

# Dr. Marlann Patterson

Materials and Nanoscience Concentration  
Coordinator, University of Wisconsin-Stout  
Associate Professor of Physics, University of  
Wisconsin - Stout  
Chemistry and Physics Department  
College of Science, Technology, Engineering,  
Mathematics and Management

Office: 234 D Jarvis Hall-Science Wing

Phone: 715-232-2560

Email: [pattersonm@uwstout.edu](mailto:pattersonm@uwstout.edu)

Personal website: [www.marlannpatterson.com](http://www.marlannpatterson.com)

## Brief Biography

Experienced Physics Professor, Researcher & Student Advocate, Materials Scientist & Nanotechnologist

**Teaching Interests:** Entry-level undergraduate courses: physics, physical science, materials science, general engineering; advanced undergraduate courses: modern physics, quantum mechanics, thermodynamics, solid state physics, plasma processing, X-Ray diffraction, phase transformations, process engineering analysis; interactive learning methods and technologies (studio classrooms, clickers, think/pair/share, team based learning); cognitive evaluation (concept inventories, real time assessments, etc.)

**Research Interests:** Spintronic nanoclusters including synthesis, layering, characterization (SEM, TEM, AFM, SQUID, AGFM, etc.); plasma processing, including etching, deposition, sputter deposition, gas phase aggregation, ion energy control, plasma source design; plasma waste treatment.

**Professional Interests:** PUI Teaching, UG Research, Program Leadership, Student Advising, Academic Community Building

## Languages

- Spanish (Beginner)
- Portuguese (Beginner)

## Office Hours

Day	Time
Mo We Fr	2:30 - 3:25
We	8:00 - 11:00
Th	1:25 - 3:25

## Education

- **Ph D Materials Science**  
University of Wisconsin  
Madison, WI, United States, 2005
- **MS Materials Science**  
University of Wisconsin  
Madison, WI, United States, 2000
- **BS Physics**  
University of Florida  
Gainesville, FL, United States, 1996

## Work Experience

### Academic - Post-Secondary

- **University of Wisconsin-Stout**, Applied Science Program  
Materials and Nanoscience Concentration Coordinator  
July 1, 2013 -
- **University of Wisconsin - Stout**, Chemistry and Physics Department  
Associate Professor of Physics  
June 16, 2013 -
- **University of Nebraska - Lincoln**, Materials Research Science and Engineering Center  
Summer Faculty Research Fellow  
June 1, 2014 - July 31, 2015
- **Univeristy of Wisconsin - Stout**, Physics  
Assistant Professor  
August 15, 2008 - June 15, 2013
- **Nebraska Center for Materials and Nanoscience**, MRSEC  
Visiting Summer Research Professor  
August 1, 2006 - August 15, 2008
- **Univeristy of Wisconsin - Platteville**, Chemistry and Engineering Physics, College of Engineering  
Assistant Professor of Physics  
August 15, 2004 - August 15, 2008
- **Univeristy of Wisconsin**  
Research Assistant  
August 15, 1997 - December 29, 2004
- **Madison Area Technical College**, Physics  
Adjunct Faculty  
August 15, 2003 - May 1, 2004
- **University of Florida**  
Honors Physics Student  
August 15, 1993 - August 15, 1996

### Government

- **Sandia National Laboratories**  
Research Intern  
September 1, 2000 - November 15, 2000

### Industry

- **Bell Labs, Lucent Technologies, Microelectronics Group**  
Member of Technical Staff - Level I  
July 15, 1996 - June 15, 1997

- **Bell Labs, Lucent Technologies, Microelectronics Group**  
Summer Student Intern  
June 15, 1993 - August 15, 1995

## Intellectual Contributions

### Journal Article

- Koten, M. A., Voeller, S., Patterson, M., & Shield, J. E. (2016). In-situ measurements of plasma properties during gas-condensation of Cu nanoparticles. *Journal of Applied Physics*, 119(114306), AIP Publishing, LLC.
- Patterson, M. (2012). Laser-assisted atom probe tomography investigation of magnetic FePt nanoclusters: First experiments',. *Journal of Alloys and Compounds*, 515,40.
- Patterson, M., Cochran, A., Ferina, J., Rui, X., Zimmerman, T. A., Sun, Z., Kramer, M. J., Sellmyer, D. J., & Shield, J. E. Early stages of direct L10 FePt nanocluster formation: The effects of plasma characteristics. *J. Vac. Sci. Technol.* , 28(2).
- Patterson, M. (2007). Arbitrary substrate voltage wave forms for manipulating energy distribution of bombarding ions during plasma processing. *Plasma Sources Science & Technology*, 16(2), 257.

### Book

- Nucci, J. A. (2010). Materials Education. IN Patterson, M., Marshall, E. D., Wade, C. G., & Dunham, D. J. (Eds.), *Proceedings of the Materials Research Society*, 1233, 1233, Cambridge University Press.

### Conference Proceeding

- Patterson, M. (2008). Plasma ion heating produces L10 FePt nanoclusters. , 1087E(8), Materials Research Society Symposium Proceedings.

## Presentations

### Seminar

- Patterson, M. (December, 2015). . , La Crosse, WI, United States.
- Patterson, M. (October 9, 2014). How to Be an Academic. GERS Seminars, Madison, WI, United States.

### Paper

- Patterson, M. (September, 2008). In situ formation of L10 FePt nanoclusters via plasma ion heating during inert gas condensation. Magnetism and Magnetic Materials Conference,
- Patterson, M. (September, 2007). Where Materials Meet Plasmas: The making of nanoclusters. Materials Science UW System Symposium, Eau Claire, WI.
- Patterson, M. (September, 2006). Creating arbitrary substrate voltage wave forms for manipulating energy distribution of bombarding ions during plasma processing. Gaseous Electronics Conference,

### Poster

- Patterson, M. (September, 2008). Plasma Probe and AFM Characterization of Fe Nanomagnets. UW-Platteville Research Poster Day,
- Patterson, M. (February, 2008). Method to Create Cubic FePt Clusters During in situ Gas-Phase Aggregation. Materials Research Society Spring Meeting, San Francisco, CA.
- Patterson, M. (September, 2007). Plasma-Aided Nanomagnet Control and Characterization. Center for Plasma-Aided Manufacturing talk, Madison, WI.
- Patterson, M. (September, 2007). Method to Create Cubic FePt Clusters During in situ Gas-Phase Aggregation. Midwest Solid State Conference, Lincoln, NE.
- Patterson, M. (September, 2007). Deposition of Nano-Magnets via Aggregate Sputtering. UW-Platteville Research Poster Day,

- Patterson, M. (September, 2006). Observation of Self Assembly of Nickel Nanowires. UWP Research Poster Session,
- Patterson, M. (January, 2006). Magnetic property characterization of MnAu nanoclusters in an Fe matrix. UW-Platteville Research Presentation,
- Patterson, M. (September, 2002). Control and Measurement of Ion Bombardment Energies at Substrates Biased with Tailored Voltage Waveforms. Plasma-Aided Manufacturing Seminar, Madison, WI.
- Patterson, M. (September, 2000). Antenna Configurations for Large-Area rf Inductive Plasma Sources. 47th Symposium of the American Vacuum Society, Boston, MA.
- Patterson, M. (September, 2000). Antenna Configurations for Large-Area rf Inductive Plasma Sources. Plasma-Aided Manufacturing Seminar, Madison, WI.
- Patterson, M. (September, 1999). Antennas for Large-Area Inductively Coupled Plasmas. 46th Symposium of the American Vacuum Society, Seattle, WA.
- Patterson, M. (September, 1999). Making Diamond-Like Carbon. Materials Science Program Seminar, Madison, WI.

## Applied Research

### Uncategorized

- **Plastics Manufacturer (Greater Minneapolis Area)**  
Consultant (July 2015 - March 2016)

## Grants, Contracts, and Sponsored Research

### Grant

- Kirk, J. S., Patterson, M., & Kramschuster, A. MRI-R2: Instrument Acquisition for Advanced Nanomaterials and Characterization. Sponsored by UW-System ARRA Grant Program, \$19816 (Funded).
- Patterson, M. Course, Curriculum and Laboratory Improvement (CCLI). Sponsored by NSF (Funded).

## Media Contributions

### TV

- **PBS Nova: Making Stuff Education Collection** (February 22, 2012)  
On the production team of Making Stuff Education  
(<http://www.pbslearningmedia.org/collection/nvms/>)

## Awards, Fellowships, Honors, and Scholarships

### Fellowship

- Faculty/Student Pair Summer Research Fellowship, University of Nebraska - Lincoln (May 2015)
- Faculty/Student Pair Summer Research Fellowship, University of Nebraska - Lincoln (May 2014)
- Faculty/Student Pair Summer Research Fellowship,
- Faculty/Student Pair Summer Research Fellowship,
- Faculty/Student Pair Summer Research Fellowship,
- Advanced Opportunity Fellowship,
- Opportunity Awards Fellow (OAP),

### Award

- Sabbatical, UW - Stout (September 2014)

### Honor

- Teaching Champion, Nakatani Teaching and Learning Center (May 2014)
- Elected Councilor for Council on Undergraduate Research (CUR),
- High Merit rating on annual review,

### Scholarship

- Graduate Engineering Research Scholarship,

## Professional Memberships

- ASM International (ASM)
- Minnesota Chapter of the American Vacuum Society (MN-AVS)
- American Society of Engineering Educators (ASEE)
- Materials Research Society
- American Association of Physics Teachers (AAPT)
- American Physical Society (APS)
- Wisconsin Association of Physics Teachers
- Council on Undergraduate Research (CUR)
- Science and Technology of Materials, Interfaces and Processing (AVS)
- Sigma Pi Sigma
- Society of Physics Students (SPS)

## Service

### Department / School

- **Developer**, Department of Chemistry and Physics Web Page (August 20,2014 - Present)
- **Organizer**, Physics (Re)Assessments (August 20,2013 - May 10, 2015)
- **Organizer**, Physics Tutor Center (August 20,2013 - May 10, 2015)
- **Developer**, Physics Department Web Page (February 1,2009 - May 30, 2014)
- Faculty Senate (April 2011 - May 27, 2014)

### College

- **Faculty Advisor**, UW-Stout Chapter of the Materials Research Society (January 2011 - Present)

### University

#### UW Stout

- **Representative**, Faculty Senate (August 25,2010 - May 25, 2014)
- **Chairperson**, Personnel Policies Committee (PPC) (November 25,2013 - May 20, 2014)
- **Representative**, Personnel Policies Committee (PPC) (August 25,2011 - May 20, 2013)

### Professional

- **Board of Directors**, Regional Materials and Manufacturing Network (RM2N) (July 1,2016 - Present)
- **Advisory Board Member**, CVTC Nano Engineering Technology Program (October 2014 - Present)
- **Advisory Board Member**, Normandale Vacuum Technology Program (December 2012 - Present)
- **Representative**, Regional Materials and Manufacturing Network (RM2N) (March 15,2013 - June 15, 2016)
- **Officer, Treasurer**, Minnesota Chapter of the American Vacuum Society (January 1,2012 - December 31, 2014)

- **Organizer**, Materials Research Society (November 1,2010 - May 1, 2012)
  - **Organizer**, Materials Research Society (July 1,2008 - February 1, 2010)
- Councilor**, Council of Undergraduate Research (January 1,2005 - December 31, 2009)