

Ryan P. McLaughlin

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CURRENT POSITION

Associate Professor

Department of Chemistry, Seattle University, Seattle, WA

Research Interests: Atmospheric and Environmental Chemistry, Molecular Spectroscopy and Microscopy, Laser-Induced Breakdown Spectroscopy

EDUCATION and PROFESSIONAL EXPERIENCE

Department Chair

Department of Chemistry, Seattle University, Seattle, WA (2014-2017)

Associate Professor of Chemistry

Department of Chemistry, Seattle University, Seattle, WA (2007-present)

Fulbright Scholar and Visiting Professor

Department of Chemistry and Center for Research in Atmospheric Chemistry (CRAC),
University College Cork, Cork, Ireland (2009-10)

Assistant Professor of Chemistry

Department of Chemistry, Seattle University, Seattle, WA (2001-07)

Postdoctoral Fellow

Teacher-Scholar Program in Environmental/Physical Chemistry,

Department of Chemistry, University of Washington, Seattle, WA (2000-2001)

Research Project: *Phase-Dependent Photodissociation Dynamics of NO_x Reservoir Compounds*

Advisor: Philip J. Reid

Doctor of Philosophy, Physical Chemistry (1999)

University of California, Berkeley, CA

Thesis Title: *IR Laser Absorption Spectroscopy of Jet-Cooled Biomolecules and Water Clusters*

Advisor: Richard J. Saykally

Bachelor of Science, Chemistry, *cum laude*, Coolidge Otis Chapman Honors Scholar (1993)

University of Puget Sound (UPS), Tacoma, WA

Thesis title: *Synthesis of Opiate Affinity Ligands from β -Naltrexone*

Advisor: William E. Dasher

INSTRUCTIONAL EXPERIENCE

- General Chemistry I, II and III (CH 1500, 1510 and 1520) and Laboratory (CH 1501, 1511 and 1521)
- Physical Chemistry I, II and III (CH 3500, 3510 and 3520) and Laboratory (CH 3511 and 3521)
- Instrumental Analysis (CH 4000)
- Organic Chemistry Laboratory (CH 2501)
- Senior Research Seminar (CH 4985)
- Spectroscopy (CM 2007, *taught on sabbatical at UCC*)
- Kinetics (CM 3006, *taught on sabbatical at UCC*)
- Photochemistry (CM 4002, *taught on sabbatical at UCC*)

PUBLICATIONS (*designates undergraduate research student)

- 14) R.P. McLaughlin; G.S. Mason; A.L. Miller; C.B. Stipe; J.D. Kearns; * M.W. Prier; * J.D. Rarick, * "Note: A Portable Laser Induced Breakdown Spectroscopy (LIBS) Instrument for Rapid Sampling and Analysis of Silicon-Containing Aerosols," *Review of Scientific Instruments*, DOI: 10.1063/1.4949506 (2016)
- 13) J.M. Langenhan; R.P. McLaughlin; L.M. Rozal; * M.S. Clay; * S.L. Loskot; * P.J. Alaimo, "Using Density Functional Theory to Calculate the Anomeric Effect in Hydroxylamine and Hydrazide Derivatives of Tetrahydropyran," *Journal of Carbohydrate Chemistry*, DOI:10.1080/07328303.2016.1139122 (2016)
- 12) D. O'Sullivan; R.P. McLaughlin; K. Clemitshaw; J.R. Sodeau, "Cold-Surface Photochemistry of Selected Organic Nitrates," *J. Phys. Chem. A* **118** 9890 (2014)
- 11) J.O. Richardson; D.J. Wales; S.C. Althorpe; R.P. McLaughlin; M.R. Viant; O. Shih; R.J. Saykally, "Investigation of Terahertz Vibration-Rotation Tunneling Spectra for the Water Octamer," *J. Phys. Chem. A* **117** 6960 (2013)
- 10) R.P. McLaughlin; D. O'Sullivan; J.R. Sodeau, "Cold Surface Photochemistry of Primary and Tertiary Alkyl Nitrites," *J. Phys. Chem. A* **116** 6759 (2012)
- 9) R.P. McLaughlin; J.D. Glennon, "Spectroscopy, Overview," *Encyclopedia of Dairy Sciences*, 2nd Ed., Elsevier (2011)
- 8) R.P. McLaughlin; W. Donald; * D. Jitjai; * Y. Zhang*, "Vibrational Analysis of N-butyl, Isobutyl Sec-butyl and Tert-butyl Nitrite," *Spec. Chem. Acta A* **67** 178 (2007).
- 7) H. A Harker; M.R. Viant; F.N. Keutsch; E.A. Michael; R.P. McLaughlin; R.J. Saykally, "Water Pentamer: Characterization of the Torsional-Puckering Manifold by Terahertz VRT Spectroscopy," *J. Phys. Chem. A* **109** 6483 (2005). [cover article]
- 6) R.N. Caseas; J.B. Paul; R.P. McLaughlin; T. Mourik; R.J. Saykally, "Infrared Cavity Ringdown Spectroscopy of Jet-Cooled Nucleotide Base Clusters and Water Complexes," *J. Phys. Chem. A* **108** 10989 (2004).
- 5) R.P. McLaughlin; B. Barham; P.J. Reid, "Excited-State Dynamics of Isopropyl Nitrate in the Condensed Phase from Resonance Raman Intensities," *J. Phys. Chem. A* **107** 9105 (2003).
- 4) R.P. McLaughlin; B. Bird; * P.J. Reid, "Vibrational Mode Analysis of Isopropyl and Isobutyl Nitrate," *Spec. Chem. Acta A* **58** 2571 (2002).
- 3) M.G. Brown; M.R. Viant; R.P. McLaughlin; C.J. Keoshian; R.J. Saykally, "Quantitative Characterization of the Water Trimer Torsional Manifold by Terahertz Laser Spectroscopy and Theoretical Analysis. II. (H₂O)₃," *J. Chem. Phys.* **111** 7789 (1999).
- 2) K. Liu; R.S. Fellers; M.R. Viant; R.P. McLaughlin; M.G. Brown; R.J. Saykally, "A Long Path-length Pulsed Slit Valve Appropriate for High Temperature Operation: Infrared Spectroscopy of Jet-Cooled Large Water Clusters and Nucleotide Bases," *Rev. Sci. Instr.* **67** 410 (1996).
- 1) M.R. Viant; R.S. Fellers; R.P. McLaughlin; R.J. Saykally, "Infrared Laser Spectroscopy of Uracil in a Pulsed Slit Jet," *J. Chem. Phys.* **103** 9502 (1995).

RESEARCH GRANTS and SUPPORT (Current Total ~ \$925K)

- 12) **Summer Faculty Fellowship**, "Detection of Airborne Diesel Particulate Matter using Laser Induced Breakdown Spectroscopy," Seattle University, 2017; \$9,700
- 11) **Development Grant** (#2012189:JVZ:5/23/2013), "Purchase of Spectroscopy Instrumentation, For a Shared Core Research Facility," Murdock Charitable Trust, July, 2013 – 2015; \$265,908.
- 10) **NSF Major Research Instrumentation (MRI) Grant** (# CHE-1229760), "Acquisition of a Raman-LIBS Microscope for Interdisciplinary Research and Research Training at Seattle University," National Science Foundation; August, 2012 – 2014; \$275,809.
- 9) **Summer Faculty Fellowship**, "Conformationally Dependent Photochemical Reaction Rates and Environmental Impact of Alkyl Nitrite Compounds," Seattle University, 2012; \$7,100.

- 8) **Fulbright Scholar Grant**, “Ice surface photochemistry of organic nitrates and the integration of novel atmospheric science with guided inquiry learning,” Fulbright Program, 2009-10, \$56,750
- 7) **Hewlett-Packard Technology in Teaching Leadership Grant**, “Tablet PC’s for integration of cooperative learning groups with a dynamic visual context: animations, simulations, and information mining,” Hewlett Packard Corporation, 2007-09; \$120,000 [with Greg Mason, Seattle University]
- 6) **Demonstration Projects in Assessment Grant**, “Assessing the Role of Ab Initio Physical Chemistry Modeling Software for In-Class Cooperative Learning,” Seattle University, 2006-07; \$4820
- 5) **NSF Major Research Instrumentation (MRI) Grant**, “Acquisition of a 400 MHz NMR spectrometer for research and research training at Seattle University,” National Science Foundation, 2006-09; \$368,401 [Co-PI]
- 4) **Murdock Charitable Trust Ramp-Up Grant**, “Condensed Phase Photochemical Reaction Dynamics of Alkyl Nitrates,” M.J. Murdock Charitable Trust, 2004–06; \$53,051 [Co-PI]
- 3) **Summer Faculty Fellowship**, “Condensed Phase Photochemical Reaction Dynamics of Alkyl Nitrates,” Seattle University, 2003; \$2,500
- 2) **Faculty Innovation Grant**, “Condensed Phase Photochemical Reaction Dynamics of Alkyl Nitrates,” Seattle University, 2002; \$4,000
- 1) **American Chemical Society-Petroleum Research Fund**, “Condensed Phase Photochemical Reaction Dynamics of Alkyl Nitrates,” Grant # 38009-GB6, 2002-04; **\$35,000**

PRESENTATIONS

*designates undergraduate research assistant and presenting authors are underlined

- 30) R.P. McLaughlin and G.S. Mason, “A portable laser induced breakdown spectroscopy instrument for the analysis of airborne particulate matter,” American Chemical Society Northwest Regional Meeting (NORM), Oregon State University, Corvallis, OR (April, 2017)
- 29) I. Gerbec,* C. Nguyen,* and R.P. McLaughlin, “Laser Induced Breakdown Spectroscopy for the Detection of Airborne Silicates in Real-Time,” Seattle University Undergraduate Research Association (SUURA) Celebration of Student Scholarship Conference, Seattle University, Seattle, WA (May, 2016)
- 28) R.P. McLaughlin, G.S. Mason, A.L. Miller, C.B. Stipe, J.D. Kearns,* M.W. Prier* and J.D. Rarick,* “A Portable Laser Induced Breakdown Spectroscopy (LIBS) Instrument for Rapid Sampling and Analysis of Silicon-Containing Aerosols,” American Chemical Society Undergraduate Research Symposium, Central Washington University, Ellensburg, WA (April, 2016)
- 27) J.D. Rarick,* I. Gerbec,* M.W. Prier,* G.S. Mason, A.L. Miller, C.B. Stipe and R.P. McLaughlin, “Laser Induced Breakdown Spectroscopy (LIBS) as a Tool for Real-time Analysis of Airborne Silica,” Seattle University Undergraduate Research Association (SUURA) Celebration of Student Scholarship Conference, Seattle University, Seattle, WA (May, 2015).
- 26) J.D. Rarick,* I. Gerbec,* M.W. Prier,* G.S. Mason, A.L. Miller, C.B. Stipe and R.P. McLaughlin, “Laser Induced Breakdown Spectroscopy (LIBS) as a Tool for Real-time Analysis of Airborne Silica,” American Chemical Society Undergraduate Research Symposium, Pacific Lutheran College, Tacoma, WA (April, 2015)
- 25) J. Rarick,* P. McDonnell* and R.P. McLaughlin, “Vibrational Characterization of Multi-Functional Alkyl Nitrates,” Murdock College Science Research Conference, Vancouver, WA (Nov, 2014)
- 24) E. Charlesworth,* and R.P. McLaughlin, “Investigation of Signal-to-Mass Ratio Relative to Particle Radius for Silica Particles Analyzed with Laser-Induced Breakdown Spectroscopy,” Seattle University Undergraduate Research Association (SUURA) Celebration of Student Scholarship Conference, Seattle University, Seattle, WA (May, 2014).
- 23) L. Rozal,* S. Loskot,* R.P. McLaughlin and J.M. Langenhan, “The Anomeric Effect,” Seattle University Undergraduate Research Association (SUURA) Celebration of Student Scholarship Conference, Seattle University, Seattle, WA (May, 2013).

- 22) R.P. McLaughlin, D. O'Sullivan, K. Clemitshaw and J.R. Sodeau, "*Cold-Surface Photochemistry of Organic Nitrates*," **Poster Presentation**, 245th American Chemical Society National Meeting, New Orleans, Louisiana (April, 2013)
- 21) R.P. McLaughlin, "*Cool Chemistry in Ireland: Exploring the Heterogeneous Processing of Organic Nitrates on Thin-films of Water-ice*," **Invited Seminar**, Seattle University Natural Science Seminar, Seattle University, Seattle, WA (March 2012)
- 20) M. Clay,* J.M. Langenhan and R.P. McLaughlin, "*Quantifying the anomeric effect in glycosylated oxyamines and hydrazines*," **Oral Presentation**, 20th Murdock Trust Regional Conference on Undergraduate Research, Seattle University, Seattle WA (November, 2011).
- 19) R.P. McLaughlin, D. O'Sullivan and J.R. Sodeau, "*Photolysis of Organic Nitrites and Nitrates on Thin-Films of Water Ice*," **Poster Presentation**, International Polar Year Conference, Oslo. Norway (June, 2010).
- 18) R.P. McLaughlin, "*Use of Tablet PC Technology in a Group Learning Form*," **Poster Presentation**, EdTech Conference, Athlone, Ireland (May, 2010).
- 17) R.P. McLaughlin, D. O'Sullivan and J.R. Sodeau, "*Study of Organic Nitrite and Nitrate Thin-film Photolysis using RAIRS*," **Invited Seminar**, Environmental Research Institute, Cork, Ireland (April, 2010).
- 16) R.P. McLaughlin and Greg S. Mason, "*Tablet PC's for integration of cooperative learning groups with a dynamic visual context: animations, simulations, and information mining*," **Poster Presentation**, Hewlett-Packard Technology for Teaching Worldwide Higher Education Conference, San Diego, CA (February, 2008).
- 15) R.P. McLaughlin, W. Donald,* D. Jitjai* and Y. Zhang*, "*Vibrational Analysis of n-butyl, iso-butyl, sec-butyl and tert-butyl nitrite*," **Poster Presentation**, Celebration of Faculty Scholarship and Research, Seattle University, Seattle, WA, (April, 2006).
- 14) W. Donald,* Y. Zhang*, D. Jitjai* and R.P. McLaughlin, "*Vibrational Analysis of n-butyl, iso-butyl, sec-butyl and tert-butyl nitrite*," **Poster Presentation**, 14th Regional Conference on Undergraduate Research, Northwest Nazarene University, Nampa, ID (November, 2005).
- 13) W. Donald,* Y. Zhang* and R.P. McLaughlin, "*Vibrational Analysis of n-butyl, iso-butyl and tert-butyl nitrite*," **Poster Presentation**, 60th Northwest Regional Meeting of the American Chemical Society, Westmark Conference Center, Fairbanks, AK (June, 2005).
- 12) W. Donald,* Y. Zhang* and R.P. McLaughlin, "*Vibrational Analysis of n-butyl, iso-butyl and tert-butyl nitrite*," **Poster Presentation**, American Chemical Society Puget Sound Section Undergraduate Research Symposium, Seattle Pacific University, Seattle, WA (April, 2005).
- 11) W. Donald,* Y. Zhang* and R.P. McLaughlin, "*Vibrational Analysis of NO_x Reservoir Compounds*," **Poster Presentation**, 13th Regional Conference on Undergraduate Research, University of Portland, Portland, OR (November, 2004).
- 10) R.P. McLaughlin, "*How We Describe Things We Can't See: Using Laser Spectroscopy to Watch Dissociative Reactions*," **Invited Seminar**, Bannan Scholars, Seattle University, Seattle, WA (November, 2004).
- 9) R.P. McLaughlin, "*Thermal Imaging Technology and Limitations*," **Invited Talk**, CRIM-305, School of Law, Seattle University, Seattle, WA (October, 2004).
- 8) R.P. McLaughlin, C. Capacci*, B. Nyholm and P. Reid, "*Resonance Raman Intensity Analysis of Isopropyl Nitrate in the Condensed Phase*," **Poster Presentation**, 12th Regional Conference on Undergraduate Research, Pacific Lutheran University, Tacoma, WA (November, 2003).
- 7) C. Capacci* and R.P. McLaughlin, "*Alkyl Nitrate Photochemistry*," **Poster Presentation**, American Chemical Society-Undergraduate Research Symposium, Seattle University, Seattle, WA (May, 2003).
- 6) R.P. McLaughlin and C. Capacci*, "*Vibrational Analysis of Atmospheric Alkyl Nitrates*," **Poster Presentation**, Celebration of Faculty Scholarship and Research, Seattle University, Seattle, WA, (April, 2003).
- 5) C. Capacci* and R.P. McLaughlin, "*Resonance Raman Spectroscopy of Atmospheric Alkyl Nitrates*," **Poster Presentation**, 11th Regional Conference on Undergraduate Research, Whitman College, Walla Walla, WA (November, 2002).

- 4) R.P. McLaughlin and P.J. Reid, “*Atmospheric Photochemistry of Alkyl Nitrates*,” **Invited Seminar**, Department of Chemistry, University of Idaho, Moscow, ID (April, 2002).
- 3) R.P. McLaughlin and P.J. Reid, “*Atmospheric Photochemistry of Alkyl Nitrates*,” **Invited Seminar**, Department of Chemistry, University of Puget Sound, Tacoma, WA (March, 2002).
- 2) R.P. McLaughlin, B. Bird* and P.J. Reid, “*Early-time Photochemical Reaction Dynamics of Isopropyl Nitrate in the Condensed Phase*,” **Contributed Talk**, 56th Northwest Regional Meeting American Chemical Society, Seattle University, Seattle, WA (June, 2001).
- 1) R.P. McLaughlin, B. Bird* and P.J. Reid, “*Early-time Photochemical Reaction Dynamics of Isopropyl Nitrate*,” **Invited Seminar**, Department of Chemistry, Western Washington University, Bellingham, WA (May, 2001).

PROFESSIONAL REVIEWS

- 1) **Process Oriented Guided Inquiry Learning (POGIL) Activity Review**, “*Phylogenetic Trees*” (2017)
- 2) **Manuscript Review**, A. Kohnle, C. Benfield, G. Haehner, and M Paetku, “*Interactive simulations to support quantum mechanics instruction for chemistry students*,” *Journal of Chemical Education* (2016)
- 3) **External Review for Tenure and Promotion Decision**, Department of Chemistry, Loyola Marymount University, Los Angeles, CA (2015)
- 4) **Process Oriented Guided Inquiry Learning (POGIL) Physical Chemistry Laboratory Review** “*What are the kinetic parameters of a heterogeneous reaction?*”(2014)
- 5) **Grant Review**, American Chemical Society- Petroleum Research Fund “*Terahertz Spectroscopy of Gas Clathrate Hydrates*”, PRF#53102 (2013)
- 6) **Process Oriented Guided Inquiry Learning (POGIL) Activity Review** , “*Point Groups*” (2013)
- 7) **Process Oriented Guided Inquiry Learning (POGIL) Activity Review**, “*Vibrational Spectroscopy*” (2013)
- 8) **External Tenure Review** – Requested by Associate Dean Christopher Brooks, University of San Francisco, Department of Arts and Sciences (2012)
- 9) **Grant Review**, American Chemical Society- Petroleum Research Fund, “*Investigating the Molecular Interactions Between Solute and Cosolvent Molecules in Supercritical CO₂*,” PRF # 44487-B4 (2005).
- 10) **Textbook Review**, Levine, *Quantum Chemistry*, 5th Ed., Chapt. 5 and 6, Prentice Hall (2005).
- 11) **Manuscript Review**, J. Lewins, “*A New Calculation of the Work of Formation of Bubbles and Drops*,” Paper # 04PA0340, *Proceedings of the Royal Society A* (2005).
- 12) **Grant Review**, American Chemical Society- Petroleum Research Fund, “*Atmospheric Dicarbonyl Photoproducts in Urban Air Pollution*,” Grant proposal # 38314-GB4 (2002).

PROFESSIONAL DEVELOPMENT

- 1) **Faculty Learning Community: The Department Chair as Transformative Diversity Leader: Building Inclusive Learning Environments in Higher Education**, Center for Faculty Development, Seattle University, Seattle, WA (2017)
- 2) **New Chair and Director Institute**, Talaris Conference Center, Seattle, WA (2014)
- 3) **Faculty Training - New Health Professions Evaluation Process**, Seattle University, Seattle WA (2014)
- 4) **Panel Discussion, “The Short Straw? Pros and Cons of Becoming a Department Chair**, Seattle University, Seattle, WA (2013)
- 5) **Pre-Medical Advisor Conference**, University of Washington, Seattle, WA (2013)
- 6) **Advanced Process Oriented Guided Inquiry Learning (POGIL) Workshop**, Seattle University, Seattle, WA (2006).
- 7) **Process Oriented Guided Inquiry Learning (POGIL) Workshop**, Linfield College, McMinnville, OR (2005).
- 8) **Washington College Chemistry Teachers Association Conference**, Leavenworth, WA (2003 and 2006).
- 9) **Biennial Conference on Chemical Education**, Western Washington University, Bellingham, WA (2002).

UNIVERSITY SERVICE

- 1) **General Chemistry Committee, Co-Chair**, Seattle University (2016)
- 2) **Department Chair**, Department of Chemistry, Seattle University (2014 – 2017)
- 3) **College of Science and Engineering Curriculum Committee**, Seattle University (2014 – 16)
- 4) **Faculty Library Representative, Chemistry Department**, Seattle University (2015-16)
- 5) **Academic Dismissal Committee (ad hoc), Member**, College of Science and Engineering, Seattle University (2014)
- 6) **Master Teaching Schedule Committee, Member**, Chemistry Department, Seattle University (2013-14)
- 7) **Search Committee, Member**, Pre-Health Advisor, Seattle University (2013)
- 8) **University Core Curriculum Committee**, Seattle University (2013 – present)
- 9) **General Chemistry Curriculum Committee, Member**, Department of Chemistry, Seattle University (2012- present)
- 10) **Safety Committee, Chair**, Department of Chemistry, Seattle University (2012-13)
- 11) **Accepted Student Department Reception Leader**, College of Science and Engineering (2013)
- 12) **Graduate Fellowship and Scholarship Review Committee**, College of Science and Engineering (2012-13)
- 13) **Core Curriculum Review Committee**, Seattle University (2012-13)
- 14) **Curriculum Committee**, College of Science and Engineering (2012)
- 15) **Safety Committee, Member**, Department of Chemistry, Seattle University (2011-12)
- 16) **Pre-Health Interview Panel**, College of Science and Engineering, Seattle University (2010-2013)
- 17) **Science and Engineering Facilities Planning Committee**, Department of Chemistry Representative, Seattle University (2010-11)
- 18) **Academic Assembly**, College of Science and Engineering representative, Seattle University (2004-07)
- 19) **Panel Member**, “Preparing Chemical Leaders of Tomorrow”, University of Washington(2004)
- 20) **Mentor**, Center for Workforce Development, University of Washington (2003)
- 21) **Academic Assembly**, College of Science and Engineering representative, Seattle University (2003)
- 22) **Discussion Leader**, Freshman Academic Day, Seattle University (2002)
- 23) **Panel Member**, “Meeting the Academic Challenge,” Seattle University (2002)
- 24) **Faculty Co-Advisor**, Seattle University Chemistry Student Organization (2001-05)

SELECTED HONORS AND AWARDS

- 1) Abramson Fellowship (U.C. Berkeley, 1993)
- 2) Coolidge Otis Chapman Honors Scholar (UPS, 1993)
- 3) Allenmore Medical Foundation Scholarship (UPS, 1992)
- 4) Fehlandt Scholarship (UPS, 1992)
- 5) Enrichment Committee Research Grant (UPS, 1992)
- 6) Murdock Summer Research Award (UPS, 1991)
- 7) Phi Beta Kappa (1990-present)

PROFESSIONAL AFFILIATIONS

- 1) Washington College Chemistry Teachers Association (2001-present)
- 2) American Chemical Society (1999-present)