

James P. Hamilton

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EDUCATION

Ph.D., Physical and Analytical Chemistry, University of Wisconsin-Madison Jan 1994
Masters Research, Inorganic Chemistry and Surface Science, University of Maine-Orono September 1986
B.A., Chemistry, University of Maine-Orono May 1984

EXPERIENCE

Professor, Physical & Analytical Chemistry, University of Wisconsin-Platteville 2005-Present

Teaching responsibilities have included General Chemistry, Chemistry for Engineers, Physical Chemistry Lecture and Lab, Applied Optics Lab and research and directed studies in Chemistry, Physics and Engineering Physics. Funded research projects in diamond spectroscopy, polymer and nanomaterials synthesis and characterization, nonlinear optics and photonics, organic dye synthesis, surface characterization of optical cleanliness and instrumentation development. Masters Thesis Supervisor (2 Students, Fuel Cell Theses), Electrical and Controls Engineering, Dublin Institute of Technology, Dublin, Ireland, 2004-2005. External PhD Committee Examiner, Environmental Engineering, University of Stavanger, Stavanger, Norway. Active Collaborations with W.M. Keck Telescope, Hawaii, Smithsonian Museum of Natural History, Center for Nanomaterials at Argonne National Lab, Trinity College Dublin and GSI Darmstadt PHELIX Petawatt Laser System. At the behest of Smithsonian Curators, used our technology to clean the Hope Diamond in Washington, D.C. in December 2004.

Founder & President, Dantronix Research & Technologies, LLC, www.dantronix.com 1994 - Present

Launched and was involved in every business and technical aspect of a start-up company that develops products for substrate cleaning and protection, consulting, instrumentation, contract R&D. Single-handed development of national and international sales, marketing, shipping and web based business for Opticlean Polymer, a Sky & Telescope Magazine 1998 product of the year. Sales in over 53 countries.

Faculty Appointment, Argonne National Laboratory, Advanced Photon Source, Argonne, IL 1999 – Present

User/Scientist, Jefferson National Lab, Free Electron Laser Facility, Newport News, VA 1999 – Present

Associate Professor, University of Wisconsin-Platteville 1998 – 2005

Assistant Professor & Lecturer, University of Wisconsin-Platteville 1993 – 1998

Graduate Research, UW-Madison, Chemistry Department 1986 - 1993

Development of novel analytical techniques for selective detection and investigation of molecules in solution. Design, computerization and construction of tunable mid-IR laser Four-Wave Mixing and IR-Visible Double Resonance Fluorescence instrumentation. Several patent disclosures accepted.

Masters Research, Surface Science, U-Maine-Orono 1984 - 1986

Masters coursework in Inorganic Chemistry. Designed and constructed a Laser Raman Surface Spectrometer Laboratory. UHV surface characterization of polyimide/metal surface interactions concurrently performed with Raman and fluorescence studies.

Owner and Operator, Perfect Painting Company May 1982 - October 1983

Started and ran a successful commercial and residential painting, refurbishing and light construction company in the Boston suburbs. Managed up to nine full time employees in summer.

Substitute Teacher, Boston Suburb Schools, approx. 40 days experience (K-12). 1982-1983

Oil Rig and Pipeline Worker Summer 1981

Roughneck and chainhand working out of Douglas, Wyoming.

Undergraduate Research, University of Calgary, Calgary Alberta September 1980 - May 1982

Extensive use of C13 NMR, GC, HPLC, IR and MS for the identification and analysis of crude oil and tar sands extracts in an organic chemistry lab. Large scale synthesis of plant hormones.

AWARDS, PATENTS, FUNDED PROPOSALS AND CONSULTING

- 2006 Abughalous Award for Excellence in Scholarly Research, University of Wisconsin – Platteville.
- PhD Thesis Committee Member, University of Stavanger, Stavanger, Norway, PhD Defense: July 8th, 2005
- Awarded \$47k, Wisconsin Applied Research Grant, July 2005- June 2006
- Awarded \$4.8k Opportunity Fund Grant for construction of multiple time resolved fluorescence spectrometers to study diamond luminescence on Gems from the Smithsonian's National Gem Collection working with Curator Jeffery Post.
- W.M. Keck & ESO's Gemini Observatories, Mauna Kea, Hawaii, April 2005, Telescope sponsored consulting trip atop Mauna Kea to develop methods to clean and protect optics and reduce environmental contamination in an ecologically sensitive zone at 14,000ft. December 2004, March 2005.
- Masters Thesis Co-Supervisor, "*Novel Hydrogen Alkaline Fuel Cells*", Dublin Institute of Technology, Dublin Ireland, Electrical & Controls Engineering, Students Steffen Schut and Gerhard Sauer, October 2003-Present. Multiple trips to Ireland and Germany sponsored by an Irish Government Grant.
- Granted c. \$500k in instrumentation including an SEM and nanosecond OPO. US Department of Energy, Energy Related Laboratory Equipment Program, For example DOE Grant # DE-FG26-03NT41687.
- 2003 Teaching Excellence Award, *Tau Beta Pi*, selected by students the Engineering Honor Society for one of two annual awards at UWP, December 2003.
- Awarded \$46k State of WI Applied Research Grant, "*Polymer Cleaning of Precision Optics and Surfaces*", 2002-3
- Anro Engineering, Lexington, MA, 1999-2000, Program Manager and Programmer on a \$70k Dantronix initiative using UWP faculty to encode Anro's Radar Sidelobes simulations for federal clients.
- Participating Faculty Collaborator, \$150 million Argonne Nanotechnology Proposal, September 2000
- "*Biological Phosphorous Uptake by Bacteria in Sludge Monitored by Acetic Acid Levels in Sludge, A Chromatographic Study*", Spring & Summer 1997, worked on Research Grant, with M. Anderson, Environmental Engineering.
- Participating Faculty Collaborator, \$150 million Argonne Nanotechnology Proposal, September 2000, this resulted in the formation of the Argonne Center for Nanophase Materials.
- Industrial Contract R&D and Consulting Contracts Awarded, \$28k since 1997

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| <i>"High Intensity Blackbody Lamp Spectral Shift Determination"</i> , Barnstead Int'l, | 2003 |
| <i>"Determination of Failure Mechanisms of Ribbon/Mica Heaters using XRF-SEM"</i> , Barnstead Int'l, | 2003 |
| <i>"Evaluation and Characterization of Quantech Fluorimeters as LC Detector"</i> , Barnstead Int'l, | 2002 |
| <i>"Online Process Monitoring of Phenolic Curing and Ultrasonic Characterization"</i> , LCC Industries, | 1999 |
| <i>"Evaluation of and Development of SOP's and Application Notes for Fluorimeters"</i> , Barnstead Int'l, | 1999 |
| <i>"Development of IR Reflectance Standards and IR Gold Mirrors"</i> , Epner Technology, Brooklyn, NY | 1998 |
- Patent Disclosures Accepted:

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| <i>"Novel, Sensitive and Inexpensive Pyroelectric Detector"</i> | |
| <i>"Inexpensive, Simple Laser Beam Profiler with LED Readout"</i> | |
| <i>"Ultrathin Window, Ultrathin Pathlength Spectroscopic Cell"</i> | |
| <i>"Applications of DOVE IR4WM Spectroscopy and Instrumentation"</i> | |

 Wisconsin Alumni Research Foundation, Madison, Wisconsin, August 1993
- Research proposal reviewer, U.S. Civilian Research and Development Foundation, Aug 2004
- Research proposal reviewer, Advance Photon Source, Argonne National Lab, Aug 2000- Present
- Warbird Airshows, Dayton, Ohio, Scientific and Technical Consultant, 1996-2001
- NSF Chautauqua & Case Studies Institute Awardee, Univ. of Dayton, July 2000, SUNY Buffalo, June 1998
- Scholarly Activity Improvement Fund (SAIF) Grant Recipient 1996, 1999, 2005
- Wisconsin Teaching Fellow, 1999-2000, UW System Fellow of Women in Science 1995-1996
- CLEO '93 Post Deadline Presentation: "Vibrationally Enhanced IRFWM", Baltimore. May 1993
- NSF International Travel Award Recipient, Erice Sicily, 1991

PUBLICATIONS

"Unprecedented Speed in Capillary Electrophoretic Separation of Nucleic Acids with Laser Induced Fluorescence Detection," Choua Yang, Brenden Carroll, Steven A. Steiner, James P. Hamilton, Analytical Chemistry, (in Preparation)

"Characterization of Opticlean Strip Coating Surface Cleanliness," James P. Hamilton, L. Assoufid, S.P. Frigo, Brenden J. Carroll, and Matthew S. Lewis, Applied Optics, (in preparation)

“Demonstration of Safe Cleaning of Nanostructures using Opticlean Strip Coating via Nomarski and Atomic Force Microscopy,” James P. Hamilton, S.P. Frigo, Brenden J. Carroll, Matthew S. Lewis and L. Assoufid, (to be submitted), (in preparation)

“Experimental Studies for a New Family of Infrared Four Wave Mixing Spectroscopies,” John C. Wright, James P. Hamilton, A. Zilian, Peter C. Chen, M.L. LaBuda, *Applied Spectroscopy*, 52(3), 380 (1998)

“Observation of Vibrational Enhancement using PreResonant Infrared Four Wave Mixing”, James P. Hamilton, Mitchell. L. Labuda, John C. Wright, *Chemical Physics Letters*, 277 (1997), 175-182.

“Theoretical Foundations for a New Family of Infrared Four Wave Mixing Spectroscopies,” John C. Wright, P. C. Chen, James P. Hamilton, A. Zilian, M.L. LaBuda. *Applied Spectroscopy*, 51(7), 949, 1997

"IR Four Wave Mixing Interferometry", A. Zilian, M.L. LaBuda, J.P. Hamilton, P.C. Chen and John C. Wright. *Journal of Luminescence*, 174, 33, 1994

"A New Four Wave Mixing Process: Vibrationally Enhanced IR Spectroscopy", A. Zilian, M.L. LaBuda, James P. Hamilton, P.C. Chen and John C. Wright, *Journal of Luminescence*, 174, 38, 1994

PRESENTATIONS AND CONFERENCES

- Chair: Nanotechnology Session at American Chemical Society Meeting, Great Lakes Region, June 2003
- Conference: “*Phosphorous Mitigation and Runoff Monitoring*,” UW Farm Research Symposium, Spring 2005.
- Invited Panel Member & Presenter: “*Peer Editing Term Papers*”, Focusing on Teaching and Learning: Marking 20 Years of the Wisconsin Teaching Fellows/Scholars Program, April 2005
- Invited Lecture: “*Commercialization of Chemical Technology*”, 36th Great Lakes Meeting, Peoria, IL, Oct. 2004
- Invited Lectures: “*Cleaning, Protecting & Replicating Optical and Nano Surfaces*”
 - University of Nebraska-Lincoln, Analytical Chemistry Lecture, April 2005
 - Gesellschaft für Schwerionenforschung, PHELIX Petawatt Laser Program Darmstadt Germany, January 2005
 - W.M. Keck Headquarters and University of Hawaii, Waimea and Hilo Hawaii, December 2004
 - Royal Dutch Embassy, Washington, D.C., by Paul van de Brouw
 - University of Wisconsin-LaCrosse, Chemistry Seminar, November, 2004
 - Institute for Science and Mathematics, University of Stavanger, Stavanger, Norway, October 2003
 - Trinity College Dublin, Physics, Dublin Ireland, October 2003
 - Facility for Optical Characterization & Spectroscopy, Dublin Institute of Technology, Dublin, Ireland, Oct. 2003
 - Lawrence University, Chemistry Colloquium, October 2003
 - Faculty of Optical Engineering, Univ. of Applied Sciences, Darmstadt, Germany, June 2002
 - Faculty of Chemical Technologies, Univ. of Applied Sciences, Darmstadt, Germany, June 2002
 - University of Wisconsin-Milwaukee, Chemistry Graduate Colloquium, October 2001
 - Northern Illinois University, Chemistry Graduate Colloquium, April 2001
 - University of Wisconsin-LaCrosse, Physics Colloquium, November 2000
 - University of Dayton, Electro-Optics/Physics Colloquium, July 2000
 - NASA Glenn Space Center Microgravity Institute, Cleveland, Ohio, July 2000
 - The Analytical Sciences Corporation, Chantilly, VA, August 2000
 - Cleveland Crystals Corp, Cleveland, OH, June 2000
 - Zygo Optics Inc., Middlefield, CT, June 2000
- Conference Presentation, American Physical Society Meeting, Seattle, WA 2001
- Invited Lecture: “Phase Matching in IR Four Wave Mixing”,
 - 4th National Symposium on Mathematical Modeling in the Undergrad. Curriculum, UW-LaCrosse, WI
- Program Chair & Presider, Chemistry & Engineering Programs, 11th Annual Symposium for Undergraduates in Science, Math & Engineering, November 2000
- Conference on Lasers and Electro-Optics (CLEO), Baltimore, MD, May, 1995, 1996, 1997
- Lecture: “Four Wave Mixing”, Univ. of N. Arizona, Chemistry Colloquium, March 1995
- Lecture: “GC-Mass Spectroscopy”, UWP Chemistry Colloquium, February 1995
- International Conference on Lasers and Electrooptics (CLEO), Baltimore, May 1995
- Holt Publishing, Introductory chemistry text, paid evaluation and book review, April 1995
- Lecture: "Vibrationally Enhanced Infrared Four-Wave Mixing"
 - Chemical and Laser Sciences Division, Los Alamos National Laboratory, January 1994
- Lecture: “Non-Linear Optics and Lasers”, UWP Physics Colloquium, November 1994

- Poster: "Vibrationally Enhanced 4-Wave Mixing", ACS Regional Meeting, Ann Arbor, MI June 1993
- Lecture: "Infrared Four Wave Mixing: A Revolution in Spectroscopy"
Chemical and Laser Sciences Division, Los Alamos National Laboratory, June 1993
- Invited Lecture: "Site and Component Selective IR and Visibly Resonant Four-Wave Mixing"
Department of Physics, Universitaire Instelling Antwerpen, Antwerp, Belgium, July 1991
- Lecture: "Infrared Four-Wave Mixing and Double Resonance Fluorescence"
NATO ASI-International School of Atomic and Molecular Spectroscopy, Erice, Italy, June 1991

PROFESSIONAL AND UNIVERSITY SERVICE

- External Tenure Evaluator, University of Wisconsin-Milwaukee, Chemistry Department, 2003-2004
- Radiation Safety Officer, UW-Platteville 1998-Present
- Departmental Safety Officer, Chemistry & Engineering Physics, 2004-Present
- Chair, Academic Information Technology Commission, 1997 - 2000
- Vice-Chair, Academic Information Technology Commission, Spring 1997
- Chair, University Strategic Plan Information Technology Subcommittee, 1995
- Chair, EMS Strategic Plan Committee, 1998 -1999
- College Industrial Advisory Board Departmental Representative, 1998-Present
- Chair, Tenure Track Search Committee, 2 positions, 1997, 3 Positions - 2001
- Chancellors Multicultural Student Mentoring Program Volunteer, 1999 - 2002
- Wisconsin Chemistry Week Coordinator, American Chemical Society, 2000 - Present
- UWP CO₂ Cutting laser Working Group Member, 1998-2001
- UWP Hazardous Materials Committee, Member, 2000 - Present
- UWP Bylaws Committee Member, 2000 – 2002, 2004 - Present
- Advisor, Alchemists, American Chemical Society Student Affiliate Group, 1994-1998
- Volunteer Scientist, Science-By-Mail Program, Museum of Science, Minneapolis, 1993 -1995
- Campus Beautification Committee, 1994 - 1999
- Member, Friends of International Students, 1994 - Present
- Coordinator UWP French Discussion Table, 2000 – 2002

PUBLIC AND COMMUNITY SERVICE

- Optimist International Member, 1998 - Present
- Founder & Advisor, UWP Habitat for Humanity Chapter, September, 1998 - Present
- UWP French Club, German Club, International Student Club, Alchemists, Student Physics Club
- Boy Scout Merit Badge Counselor, Tri State Region, 1998-2002
- Friends of Rountree Branch Creek, 1997 - 2002
- Guest Speaker, Benton HS, '97, '98; Platteville HS, '97, '99, '01, '03; Mineral Point HS, '97, '99, '01
- Guest Speaker, Casseville Career Day, December 1998,
- O.E.Gray Science Fair, May 6th and 7th, 1995, 1997, 1998
- Platteville Old House Enthusiasts Member, 1993-Present
- Board of Trustees, "Preserving Historic Platteville", Non-Profit Foundation, Fall 1997 - Present
- Chair of Eagle Heights Community Services and Childcare Committee, 1987-1990
- Elected Representative to the Eagle Heights Assembly, Madison WI, 1986-1990
- Member, UW-Madison Dean of Students Advisory Board, 1987-1989
- Platteville Youth Soccer Head Coach, Summer 1994, 1995, Hockey Co-Coach, Winter 1997

PROFESSIONAL AFFILIATIONS

American Chemical Society, American Physical Society, Sigma Xi (Honorary Research Society)
Society for Applied Spectroscopy, Sigma Pi Sigma (Honorary Physics Society)

LANGUAGES

Conversant in French and German. Studied Italian, Spanish, Korean & Japanese.