

Spectroscopist/ Research Scientist

Patrick Blower

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Personal Summary:

I am an innovative and hard working scientist who is excited about new and interesting projects involving spectroscopy, optics, and chemistry. I am accomplished as a laser spectroscopist with a solid background in nonlinear optics and ultrafast laser systems as well as a well-rounded researcher. I have given oral presentations at national conferences and published in premier journals. I have excellent communication skills and have the ability to work independently while also being an exceptional team member and manager. I am currently seeking employment in the research and optical industries.

Education:

2004-2013

Ph.D. - Physical Chemistry

- University of Oregon
- Research Advisor: Geraldine Richmond
- Thesis Topic: Nonlinear optical spectroscopy and surface tension of dicarboxylic adsorption at the air/water interface

2000-2004

B.A. - Chemistry

- New College of Florida
- Research Advisor: Malkiat Johal
- Thesis Topic: Imaging of POPC lipid bilayers using Imaging Ellipsometry/surface tension and ellipsometric investigations of POPC bilayers

Technical Specialization:

Design and construction of ultrafast optical laser (solid-state) systems for non-linear spectroscopic experiments in the mid-IR and visible regions including use, diagnostics, and maintenance of commercial components

- fs Regenerative amplifiers (1W and 3W)
- Optical parametric amplifiers/oscillators (OPA and TOPAS)
- Ti:Sapphire oscillators

Extensive experience in femtosecond pumped optical parametric amplifiers with

specific emphasis on the generation of mid IR wavelengths which involves multiple frequency conversion stages including white light continuum generation and difference frequency generation

Proficient in optical dispersion, refractive and diffractive optics, and pulse shaping

Hands on experience with troubleshooting and fixing various optical problems, including optical alignment using a variety of procedures

Technical experience with optical equipment including monochrometers, CCD cameras, beam profilers, oscilloscopes, power meters, gated data acquisition, and MCT detectors as well as maintenance of laser equipment and optical components

Designed and built two BBSFG (Broadband Sum Frequency Generation) systems which were used to conduct experiments at a vapor/liquid interface in reflection geometry in the Richmond Lab

Proficiency in using:

- Surface Tension (expertise in Wilhelmy Plate method)
- FT-IR
- PM-IRRAS
- Ellipsometry

Professional Experience:

Undergraduate Research Assistant, Center for Biophotonics, University of California, Davis, Summer 2003

Worked under the direction of Dr. Atul Parikh

Research Assistant, Department of Chemistry, University of Oregon, 2005-2013

Teaching Assistant, Department of Chemistry, University of Oregon, 2004-2006

General Chemistry Laboratory TA 2004-2005

Instrumental Analysis TA 2006

Experience working with undergraduates, graduate students, and lab managers

- Mentored three undergraduate students who all went on to join the University of Oregon Chemistry Graduate Program

Publications:

M. Kido-Soule, P. Blower, and G.L. Richmond. Effects of Atmospherically Important Solvated Ions on Organic Acid Adsorption at the Surface of Aqueous Solutions. *J. Phys. Chem. B*, **2007**, *111* (49), pp 13703–13713

M. Kido-Soule, P. Blower, and G.L. Richmond. Nonlinear Vibrational Spectroscopic Studies of the Adsorption and Speciation of Nitric Acid at the Vapor/Acid Solution Interface. *J. Phys. Chem. A*, **2007**, *111* (17), pp 3349–3357

P. Blower, E. Shamay, L. Kringle, S. Ota, and G.L. Richmond. Surface Behavior of Malonic Acid Adsorption at the Air/Water Interface. *J. Phys. Chem. A*, **2013**, *117* (12), pp 2529-2542. *Note: Chosen for consideration of the cover, created art which was selected for the cover.*

P. Blower, S. Ota, N. Valley, S. Wood, and G.L. Richmond. Sink or Surf: Atmospheric Implications for Succinic Acid at Aqueous Surfaces, 2013, *manuscript submitted*.

Talks and Posters:

Material Science Institute, December 2007, Poster

239th American Chemical Society National Meeting, San Francisco 2010, Poster:
“Where strong acids become weak: Vibrational sum frequency spectroscopy investigations of nitric acid adsorption at the air/water interface”

241st American Chemical Society National Meeting, Anaheim 2011 Oral Presentation:
“Surface spectroscopic studies of dicarboxylic acids adsorbed at the vapor/water boundary”

243rd American Chemical Society National Meeting, San Diego 2012 Oral Presentation:
“Dicarboxylic adsorption at the air/water interface: Complex behavior from small molecules”