 334 (2006).

7. "Tailoring Air Defects in Self-Assembled Photonic Band Gap Crystals,"
   Y. Jun, C. A. Leatherdale, and D. J. Norris; *Adv. Mater.* **17**, 1908 (2005).

8. "Doping Semiconductor Nanocrystals,"
   S. C. Erwin, L. Zu, M. I. Haftel, Al. L. Efros, T. A. Kennedy, and D. J. Norris; *Nature* **436**, 91 (2005).

9. "Opaline Photonic Crystals: How Does Self-Assembly Work?"
   D. J. Norris, E. G. Arlinghaus, L. Meng, R. Heiny, and L. E. Scriven; *Adv. Mater.* **16**, 1393 (2004).

10. "Avoiding Cracks in Self-Assembled Photonic Band Gap Crystals,"
    A. A. Chabanov, Y. Jun, and D. J. Norris; *Appl. Phys. Lett.* **84**, 3573 (2004).

11. "Selective Excitation of Erbium in Silicon-Infiltrated Silica Colloidal Photonic Crystals,"
    J. Kalkman, E. de Bres, A. Polman, Y. Jun, D. J. Norris, D. C. 't Hart, J. P. Hoogenboom, and A. van Blaaderen; *J. Appl. Phys.* **95**, 2297 (2004).

12. "Electronic Structure in Semiconductor Nanocrystals: Optical Experiment,"
    D. J. Norris; in *Semiconductor and Metal Nanocrystals: Synthesis and Electronic and Optical Properties*, edited by V. I. Klimov, New York: Marcel Decker (2004).

13. "Quantum Dot Photonic Crystals,"
    D. J. Norris and Yu. A. Vlasov; in *Semiconductor Nanocrystals, From Basic Principles to Applications*, edited by Al. L. Efros, D. J. Lockwood, and L. Tsybeskov, New York: Kluwer (2003).

14. "*In Vivo* Imaging of Quantum Dots Encapsulated in Phospholipid Micelles,"
    B. Dubertret, P. Skourides, D. J. Norris, V. Noireaux, A. H. Brivanlou, and A. Libchaber; *Science* **298**, 1759 (2002).

15. "Device Physics: Defective Promise in Photonics,"
    T. A. Taton and D. J. Norris; *Nature* **416**, 685 (2002).

16. "Future Directions in Solid State Chemistry: Report of the NSF-Sponsored Workshop,"
    R. J. Cava, F. J. DiSalvo, L. E. Brus, K. R. Dunbar, C. B. Gorman, S. M. Haile, L. V. Interrante, J. L. Musfeldt, A. Navrotsky, R. G. Nuzzo, W. E. Pickett, A. P. Wilkinson, C. Ahn, J. W. Allen, P.C. Burns, G. Ceder, C. E. D. Chidsey, W. Clegg, E. Coronado, H. Dai, M. W. Deem, B. S. Dunn, G.

Galli, A. J. Jacobson, M. Kanatzidis, W. Lin, A. Manthiram, M. Mrksich, D. J. Norris, A. J. Nozik, X. Peng, C. Rawn, D. Rolison, D. J. Singh, B. H. Toby, S. Tolbert, U. B. Wiesner, P. M. Woodward, and P. Yang; *Progress in Solid State Chemistry* **30**, 1 (2002).

17. "Doping and Charging in Colloidal Semiconductor Nanocrystals,"
M. Shim, C. Wang, D. J. Norris, and P. Guyot-Sionnest; *MRS Bulletin* **26**, 1005 (2001).

18. "New Aspects of Nanocrystal Research,"
edited by L. M. Liz-Marzan and D. J. Norris; special issue of the *MRS Bulletin*, Vol. 26, No. 12 (2001).

19. "On-Chip Natural Assembly of Silicon Photonic Bandgap Crystals,"
Yu. A. Vlasov, X.-Z. Bo, J. C. Sturm, and D. J. Norris; *Nature* **414**, 289 (2001).

20. *Nonlithographic and Lithographic Methods of Nanofabrication — From Ultralarge-Scale Integration to Photonics to Molecular Electronics*,
edited by L. Merhari, J. A. Rogers, A. Karim, D. J. Norris, and Y. Xia; *Proc. Mat. Res. Soc.* **636** (2001).

21. "The Complete Photonic Band Gap in Inverted Opals: How Can We Prove It Experimentally?"
D. J. Norris and Yu. A. Vlasov; in *Photonic Crystals and Light Localization in the 21st Century*, edited by C. M. Soukoulis, Dordrecht: Kluwer Academic (2001).

22. "Chemical Approaches to Three-Dimensional Semiconductor Photonic Crystals,"
D. J. Norris and Yu. A. Vlasov; *Adv. Mater.* **13**, 371 (2001).

23. "High-Quality Manganese-Doped ZnSe Nanocrystals,"
D. J. Norris, N. Yao, F. T. Charnock, and T. A. Kennedy; *Nano Letters* **1**, 3 (2001).

24. "Conjugated-Polymer Photonic Crystals,"
M. Deutsch, Yu. A. Vlasov, and D. J. Norris; *Adv. Mater.* **12**, 1176 (2000).

25. "Single-Domain Spectroscopy of Self-Assembled Photonic Crystals,"
Yu. A. Vlasov, M. Deutsch, and D. J. Norris; *Appl. Phys. Lett.* **76**, 1627 (2000).

26. *Semiconductor Quantum Dots*,
edited by S. C. Moss, D. Ila, H. W. Lee, and D. J. Norris; *Proc. Mat. Res. Soc.* **571** (2000).

27. "Synthesis of Photonic Crystals for Optical Wavelengths from Semiconductor Quantum Dots,"
Yu. A. Vlasov, N. Yao, and D. J. Norris; *Adv. Mater*. **11**, 165 (1999).

28. "Simultaneous Imaging of Individual Molecules Aligned Both Parallel and Perpendicular to the Optic Axis," R. M. Dickson, D. J. Norris, and W. E. Moerner; *Phys. Rev. Lett.* **81**, 5322 (1998).

29. "Excitation of a Single Molecule on the Surface of a Spherical Microcavity,"
D. J. Norris, M. Kuwata-Gonokami, and W. E. Moerner; *Appl. Phys. Lett.* **71**, 297 (1997).

30. "Optical Properties of Semiconductor Nanocrystals (Quantum Dots),"
D. J. Norris, M. G. Bawendi, and L. E. Brus; in *Molecular Electronics*, edited by J. Jortner and M. Ratner, Oxford: Blackwell Science (1997).

31. "Single Molecule Spectroscopy and Quantum Optics in Solids,"
W. E. Moerner, R. M. Dickson, and D. J. Norris; in *Advances in Atomic, Molecular, and Optical Physics* **38**, edited by B. Bederson and H. Walther, San Diego: Academic Press (1997).

32. "Single Molecule Nanophotonics in Solids,"
W. E. Moerner, R. M. Dickson, and D. J. Norris; *Mat. Sci. and Eng. B* **48**, 169 (1997).

33. "Single Molecules Solvated in Pores of Poly(acrylamide) Gels,"
R. M. Dickson, D. J. Norris, Y.-L. Tzeng, R. Sakowicz, L. S. B. Goldstein, and W. E. Moerner; *Mol. Cryst. Liq. Cryst.* **291**, 31 (1996).

34. "Three-Dimensional Imaging of Single Molecules Solvated in Pores of Poly(acrylamide) Gels,"
R. M. Dickson, D. J. Norris, Y.-L. Tzeng, and W. E. Moerner; *Science* **274**, 966 (1996).

35. "Photoluminescence Spectroscopy of Single CdSe Nanocrystallite Quantum Dots,"
S. A. Empedocles, D. J. Norris, and M. G. Bawendi; *Phys. Rev. Lett.* **77**, 3873 (1996).

36. "Band Edge Exciton in Quantum Dots of Semiconductors with a Degenerate Valence Band: Dark and Light Exciton States," Al. L. Efros, M. Rosen, M. Kuno, M. Nirmal, D. J. Norris, and M. G. Bawendi; *Phys. Rev. B* **54**, 4843 (1996).

37. "Size Dependence of Exciton Fine Structure in CdSe Quantum Dots,"
D. J. Norris, Al. L. Efros, M. Rosen, and M. G. Bawendi; *Phys. Rev. B* **53**, 16347 (1996).

38. "Measurement and Assignment of the Size-Dependent Optical Spectrum in CdSe Quantum Dots,"
D. J. Norris and M. G. Bawendi; *Phys. Rev. B* **53**, 16338 (1996).

39. "Observation of the 'Dark Exciton' in CdSe Quantum Dots,"
M. Nirmal, D. J. Norris, M. Kuno, M. G. Bawendi, Al. L. Efros, and M. Rosen; *Phys. Rev. Lett.* **75**, 3728 (1995).

40. "Structure in the Lowest Absorption Feature of CdSe Quantum Dots,"
D. J. Norris and M. G. Bawendi; *J. Chem. Phys.* **103**, 5260 (1995).

41. "Stark Spectroscopy of CdSe Nanocrystallites: The Significance of Transition Linewidths,"
A. Sacra, D. J. Norris, C. B. Murray, and M. G. Bawendi; *J. Chem. Phys.* **103**, 5236 (1995).

42. "Measurement of the Size Dependent Hole Spectrum in CdSe Quantum Dots,"
D. J. Norris, A. Sacra, C. B. Murray, and M. G. Bawendi; *Phys. Rev. Lett.* **72**, 2612 (1994).

43. "Synthesis and Characterization of Nearly Monodisperse CdE (E = S, Se, Te) Semiconductor Nanocrystallites," C. B. Murray, D. J. Norris, and M. G. Bawendi; *J. Am. Chem. Soc.* **115**, 8706 (1993).

44. "Size-Dependent Spectroscopy and Photodynamics of Some II-VI Semiconductor Nanocrystallites (Quantum Dots)," M. Nirmal, C. B. Murray, D. J. Norris, and M. G. Bawendi; *Proc. SPIE - Int. Soc. Opt. Eng.* **1861**, 280 (1993).

45. "Synthesis and Structural Characterization of II-VI Semiconductor Nanocrystallites (Quantum Dots),"
C. B. Murray, M. Nirmal, D. J. Norris, and M. G. Bawendi; *Z. Phys. D* **26**S, 231 (1993).

46. "Surface Electronic Properties of CdSe Nanocrystallites,"
M. Nirmal, C. B. Murray, D. J. Norris, and M. G. Bawendi; *Z. Phys. D* **26**, 361 (1993).

47. "Size-Dependent Optical Spectroscopy of II-VI Semiconductor Nanocrystallites (Quantum Dots),"
D. J. Norris, M. Nirmal, C. B. Murray, A. Sacra, and M. G. Bawendi; *Z. Phys. D* **26**, 355 (1993).

Talks and Presentations

1. "Why Has Doping Been Difficult in Semiconductor Nanocrystals?"
   invited seminar presented at the *National Nanotechnology Laboratory*; Lecce, Italy; February 2007.

2. "Why Has Doping Been Difficult in Semiconductor Nanocrystals?"
   invited seminar presented at the *Center for Functional Nanostructures* and *the Light Technology Institute at the University of Karlsruhe*; Karlsruhe, Germany; January 2007.

3. "Fluorescent Frogs and Doped Dots,"
   poster presented at the *Japanese-American Frontiers of Science Workshop*; Irvine, CA; December 2006.

4. "Fluorescent Frogs Need Doped Dots: But How Do We Dope?"
   invited seminar presented at the *Walter Schottky Institute of the Technische Universität München*; Garching, Germany; November 2006.

5. "Doping Semiconductor Nanocrystals,"
   invited talk presented at the *Introductory Meeting for Alexander von Humboldt Fellows*; Cologne, Germany; October 2006.

6. "Doping Semiconductor Nanocrystals,"
   invited talk presented at the *Fall Meeting of the European Materials Research Society (EMRS)*; Warsaw, Poland; September 2006.

7. "Doping Semiconductor Nanocrystals,"
   invited seminar presented at the *Chemistry Department of the University of Wisconsin*; Madison, WI; August 2006.

8. "Doping Semiconductor Nanocrystals,"
   invited talk presented at the *American Chemical Society Central Regional Meeting*; Frankenmuth, MI; May 2006.

9. "Doping Semiconductor Nanocrystals,"
   invited seminar presented at the *Center for Research at the Bio/Nano Interface at the University of Florida*; Gainesville, FL; May 2006.

10. "Doping Semiconductor Nanocrystals,"
    invited seminar presented at the *James Franck Institute at the University of Chicago*; Chicago, IL; April 2006.

11. "Doping Semiconductor Nanocrystals,"
    invited seminar presented at *Innovalight Inc.*; Santa Clara, CA; April 2006.

12. "Doping Semiconductor Nanocrystals,"
    invited seminar presented at the *Chemistry Department of the University of Notre Dame*; South Bend, IN; March 2006.

13. "Doping Semiconductor Nanocrystals,"
    invited talk presented at the *Third International Workshop on Multifunctional Materials*; Bariloche, Argentina; March 2006.

14. "Doping Semiconductor Nanocrystals,"
    invited seminar presented at the *Chemistry Department of the University of Utah*; Salt Lake City, UT; February 2006.

15. "The Role of the Surface and Surface Ligands in the Doping of Semiconductor Nanocrystals," **invited** talk presented at the *Fall Meeting of the Materials Research Society (MRS)*; Boston, MA; November 2005.

16. "Doping Semiconductor Nanocrystals," **invited** talk presented at *Optics East 2005*; Boston, MA; October 2005.

17. "Self-Assembled Photonic Band Gap Materials," **invited** talk presented at *Optics East 2005*; Boston, MA; October 2005.

18. "Self-Assembled Photonic Band Gap Materials," **invited** seminar presented at the *Materials Science and Engineering Department of Cornell University*; Ithaca, NY; September 2005.

19. "Doping Semiconductor Nanocrystals," **invited** seminar presented in the *Physics Department of the University of Texas at Austin*; Austin, TX; September 2005.

20. "Self-Assembled Photonic Band Gap Materials," **invited** seminar presented at the *Chemistry Department of the University of Colorado*; Boulder, CO; September 2005.

21. "Photonic Crystals," **invited** tutorial presented at the *Chemistry Department of the University of Colorado*; Boulder, CO; September 2005.

22. "Doping Semiconductor Nanocrystals," **invited hot topic** talk presented at the *Gordon Research Conference on Clusters, Nanocrystals, and Nanostructures*; New London, CT; July 2005.

23. "Opaline Photonic Crystals: How Does Self-Assembly Work?" **invited** talk presented at the *Gordon Research Conference on Thin Films and Crystal Growth*; Mount Holyoke, MA; June 2005.

24. "Doping Semiconductor Nanocrystals," **invited** talk presented at the *Spring Meeting of the Materials Research Society (MRS)*; San Francisco, CA; March 2005.

25. "Doping Semiconductor Nanocrystals," **invited** seminar presented at the *Integrative Education and Research Graduate Traineeship (IGERT) program on Nanoparticle Science and Engineering at the University of Minnesota*; Minneapolis, MN; March 2005.

26. "Doping Semiconductor Nanocrystals: Experiment," contributed talk presented at the *March Meeting of the American Physical Society (APS)*; Los Angeles, CA; March 2005.

27. "Self-Assembled Photonic Band Gap Materials," **invited** seminar presented at the *Chemistry Department of the University of Houston*; Houston, TX; February 2005.

28. "Opaline Photonic Crystals: How Does Self-Assembly Work?" **invited** seminar presented at the *Materials Science and Engineering Department of the Rensselaer Polytechnic Institute*; Troy, NY; January 2005.

29. "Opaline Photonic Crystals: How Does Self-Assembly Work?"
invited seminar presented at the *Naval Research Laboratory*; Washington, D.C.; January 2005.

30. "Doping Semiconductor Nanocrystals,"
invited seminar presented at the *Physics Department of the University of Dortmund*; Dortmund, Germany; December 2004.

31. "Silicon Self-Assembled Photonic Band Gap Crystals,"
invited talk presented at the *Fall Meeting of the Materials Research Society (MRS)*; Boston, MA; November 2004.

32. "From a Computer Company to an Engineering Department,"
invited seminar presented at the *Careers in Academia Seminar Series in the Chemistry Department of the University of Illinois*; Urbana, IL; November 2004.

33. "Opaline Photonic Crystals: How Does Self-Assembly Work?"
invited seminar presented at the *Chemistry Department of the University of Illinois*; Urbana, IL; November 2004.

34. "*In Vivo* Imaging with Quantum Dots,"
invited talk presented at the *49th Annual Meeting of SPIE*; Denver, CO; August 2004.

35. "Self-Assembled Photonic Band Gap Crystals,"
invited talk presented at the *Gordon Research Conference on Solid State Chemistry*; New London, NH; July 2004.

36. "Self-Assembly of Photonic Band Gap Crystals,"
invited talk presented at the *German-American Frontiers of Chemistry Symposium*; Kloster Seeon, Germany; July 2004.

37. "Self-Assembled Photonic Crystals,"
invited talk presented at the *Gordon Research Conference on Complex Fluids*; New London, NH; July 2004.

38. "Quantum Dots in Frogs,"
invited lecture presented at the *PRF Summer School on Nanoparticle Materials*; Ypsilanti, MI; June 2004.

39. "Opaline Photonic Crystals: How Does Self-Assembly Work?"
invited lecture presented at the *PRF Summer School on Nanoparticle Materials*; Ypsilanti, MI; June 2004.

40. "The Photonic Band Gap and Colloidal Crystals,"
invited lecture presented at the *PRF Summer School on Nanoparticle Materials*; Ypsilanti, MI; June 2004.

41. "Biological Imaging with Quantum Dots,"
invited talk presented at the *24th Annual Conference of the Center for Nonlinear Studies (CNLS)*; Santa Fe, NM; May 2004.

42. "Biological Imaging with Quantum Dots,"
invited talk presented at the *Quantum Dot 2004 Conference*; Banff, Alberta, Canada; May 2004.

43. "Biological Imaging with Quantum Dots,"
invited talk presented at the *Spring Meeting of the Materials Research Society (MRS)*; San Francisco, CA; April 2004.

44. "Biological Imaging with Quantum Dots,"
invited talk presented at the *Design of Medical Devices Conference*; Minneapolis, MN; April 2004.

45. "Self-Assembled Photonic Band Gap Crystals,"
invited talk presented at the *Meeting of the American Chemical Society (ACS)*; Anaheim, CA; March 2004.

46. "Self-Assembly of Photonic Band Gap Crystals,"
invited seminar presented at *Sandia National Laboratory*; Albuquerque, NM; March 2004.

47. "Biological Imaging with Quantum Dots,"
invited talk presented at the *Science of Learning Workshop at the University of New Mexico*; Albuquerque, NM; March 2004.

48. "Self-Assembly of Photonic Band Gap Crystals,"
invited talk presented at the *Japanese-American Frontiers of Science Workshop*; Kanagawa, Japan; December 2003.

49. "Quantum Dots in Frogs,"
invited seminar presented at the *Minnesota Microscopy Society*; Minneapolis, MN; November 2003.

50. "Quantum Dots in Frogs,"
invited seminar presented at the *Physics Department of the University of Minnesota*; Minneapolis, MN; November 2003.

51. "Quantum Dots in Frogs,"
invited seminar presented at the *Integrative Education and Research Graduate Traineeship (IGERT) program on Advanced Optical Materials of the University of California at Santa Barbara*; Santa Barbara, CA; October 2003.

52. "Self-Assembled Photonic Band Gap Crystals,"
invited talk presented at the *Frontiers in Optics program at the annual meeting of the Optical Society of America (OSA)*; Tuscon, AZ; October 2003.

53. "Dots in Frogs,"
invited seminar presented at the *Chemistry Department of the University of Rochester*; Rochester, NY; September 2003.

54. "Quantum Dots in Frogs,"
invited seminar presented at the *General Electric Global Research Center*; Niskayuna, NY; September 2003.

55. "Self-Assembly of Photonic Band Gap Materials,"
invited talk presented at the *Bio-Inspired Processes Workshop*; Atlanta, GA; August 2003.

56. "In Vivo Imaging with Quantum Dots,"
invited talk presented at the *Workshop on Excited State Processes in Electronic and Bio Nanomaterials*; Los Alamos, NM; August 2003.

57. “Quantum Dots in Frogs,”
invited seminar presented at the *National Institute of Standards and Technology*; Gaithersburg, MD; June 2003.

58. “Quantum Dots in Frogs,”
invited seminar presented at the *Naval Research Laboratory*; Washington, D.C.; June 2003.

59. “In Vivo Imaging of Quantum Dots Encapsulated in Phospholipid Micelles,”
invited talk presented at the *Spring Meeting of the Materials Research Society (MRS)*; San Francisco, CA; April 2003.

60. “Dots in Frogs: the Use of Nanocrystals in Biology,”
invited seminar presented at the *Chemistry Department of the University of Minnesota*; Minneapolis, MN; February 2003.

61. “Quantum Dots in Frogs,”
invited seminar presented at the *Biotechnology Institute of the University of Minnesota*; St. Paul, Minnesota; February 2003.

62. “Self-Assembled Photonic Band Gap Crystals,”
invited talk presented at the *DARPA Topical Meeting of the Optical Bandgap Research*; San Diego, CA; January 2003.

63. “Quantum Dots in Frogs,”
invited seminar presented at the *University of Liege*; Liege, Belgium; January 2003.

64. “Nanophotonics Tutorial,”
invited tutorial presented at the *Fall Meeting of the Materials Research Society (MRS)*; Boston, MA; December 2002.

65. “On-Chip Assembly of Silicon Photonic Bandgap Crystals,”
invited talk presented at the *International Workshop on Photonic and Electromagnetic Crystal Structures (PECS-IV)*; Los Angeles, CA; October 2002.

66. “Photonic Crystals: A Tutorial Review,”
invited seminar presented at the *3M Science Research Center*; St. Paul, MN; September 2002..

67. “Quantum Dot Photonic Crystals,”
invited talk presented at the *Meeting of the American Chemical Society (ACS)*; Boston, MA; August 2002.

68. “On-Chip Assembly of Silicon Photonic Bandgap Crystals,”
invited talk presented at the *Electronic Materials Conference (EMC2002)*; Santa Barbara, CA; June 2002.

69. “Self-Assembled Photonic Band Gap Crystals,”
invited seminar presented at the *Chemistry Division of Argonne National Laboratory*; Argonne, IL; May 2002.

70. “Self-Assembled Photonic Band Gap Crystals,”
invited seminar presented at the *Department of Materials and Nuclear Engineering of the University of Maryland*; College Park, MD; May 2002.

71. "On-Chip Assembly of Silicon Photonic Bandgap Crystals,"
invited talk presented at the *Spring Meeting of the Materials Research Society (MRS)*; San Francisco, CA; April 2002.

72. "On-Chip Assembly of Silicon Photonic Bandgap Crystals,"
invited talk presented at the *2nd DARPA Workshop on Novel Technologies for the Transport and Manipulation of Light*; Arlington, VA; February 2002.

73. "On-Chip Assembly of Silicon Photonic Bandgap Crystals,"
invited seminar presented at the *Chemical Engineering Department of the University of California at Santa Barbara*; Santa Barbara, CA; January 2002.

74. "On-Chip Assembly of Silicon Photonic Bandgap Crystals,"
invited seminar presented at the *3M Science Research Center*; St. Paul, MN; January 2002.

75. "On-Chip Assembly of Silicon Photonic Bandgap Crystals,"
invited talk presented at the *Fall Meeting of the Materials Research Society (MRS)*; Boston, MA; November 2001.

76. "Inverted Opals and the Photonic Band Gap,"
invited talk presented at the *NSF Workshop on Solid State Chemistry*; Davis, CA; October 2001.

77. "On-Chip Assembly of Silicon Inverted Opals,"
invited talk presented at the *Knowledge Foundation's Conference on Photonic Nanostructures*; San Diego, CA; October, 2001.

78. "Semiconductor Inverted Opals as Photonic Crystals,"
invited seminar presented at the *Van der Waals-Zeeman Colloquium*; University of Amsterdam, Amsterdam, the Netherlands; September 2001.

79. "Inverted Opals and the Photonic Band Gap,"
invited colloquium presented at the *FOM-Institute for Atomic and Molecular Physics*; Amsterdam, the Netherlands; September 2001.

80. "Inverted Opals and the Photonic Band Gap,"
invited seminar presented at the *Chemistry Department of the University of Strasbourg*; Strasbourg, France; September 2001.

81. "Sub-Domain Spectroscopy on Self-Assembled Photonic Crystals,"
invited talk presented at the *10th International Conference on II-VI Compounds*; Bremen, Germany; September 2001.

82. "High-Quality Mn-Doped ZnSe Nanocrystals,"
poster presented at the *10th International Conference on II-VI Compounds*; Bremen, Germany; September 2001.

83. "Inverted Opals as Photonic Crystals,"
invited talk to be presented at the *Gordon Research Conference on the Chemistry of Electronic Materials*; New London, CT; July 2001.

84. "Inverted Opals and the Photonic Band Gap,"
invited talk presented at the *3rd Annual Cross Border Workshop on Laser Science*, University of Toronto; Toronto, Canada; May 2001.

85. “Inverted Opals as Photonic Crystals,”
invited seminar presented at the *Department of Physics of the New Jersey Institute of Technology*; Newark, NJ; April 2001.

86. “Inverted Opals as Photonic Crystals,”
invited seminar presented at the *Department of Chemistry of the University of Chicago*; Chicago, IL; April 2001.

87. “Inverted Opals and the Photonic Band Gap,”
invited seminar presented at the *Department of Chemical Engineering and Materials Science at the University of Minnesota*; Minneapolis, MN; March 2001.

88. “Magnetically-Doped Semiconductor Quantum Dots (Nanocrystals),”
invited talk presented at the *Meeting of the American Physical Society (APS)*; Seattle, WA; March 2001.

89. “Probing the Photonic Band Gap in Inverted Opals,”
invited talk presented at *Particles 2001*; Orlando, FL; February 2001.

90. “Inverted Opals and the Photonic Band Gap,”
invited seminar presented at the *IBM T. J. Watson Research Center*; Yorktown Heights, NY; January 2001.

91. “Probing the Photonic Band Gap in Inverted Opals,”
invited seminar presented at the *Department of Physics of Queens College*; New York, NY; December 2000.

92. “Self-Organized Photonic Crystals,”
invited talk presented at the *Fall Meeting of the Materials Research Society (MRS)*; Boston, MA; November 2000.

93. “Self-Organized Photonic Crystals,”
invited seminar presented at the *Department of Chemistry of Princeton University*; Princeton, NJ; October 2000.

94. “Self-Organized 3D Photonic Crystals,”
invited seminar presented at the *International School of Quantum Electronics, 29th Course: Nanoscale Linear and Nonlinear Optics*; Erice, Sicily (Italy); July 2000.

95. “Self-Organized 3D Photonic Crystals,”
invited talk presented at the *NATO Advanced Studies Institute on Photonic Crystals and Light Localization*; Crete, Greece; June 2000.

96. “Self-Assembled Photonic Crystals,”
invited seminar presented at the *Modern Optics and Spectroscopy Seminar at the Massachusetts Institute of Technology*; Cambridge, MA; May 2000.

97. “Self-Assembled Photonic Crystals,”
talk presented at the *Meeting of the American Physical Society (APS)*; Minneapolis, MN; March 2000.

98. “Chemically-Assembled Photonic Crystals,”
invited seminar presented at *JILA at the University of Colorado*; Boulder, CO; February 2000.

99. "Self-Assembled Photonic Crystals,"
invited seminar presented at the *Department of Chemistry of the Georgia Institute of Technology*; Atlanta, GA; February 2000.

100. "Conjugated-Polymer Photonic Crystals,"
talk presented at the *Fourth International Topical Conference on Optical Probes of Conjugated Polymers and Photonic Crystals*; Salt Lake City, UT; February 2000.

101. "Self-Assembled Photonic Crystals,"
invited talk presented at the *Center for Photonics and Optoelectronic Materials (POEM) at Princeton University*; Princeton, NJ; January 2000.

102. "Self-Assembled Photonic Crystals,"
invited seminar presented at the *Department of Chemistry of the Massachusetts Institute of Technology*; Cambridge, MA; November 1999.

103. "Quantum Dot Photonic Crystals,"
talk presented at the *1999 NSF Workshop on Materials Chemistry*; Minneapolis, MN; October 1999.

104. "Self-Assembled Photonic Crystals,"
invited seminar presented at the *Department of Chemistry of the University of California at Berkeley*; Berkeley, CA; October 1999.

105. "Quantum Dot Photonic Crystals,"
talk presented at the *Sixth International Conference on the Optics of Excitons in Confined Systems*; Ascona, Switzerland; August 1999.

106. "Quantum Dot Photonic Crystals,"
invited talk presented at the *Gordon Research Conference on Clusters, Nanocrystals, and Nanostructures*; New London, CT; July 1999.

107. "Quantum Dot Photonic Crystals,"
talk presented at the *Meeting of the American Physical Society (APS)*; Atlanta, GA; March 1999.

108. "Quantum Dot Photonic Crystals,"
invited seminar presented at the *Naval Research Laboratory*; Washington, D.C.; February 1999.

109. "Quantum Dot Photonic Crystals,"
invited seminar presented at the *MRSEC Seminar Series of Columbia University*; New York, NY; January 1999.

110. "Quantum Dot Photonic Crystals,"
poster presented at the *Workshop on Electromagnetic Crystal Structures (WECS)*; Laguna Beach, CA; January 1999.

111. "Colloidal Quantum Dots and the Quantum Dot Honeycomb,"
invited colloquium presented at the *Department of Physics of the City College of New York*; New York, NY; October 1998.

112. "Colloidal Quantum Dots,"
invited seminar presented at the *Department of Physics of the University of Pennsylvania*; Philadelphia, PA; July 1998.

113. "Excitation of a Single Molecule on the Surface of a Spherical Microcavity," poster presented at the *Conference for Recent Advances in the Physics of Single Quantum Dots*, Naval Research Laboratory; Washington D.C.; July 1997.

114. "Excitation of a Single Molecule on the Surface of a Spherical Microcavity," poster presented at the *Meeting of the American Chemical Society* (ACS); San Francisco, CA; April 1997.

115. "Can Optical Heterodyne Detection be used to Observe the Mollow Triplet in a Single Molecule?" poster presented at the *European Union Workshop on Single Molecule Spectroscopy: New Systems and Methods*; Ascona, Switzerland; March 1996.

116. "Measurement and Assignment of the Size-Dependent Optical Spectrum in CdSe Quantum Dots," talk presented at the *Meeting of the American Physical Society (APS)*; San Jose, CA; March 1995.

117. "Using Size-Selective Spectroscopy to Study the Evolution of Quantum Dot Electronic States," **invited** seminar presented at the *Modern Optics and Spectroscopy Seminar series at the Massachusetts Institute of Technology*; Cambridge, MA; December 1994.

118. "Size Dependent Optical Spectroscopy of II-VI Semiconductor Nanocrystallites (Quantum Dots)," poster presented at the *Gordon Research Conference on Metal and Semiconductor Clusters*; Wolfeboro, NH; August 1993.

119. "Size Dependent Optical Spectroscopy of II-VI Semiconductor Nanocrystallites (Quantum Dots)," talk and poster presented at the *Meeting of the American Physical Society (APS)*; Seattle, WA; March 1993.

120. "Size Dependent Optical Spectroscopy of II-VI Semiconductor Nanocrystallites (Quantum Dots)," **invited** seminar presented at *MIT's Interdepartmental Seminar on Nanostructured Materials*; Cambridge, MA; March 1993.

121. "Size Dependent Optical Spectroscopy of II-VI Semiconductor Nanocrystallites (Quantum Dots)," poster presented at the *Sixth International Symposium on Small Particles and Inorganic Clusters*; Chicago, IL; September 1992.

Patents

1. "Self-Assembled Photonic Crystals and Methods for Manufacturing Same," D. J. Norris, Yu. A. Vlasov, X.-Z. Bo, and J. Sturm; U.S. Patent No. 6,858,079, granted February 22, 2005.

2. "Method for Preparing High-Quality Manganese-Doped Semiconductor Nanocrystals," D. J. Norris; U.S. Patent No. 6,780,242, granted August 24, 2004.

3. "Three-Dimensionally Patterned Materials and Methods for Manufacturing Same Using Nanocrystals," D. J. Norris and Yu. A. Vlasov; U.S. Patent No. 6,139,626, granted October 31, 2000.