

Christopher B. Babayco

Department of Chemistry
Southern Oregon University
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Education

Ph.D., Chemistry, Emphasis in Analytical Chemistry, University of California, Davis.
Dissertation: "Spectroscopic Investigation of the Ordering of Aliphatic Chains: From Biomembranes to Molecular Electronics".
Advisors: Atul N. Parikh and Donald Land. June 2010

Bachelors of Arts, Chemistry, Willamette University, Salem, Oregon.
Thesis: Determination of Aniline / *n*-Hexane Liquid-Liquid Phase Diagram.
Advisor: J. Charles Williamson. May 2004

Professional Experience

Assistant Professor of Chemistry September 2021 – Present

Associate Professor of Chemistry June 2016 – July 2021

Assistant Professor of Chemistry August 2010- June 2016

Columbia College, Columbia, Missouri

Responsibilities include teaching Analytical Chemistry, Environmental Chemistry, and Introductory Chemistry with corresponding laboratories, Chemistry for Biology and Health Sciences, and the Freshman Seminar. Advising student research directed studies and senior distinction research projects.

Head Teaching Assistant September 2007 – June 2010

University of California, Davis

Supervised graduate students teaching general chemistry discussions and laboratories. Prepared and presented guest lectures. Assisted with examination creation, proctoring and grading.

Teaching Assistant September 2004 – June 2007

University of California, Davis

Prepared and taught general and honors introductory chemistry discussion sections and laboratories, evaluated student laboratory reports for upper level undergraduate laboratory courses in analytical and physical methods, spectroscopy and group theory.

Research

Ongoing Research Projects – Southern Oregon University

Characterizing the occurrence and fates of anthropogenic environmental contaminants. Currently this is focused on the changes to the occurrence and distribution of metals and persistent organic pollutants in the Bear Creek watershed following the Alameda Fire and their impact on microbial communities.

Doctoral Research Projects, with Atul N. Parikh and Donald P. Land - University of California, Davis

Spectroscopic investigations of buried molecular assemblies focusing on the structure and phase behavior applications in molecular junctions and lipid membranes. Developed and validated an experimental apparatus for the simultaneous measurement of vibrational spectra and electronic measurements of molecular junctions between metal layers.

Prequalifying Research Project, with Peter Kelly – University of California, Davis

Investigation of size resolved ambient aerosols in the California Central Valley analyzed using laser desorption time of flight mass spectrometry. During a sampling campaign in Yosemite National Park, identified an organic tracer for wood smoke that has subsequently been used to determine the longevity of wood smoke particulate following forest fires.

Undergraduate Research Project, with J. Charles Williamson - Willamette University

Development of methods for the elucidation of thermodynamic properties of binary liquid-liquid solutions using laser light scattering, specifically the difference in the Rayleigh and Mie scattering as the system undergoes critical opalescence.

Research Publications:

Christopher B. Babayco, Donald P. Land, Richard A. Kiehl, Atul N. Parikh “Characterization of Buried Metal-Molecule-Metal Junctions Using Fourier Transform Infrared Microspectroscopy”. *Review of Scientific Instruments* **85**, 094103 (2014). DOI: 10.1063/1.4896477

Christopher B. Babayco, Pauline J. Chang, Donald P. Land, Richard A. Kiehl, Atul N. Parikh “Evolution of Conformational Order During Self-Assembly of Alkanethiols on Hg Droplets: An Infrared Spectro-microscopy Study”. *Langmuir*, **29**(26), 8203 (2013). DOI: 10.1021/la4014366

Christopher B. Babayco, Sennur Turgut, Andreia Michelle Smith, Babak Sanii, Donald Land, Atul Parikh “A comparison of lateral diffusion in supported lipid monolayers and bilayers”, *Soft Matter*, **6**, 5877 (2010). DOI: 10.1039/C0SM00643B

Kevin M. Dean, Christopher B. Babayco, Daniel R.B. Sluss, J. Charles Williamson “The Accuracy of Liquid-Liquid Phase Transition Temperatures from Semiautomated Light Scattering Measurements”. *Journal of Chemical Physics*, **133**, 074506, (2010).

Research Presentations:

Katie Espen*, Kent N. Strodtman, Christopher B. Babayco, *Wastewater Flooding Induced Changes in the Soil Microbiome and Enzymatic Activity Within the Eagle Bluffs Conservation Area*. Missouri Academy of Sciences Annual Meeting, April 2021.

Lindsey Hedges,* Christopher B. Babayco, *Quantification of Widespread Cocaine Contamination Across One Dollar Bills in the Southern Midwest*. Missouri Academy of Sciences Annual Meeting, April 2019.

Christopher B. Babayco, *Cocaine Detection in Eagle Bluffs Conservation Area*. Missouri Natural Resources Conference, February 2018.

Sylvanna H. Couch,* Christopher B. Babayco, *Identification of Cocaine and Cocaine Metabolites in Eagle Bluffs Conservation Area*. Missouri Academy of Sciences Annual Meeting, April 2017.

Michael Brown,* Jessica Mondy,* Christopher B. Babayco, *Comparison of Extraction Methodologies for the Recovery of Gun Cleaning Oils for Forensic Analysis*. Alpha Chi National Meeting, Chicago, Illinois, March 2015.

* Denotes an undergraduate student researcher

Research Presentations Continued:

Christopher B. Babayco, Pauline J. Chang, Richard Kiehl, Atul N. Parikh, *Spectroscopic Investigation of the Formation of Self Assembled Monolayers in Real Time by Infrared Spectroscopy*. FCRP Center on Functional Engineered Nano Architectonics, 6th Annual Review, Los Angeles, California, January 2010.

Christopher B. Babayco, Richard Kiehl, Atul N. Parikh, *Chemical Strategies to Improve the Electrical and Spectroscopic Probes of Metal-Molecule-Metal Junctions*, Poster Presentation. FCRP Center on Functional Engineered Nano Architectonics, 5th Annual Review, Los Angeles, California January 2009.

Christopher B. Babayco, Kevin M. Dean, Daniel R.B. Sluss, J. Charles Williamson, *Using light scattering data to assign liquid-liquid phase transition temperatures*, 62nd Northwest Regional Meeting of the American Chemical Society, Boise, Idaho, June 2007.

Christopher B. Babayco and Peter. Kelly, *Chemical Speciation of Particulate Matter in the Central Valley*, Air and Waste Management Association Symposium on Air Quality Measurement Methods and Technology, San Francisco, California, May 2007.

Christopher B. Babayco and Peter. Kelly, *Observation of alpha-pinene oligomers in ambient wood smoke aerosol particulate*, Poster Presentation. American Geophysics Union, National Meeting, San Francisco, California, December 2005.

Christopher B. Babayco and Peter. Kelly, *Chemical Markers for Wood Smoke in Aerosol Samples*, Poster Presentation. 7th Annual UC Davis Conference for Environmental Health Scientists, Napa, California, August 29, 2005.

Christopher B. Babayco, J. Charles Williamson, *Precise determination of binary liquid phase transition temperatures using laser light scattering*. Poster Presentation. 224th American Chemical Society National Meeting, Philadelphia, Pennsylvania, August 2004.

Christopher B. Babayco, J. Charles Williamson, *Interpretations of Light Scattering for the Measurement of Binary Liquid Systems*, Poster Presentation. 10th Annual Murdock Pacific Northwest Regional Meeting, Pacific Lutheran University, November 2003.

Christopher B. Babayco, J. Charles Williamson, *Measurement and Interpretation of Liquid-Liquid Cloud Point Transitions*, 17th Annual National Conference of Undergraduate Research, University of Utah, March 2003; and at 9th Annual Murdock Pacific Northwest Regional Meeting, Whitman College, November 2002.

Non-Academic Publications

“Patina Disposal”, *Art Jewelry*, January 2014, p. 58.

“Why does this work?” *Art Jewelry*, July 2013, p. 59.

Internal Grant Applications

Columbia College Summer Research Grant (\$2,400 - Funded)	2013
“Characterization of the competitive adsorption of ignitable liquids”	
Columbia College Summer Research Grant (\$2,400 - Funded)	2012
“Development of self-assembled porphyrin monolayers for optical sensing”	

External Grant Applications

NSF S-STEM (\$606,396 – Not Funded) “Cougars advancing science through enrichment and scholarship (CASES)”	2014
NSF S-STEM (\$599,890 – Not Funded) “Cougars advancing science through enrichment and scholarship (CASES)”	2013
RCSA Cottrell College Science Award (\$35,000 – Not Funded) “Characterization of non-covalent interactions between metal-chelated porphyrin monolayers and gas phase molecules”, PI: Christopher B. Babayco	2013
Pittsburg Conference Memorial National College Grants Program (\$10,000– Not Funded) “Purchase of Agilent Fluorescence Spectrometer”	2012

Southern Oregon University Departmental Service

Advanced Southern Credit Coordinator 2019 - 2021

Columbia College Institutional Governance and Service

Director of General Education	2019 - 2021
<u>Chair</u> , General Education Committee	2019 - 2021
<u>Chair</u> , College-Wide Curriculum and Academic Policies Committee	2018 - 2020
	2016 - 2017
<u>Chair</u> , NSM School Curriculum and Academic Policies Committee	2016 - 2017
Vice-President, Columbia College Faculty Association	2014 - 2016
Center for Excellence and Learning Steering Committee	2014 - 2016
Faculty Representative, Curriculum and Academic Policies Committee	2014 - 2016
Faculty Representative, Presidential Academic Structure Task Force	2014 - 2015
Faculty Representative, Campus Judicial Review	2011 - 2016
Faculty Mentor, Science Living-Learning Community	2012 - 2015
Faculty Representative, Board of Trustees	2013 - 2015
Day Campus Retention Living Learning Community Team	2013 - 2015
<u>Chair</u> , Science Recruitment and Retention BOOGIE Team	2011 - 2014
Untenured Faculty Member, Tenure Review and Promotion Board	2012 - 2013
Faculty Representative, Instructional Facilities, Resources and Support	2011 - 2013
Co-advisor, Science Club	2011 - 2013
Faculty Representative, Faculty Social Committee	2010 - 2011

Professional Affiliations and Service

American Chemical Society, Member
 ACS Chemical Education Division, Member
 Society of Environmental Toxicology and Chemistry, Member
 External Thesis Member, University of California, Davis Masters of Forensic Science Candidate
 University of Missouri Local ACS Section, Chair 2012
 University of Missouri Local ACS Section, Chair-Elect 2011

Professional Teaching Development and Activities

Teaching Pedagogy Training

- Introduction to Progress Orientated Guided Inquiry Learning (POGIL), Rockhurst University, Kansas City, November 2012
- Instructional Technology Intensive Seminar, Columbia College, May 2012

Teaching Assistant Consultant, University of California, Davis, Teaching Resource Center September 2005 – June 2006

- Organized and facilitated a campus-wide, first-year Teaching Assistant Orientation program, providing first-time TA's instruction for effective teaching, building confidence in the classroom, and professional development activities for successful teaching. Provided follow-up workshops and personal consultations, using peer review, in-class observations, and student interviews.
- Organized and facilitated campus-wide workshops throughout the academic year to improve quality of teaching assistant instruction.

Participant, Seminar on College Teaching, Teaching Resource Center, UC Davis, Winter 2005

- Weekly seminar on techniques and methods for teaching at the university.

Participant, Teaching Partners Program, Teaching Resource Center, UC Davis, Winter 2005

- Peer teaching program with other teaching assistants to improve quality of teaching through peer review and evaluation of teaching methods.

Teaching Workshops Taught

- “iPads in the Classroom” presented to Columbia College Faculty, December 2012.
- “Understanding the Challenge of Different Learning Styles” presented to University of California, Davis graduate students and postdocs, April 2006.
- “When PowerPoint Goes Bad: Where is the Power?” presented to University of California, Davis graduate students and postdocs, February 2006.
- “Hot Topics In Teaching” presented to University of California, Davis graduate students and postdocs, February 2006.

Awards and Honors

- Favorite First Year Professor, Columbia College, 2014-2015
- Friend of Student Affairs, Department of Student Affairs, Columbia College, 2012-2013