

ELIZABETH A. RAYMOND

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CURRENT POSITION

Assistant Professor, Department of Chemistry, WWU, September 2006-present
Developing an undergraduate research program to investigate the adsorption of atmospherically relevant molecules to the vapor/water interface using nonlinear optical spectroscopy and surface tension measurements.

EDUCATION

Ph.D. Physics, University of Oregon, December 2003
Research Advisor: Professor Geraldine L. Richmond
Thesis title: "Vibrational Sum-Frequency Spectroscopic Investigations of Hydrogen-Bonding Interactions at the Vapor/Water Interface"

B.A. Chemistry/Physics, May 1997
Whitman College, Walla Walla, WA

RESEARCH EXPERIENCES

Post-doctoral research with Prof. Benjamin Schwartz, December 2003-August 2006
Department of Chemistry and Biochemistry, UCLA
Characterizing interfaces within organic light emitting diodes (OLED's) using second harmonic generation (SHG) and femtosecond pump-probe spectroscopy.

Doctoral research with Prof. Geraldine Richmond, 1998-2003
Department of Chemistry, University of Oregon
Investigated hydrogen-bonding interactions at air/aqueous solution interfaces using vibrational sum-frequency spectroscopy (VSFS).

NSF Research Experience for Undergraduates (REU), Summer 1996
Professor Geraldine Richmond, Department of Chemistry, University of Oregon
Studied the pH dependence of charged surfactants at the air/water interface using vibrational sum-frequency spectroscopy.

NSF Research Experience for Undergraduates (REU), Summer 1995
Professor Phillip Gould, Department of Physics, University of Connecticut
Built a phase control device for laser beams used to cool and trap Rb atoms.

TEACHING EXPERIENCE

Physical Chemistry, Dept. of Chemistry, WWU, Fall 2006
Taught the 1st quarter of physical chemistry for chemistry and biochemistry majors, covering topics in quantum mechanics from a particle in a box to atomic orbitals and spectroscopy.

General Chemistry, Dept. of Chemistry UCLA, Summer 2006

Taught a section (~50 students) of first quarter general chemistry in a 5 week summer session, in which the student population ranged from high school students to college seniors. Topics included stoichiometry, nomenclature, and atomic and molecular structure.

General Chemistry, Dept. of Chemistry, UCLA, Winter 2006

Taught a section (~350 students) of second quarter general chemistry for physical science majors. Topics included: states of matter, thermodynamics, equilibrium, acid/base chemistry, and kinetics.

Honors General Chemistry, Dept. of Chemistry, UCLA, Winter 2005

Taught the honors section of general chemistry, "Energetics and Change". Topics included thermodynamics, statistical mechanics, acid/base chemistry, equilibrium, and kinetics.

Head Lab Teaching Assistant, Dept. of Physics, University of Oregon, Spring 1999

Set-up and tested experiments for all sections of the introductory physics lab, in addition to teaching two sections.

Laboratory Teaching Assistant, Dept. of Physics, University of Oregon 1997-1999

Facilitated self-discovery learning of basic physics concepts in kinematics, thermodynamics, optics, and electronics using "Real Time Physics" curriculum.

Undergraduate Teaching Assistant, Dept. of Chemistry, Whitman College 1994-1997

Prepared, set-up, and assisted students with experiments for general chemistry, quantitative analysis, organic chemistry, and physical chemistry laboratories.

Student Academic Advisor, Whitman College 1994-1995

Advised freshman on academic matters, as well as assisting with coursework in varying disciplines, including math, physics, chemistry, and paper writing.

HONORS AND AWARDS

NSF Integrative Graduate Education and Research Traineeship (IGERT) Fellowship,
Fall 2001-Fall 2003

Western Spectroscopy Association Travel Award, January 2002

ACS Physical Chemistry Travel Fellowship, San Diego, April 2001

Outstanding Senior in Chemistry Award, American Institute of Chemists, 1997

Distinction on Oral and Written Exams, Departments of Chemistry and Physics,
Whitman College, 1997

Academic Merit Scholarship, Whitman College 1993-1997

Honors at Admission, Whitman College, 1993

COMMITTEES:

AMSEC Kaiser-Borsai scholarship committee

Chemistry department graduate admissions committee

Chemistry department honors thesis committee

MEMBERSHIPS AND PROFESSIONAL DEVELOPMENT

Preparing Future Faculty course, UCLA, 2005-2006
Participant in CoACh post-doctoral workshop, April 2004.
American Chemical Society, 1998-present

PUBLICATIONS

E. A. Raymond, G. L. Richmond, *Probing the Molecular Structure and Bonding of the Surface of Aqueous Salt Solutions*, J. Phys. Chem. B., **108**(16), 5051, (2004)

M. G. Brown, D. S. Walker, E. A. Raymond, G. L. Richmond, *Vibrational Sum-Frequency Spectroscopy of Alkane/Water Interfaces: Experiment and Theoretical Simulation*, J. Phys. Chem. B, **107**(1), 237, (2003)

E.A. Raymond, T.L. Tarbuck, M.G. Brown, G.L. Richmond, *Isotopic Dilution Studies of the Hydrogen-Bonding Interactions at the Vapor/Water Interface as Investigated by Vibrational Sum-Frequency Spectroscopy*, J. Phys. Chem. B., **107**(2), 512, (2003)

E.A. Raymond, T.L. Tarbuck, G.L. Richmond, *Isotopic Dilution of the Vapor/Water Interface*, J. Phys. Chem. B., **106**(11), 2817 (2002)

H.C. Allen, E.A. Raymond, G.L. Richmond, *Surface Structural Studies of Methane Sulfonic Acid at Air/Aqueous Solution Interfaces Using Vibrational Sum Frequency Spectroscopy*, J. Phys. Chem. A. **105**(9), 1645 (2001)

M.G. Brown, E.A. Raymond, H.C. Allen, G.L. Richmond, *The Analysis of Interference Effects in the Sum Frequency Spectra of Water Interfaces*, J. Phys. Chem. A. **104**(45), 10220 (2000)

H.C. Allen, E.A. Raymond, G.L. Richmond, *Non-linear Vibrational Sum Frequency Spectroscopy of Atmospherically Relevant Molecules at Aqueous Solution Surfaces*, Curr. Op. in Coll. & Int. Sci., **5**, 74 (2000)

E.A. Raymond, D.E. Gragson, R.A. Walker, G.L. Richmond, *A Study of the Effect of pH on Surfactants and Water Structure at the Air/Water Interface Using Sum Frequency Generation*, J. of Undergrad. Res., **3**, 145, (1997)

CONFERENCE PRESENTATIONS

“Second Harmonic Studies of Conjugated Polymer Interfaces.” Poster presentation, Western Spectroscopy Association meeting, January 2005.

“Spectroscopic Studies of Aqueous Alkali Halide Solution Surfaces.” Poster presentation, selected for Sci-Mix, Anaheim ACS meeting, March 2004.

“Adsorption of Ions at the Surface of Aqueous Salt Solutions as Investigated by Vibrational Sum-Frequency Spectroscopy.” Poster presentation, Physics and Chemistry of Liquids Gordon Research Conference, August 2003.

“Effect of Salts on Hydrogen-Bonding at the Vapor/Water Interface, as Investigated by Vibrational Sum-Frequency Spectroscopy.” Poster presentation, Western Spectroscopy Association meeting, January 2003.

“Isotopic Dilution Studies of the Vapor/H₂O Interface, as Investigated by Vibrational Sum-Frequency Spectroscopy. Poster presentation.” Poster presentation, Water and Aqueous Solutions Gordon Research Conference, August 2002.

“Hydrogen Bonding Interactions at the Vapor/Water Interface.” Oral presentation, Orlando ACS meeting, April 2002.

“Vibrational Sum-Frequency Spectroscopy of Vapor/H₂O:HOD:D₂O Interfaces.” Oral presentation, American Physical Society March Meeting, Indianapolis, March 2002.

“Isotopic Dilution Studies of the Vapor/Water Interface. Oral presentation,” Oral Presentation, Western Spectroscopy Association meeting, January 2002.

“Investigations of Interfacial Water Structure in the Presence of Atmospherically Relevant Molecules.” Oral presentation, San Diego ACS Meeting, April 2001.

“Investigations of the Vapor/Water Interface via Vibrational Sum Frequency Spectroscopy (VSFS).” Poster presentation, Western Spectroscopy Association meeting, January 2001.

“The Role of Molecular Interactions on the Surface Structure of Aqueous Methane Sulfonic Acid and Dimethyl Sulfoxide Solutions.” Oral presentation, NW Regional APS meeting, Eugene, June 2000.

“Surface Structure of Aqueous Methane Sulfonic Acid and Dimethyl Sulfoxide Solutions: Application to Atmospheric Aerosol Chemistry.” Oral presentation, San Francisco ACS meeting, April 2000.

“Surface Vibrational Spectroscopy of Aqueous Methane Sulfonic Acid Solution.” Poster presentation, Western Spectroscopy Association meeting, January 2000.