

Paul Gregory Van Patten, Ph.D.

Professor of Chemistry

Education

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| 1996: | Ph.D. | Physical Chemistry | University of South Carolina |
| | <i>Dissertation Title: <u>Scanning Tunneling Microscopy Innovations for Chemical Synthesis and Analysis on the Nanometer Scale</u></i> | | |
| 1992: | B.A. | Chemistry | University of Virginia |

Employment

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| 2012-: | Professor and Chair | Dept. of Chemistry | Middle Tennessee State Univ. |
| 2005-2012: | Associate Professor | Dept. of Chem. & Biochem. | Ohio University |
| 1999-2005: | Assistant Professor | Dept. of Chem. & Biochem. | Ohio University |
| 1996-99: | Postdoctoral Fellow | Chem. Sci. & Tech. Div. | Los Alamos Nat'l Laboratory |

Other Experience and Professional Memberships

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|------------|-----------------------------------------------------------------------|
| 2008-2012: | Director, Condensed Matter & Surface Science Program, Ohio University |
| 1994-: | Member, American Chemical Society |
| 2000-2010: | Member, Materials Research Society |
| 1994-98: | Member, American Vacuum Society |
| 2012-: | Member, Royal Society of Chemistry |

Research Area

Colloidal nanocrystals synthesis and characterization. Photophysics and solar energy applications of semiconductor nanocrystals. Ultrafast laser spectroscopy.

Honors and Awards

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| 2008-09: | Alexander von Humboldt Foundation Fellowship for Established Researchers | |
| 2004: | Jeanette Grasselli-Brown Teaching Award | Ohio University |
| 1995: | Award for Excellence in Research | University of South Carolina |
| | National Award for Graduate Research | American Vacuum Society |
| | Applied Surface Science Division Student Award | American Vacuum Society |
| 1994: | Nanometer-scale Sci. & Tech. Div. Travel Award | American Vacuum Society |

Teaching Interests: General Chemistry and Physical Chemistry, undergraduate and graduate

Service and Administrative Roles

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| 2016- | MTSU Chairs Council Secretary |
| 2013-14 | MTSU General Education Committee |
| 2011-12 | Faculty Senate (Facilities & Finance Committee) |
| 2011-12 | College of Arts & Sciences Curriculum Committee |
| 2008-12 | Director, Condensed Matter & Surface Science Program |
| 2006-8 | Faculty Senate (Facilities & Finance, Executive Committee) |
| 2004-5 | Chemistry Graduate Recruiting/Admissions Chair |

Patents Awarded

1. P. G. Van Patten and G. Q. Pan, "A Direct Pyrolysis Route to GaN Quantum Dots," US patent number 7,488,384.
2. P. G. Van Patten and G. Q. Pan, "Room Temperature Synthesis of GaN Nanopowder," US patent number 7,641,880.

Publications

1. A. L. Morris, C. Lin, S. E. Benjamin, V. V. N. M. Devarasetty, W. R. Tilluck, E. I. Lozano, H. Hamo, X. A. Aguilar, P. G. Van Patten, "Toward Improved Scalability of Cation Exchange Reactions of Metal Chalcogenide Nanocrystals," *Chem. Mater.* **2017**, *29*, 6596-6600. DOI: 10.1021/acs.chemmater.7b01065.
2. W. R. Tilluck, A. L. Morris, J. K. Gurchiek, A. D. Evans, P. G. Van Patten, "Rapid and facile synthesis of high-quality, oleate-capped PbS nanocrystals using air-stable precursors," *RSC Advances* **2016**, *6*, 81780-81788. DOI: 10.1039/c6ra12592a.
3. Y. Yan, L. Wang, C. B. Vaughn, G. Chen, P. G. Van Patten, "Spectroscopic Investigation of Oxygen Sensitivity in CdTe and CdTe/CdS Nanocrystals," *J. Phys. Chem. C* **2011**, *115*, 24521-24527. DOI: 10.1021/jp2067638.
4. Y. Yan, G. Chen, P. G. Van Patten, "Ultrafast Exciton Dynamics in CdTe Nanocrystals and Core/Shell CdTe/CdS Nanocrystals," *J. Phys. Chem. C* **2011**, *115*, 22717-22728. DOI: 10.1021/jp204420q.
5. P. G. Van Patten, "Enhancement of Optical Gain in Semiconductor Nanocrystals through Energy Transfer," *J. Phys. Chem. C* **2008**, *112*, 10622-10631.
6. M. E. Germain, T. R. Vargo, B. A. McClure, J. J. Rack, P. G. Van Patten, M. Odoi, M. J. Knapp, "Quenching Mechanism of Zn(salicylaldimine) by Nitroaromatics," *Inorg. Chem.* **2008**, *47*, 6203-6211.
7. T. Krebs, H. L. Tan, G. Andersson, H. Morgner, and P. G. Van Patten, "Increased Layer Interdiffusion in Polyelectrolyte Films upon Annealing in Water and Aqueous Salt Solutions," *Phys. Chem. Chem. Phys.* **2006**, *8*, 5462-5468.
8. G. Q. Pan, M. E. Kordesch, and P. G. Van Patten, "Room Temperature Synthesis of GaN Nanopowder," *Chem. Mater.* **2006**, *18*, 5392-5394.
9. G. Q. Pan, M. E. Kordesch, and P. G. Van Patten, "New Pyrolysis Route to GaN Quantum Dots," *Chem. Mater.* **2006**, *18*, 3915-3917.
10. D. G. Wu, M. E. Kordesch, and P. G. Van Patten, "A New Class of Capping Ligands for Synthesis of CdSe Nanocrystals," *Chem. Mater.* **2005**, *17*, 6436-6441.
11. H. L. Tan, T. Krebs, G. Andersson, D. Neff, M. Norton, H. Morgner, "Internal Structure of Polyelectrolyte Multilayers Probed via Neutral Impact Collision Ion Scattering Spectroscopy," *Langmuir* **2005**, *21*, 2598-2604.
12. P. G. Van Patten, "Metal-Polymer Nanocomposites Edited by Luigi Nicolais and Gianfranco Carotenuto (National Research Council, Naples, Italy). John Wiley & Sons, Inc.: Hoboken, NJ. 2005. xiv + 300 pp. \$99.95. ISBN 0-471-47131-3." (Book Review) *J. Am. Chem. Soc.* **2005**, *127*, 5728-5728.
13. H. L. Tan, M. J. McMurdo, G. Pan, P. G. Van Patten, "Temperature Dependence of Polyelectrolyte Multilayer Assembly," *Langmuir* **2003**, *19*, 9311-9314.
14. H. Meng, J. Zheng, A. J. Lovinger, B.-C. Wang, P. G. Van Patten, Z. Bao, "Oligofluorene-thiophene Derivatives as High-Performance Semiconductors for Organic Thin Film Transistors," *Chem. Mater.* **2003**, *15*, 1778-1787.
15. H. H. Richardson, P. G. Van Patten, D. R. Richardson, M. E. Kordesch, "AC Thin-Film Electroluminescent Devices Grown on Plastic Substrates Using an Amorphous AlN:Tb³⁺ Phosphor," *Appl. Phys. Lett.* **2002**, *80*, 2207-2209.
16. J. Zheng, M. S. Stevenson, R. S. Hikida, P. G. Van Patten, "Influence of pH on Dendrimer-Protected Nanoparticles," *J. Phys. Chem. B* **2002**, *106*, 1252-1255.
17. M. L. Caldwell, P. G. Van Patten, M. E. Kordesch, H. H. Richardson, "Visible Luminescent Activation of Amorphous AlN:Eu Thin-Film Phosphors with Oxygen," *MRS Internet J. Nitride Semicond. Res.* **2001**, *6*, 13:1-5.

18. A. L. Martin, C. M. Spalding, V. I. Dimitrova, P. G. Van Patten, M. L. Caldwell, M. E. Kordesch, H. H. Richardson, "Visible Emission from Amorphous AlN Thin-Film Phosphors with Cu, Mn, or Cr," *J. Vac. Sci. Technol. A* **2001**, *19*, 1894-1897.
19. V. I. Dimitrova, P. G. Van Patten, H. Richardson, M. E. Kordesch, "Photo-, Cathodo-, and Electroluminescence Studies of Sputter Deposited AlN:Er Thin Films," *Appl. Surf. Sci.* **2001**, *175-176*, 480-483.
20. M. L. Caldwell, A. L. Martin, V. I. Dimitrova, P. G. Van Patten, M. E. Kordesch, H. H. Richardson, "Emission Properties of an Amorphous AlN:Cr³⁺ Thin-Film Phosphor," *Appl. Phys. Lett.* **2001**, *78*, 1246-1248.
21. V. I. Dimitrova, P. G. Van Patten, H. H. Richardson, M. E. Kordesch, "Visible Emission from Electroluminescent Devices Using an Amorphous AlN:Er³⁺ Thin-Film Phosphor," *Appl. Phys. Lett.* **2000**, *77*, 478-479.
22. P. G. Van Patten, A. P. Shreve, and R. J. Donohoe, "Structural and Photophysical Properties of a Water-Soluble Porphyrin Associated with Polycations in Solution and Electrostatically-Assembled Ultrathin Films," *J. Phys. Chem. B* **2000**, *104*, 5986-5992.
23. J. Chen, M. A. Reed, C. L. Asplund, A. M. Cassell, M. L. Myrick, A. M. Rawlett, J. M. Tour, P. G. Van Patten "Placement of Conjugated Oligomers in an Alkanethiol Matrix by Scanned Probe Microscope Lithography," *Appl. Phys. Lett.* **1999**, *75*, 624-626.
24. J. D. Noll, M. A. Nicholson, P. G. Van Patten, C.-W. Chung, and M. L. Myrick, "Template Electropolymerization of Polypyrrole Nanostructures on Highly Ordered Pyrolytic Graphite Step and Pit Defects," *J. Electrochem. Soc.* **1998**, *145*, 3320-3328.
25. P. G. Van Patten, A. P. Shreve, J. S. Lindsey, and R. J. Donohoe, "Energy Transfer Modeling for the Rational Design of Multiporphyrin Light-Harvesting Arrays," *J. Phys. Chem. B.* **1998**, *102*, 4209-4216.
26. P. G. Van Patten, J. D. Noll, and M. L. Myrick, "Comment on 'Formation of Holes in Alkanethiol Monolayers on Gold,'" *J. Phys. Chem. B* **1997**, *101*, 7874-7875.
27. P. G. Van Patten, J. D. Noll, and M. L. Myrick, "Spark-Gap Atomic Emission Microscopy 2. Improvements in Resolution," *J. Vac. Sci. Technol. B* **1997**, *15*, 282-286.
28. P. G. Van Patten, J. D. Noll, M. L. McLester, Y.-G. Kim, and M. L. Myrick, "Scanning Tunneling Microscopy Under Polar Liquids with Uncoated Tips," *Langmuir* **1997**, *13*, 365-368.
29. P. G. Van Patten, J. D. Noll, M. L. Myrick, C. R. Li, T. S. Sudarshan, "Spark-Gap Atomic Emission Microscopy," *J. Phys. Chem.* **1996**, *100*, 3646-3651.
30. J. D. Noll, P. G. Van Patten, M. A. Nicholson, K. S. Booksh, and M. L. Myrick, "Flow Injection System for the Scanning Tunneling Microscope," *Rev. Sci. Instrum.* **1995**, *66*, 4150-4156.

Book Chapters

1. J. D. Noll, P. G. Van Patten, and M. L. Myrick, "Flow Injection Scanning Tunneling Microscopy," in *Atomic Force Microscopy/Scanning Tunneling Microscopy 2*, edited by Samuel H. Cohen and Marcia L. Lightbody (Plenum, 1997).
2. P. G. Van Patten, J. D. Noll, and M. L. Myrick, "Nanometer-Scale Qualitative Analysis of Surfaces with a Modified Scanning Tunneling Microscope/Field Emission Source," in *Atomic Force Microscopy/Scanning Tunneling Microscopy 2*, edited by Samuel H. Cohen and Marcia L. Lightbody (Plenum, 1997).

Peer-reviewed Proceedings Publications

1. P. G. Van Patten, H. L. Tan, T. Krebs, G. Andersson, D. Neff, M. Norton, H. Morgner, "Inside Polyelectrolyte Multilayers," *Polym. Mater. Sci. Eng.* **2004**, *90*, 751-752.
2. H. L. Tan, T. Krebs, G. Andersson, H. Morgner, P. G. Van Patten, "Neutral Impact Collision Ion Scattering Spectroscopy: A Novel Method for Studying Polyelectrolyte Multilayer Film Structure," *Polym. Mater. Sci. Eng.* **2004**, *90*, 587-588.

3. H. L. Tan, P. G. Van Patten, "Studying Polyelectrolyte Multilayer Structure Using Modified Low-Energy Ion Scattering Spectroscopy," *Polym. Mater. Sci. Eng.* **2003**, 89, 345.
4. P. G. Van Patten, M. R. McMurdo, G. Pan, "Do Polyelectrolyte Multilayers Lie?" *Polym. Mater. Sci. Eng.* **2003**, 88, No. 332.
5. D. D. Richardson, S. R. Ely, M. J. McMurdo, P. G. Van Patten, "Optical Response of Dendrimer-Encapsulated CdS Quantum Dots—Regulation of Inter-Particle Electronic Coupling," *Mater. Res. Soc. Symp. Proc.* **2002**, 726, Q.11.3.1-6.
6. M. S. Stevenson, P. G. Van Patten, "Metachromatic Behavior in Electrostatically-Assembled Films," *Polym. Mater. Sci. Eng.* **2001**, 84, 177-178.
7. A. L. Martin, M. L. Caldwell, M. E. Kordesch, C. M. Spalding, P. G. Van Patten, H. H. Richardson, "Luminescence Properties of Amorphous AlN Thin Film Phosphors Incorporated with Mixtures of Tb, Cu or Cu, Cr," *Mat. Res. Soc. Symp. Proc.* **2001**, 639, G6.5.1-6.
8. M. L. Caldwell, A. L. Martin, C. M. Spalding, P. G. Van Patten, M. E. Kordesch, H. H. Richardson, "Visible Emission from Thin-Film Phosphors of Amorphous AlN:Cu, Mn, and Cr," *Mat. Res. Soc. Symp. Proc.* **2001**, 639, G6.6.1-6.
9. C. M. Spalding, M. L. Caldwell, V. I. Dimitrova, A. L. Martin, M. E. Kordesch, H. H. Richardson, P. G. Van Patten, "Characterization of the Mechanism of Activation for Visible Luminescence in Rare-earth Doped Crystalline and Amorphous AlN Thin Films," *Mat. Res. Soc. Symp. Proc.* **2001**, 639, G6.22.1-6.
10. X. Shi, D. Q. Li, M. Lütt, M. R. Fitzsimmons, and P. G. Van Patten, "Self-Assembled Multilayers and Photoluminescence Properties of a New Water-Soluble Poly(para-Phenylene)," *Mat. Res. Symp. Proc.* **1998**, 488, 133-138.

Presentations at National and International Conferences

1. **Invited:** P. G. Van Patten, "Cation exchange in colloidal nanocrystals: new advances and new possibilities," *254th National Meeting of the American Chemical Society*, Washington, DC, August 2017.
2. A. L. Morris, W. R. Tilluck, S. E. Benjamin, C. Lin, H. Hamo, E. Lozano, P. G. Van Patten, "Room temperature, scalable cation exchange in PbS and CdSe quantum dots using a silver(I) complex," *253rd National Meeting of the American Chemical Society*, San Francisco, CA, April 2017.
3. X. A. Aguilar, C. Lin, A. L. Morris, S. E. Benjamin, P. G. Van Patten, "Fundamental differences in the cation exchange behaviors of cadmium- and lead chalcogenide quantum dots," *253rd National Meeting of the American Chemical Society*, San Francisco, CA, April, 2017.
4. A. L. Morris, W. Tilluck, P. G. Van Patten, "Incorporation of Ag⁺ in PbS quantum dots by cation exchange," *252nd National Meeting of the American Chemical Society*, Philadelphia, PA, August 2016.
5. W. Tilluck, S. Benjamin, C. Mings, A. Morris, P. G. Van Patten, "Cation Exchange in Quantum Dots: Lessons from the Zn/Pb System," *251st National Meeting of the American Chemical Society*, San Diego, CA, March 2016.
6. A. Morris, W. Tilluck, S. Benjamin, C. Mings, P. G. Van Patten, "Multi-step Cation Exchange of PbS Quantum Dots," *251st National Meeting of the American Chemical Society*, San Diego, CA, March 2016.
7. W. R. Tilluck, A. Evans, J. Gurchiek, C. Mings, A. Morris, P. G. Van Patten, "Incorporation of Zn²⁺ in PbS Quantum Dots via Cation Exchange," *249th National Meeting of the American Chemical Society*, Denver, CO, March 2015.
8. L. Wang, P. G. Van Patten, "Unexpected Contribution of Valence Band Holes to Transient Photobleaching in CdTe Quantum Dots," *244th National Meeting of the American Chemical Society*, Philadelphia, PA, August, 2012.

9. C. L. McCleese, P. G. Van Patten, "Measurement of Quantum Dot Absorption Coefficients via Ultrafast Transient Absorption Spectroscopy," *244th National Meeting of the American Chemical Society*, Philadelphia, PA, August, 2012.
10. Y. Yan, P. G. Van Patten, "Ultrafast Charge Carrier Dynamics in CdTe and CdTe/CdS Nanocrystals," *242nd National Meeting of the American Chemical Society*, Denver, CO, August 2011.
11. Y. Yan, P. G. Van Patten, "Synthesis of Ultra-stable, Highly Luminescent, Biocompatible CdTe/CdS Core/Shell Nanocrystals," *239th National Meeting of the American Chemical Society*, San Francisco, CA, March 2010.
12. M. M. Emara, S. Burya, P. G. Van Patten, "Multiexciton Multiplication in Semiconductor Nanocrystals through Energy Transfer," *International Workshop on Optical Properties of Coupled Semiconductor and Metallic Nanoparticles*, Dresden, Germany, July 2008.
13. **Invited:** P. G. Van Patten, "Multiexciton Multiplication in Semiconductor Nanocrystals through Energy Transfer," *Villa Conference on Interactions Among Nanostructures*, Orlando, FL, February 2008.
14. A. C. Thomas, H. H. Richardson, M. T. Carlson, P.G. Van Patten, M. E. Kordesch, A. O. Govorov, "Optical and Thermal Properties of Bimetallic Nanoparticle Complexes", *Materials Research Society Symposium*, Boston, MA, November 2007.
15. **Invited:** P. G. Van Patten, "Multiexciton Multiplication in Semiconductor Nanocrystals through Energy Transfer," *2007 Virtual Conference on Nanoscale Science and Technology*, Fayetteville, AR, October 2007.
16. A. C. Thomas, H.H. Richardson, M.T. Carlson, P.G. Van Patten, "Characterization and Optical Properties of CdTe-Au Bioconjugates", *Engineering Conferences International--Nanofluids: Fundamentals and Applications*, Copper Mountain, CO, September 2007.
17. M. M. Emara, S. Burya, P. Gregory Van Patten, "Biexciton Formation through FRET in Nanocomposites of CdTe Quantum Dots" *234th National Meeting of the American Chemical Society*, Boston, MA, August 2007.
18. J. Suter, P. G. Van Patten, "Gallium (III) Nitride Nanocrystals: Solvent Variations Aimed at Size Control." *234th National Meeting of the American Chemical Society*, Boston, MA, August 2007.
19. M. Emara, S. Burya, and P. G. Van Patten, "Long-Range Electronic Energy Transfer in Quantum Dot Nanocomposites: Toward Lowering the Optical Gain Threshold of Quantum Dots," *233rd National Meeting of the American Chemical Society*, Chicago, IL, March 2007.
20. D. G. Wu and P. G. Van Patten, "Quantum Dots Synthesis and Energy Transfer through DNA," *231st National Meeting of the American Chemical Society*, Atlanta, GA, March 2006.
21. M. Emara and P. G. Van Patten, "Photoactivation and photodeactivation of CdSe Quantum Dots in Different Polymer Matrices and Under Different Gases," *231st National Meeting of the American Chemical Society*, Atlanta, GA, March 2006.
22. **Invited:** P. G. Van Patten, "Fluorescence Resonance Energy Transfer in Quantum Dots," *32nd FACSS Meeting*, Quebec City, Canada, October 2005.
23. G. Pan, and P. G. Van Patten, "Colloidal Gallium Nitride Nanocrystals (GaN NCs) Synthesis and Characterization," *229th National Meeting of the American Chemical Society*, San Diego, CA, March 2005.
24. H. L. Tan, T. Krebs, G. Andersson, H. Morgner, and P. G. Van Patten, "Counter-ion Distribution and Polyelectrolyte Mobility in Polyelectrolyte Multilayers," *229th National Meeting of the American Chemical Society*, San Diego, CA, March 2005.
25. P. G. Van Patten, H. L. Tan, T. Krebs, G. Andersson, D. Neff, M. Norton, H. Morgner, "Inside Polyelectrolyte Multilayers," *227th National Meeting of the American Chemical Society*, Anaheim, CA, March 2004.
26. H. L. Tan, T. Krebs, G. Andersson, H. Morgner, P. G. Van Patten, "Neutral Impact Collision Ion Scattering Spectroscopy: A Novel Method for Studying Polyelectrolyte Multilayer Film

- Structure," *227th National Meeting of the American Chemical Society*, Anaheim, CA, March 2004.
27. H. L. Tan, M. J. McMurdo, G. Pan, P. G. Van Patten, "Temperature Dependence of Polyelectrolyte Multilayer Deposition," *Gordon Research Conference on Organic Thin Films*, Barga, Italy, 2003.
 28. P. G. Van Patten, M. J. McMurdo, G. Pan, "Do Polyelectrolyte Multilayers Lie?," *225th National Meeting of the American Chemical Society*, New Orleans, LA, March 2003.
 29. P. G. Van Patten, "Energetics of Quantum Dot Superstructures," *225th National Meeting of the American Chemical Society*, New Orleans, LA, March 2003.
 30. M. Maqbool, H. H. Richardson, P. G. Van Patten, M. E. Kordesch, "Luminescent Holmium Doped Amorphous AlN Thin Films for Use as Waveguides in Laser Cavities," *Materials Research Society Symposium*, Boston, MA, 2003.
 31. D. D. Richardson, S. R. Ely, M. J. McMurdo, P. G. Van Patten, "Optical Response of Dendrimer-Encapsulated CdS Quantum Dots—Regulation of Inter-Particle Electronic Coupling," *Materials Research Society Symposium*, Boston, MA, 2002.
 32. J. Zheng, M. S. Stevenson, P. G. Van Patten, "Metachromatic Behavior in Electrostatically-Assembled Thin Films," *221st National Meeting of the American Chemical Society*, San Diego, CA, 2001.
 33. M. L. Caldwell, P. G. Van Patten, M. E. Kordesch, H. H. Richardson, "Visible Luminescence Activation of Amorphous AlN:Eu Thin-Film Phosphors with Oxygen," *Materials Research Society Symposium*, San Francisco, CA, 2001.
 34. M. L. Caldwell, M. E. Little, C. M. Spalding, P. G. Van Patten, M. E. Kordesch, H. H. Richardson, "Amorphous Nitride Alloys as Hosts for Rare-Earth Luminescent Ions," *Materials Research Society Symposium*, San Francisco, CA, 2001.
 35. A. L. Martin, M. L. Caldwell, M. E. Kordesch, H. H. Richardson, C. M. Spalding, P. G. Van Patten, "White Light Emission from Electroluminescent Devices Using an Amorphous AlN:Mixed Dopant Thin Film Phosphor," *Materials Research Society Symposium*, Boston, MA, 2000.
 36. M. L. Caldwell, A. L. Martin, C. M. Spalding, M. E. Kordesch, H. H. Richardson, P. G. Van Patten, "Studies of Electroluminescent Devices from Amorphous AlN:Mn, Cu, and Cr," *Materials Research Society Symposium*, Boston, MA, 2000.
 37. C. M. Spalding, M. L. Caldwell, V. I. Dimitrova, A. L. Martin, M. E. Kordesch, H. H. Richardson, P. G. Van Patten, "Characterization of the Mechanism of Activation for Visible Luminescence in Rare-Earth Doped Crystalline and Amorphous AlN Thin Films," *Materials Research Society Symposium*, Boston, MA, 2000.
 38. P. G. Van Patten, M. S. Stevenson, "Noble Metal Nanoparticles in Polymeric Thin Films," *47th National Symposium of the American Vacuum Society*, Boston, MA, October 2000.
 39. M. L. Caldwell, A. L. Martin, C. M. Spalding, V. I. Dimitrova, P. G. Van Patten, M. E. Kordesch, H. H. Richardson, "Visible Emission from Amorphous AlN Thin-Film Phosphors Doped with Cu, Mn, or Cr," *47th National Symposium of the American Vacuum Society*, Boston, MA 2000.
 40. V. I. Dimitrova, M. E. Kordesch, H. H. Richardson, P. G. Van Patten, "Photo-, Cathodo-, and Electroluminescence Studies of Sputter-Deposited AlN:Er Thin Films," *10th International Conference on Solid Films and Surfaces*, Princeton, NJ, 2000.
 41. S. C. Allen, H. H. Richardson, P. G. Van Patten, "In-Situ Characterization of Aluminum Nitride Growth by FTIR and Interference Effects," *The Pittsburgh Conference and Exposition on Analytical Chemistry and Applied Spectroscopy*, New Orleans, LA, 2000.
 42. P. G. Van Patten, V. I. Klimov, D. W. McBranch, R. J. Donohoe "Self-Assembled, Light-Harvesting Multilayer Films Prepared Via Electrostatic Layer-by-Layer Deposition," *National Meeting of the American Chemical Society*, Dallas, TX, 1998.

43. P. G. Van Patten, D. W. McBranch, V. I. Klimov, D. Li, and R. J. Donohoe, "Photophysical Study of Binary Dye Films Designed for Biomimetic Light-Harvesting Applications," *214th National Meeting of the American Chemical Society*, Las Vegas, NV, 1997.
44. J. D. Noll, M. A. Nicholson, P. G. Van Patten, M. L. McLester, C. M. Stellman, and M. L. Myrick, "Observing Reactions Using Flow Injection Scanning Tunneling Microscopy," *The Pittsburgh Conference and Exposition on Analytical Chemistry and Applied Spectroscopy*, Chicago, IL, 1996.
45. P. G. Van Patten, J. D. Noll, M. A. Nicholson, and M. L. Myrick, "Spark Gap Atomic Emission Microscopy," *42nd National Symposium of the American Vacuum Society*, Minneapolis, MN, 1995.
46. P. G. Van Patten, J. D. Noll, M. L. McLester, Y.-G. Kim, and M. L. Myrick, "Scanning Tunneling Microscopy Under Polar Liquids with Uncoated Tips," *STM '95*, Snowmass, CO, 1995.
47. M. A. Nicholson, J. D. Noll, P. G. Van Patten, and M. L. Myrick, "Diffusion of Analyte to Tip Area of Scanning Tunneling Microscope with and without Solution Flow," *STM '95*, Snowmass, CO, 1995.
48. J. D. Noll, P. G. Van Patten, C. M. Stellman, and M. L. Myrick, "Controlling Polymer Synthesis at the Nanoscale via Oxidation of HOPG Step Defects," *The Pittsburgh Conference and Exposition on Analytical Chemistry and Applied Spectroscopy*, New Orleans, LA, 1995.
49. M. A. Nicholson, J. D. Noll, P. G. Van Patten, and M. L. Myrick, "Characterization of Scanning Tunneling Microscopy Tip Insulation Materials," *The Pittsburgh Conference*, New Orleans, LA, 1995.
50. P. G. Van Patten, J. D. Noll, and M. L. Myrick, "Excitation Parameters for Spark-Gap Atomic Emission Microscopy," *The Pittsburgh Conference*, New Orleans, LA, 1995.
51. J. D. Noll, P. G. Van Patten, and M. L. Myrick, "Synthesis of Polymers at Highly Ordered Pyrolytic Graphite Templates via Flow-Injection Scanning Tunneling Microscopy," *41st National Symposium of the American Vacuum Society*, Denver, CO, 1994.
52. P. G. Van Patten, J. D. Noll, and M. L. Myrick, "Arc Atomic Emission Microscopy," *41st National Symposium of the American Vacuum Society*, Denver, CO, 1994.
53. J. D. Noll, P. G. Van Patten, C. M. Stellman, and M. L. Myrick, "Observing Polymer Growth via Flow Injection Scanning Tunneling Microscopy," *21st Annual Conference of the Federation of Analytical Chemistry and Spectroscopy Societies*, St. Louis, MO, 1994.
54. P. G. Van Patten, J. D. Noll, M. L. Myrick, "Arc Atomic Emission Spectroscopy with High Spatial Resolution Using a Modified Scanning Tunneling Microscope/Field Emission Source," *21st Annual Conference of the Federation of Analytical Chemistry and Spectroscopy Societies*, St. Louis, MO, 1994.
55. J. D. Noll, P. G. Van Patten, and M. L. Myrick, "Flow Injection Scanning Tunneling Microscopy," *2nd Atomic Force/Scanning Tunneling Microscopy Symposium*, Natick, MA, 1994.
56. P. G. Van Patten, J. D. Noll, and M. L. Myrick, "Nanometer-scale Quantitative Analysis with a Modified STM/Field Emission Source," *2nd Atomic Force/Scanning Tunneling Microscopy Symposium*, Natick, MA, 1994.
57. P. G. Van Patten, J. D. Noll, H. C. Walsh, and M. L. Myrick, "Nano-scale Quantitative Analysis of Surfaces with a Modified STM/Field Emission Source," *The Pittsburgh Conference and Exposition on Analytical Chemistry and Applied Spectroscopy*, Chicago, IL, 1994.
58. J. D. Noll, P. G. Van Patten, and M. L. Myrick, "Imaging with a Scanning Tunneling Microscope under a Flowing Liquid," *The Pittsburgh Conference*, Chicago, IL, 1994.

Current and Former Research Advisees

High School Students

Morgan Brewer
Hannah Alsup

Morgan Fabber
Jose Martinez

Edgar Gonzalez
V.V.N. Manohar Devarasetty

Helene Hamo

Undergraduates

Melinda S. Stevenson
Doug Richardson
Sean Carlson
Meredith McMurdo
Jason Hoy
Nicole Gratzner
Scott Burya
Mary Eberly
Christopher Brent Lawson
Anthony Vallance
Keith Hutcheson

David Gordon
Alex Morris
Amanda Evans
Wayne Ryan Tilluck
Jason Gurchiek
Clay Mings
Ronald Higdon
Savannah Benjamin
Johnathan Campbell
Xyan Aguilar
Hailey Hall

Graduate Students

Jie Zheng
Niten Lalpuria
Guiquan Pan
Hazel Tan
Mahmoud Emara
John Suter

Yueran Yan
Chris McCleese
Lei Wang
Amanda Higgins
Badri Mainali
Alex Morris

Postdocs

Dengguo Wu
Cheryl Bourgeois
Chen Lin

Grants and Contracts

1. American Chemical Society
"New Materials from PbS Quantum Dots"
PI: Van Patten
06/01/2016-08/31/2016
\$2,500
2. American Chemical Society
"Doped PbS Quantum Dots"
PI: Van Patten
06/01/2015-08/31/2015
\$2,500
3. National Science Foundation
"Supplement: RUI: Materials Design and Wavefunction Engineering in Lead Sulfide Based Nanocrystals"
PI: Van Patten
07/01/2014-06/30/2017
\$20,950
4. National Science Foundation
"MTeach Noyce Teacher Scholarship Program"
PI: Phelps; Van Patten co-PI
01/01/2014-12/31/2018
\$1,427,300
5. National Science Foundation
"RUI: Materials Design and Wavefunction Engineering in Lead Sulfide Based Nanocrystals"
PI: Van Patten

- 07/01/2013-06/30/2017
\$120,000
6. American Chemical Society
"Doped PbS Quantum Dots"
PI: Van Patten
06/01/2013-08/31/2013
\$2,500
 7. National Science Foundation
"MRI: Acquisition of Transmission Electron Microscope for Advanced Materials Relating to Energy Storage, Alternative Energy, Remediation, and Superconductors"
PI: Botte; Van Patten co-PI
09/01/2011-08/31/14
\$1,169,325
 8. National Science Foundation
"CRIF:MU Acquisition of a Femtosecond Transient Absorption Spectrometer for Research and Education"
PI: Malinski; Van Patten co-PI
01/01/2010-12/31/2011
\$400,000
 9. Alexander von Humboldt Foundation
"Targeting Prostate Cancer with Quantum Dots"
PI: Van Patten
09/01/08—06/30/09
€ 40,000
 10. Ohio University 1804 Fund
"Solid State Laser Pumped Tunable Dye Laser"
PI: W. Jadwisieniczak; Van Patten co-PI
07/01/07—06/30/09
\$24,646
 11. Ohio University 1804 Fund
"IR Spectrometer for Nanoscience Research"
PI: L. Chen; Van Patten co-PI
07/01/06 – 06/30/08
\$32,000
 12. Ohio University Postdoctoral Fund
PI: Van Patten
07/01/05 – 06/30/06
\$25,000
 13. Ohio University 1804 Fund
"Nanosecond Transient Absorption Spectrometer for Faculty Research and Graduate Studies in the Chemical Sciences"
PI: J. J. Rack; Van Patten co-PI
07/21/03 – 06/30/05
\$35,000
 13. National Science Foundation
"International: Planning Visit to University of Leipzig"
Van Patten, PI
07/01/03 – 06/30/04

\$1,763

14. State of Indiana 21st Century Fund
"Center of Excellence for Computational Nanoscience"
Y.-S. Joe, PI, 10 co-investigators
02/01/03 – 01/31/05
\$1,510,321
15. National Science Foundation
"NER: AlGa_N Quantum Dots for Short Wavelength Luminescent Devices"
Van Patten PI, 2 co-PIs
08/01/02 – 07/31/04
\$85,000
16. Ohio University Research Committee
"Convenient Synthetic Route to III-Nitride Quantum Dots"
Van Patten PI
05/01/02 — 04/30/03
\$7,605
17. U. S. Army Research Office
"DURIP – Acquisition of a Spectroscopic Ellipsometer,"
Van Patten PI
04/01/01 – 03/31/02
\$109,000
18. U. S. Army Research Office
"Metachromatic Materials"
Van Patten PI
06/01/01 – 05/31/02
\$50,000
19. Ohio University 1804 Fund
"Acquisition of a Dynamic Light Scattering Particle Size Analyser"
Van Patten PI; Barbar, Blazyk, Brown, Goetz, Richardson, co-PI's
07/01/00 – 06/30/02
\$26,950