CURRICULUM VITAE

GIUSEPPE PETRUCCI, Ph.D.

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University of Vermont
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Education

9/87-12/90 **University of Florida** – Gainesville, FL
Doctor of Philosophy, Analytical Chemistry, 1990
Dissertation Title: "The Optogalvanic Effect in a Hollow Cathode Discharge: A Resonance Detector for Very Weak Light Level," under guidance of Dr. James D. Winefordner.

9/85-6/87 **University of Toronto** – Toronto, Ontario, Canada
Thesis Title: "On the Development of an Ultrasonic Nebulizer for Sample Introduction for Atomic Spectrometric Analysis," under guidance of Dr. Jon C. Van Loon.

9/82-6/85 **University of Toronto** – Toronto, Ontario, Canada
Bachelor of Science, Specialist in Chemistry

Academic Appointments

6/15-present **University of Vermont** – Burlington, VT 05405 USA
Professor, Department of Chemistry

9/06-5/15 **University of Vermont** – Burlington, VT 05405 USA
Associate Professor, Department of Chemistry

9/00-8/06 **University of Vermont** – Burlington, VT 05405 USA
Assistant Professor, Department of Chemistry
Analytical chemistry, methods and instrument development, aerosol analysis, atmospheric heterogeneous chemistry, atomic spectroscopy, aerosol mass spectrometry

3/97-2/00 **European Commission** – Joint Research Center, Ispra (VA), Italy
Research Scientist, Environment Institute, Atmospheric Processes in Global Change
Aerosol analysis, fluorescence spectroscopy, aerosol mass spectrometry

11/94-11/96 **European Commission** – Joint Research Center, Ispra (VA), Italy
Grant Holder, Environment Institute, Atmospheric Processes in Global Change
Aerosol analysis, ultra-trace elemental analysis, laser induced fluorescence

11/93-11/94 **European Commission** – Joint Research Center, Ispra (VA), Italy
NATO-NSF Postdoctoral Fellow in Engineering, Environment Institute
Photon detection, optogalvanic spectroscopy, laser fluorescence spectroscopy

1/91-10/93 **University of Florida**, Gainesville, FL, USA
Postdoctoral Fellow, Department of Chemistry
Molecular fluorescence spectroscopy, laser induced fluorescence, photon detection

Awards and Honors

2021 Inducted into the Vermont Academy of Science and Engineering

2013 2013 Research Investigator of the Year Award, Institute of Electrical and Electronics Engineers, Inc., IEEE Green Mountain Section

2006 Beynon Prize, Rapid Communications in Mass Spectrometry, John Wiley & Sons.

2003 American Society for Mass Spectrometry Research Award

1999 Best presentation in session "Monitoring Techniques and Standardization," International Conference on Air Quality in Europe: Challenges for the 2000s, Venice, Italy

1993 National Science Foundation-North Atlantic Treaty Organization Postdoctoral Fellowship in Science and Engineering

1992 Excellence Award for RIS Research and Development, 6th International Symposium on Resonance Ionization Spectroscopy-RIS 92, Santa Fe, New Mexico

1986 John E. Dove Award for Excellence in Teaching, University of Toronto, Toronto, Ontario, Canada

Patents

2012 U.S. Patent No.: 8,178,341, Electrostatic Particle Exposure System and Method of Exposing a Target Material to Small Particles, Date of Patent: May 15, 2012

Publications

Peer-reviewed publications

[1] Christopher M. Snyder, Austin C. Flueckiger and Giuseppe A. Petrucci, "Relative Humidity Impact on Organic New Particle Formation from Ozonolysis of α- and β-Pinene at Atmospherically Relevant Mixing Ratios" *Atmosphere*, **14**, 173-186, 2023.

[2] Kevin B. Fischer and Giuseppe A. Petrucci, "Utilizing an Electrical Low Pressure Impactor to Indirectly Probe Water Uptake via Particle Bounce Measurements," *Atmos. Meas. Tech.*, **14**, 7565-7577, 2021.

[3] Kevin B. Fischer, Clarissa S. Gold, Rebecca M. Harvey, Adam N. Petrucci and Giuseppe A. Petrucci "Ozonolysis chemistry and phase behaviour of 1-Octen-3-ol derived secondary organic aerosol," *Earth and Space Chemistry*, **4**(8), 1298-1308, 2020.

[4] Jonathan H Slade, Andrew P Ault, Alexander T Bui, Jenna C Ditto, Ziying Lei, Amy L Bondy, Nicole E Olson, Ryan D Cook, Sarah J Desrochers, Rebecca M Harvey, Matthew H Erickson, Henry W Wallace, Sergio L Alvarez, James H Flynn, Brandon E Boor, Giuseppe A Petrucci, Drew R Gentner, Robert J Griffin, Paul B Shepson "Bouncier particles at night: biogenic secondary organic aerosol chemistry and sulfate drive diel variations in the aerosol phase in a mixed forest," *Environ. Sci. Technol.*, **53**(9), 4977-4987, 2019.

[5] Shashank Jain, Kevin B. Fischer and Giuseppe A. Petrucci, "The Influence of Absolute Mass Loading of Secondary Organic Aerosols on Their Phase State," *Atmosphere*, **9**, 131-145 (2018).

[6] Rebecca M. Harvey, ‡ Adam P. Bateman, Shashank Jain, Yong Jie Li, Scot Martin and Giuseppe A. Petrucci, "Optical Properties of Secondary Organic Aerosol from Cis-3-Hexenol and Cis-3-Hexenyl Acetate: Effect of Chemical Composition, Humidity and Phase," *Environ. Sci. Technol.*, **50**(10), 4997-5006, 2016.

[7] Christopher M. Kenseth* and Giuseppe A. Petrucci, "Characterization of a Bipolar Near-Infrared Laser Desorption/Ionization Aerosol Mass Spectrometer," *Aerosol Sci. Technol.*, **50**(8), 790-801, 2016.

[8] S. Jain and G.A. Petrucci, "A new method to measure aerosol particle bounce using a cascade electrostatic low pressure impactor," *Aerosol Sci. Technol.,* **49**, 390-399, 2015.

[9] R. Harvey and G.A. Petrucci, "Molecular control of reaction kinetics and SOA yield in the ozonolysis of unsaturated volatile organic compounds alkenes," *Atmos. Environ.,* **122**, 188-195, 2015.

[10] S. Jain, J. Zahardis and G.A. Petrucci, "Soft ionization chemical analysis of secondary organic aerosol from green leaf volatiles emitted by turf grass," *Environ. Sci. Technol.*, **48**(9) 4835-4843 (2014).

[11] R.M. Harvey, J. Zahardis and G.A. Petrucci, "Establishing the contribution of lawn mowing to atmospheric aerosol levels in American suburbs," *Atmos. Chem. Phys.*, **14**, 797-812 (2014)

[12] M. Subramanian, A.L. Hunt, G.A. Petrucci, Z. Chen, E.D. Hendley and B.M. Palmer, "Differential metal content and gene expression in rat left ventricular hypertrophy due to hypertension and hyperactivity, *J. Trace Elem. Med. Biol.* **28**(3), 311-316 (2014).

[13] J. Zahardis, S. Geddes and G.A. Petrucci, "Improved understanding of atmospheric organic aerosols via innovations in soft ionization Aerosol Mass Spectrometry," *Anal. Chem.*, **83** (7), 2409-2415 (2011); Cover Feature Article**.**

[14] S. Geddes, B. Nichols, S. Flemer Jr., J. Eisenhauer, J. Zahardis and G.A. Petrucci, "Near-Infrared Laser Desorption/Ionization Aerosol Mass Spectrometry for investigating primary and secondary organic aerosols under low loading conditions," *Anal. Chem.,* **82**(19) 7915-7923 *(*2010).

[15] S. Geddes, B. Nichols, K. Todd, J. Zahardis and G.A. Petrucci, "Near-infrared laser desorption/ionization aerosol mass spectrometry for measuring organic aerosol at atmospherically relevant aerosol mass loadings," *Atmos. Meas. Tech.*, **3**, 1175-1183 (2010).

[16] S. Geddes, J. Zahardis and G.A. Petrucci, "Chemical transformations of peptide containing fine particles: oxidative processing, accretion reactions and implications to the atmospheric fate of cell-derived materials in organic aerosol," *J. Atmos. Chem.*, **63**(3), 187-202 (2009).

[17] S. Geddes, J. Zahardis, J. Eisenhauer, and G.A. Petrucci, "Low energy photoelectron capture resonance ionization aerosol mass spectrometry of small peptides with Cysteine residues: Cys-Gly, γ-Glu-Cys and glutathione (γ-Glu-Cys-Gly)," *Int. J. Mass Spectrom,* **282**(1-2), 13-20 (2009).

[18] J.P. Stevens, J. Zahardis, M. MacPherson, B.T. Mossman and G.A. Petrucci, "A new method for quantifiable and controlled dosage of particulate matter for in vitro studies: the electrostatic particulate dosage and exposure system (EPDExS)," *Toxicol. In Vitro*, **22**, 1768-1774 (2008).

[19] K.A. Puzey, P.J. Gardner, V.K. Petrova, C.W. Donnelly and G.A. Petrucci, "Automated species and strain identification of bacteria in complex matrices using FTIR spectroscopy," Proceedings of the SPIE (International Society for Optical Engineering), Chemical, Biological, Radiological, Nuclear, Explosive Sensors IX, 2008

[20] J. Zahardis, S. Geddes and G.A. Petrucci, "The ozonolysis of primary aliphatic amines in single and multicomponent fine particles," *Atmos. Chem. Phys.*, **8**, 1181-1194 (2008).

[21] J. Zahardis, S. Geddes and G.A. Petrucci, "Detection of free amino acids in proxies of marine aerosol by photoelectron resonance capture ionization aerosol mass spectrometry," *Int. J. Environ. Anal. Chem.*, **88** (3), 177-184 (2008)

[22] B.J. Holmes and G.A. Petrucci, "Oligomerization of levoglucosan by Fenton chemistry in proxies of biomass burning aerosols," *J. Atmos. Chem.*, **58**, 151 – 166 (2007).

[23] A.L. Hunt, G.A. Petrucci, P.R. Bierman and R.C. Finkel, "Investigation of metal matrix systems for cosmogenic 26Al analysis by accelerator mass spectrometry," *Nucl. Instrum. Methods Phys. Res., Sect. B*, **260**, 633-636 (2007)

[24] J. Zahardis and G.A Petrucci, "The oleic acid-ozone heterogeneous reaction system: products, kinetics, secondary chemistry, and atmospheric implications of a model system – a review," *Atmos. Chem. Phys.*, **7**, 1237 – 1274 (2007).

[25] A.L. Hunt and G.A. Petrucci, "On-line organic aerosol analysis by mass spectrometry," *Encyclopedia of Mass Spectrometry,* **Vol. 6**, Elsevier (2006).

[26] A.L. Hunt and G.A. Petrucci, "Photoelectron resonance capture ionization mass spectrometry (PERCI-MS)," *Encyclopedia of Mass Spectrometry*, **Vol. 6**, Elsevier (2006).

[27] B.J. Holmes and G.A. Petrucci, "Water-soluble oligomer formation from acid catalyzed reactions of levoglucosan in proxies of atmospheric aqueous aerosols," *Environ. Sci. Technol.*, **40** (11) 4983-4989, (2006).

[28] J. Zahardis, B. W. LaFranchi and G.A. Petrucci, "Photoelectron Resonance Capture Ionization Mass Spectrometry of Fatty Acids in Olive Oil," *Eur. J. Lipid Sci. Technol.* **108** (11), 925-935, (2006).

[29] B.W. LaFranchi and G.A. Petrucci, "A comprehensive characterization of photoelectron resonance capture ionization aerosol mass spectrometry for the quantitative and qualitative analysis of organic particulate matter," *Int. J. Mass Spectrom.*, **258** (1-3), 120-133, (2006).

[30] J. Zahardis, B.W. Lafranchi and G.A. Petrucci, "The heterogeneous reaction of particle-phase methyl esters and ozone elucidated by photoelectron resonance capture ionization: direct products of ozonolysis and secondary reactions leading to the formation of ketones," *Int. J. Mass Spectrom.* **253** 38-47, (2006).

[31] A.L. Hunt, G.A. Petrucci, P. Biermann and R.G. Finkel, "Metal matrices to optimize ion beam currents for accelerator mass spectrometry," *Nucl. Instrum. Methods Phys. Res., Sect. B*, **243**, 216-222, (2006).

[32] J. Zahardis, B.W. LaFranchi and G.A. Petrucci, "Direct Observation of Polymerization in the Oleic Acid-Ozone Heterogeneous Reaction System by Photoelectron Resonance Capture Ionization Aerosol Mass Spectrometry," *Atmos. Environ.* **40**, 1661-1670, (2006)

[33] J. Zahardis, B.W. LaFranchi and G.A. Petrucci, "Photoelectron resonance capture ionization-aerosol mass spectrometry of the ozonolysis products of oleic acid particles: direct measure of higher molecular weight oxygenates," *J. Geophys. Res.*, **110**, D08307, doi:10.1029/ 2004JD005336.

[34] B.W. LaFranchi, J. Zahardis and G.A. Petrucci, "Photoelectron resonance capture ionization mass spectrometry: A soft ionization source for mass spectrometry of particle-phase organic compounds," *Rapid Comm. Mass Spectrom.*, **18**, 2517-2521, (2004)

[35] B.W. LaFranchi and G.A. Petrucci, "Photoelectron resonance capture ionization (PERCI): A novel technique for the soft ionization of organic compounds," *J. Am. Soc. Mass Spectrom.* **15**, 424-430, (2004).

[36] B.W. LaFranchi, M. Knight and G.A. Petrucci, "Leaching as a Source of Residual Particles from Nebulization of Deionized Water," *J. Aerosol Sci.*, **34**(11), 1589-1594, (2003).

[37] M. Knight and G.A. Petrucci, "A Study of Residual Particle Concentrations Generated by the Ultrasonic Nebulization of Deionized Water Stored in Different Container Types," *Anal. Chem.*, **75**, 4486-4492, (2003).

[38] A.L. Hunt and G.A. Petrucci, "Analysis of Single Ultrafine and Organic Particles by Aerosol Mass Spectrometry," *Trends Anal. Chem.*, **72**, 74-81 (2002).

[39] M. Nunez-Hidalgo, P. Cavalli, G. A. Petrucci and N. Omenetto, "Analysis of Sulphuric Acid Aerosols By Laser-Induced Breakdown Spectroscopy And Laser-Induced Photofragmentation," *Appl. Spectrosc.*, **54**(12), 1805-1816, (2000).

[40] G.A. Petrucci, P.B. Farnsworth, P. Cavalli and N. Omenetto, "A Differentially Pumped Particle Inlet for Sampling of Atmospheric Aerosols into a Time-of-Flight Mass Spectrometer: Optical Characterization of the Particle Beam," *Aerosol Sci. Technol.*, **33** (1/2), 105-121, (2000).

[41] H. Beissler, G.A. Petrucci, P. Cavalli and N. Omenetto, "Blank Problems in the Detection of Gold by Electrothermal Atomisation and Laser Induced Fluorescence," *Spectrochim. Acta B*, **54**, 2115-2120, (1999).

[42] G.A. Petrucci, P. Cavalli and N. Omenetto, "A Feasibility Study of the Use of Electrostatic Deposition and Laser-Induced Fluorescence in a Graphite Furnace for Size-Segregated Analysis of Lead and Gold in Ultrafine (0.02-0.2 μm) Particles," *Spectrochim. Acta B*, **52**, 1597-1615, (1997).

[43] R.E. Neuhauser, U. Panne, R. Niessner, G.A. Petrucci, P. Cavalli and N. Omenetto, "On-Line and In-Situ Detection of Lead Aerosols by Plasma-Spectroscopy and Laser-Excited Atomic Fluorescence Spectroscopy," *Anal. Chim. Acta,* **346**, 37-48, (1997).

[44] H. Beissler, G.A. Petrucci, K. Baechmann, U. Panne, P. Cavalli and N. Omenetto, "Determination of Ultra-Trace Levels of Gold in Size-Segregated Atmospheric Particulate Samples by Laser Induced Fluorescence: Towards and Aerosol Tracer," *Fresenius J. Anal. Chem.*, **355**, 345-347 (1996).

[45] N. Omenetto, P. Cavalli, M. Hidalgo and G. A. Petrucci, "Laser Induced Photofragmentation and Fluorescence Spectroscopy: Tools for Studying Atmospheric Chemical Reactions and Aerosols," *Annal. Chim.*, **87**, 241-253, (1997).

[46] H. Beissler, K. Baechmann, F. Raes, G.A. Petrucci and N. Omenetto, "Applicability of Gold as an Atmospheric Aerosol Tracer," *Atmos. Environ.*, **31**(15), 2329-2336, (1997).

[47] N. Omenetto, G. A. Petrucci, P. Cavalli and J.D. Winefordner, "Absolute and/or Relative Detection Limits in Laser-Based Analysis: The Ends Justifies the Means," *Fresenius J. Anal. Chem.*, **355**, 878-882, (1996)

[48] G.A. Petrucci, J.D. Winefordner and N. Omenetto, "The Relaxation Oscillator as a Resonance Photon Detector, *Appl. Phys. B.*, **62**, 457-464, (1996)

[49] G.A. Petrucci, H. Beissler, O. Matveev, P. Cavalli and N. Omenetto, "Analytical and Spectroscopic Characterization of Double-Resonance Laser-Induced Fluorescence of Gold Atoms in a Graphite Furnace and in a Flame," *J. Anal. At. Spectrom.*, **10**, 885-890, (1995).

[50] G.A. Petrucci, D. Imbroisi, B.W. Smith and J.D. Winefordner, "Detection of OH in an Atmospheric Pressure Flame *via* Laser Enhanced Ionization of Indium," *Spectrochim. Acta B,* **49**, 1569-1578 (1994).

[51] J.D. Winefordner, G.A. Petrucci, C.L. Stevenson and B.W. Smith, "Theoretical and Practical Limits in Atomic Spectroscopy-Plenary Lecture," *J. Analyt. At. Spectrom.*, **9**, 131-143, (1994).

[52] R.G. Badini, G.A. Petrucci and J.D. Winefordner, "Study of the Double-Resonance Ionization Spectrum of Indium with Emphasis on the Resonance Detection of Photons," *J. Quant. Spectrosc. Rad. Trans.*, **50**, 47-54 (1993).

[53] B.W. Smith, G.A. Petrucci, R.G. Badini and J.D. Winefordner, "Graphite Furnace Vaporization with Laser Enhanced Ionization Detection," *Anal. Chem.*, **65**, 118-122 (1993).

[54] G.A. Petrucci and J.D. Winefordner, "The Double-Resonance Optogalvanic Effect of Neon as a Sensitive Photon Detector," *Spectrochim. Acta*, **47B**, 437-447 (1992).

[55] G.A. Petrucci, R.G. Badini and J.D. Winefordner, "Photon Detection Based on Pulsed, Laser Enhanced Ionization and Photoionization of Magnesium Vapour: Experimental Characterization," *J. Analyt. At. Spectrom.*, **7**, 481-491 (1992).

[56] R. Indralingam, J.B. Simeonsson, G.A. Petrucci, B.W. Smith and J.D. Winefordner, "Raman Spectroscopy with Metal Vapour Filters," *Anal. Chem.,* **64**, 964-967 (1992).

[57] G.A. Petrucci, R.G. Badini and J.D. Winefordner, "Resonance Detection of Photons," in *Resonance Ionization Spectroscopy 1992,* Institute of Physics Conference Series Number 128, IOP Press, Philadelphia, PA, 333-336 (1992).

[58] B.W. Smith, G.A. Petrucci, R.G. Badini and J.D. Winefordner, "Graphite Furnace Atomization with Laser Enhanced Ionization Detection," in *Resonance Ionization Spectroscopy 1992,* Institute of Physics Conference Series Number 128, IOP Press, Philadelphia, PA, 309-312 (1992).

[59] G.A. Petrucci, C.L. Stevenson, B.W. Smith, J.D. Winefordner and N. Omenetto, "Experimental Evaluation of the Autoionization Cross-Section of the Magnesium Transition at 300.9 nm by Laser Induced Fluorescence," *Spectrochim. Acta,* **46B**, 975-981 (1991).

[60] G.A. Petrucci and J.D. Winefordner, "Use of the Optogalvanic Effect to Examine the Laser Power Dependency of Several Excitation/Ionization Mechanisms in a Hollow Cathode Discharge," *Appl. Spectrosc.,* **45**(9), 1485-1490 (1991).

[61] G. Zizak, G.A. Petrucci, C.L. Stevenson and J.D. Winefordner, "Ground State Saturated Population Distribution of OH in an Acetylene-Air Flame measured by Two Optical Double-Resonance Pump-Probe Approaches," *Appl. Opt.,* **30**(36), 5270-5275 (1991).

[62] N.J. Szabo, H.W. Latz, G.A. Petrucci and J.D. Winefordner, "Reduction of Matrix Effects in Laser-Enhanced Ionization by Using a Coiled Electrode," *Anal. Chem.,* **63**, 704-707 (1991).

[63] J. Anwar, J.M. Anzano, G.A. Petrucci and J.D. Winefordner, "Microdetermination of Fluoride by Laser Excited Molecular Fluorescence Spectroscopy in a Graphite Furnace," *Microchemical Journal,* **43**, 77-84 (1991).

[64] G. Petrucci and J.C. Van Loon, "Studies of Ultrasonic Nebulizer Parameters in Search of a Simple, Reliable System," *Spectrochim. Acta,* **45B**, 959-968 (1990).

[65] J.A. Vera, M.B. Leong, C.L. Stevenson, G. Petrucci and J.D. Winefordner, "Laser Excited Atomic Fluorescence Spectrometry with Electrothermal Tube Atomization," *Talanta*, **36**, 1291-1293 (1989).

[66] K. Fujiwara, M.A. Mignardi, G. Petrucci, B.W. Smith and J.D. Winefordner, "Determination of Phosphorous by ICP-AES using Solid-Phase Hydride Generation," *Spectrosc. Lett.,* **22**, 1125-1140 (1989).

[67] G. Petrucci and J.C. Van Loon, "Flame Atomic Absorption and ICP-Atomic Emission Spectroscopic Determination of Cu, Zn and Cd in Solid Suspensions of Biological Materials," *Fresenius Z. Anal. Chem.,* **326**, 345-349 (1987).

Invited Seminars

[1] "Chemical role of water on secondary organic aerosol formation and ageing," National Center for Atmospheric Research, Boulder, CO, May 30-31, 2018.

[2] "Atmospheric Secondary Organic Aerosols Viewed Through Analytical Chemistry," Colgate University, October 2, 2018.

[3] "Tantalizing glimpses into the 'lives' of atmospheric organic particles," University of Florida, Gainesville, FL, March 17, 2016.

[4] "Organic particles in the atmosphere: where do they come from, what is their chemistry and why are they important?", University of New Hampshire, Durham, NH, November 5, 2015.

[5] "Green Leaf Volatiles: A Regional Source of Atmospheric Secondary Organic Aerosol," SUNY, Potsdam, NY, November 19, 2013.

[6] "New Methods for the Analysis of Atmospheric Organic Aerosols," St. Lawrence University, NY, November 19, 2013.

[7] "Green Leaf Volatiles: A Regional Source of Atmospheric Secondary Organic Aerosol," SUNY, Environmental Science and Forestry, Syracuse, NY, November 8, 2013

[8] "Advancing measurements of organic aerosols under atmospherically relevant aerosol mass loadings," Michigan Technical University, Oct. 24, 2011.

[9] "On-line analysis of atmospherically relevant organic aerosols: Studies toward their formation, chemistry and atmospheric aging," Middlebury College, Nov. 11, 2011.

[10] "Atmospheric formation of secondary organic aerosols as studied by soft ionization aerosol mass spectrometry," State University of New York, Fredonia, Nov. 12, 2010.

[11] "Analysis and Heterogeneous Chemistry of Atmospheric Organic Particles," Queens College, City University of New York, Nov. 17, 2008.

[12] "The Application of Photo-Electron Resonance Capture Ionization Aerosol Mass Spectrometry (PERCI-AMS) to Organic Nitrogen Components of Atmospheric Particulate Matter," Scott Geddes, James Zahardis and Giuseppe A. Petrucci, NERM2008, Burlington, VT, USA, June 29 – July 2, 2008.

[13] "Automated species and strain identification of bacteria in complex matrices using FTIR spectroscopy," K.A. Puzey, P.J. Gardner, V.K. Petrova, C.W. Donnelly and G.A. Petrucci, SPIE (International Society for Optical Engineering), Chemical, Biological, Radiological, Nuclear, Explosive Sensors IX, Orlando, FL, USA, March 17-20, 2008

[14] "Oxidative Processing of Organic Particulate Nitrogen," Federation of Analytical Chemistry and Spectroscopy Societies, FACSS 2007, Memphis, TN, USA October 14-18.

[15] "Photoelectron Resonance Capture Ionization Mass Spectrometry: Analysis of Atmospheric Organic Particles," G.A. Petrucci, University of Delaware, Newark, DE, USA, April 16, 2005.

[16] "Photoelectron Resonance Capture Ionization-Mass Spectrometry for On-line Investigation of Heterogeneous Reactions on Atmospheric Particles," G.A. Petrucci, University of New Hampshire, Durham, NH, USA, April 22, 2004.

[17] "Analysis of Particle-Phase Organics by Photoelectron Resonance Capture Ionization-Mass Spectrometry," G.A. Petrucci, Université Laval, Laval, PQ, Canada, March 24, 2004.

[18] "Use of lasers in Analytical chemistry," G.A. Petrucci, 84th Canadian Society for Chemistry Conference and Exposition, Montreal, PQ, Canada, May 26-30, 2001.

[19] "Laser aerosol mass spectrometry for the on-line analysis of individual fine and ultrafine particles," G.A. Petrucci, Federation of Analytical Chemistry and Spectroscopy Societies, FACSS 2001, Detroit, MI, USA, October 7-12.

Presentations

[1] Christopher N. Snyder and Giuseppe A. Petrucci, "Chemical Role of Water on Secondary Organic Aerosol Formation and Ageing," American Association for Aerosol Research, 37th annual conference, October 14-18, 2019 in Portland, Oregon

[2] Kevin B. Fischer and Giuseppe A. Petrucci, "Dynamic nature of the particle phase for select green leaf volatile derived secondary organic aerosols," American Chemical Society National Meeting, August 25 – 29, 2019, San Diego, CA

[3] Kevin B. Fischer and Giuseppe A. Petrucci, "Dynamic nature of the particle phase for select green leaf volatile derived secondary organic aerosols," Champlain Area Chemistry Symposium, October 11, 2019, Burlington, VT

[4] Kevin B. Fischer and Giuseppe A. Petrucci, "Dynamic nature of the particle phase for select green leaf volatile derived secondary organic aerosols," American Association for Aerosol Research, 37th Annual Conference, October 14 – 18, 2019, Portland, OR

[5] "Effect of relative humidity on the phase and chemical properties of cis-3-hexenyl acetate derived secondary organic aerosol," August 19-23, 2018, American Chemical Society National Meeting, Boston, MA

[6] "The Influence of Monoterpene and Isoprene Nitrates on the Chemistry and Phase State of Secondary Organic Aerosol in a Low-NOx Mixed Deciduous/Coniferous Forest," Slade, J. H., Jr.; Shepson, P. B.; Desrochers, S. J.; Harvey, R. M.; Wallace, W.; Bui, A.; Griffin, R. J.; Kavassalis, S.; Shi, Q.; Murphy, J. G.; Cook, R.; Connor, M.; Ault, A. P.; Pratt, K.; Alwe, H. D.; Millet, D. B.; Bertman, S. B.; Stevens,

P. S.; Wennberg, P. O.; Boor, B.; Petrucci, G. (2016) American Geophysical Union Proceedings, Fall General Assembly Dec. 2016

[7] "Control of ozonolysis kinetics and aerosol yield by nuances in the molecular structure of volatile organic compounds," Rebecca M. Harvey and Giuseppe A. Petrucci, August 2-7, 2015, Gordon Research Conference-Atmospheric Chemistry, Waterville Valley, NH.

[8] "A new method to measure aerosol particle bounce using a cascade electrical low pressure impactor," Shashank Jain and Giuseppe A. Petrucci, August 2-7, 2015, Gordon Research Conference-Atmospheric Chemistry, Waterville Valley, NH.

[9] "Control of ozonolysis kinetics and aerosol yield by nuances in the molecular structure of volatile organic compounds," Rebecca M. Harvey and Giuseppe A. Petrucci, American Association for Aerosol Research Annual Conference, October 12-16, 2015, Minneapolis, MN.

[10] "A New Method To Measure Aerosol Particle Bounce And Estimating The Phase State Of Atmospheric Aerosols," Shashank Jain and Giuseppe A. Petrucci, American Association for Aerosol Research Annual Conference, October 12-16, 2015, Minneapolis, MN.

[11] "Molecular Control of SOA Formation and Yield in Plant Volatile Systems," R.M. Harvey, J. Zahardis, S. Jain and G.A. Petrucci, Gordon Conference on Plant Volatiles," Ventura, CA, January 25-26, 2014.

[12] "Phase Transitions and Separation of Mixed Organic-Inorganic Particles," S.T. Martin, M. K. Smith, A.K. Bertram, E. Sauko, M. Kuwata, S. Zorn, T. Koop, G. Petrucci, A. Virtanen, European Aerosol Conference, Manchester, UK, September 4-9, 2011.

[13] "Phase Transitions and Separation of Mixed Organic-Inorganic Particles," S.T. Martin, M. K. Smith, A.K. Bertram, E. Sauko, M. Kuwata, S. Zorn, T. Koop, G. Petrucci, A. Virtanen, American Chemical Society, Denver, CO, August 29, 2011.

[14] "Near-Infrared Laser Desorption/Ionization Aerosol Mass Spectrometry (NIR-LDI-AMS): Advancing measurements of organic aerosols under atmospherically relevant concentrations of organic aerosol," S. Geddes, B. Nichols, J. Eisenhauer, J. Zahardis and G.A. Petrucci, American Association for Aerosol Research, Portland, OR, October 24-29, 2010.

[15] "The Electrostatic Particulate Dosage and Exposure System (EPDExS): A Method for Quantifiable and Controlled Dosage of Respirable Size Particles for In Vitro Studies," J. Brutman, I. Mikheyeva and G.A. Petrucci, American Association for Aerosol Research, Portland, OR, October 24-29, 2010.

[16] "Near-Infrared Laser Desorption/Ionization Aerosol Mass Spectrometry (NIR-LDI-AMS): Soft Ionization at atmospherically relevant Mass Loadings," S. Geddes and G.A. Petrucci, New England Aerosol Conference, Harvard University, Cambridge, MA, July 23, 2010.

[17] "Near-Infrared Laser Desorption/Ionization Aerosol Mass Spectrometry for Measuring Organic Aerosol at Atmospherically Relevant Mass Loadings," B. Nichols, S. Geddes, K. Todd, J. Zahardis and G.A. Petrucci, NERMS, Plattsburgh, NY, June 4, 2010.

[18] "Recent Developments and Improved Understanding of Photoelectron Resonance Capture Ionization Aerosol Mass Spectrometry for the Analysis of Organic Particles," B.W. LaFranchi, J. Zahardis, and G.A. Petrucci, American Society for Mass Spectrometry conference, ASMS 2006, Seattle, WA, USA, May 29-June 2, 2006.

[19] "Investigation of High Molecular Weight (>282 u) Products from the Heterogeneous Reaction of Ozone with Oleic Acid Particles," B.W. LaFranchi, J. Zahardis, and G.A. Petrucci, American Association for Aerosol Research, AAAR '05, Austin, TX, USA, October 17-21, 2005.

[20] "Application of Photoelectron Resonance Capture Ionization (PERCI) Mass Spectrometry to the Analysis of Comestible Oils and Oil-Derived Fuels," Federation of Analytical Chemistry and Spectroscopy Societies Conference 2005, Quebec City, Canada, October 9-13, 2005.

[21] "The effect of matrix electron affinity on ion beam currents for BeO analysis," A.L. Hunt, P. Biermann, and G.A. Petrucci, 10th International Conference on Accelerator Mass Spectrometry, University of California, Berkeley, CA, USA, September 4-9, 2005.

[22] "Measurement of atmospheric organic particles by photoelectron resonance capture ionization (PERCI) aerosol mass spectrometry (AMS)," J. Zahardis, B.W. LaFranchi, and G.A. Petrucci, Gordon Research Conference, Atmospheric Chemistry, Big Sky, MT, USA, September 4-9, 2005.

[23] "Effects of metal mixing matrices on beryllium beam currents," A.L. Hunt, P.R. Bierman, G.A. Petrucci and R.C. Finkel, European Science Foundation IAAMS, Isle of Arran, Scotland, November 16-19, 2004.

[24] "Investigation of Oleic Acid Particles by PERCI-AMS," J. Zahardis, B.W. LaFranchi, and G.A. Petrucci, American Association for Aerosol Research, AAAR 2004, Atlanta, GA, USA, October 4-8.

[25] "Photoelectron Resonance Capture Ionization: A New Method for the Study of Organic Aerosols," B.W. LaFranchi, 2004 EPA STAR Graduate Fellowship Conference, Washington DC, October 11-13, 2004.

[26] "Photoelectron resonance capture ionization (PERCI) aerosol mass spectrometry: A new, sensitive method for the analysis of atmospheric particle-phase organics," G.A. Petrucci, B.W. La Franchi and J. Zahardis, American Society for Mass Spectrometry Annual Conference, ASMS 2004, Nashville, TN, USA, May 23-27.

[27] "Resonance Electron Capture Ionization Aerosol Mass Spectrometry for the Analysis of Ultrafine Organic Particles," B.W. La Franchi and G.A. Petrucci, American Association for Aerosol Research, AAAR 2003, Anaheim, CA, USA, October 20-24.

[28] "Photoelectron Resonance Capture Ionization (PERCI) Time-of-Flight Mass Spectrometry," B.W. La Franchi and G.A. Petrucci, American Society for Mass Spectrometry Annual Conference, ASMS 2003, Montreal, Quebec, Canada, June 8-12.

[29] "Measurement of atmospheric particle-phase mercury by laser aerosol mass spectrometry," B.J. Holmes, B.W. LaFranchi and G.A. Petrucci, Federation of Analytical Chemistry and Spectroscopy Societies, FACSS 2002, Providence, RI, USA, October 13-17.

[30] "Difficulties in generating reference ultrafine aerosols by solution nebulization," B.W. LaFranchi, M. Knight and G.A. Petrucci, American Association for Aerosol Research, AAAR 2002, Charlotte, NC, USA, October 7-11.

[31] "Background ultrafine particle distributions from the nebulization of pure water," M.C. Knight, A.L. Hunt and G.A. Petrucci," American Association for Aerosol Research, AAAR 2001, Portland, OR, USA October 15-19, 2001.

[32] "Time-Resolved Photofragmentation Spectroscopy of Sodium-Containing Aerosols with Laser Excitation at 193 nm," N. Omenetto, M. Nunez-Hidalgo, P. Cavalli and G.A. Petrucci, FACSS 99 (Federation of Analytical Chemistry and Spectroscopy Societies), Vancouver, Canada, October 24-29, 1999.

[33] "A Differentially Pumped Particle Inlet for Sampling of Atmospheric Aerosols into a Time-of-Flight Mass Spectrometer: Characterization and Initial Results," G.A. Petrucci, P.B. Farnsworth, P. Cavalli and N. Omenetto, FACSS 99 (Federation of Analytical Chemistry and Spectroscopy Societies), Vancouver, Canada, October 24-29, 1999.

[34] "Real Time Chemical and Physical Characterization of Individual Aerosol Particles by Laser Ionization, Time-of-Flight Mass Spectrometry," G.A. Petrucci, P. Cavalli, P.B. Farnsworth and N. Omenetto, European Aerosol Conference (EAC 99), Prague, Czech Republic, September 4-10, 1999.

[35] "A Single Particle Mass Spectrometer for the On-Line Chemical Analysis of Individual Atmospheric Aerosol Particles," G.A. Petrucci, P.Cavalli, P.B. Farnsworth and N. Omenetto, International Conference on Air Quality in Europe: Challenges for the 2000s, Venice, Italy, May 19-21, 1999.

[36] "Rapid Response, Size-Segregated Elemental Analysis of Accumulation Mode Aerosols," G.A. Petrucci, P.Cavalli and N. Omenetto, Seventh European Symposium on Physico-chemical Behaviour of Atmospheric Pollutants: The Oxidizing Capacity of the Troposphere," Venice, Italy, October 2-4, 1996.

[37] "Optogalvanic Detection of Laser Induced Fluorescence in Atmospheric Pressure Atomizers," G. Petrucci, C.L. Stevenson, J. Vera, N. Omenetto, B.W. Smith and J.D. Winefordner, FACSS (Federation of Analytical Chemistry and Spectroscopy Societies) XVI Conference, Chicago, IL, October 1989.

[38] "Development of an Ultrasonic Nebulizer for ICP-AES," G. Petrucci and J.C. Van Loon, CSI (Colloqium Spectroscopicum Internationale) XXV, Toronto, Ontario, Canada, June 1987.

Current and Pending Support

Pending Support

NSF, CHE (Petrucci, PI) 07/01/2022 – 06/30/2025
Title: *Mixing Ratios and Relative Humidity Impact on Organic New Particle Formation from Ozonolysis of Volatile Organic Compounds at Atmospherically Relevant Levels*
Total Award Amount: $ 555,737

Completed Work

NSF, CHE-1709751 (Petrucci, PI) 08/01/2017 – 07/31/2021
Title: *Role of chemical environment at particle genesis in defining SOA chemical, phase and optical properties*
Total Award Amount: $ 408,645

UVM-SEED (Petrucci-PI) Spring 2017
Title: *Environmental conditions at particle genesis dictate secondary organic aerosol formation, phase and optical properties*
Total Award Amount: $15,000

NSF, CHE-1213632 (Petrucci, PI) 09/01/2012 – 08/31/2016
Title: *Particle Hysteresis And Solidification Experiment: Optical and Nucleation Effects (PHASE-ONE)*
Total Award Amount: $ 687,820

NSF MRI (Petrucci, Co-PI) 08/01/2011-07/31/2014
Title: *MRI: Acquisition of a 500 MHz NMR Spectrometer for Chemistry at the University of Vermont*
Total Award Amount: $535,000

NSF AGS-0925052 (Petrucci, PI) 09/01/2009-08/31/2012
Title: *Mechanistic investigations of secondary organic aerosol growth*
Total Award Amount: $392,519

NSF AGS-1101194 (Petrucci, PI) 01/01/2011-06/30/2012

Title: *EAGER: Advancing the Analysis of Secondary Organic Aerosols Through Innovations in Soft Ionization Aerosol Mass Spectrometry*
Total Award Amount: $100,000

NSF MRI (Petrucci, Co-PI) 01/01/2010-12/31/2012
Title: *MRI-R2: Acquisition of a proton transfer reaction time-of-flight mass spectrometer for atmospheric chemistry*
Total Award Amount: $626,024

NSF MRI (CHE 0821501, Petrucci, Co-PI) 08/01/2008-07/31/2010
Title: *MRI: Acquisition of an LCMS for the Chemistry Department at the University of Vermont*
Total Award Amount: $430,735

NSF ATM-0440074 (Petrucci, PI) 02/01/2005-01/31/2008
Title: *Investigations of Atmospheric Particulate Organic Nitrates by Photoelectron Resonance Capture Ionization-Mass Spectrometry*
Total Award Amount: $375,659

DAAD19-03-1-0205 (Petrucci, co-PI) 06/01/2003-05/31/2006
Title: *Quantifying Erosion and Sedimentation in Extreme Environments: Refining and Applying the Cosmogenic Method for Army-Relevant Landscape Analysis*
Total Award Amount: $500,000

Faculty Research Support Award, (Petrucci, PI) 07/01/2009-06/30/2010
University of Vermont
Title: *Fundamental mechanistic studies of the effects of low energy radiation on the ionization and destruction of peptides and DNA*
Total Award Amount: $15,000

Multidisciplinary Research Opportunity Award (Petrucci, PI) 11/01/2008-10/31/2009
University of Vermont
Title: *In vitro toxicity of particulate matter to lung epithelial cells, studied with a novel direct particle dosage method*
Total Award Amount: $23,350

Transportation Research Center (Petrucci, PI) 10/01/2008-09/30/2009
University of Vermont (sub-Department of Defence)
Title: *Atmospheric oxidative chemistry of organic particulate emissions from fuel combustion*
Total Award Amount: $15,000

Vermont Space Grant and Vermont's NASA Epscor Program (Petrucci, PI) 09/01/2006-08/31/2007
Title: *Chemical Reactivity of Fatty Acids in Atmospheric Particles*
Total Award Amount: $13,865

Professional Affiliations

American Chemical Society
American Geophysical Union
American Association for Aerosol Research
American Association for Mass Spectrometry

Graduate and Post-doctoral Advisors

Prof. James D. Winefordner
Department of Chemistry

University of Florida
Gainesville, FL 32611

Prof. Nicolo Omenetto
Department of Chemistry
University of Florida
Gainesville, FL 32611

(formerly at the Environment Institute, Joint Research Center of the European Commission, Ispra, Italy)

Graduate Students and Post-doctoral Associates Advised

Brian Lafranchi (Ph.D., 2006)
Adam Hunt (Ph.D., 2007)
Bryan Holmes (Ph.D., 2008)
James Zahardis (Ph.D., 2009)
Scott Geddes (Ph.D., 2011)
Jessica Eisenhauer (nee Mendes) (M.S., 2013)
Colleen Small (M.S., 2013)
Rebecca Harvey (Ph.D., 2016)
Shashank Jain (Ph.D., 2017)
Kevin Fischer (Ph.D., 2021)
Christopher Snyder (Ph.D., current)
Austin Flueckiger (Ph.D., current)
Francesca Milazzo (Ph.D., current)

Undergraduate Honor's Thesis

James Stevens (2006)
Christopher Kenseth (2015)
Alex Taylor (2020)
Janey Masi (2020)
Carly Sottak (current)

Service

Department

Graduate Admissions Committee (1/01 – 5/17)
Evaluate applicants for admission to Graduate Program in Chemistry, arrange visits by and serve as liaison to prospective graduate students

Instrumentation Committee (1/01 – present, Chair 6/02 – 5/19)
Review departmental instrumentation needs and set usage policy, prepare instrumentation grant proposals, oversee instrumentation teaching assistants.

Graduate Standards Committee (8/11 – present)
Faculty Search Committees (2010-11, 2013-14, 2017-2018 (Chair), 2019 (Chair))
Department of Chemistry Chair Search Committee (2013-14)

College / University

Academic Planning and Budget Committee (2008-2010, Chair)
Strategic Planning Faculty Success Subcommittee (2013-2016)
CAS Reorganization Task Force (2018-2019)

Ad hoc reviewer

Journals	Journal of Aerosol Science
	Analytical Chemistry
	Aerosol Science and Technology
	Journal of the American Society for Mass Spectrometry
	Environmental Science and Technology
	International Journal of Mass Spectrometry
	Toxicology In Vitro
Proposals	National Science Foundation
	National Aeronautics and Space Administration
	American Chemical Society
	Department of Defence
	Department of Energy
	Romanian Research Foundation
Review Panels	
	National Aeronautics and Space Administration
	National Science Foundation
	Department of Energy