

Evan L. Neidholdt

Mail Code 127-72, Pasadena, CA 91125. Tel: (626) 395-2779 (office)

eln@caltech.edu

CAREER OBJECTIVES

Research and product development in the field of analytical instrumentation

EDUCATION

California Institute of Technology, Pasadena, CA
Ph.D, Chemical Physics/Analytical Chemistry. Thesis adviser: J.L. Beauchamp
expected January 2010

Concordia University Irvine, Irvine, CA
B.A., Chemistry and Mathematics. Undergraduate research adviser: J.W. Kenney, III
Summa Cum Laude (GPA: 3.9)
June 2005

EXPERIENCE

California Institute of Technology, Pasadena, CA, Graduate Research Assistant
Dec. 2005–Present

- Designed, prototyped, tested the switched ferroelectric plasma ionizer (SwiFerr) ion source for mass spectrometry from inception to functioning device
- Designed, prototyped and tested the ambient pressure pyroelectric ion source for mass spectrometry (APPIS) from initial idea to functioning device
- Integrated pulsed high voltage electronics and computer control interface for Field Induced Droplet Ionization (FIDI) mass spectrometry
- Interfaced nano-RDMA instrument to Thermo LCQ instrument for tandem mass-mobility measurements
- Developing apparatus for dynamic measurement of liquid droplet surface tension, for correlation with observed chemical composition changes
- Mentor to up to three undergraduate research students each summer (SURF and MURF program, Caltech)
- Built experiment specific auxiliary ion sources for use with Thermo LCQ Deca instruments: APCI, AP-MALDI
- Solved a number of unique instrumentation related problems as Head TA for Chem 6 (undergraduate P.Chem lab), to keep a wide range of instruments (ranging from very old to very modern) in working order
- Managed and performed upkeep and maintenance on laboratory instruments: Thermo LCQ Deca and Deca XP, Waters QToF 2, Ionspec FT-ICR
- Performed in-house troubleshooting and repair of the Thermo instruments for cost and time savings

Ionfinity LLC, Pasadena, CA, Consultant
Oct. 2008–June 2009

Contracted for the design, production, and testing of a novel ionization source for differential mobility spectrometry to be used in conjunction with instrumentation under development by Ionfinity

Concordia University Irvine, Irvine, CA, Undergraduate Research Assistant
2002–2005

- Designed and built computer control/DAQ interfaces for optical spectrometers using LabVIEW
- Managed conversion of classroom space to Chemical Physics laboratory space from inception to completion
- Successfully proposed funding the construction of the chemical physics labs, which resulted in full funding, and was a significant cash outlay which was greater than any previous in the sciences
- Installed/Set up key laboratory apparatus and experiments upon completion of facilities

ADDITIONAL COURSEWORK, SKILLS

Analytical methods: mass spectrometry (specialty), UV-Vis, FT-IR, Raman, fluorescence, microwave spectroscopy, LEED

Trained in the building (specifically machining) of scientific apparatus (course at UC Riverside, Riverside, CA, Summer 2003. Instructors: Jeff Lefler, Gene Ethridge) (lathe, mill, and related)

APh 109, "Introduction to Micro/Nano Fabrication Lab:" nanofabrication and characterization of simple nanoscale devices. (Caltech, Spring 2008. Instructor: Alireza Ghaffari)

Skills: Vacuum systems, prototyping and machining, CAD (Solidworks), basic TTL, LabVIEW programming

PUBLICATIONS AND PATENTS

- “Ionization Mechanism of the Ambient Pressure Pyroelectric Ion Source (APPIS) and its Application to Chemical Nerve Agent Detection” **E.L. Neidholdt** and J. L. Beauchamp, *J. Am. Soc. Mass Spec.* 2009, 20, 2093–2099.
- “Book Review: Miniaturization and Mass Spectrometry, Edited by Severine Le Gac and Albert van der Berg” **E.L. Neidholdt**, *J. Am. Chem. Soc.* 2009, 131, 7477. (DOI: 10.1021/ja903225m)
- “Switched Ferroelectric Plasma Ionizer for Ambient Mass Spectrometry” **E.L. Neidholdt** and J.L. Beauchamp. *Anal. Chem.* 2009, In preparation.
- “Switched ferroelectric plasma ionizer” **E.L. Neidholdt** and J.L. Beauchamp, Provisional Patent Application filed, 2009 (California Institute of Technology, Pasadena, CA, USA)
- “Interfacial Reactions of Ozone with Surfactant Protein B in a Model Lung Surfactant System” Kim, H.I.; Kim, H.; Shin, Y.S.; Beegle, L.; Jang, S.S; **Neidholdt, E.L.**; Goddard, W.A.; Heath, J.R.; Kanik, I.; Beauchamp, J.L. *J. Am. Chem. Soc.* 2009, Submitted for publication.
- “Ambient Pressure Pyroelectric Ion Source for Mass Spectrometry,” **E.L. Neidholdt** and J.L. Beauchamp, United States Patent Application 20080179514 (2008)
- “The Mass Spectrometer as a Chemical Laboratory: Reactions of Carbon Centered Radicals with Amino Acids in Peptides,” **E.L. Neidholdt**, J. L. Thayer, R. Hodyss, H. A. Sumner, and J.L. Beauchamp, *Proc. Nat. Acad. Sci.* 2009, In preparation.
- “Cluster Phase Chemistry: Reactivity of Metal Phenides formed from Decarboxylation of Clusters of Divalent Alkaline Earth Metals with Substituted Benzoic Acids,” **E.L. Neidholdt** and J.L. Beauchamp, *J. Phys. Chem.* 2009, In preparation.
- “Ambient Pressure Pyroelectric Ion Source for Mass Spectrometry,” **E.L. Neidholdt** and J.L. Beauchamp, *Anal. Chem.* 2007, 79, 3945–3948

PRESENTATIONS

- “Switched Ferroelectric Plasma Ionizer (SwiFerr): A Robust Ion Source for Mass Spectrometry in Harsh Environments” HEMS Meeting 2009, Santa Barbara, CA, 9/2009
- “Organic Vapor and Pharmaceuticals Analysis with the Switched Ferroelectric Plasma Ionizer (SwiFerr)” Pfizer Global R&D, Groton, CT, 8/2009
- “Manipulating Small Droplets with Pulsed Electric Fields to Examine the Physical Properties and Chemical Reactivity of Gas-Liquid Interfaces” Lake Arrowhead Ion Chemistry Conference, 1/2009, poster
- “Ions for Free: Thermally Cycled Pyroelectric Crystals and Electrocutted Liquid Droplets as Ion Sources” FACSS conference, 10/2008, Reno, NV (invited oral presentation)
- “Ionization Mechanism and Additional Applications of the Ambient Pressure Pyroelectric Ion Source” Lake Arrowhead Ion Chemistry Conference, 1/2008
- “Ambient Pressure Pyroelectric Ionization Source for Harsh Environment Mass Spectrometry” Harsh Environment Mass Spectrometry (HEMS) 9/2007, poster
- “Ambient Pressure Pyroelectric Ion Source for Mass Spectrometry” Lake Arrowhead Ion Chemistry Conference, 1/2007

HONORS AND AWARDS

- Pfizer Graduate Research Fellowship in Analytical Chemistry, 2008–2009
- Award for Outstanding Teaching Assistant, Chem 6 Winter 2008, California Institute of Technology, 2008
- 1st prize winner, Concordia University Irvine President’s Showcase of Undergraduate Research. Entry: “Low Temperature Sample Handling Techniques and Emission Spectroscopic Analysis of Bromine Gas Hydrate (Clathrate),” 2005
- Nominated for Associate Membership, Sigma Xi, 2005
- Concordia University Irvine recipient of ACS Outstanding College Chemistry Student award, Orange County Section, 2003
- GAANN Fellowship, UC Irvine. Adviser: V. Ara Apkarian, 2003
- Summer Undergraduate Research Fellowship, UC Riverside. Adviser: Chris Reed, 2002