

# NATALIE R. CRIST

## *Senior Lecturer and Laboratory Coordinator*

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Department of Chemistry  
Trinity College  
Hartford, CT 06106

## EDUCATION

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- The University of Michigan, Ann Arbor, MI** **2012**  
Ph.D. Chemistry  
Principal Advisor: Professor Mark E. Meyerhoff, Ph.D.  
Dissertation: Methods for the Detection of S-Nitrosothiols and Nitric Oxide in Blood and Breath
- The University of Michigan, Ann Arbor, MI** **2008**  
M.S. Chemistry  
Principal Advisor: Professor Mark E. Meyerhoff, Ph.D.
- The College of Wooster, Wooster, OH** **2006**  
B.A. Chemistry  
Principal Advisor: Professor Paul L. Edmiston, Ph.D.  
Dissertation: Development and Testing of a Chemical Sensor for TNT Based on Planar Integrated Optical Waveguide Attenuated Total Reflectance Spectrometry

## TEACHING EXPERIENCE

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- Senior Lecturer and Laboratory Coordinator** **Fall 2019-present**  
Department of Chemistry, Trinity College, Hartford, CT
- **Introductory Chemistry I Lab**
  - **Elementary Organic Chemistry I Lab**
  - **Elementary Organic Chemistry II Lab**
- Assistant Professor** **Fall 2017-Spring 2019**  
Department of Chemistry, University of Hawai'i at Hilo, Hilo, HI
- **Principles of Analytical Chemistry**, Chemistry 274; teaching lecture and lab to 20 students. Topics include sample preparation, statistics, electrochemistry, acid/base equilibria and titrations, spectroscopy, and separations.
  - **Instrumental Analysis**, Chemistry 431; teaching lecture and lab to 10 students. Topics include signal to noise ratios, instrumental theory of mass spectrometry, chromatography, and spectroscopy. This class is for chemistry majors.
  - **General Chemistry I**, Chemistry 124/161; teaching first semester general chemistry lecture to 40-125 students and two to four sections of general chemistry lab to 20-24 students per section. Topics include atomic structure, solubility, gas laws, and thermochemistry. This class is for science majors.

- **General Chemistry II**, Chemistry 125/162; teaching second semester general chemistry lecture to 35-95 students. Topics include kinetics, equilibrium, acid-base chemistry, and electrochemistry. This class is for science majors.

**Instructor**

**Fall 2013-Summer 2017**

Department of Chemistry, University of Hawai'i at Hilo, Hilo, HI

- **Introductory Chemistry**, Chemistry 114/151; teaching introductory chemistry to 50 students who are preparing to take General Chemistry I. Topics include gas laws, acid-base chemistry, and atomic structure.
- **General Chemistry I and II**, Chemistry 161 and 162
- **Instrumental Analysis**, Chemistry 431

**Visiting Assistant Professor**

**Fall 2012-Spring 2013**

Department of Chemistry, Albion College, Albion, MI

- **Structure and Equilibrium**, Chemistry 121, Fall 2012, Spring 2013; taught first semester general chemistry lecture to 18-24 students and general chemistry lab to 15-19 students. Topics included atomic and molecular structure, thermochemistry, equilibrium, gas laws, and acid-base chemistry. This class is for science majors as well as students needing a science credit.
- **Chemical Analysis**, Chemistry 206, Fall 2012; taught 13 chemistry majors and minors the fundamentals of analytical chemistry. The course focuses on the collection and interpretation of quantitative results, as well as the basics of instrumental analysis.
- **Inorganic Chemistry: Introduction**, Chemistry 123, Spring 2013; taught second semester general chemistry lecture to 28 students and a lab section to 24 students. Topics include solubility, electrochemistry, and kinetics. This course is for chemistry and other science majors and minors.

**Adjunct Instructor**

**Fall 2010-Winter 2011**

Science Department, Henry Ford Community College, Dearborn, MI

- **Principles of General and Inorganic Chemistry I**, Chemistry 141, Winter 2011; taught general chemistry lecture for 48 students and lab for 24 students twice a week, covering topics such as atomic structure and bonding, stoichiometry, thermodynamics, gas laws, oxidation-reduction and acid-base chemistry. This class is for science majors.
- **Principles of Chemistry**, Chemistry 131, Fall 2010; taught lecture for 2 sections of 48 students twice a week, covering topics such as stoichiometry, acids and bases, kinetics, oxidation-reduction, and solution chemistry. This class is designed for nursing and health careers students.

**Research Mentor**

**2008-2012**

Department of Chemistry, University of Michigan, Ann Arbor, MI

- Trained and advised five graduate and six undergraduate students performing research in the lab on various instrumental techniques, such as using the chemiluminescence Nitric Oxide Analyzer, UV-Vis spectroscopy, fluorescence spectroscopy, and both amperometric and potentiometric sensors.

**Graduate Student Instructor** **2006-2008**

Department of Chemistry, University of Michigan, Ann Arbor, MI

- **General Chemistry Laboratory** (Chemistry 125/126, instructor: Nancy Kerner) Fall 2006, Winter 2007; taught and graded two sections of 24 students once a week; conducted office hours
- **Introduction to Chemical Analysis Laboratory** (Chemistry 242, instructor: Jason Bennett) Winter 2008; taught 26 students various analytical techniques and oversaw their independent projects associated with the course

**Course Administrator** **Fall 2007**

Department of Chemistry, University of Michigan, Ann Arbor, MI

- **General Chemistry Laboratory** (Chemistry 125/126: enrollment: approx. 1400, instructor: Nancy Kerner); trained and supervised 30 Graduate Student Instructors, held review lectures, kept track of and organized grades and grade statistics, posted lecture materials online

**Instructor** **2007-2008, 2010-2012**

Department of Chemistry, University of Michigan, Ann Arbor, MI

- **Women in Science and Engineering**; taught 24 middle school girls various chemistry experiments and encouraged them to pursue a career in science during a week long camp in the summer
- **IBM Stem Camp**; taught approx. 15 deaf and hard of hearing high school students various chemistry experiments during a one or two day camp during the summer

## **RESEARCH EXPERIENCE**

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**Assistant Professor** **2017-2019**

Department of Chemistry, University of Hawai'i at Hilo, Hilo, HI

- Investigating teaching general chemistry the traditional approach versus the atoms first approach to determine how to maximize student achievement.
- Working with undergraduate students to use optical detection methods to analyze soil and water samples from around the Big Island of Hawai'i for phosphorus content.

**Graduate Research Assistant** **2006-2012**

Department of Chemistry, University of Michigan, Ann Arbor, MI

- Developed new method for the detection of nitric oxide in exhaled nasal breath using nitrate ion-selective electrodes and oxyhemoglobin
- Developed chemiluminescent assay system for the detection of *S*-nitrosothiols in animal blood samples
- Used the chemiluminescent assay system to determine the absence of *S*-nitrosothiols from exhaled breath condensate

**Research Assistant for Senior Independent Study** **2005 - 2006**

Department of Chemistry, The College of Wooster, Wooster, Ohio

- Made integrated optical waveguides and molecularly imprinted sol-gel materials for the use in an optical chemical sensor for TNT
- Performed integrated optical waveguide attenuated total reflectance spectrometry using a krypton-argon laser to detect the presence of gaseous TNT

**Summer Research Assistant** **2005**

Department of Chemistry, The College of Wooster, Wooster, Ohio

- Prepared molecularly imprinted sol-gel materials to be used in a chemical sensor for the hydrocarbon fluorene
- Performed fluorescence spectrometry

**Research Assistant for First Year Research Experience** **2003**

Department of Chemistry, The College of Wooster, Wooster, Ohio

- Studied the crystal structures of eighty inorganic compounds to be further examined in a senior Independent Study

**HONORS**

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- American Institute of Chemists Award (2006)
- Awarded Honors on Senior Independent Study project
- Awarded four-year Science and Mathematics Scholarship

**PRESENTATIONS**

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**Panelist for “Labor Pains: Fighting for Women in Science”** University of Hawai’i at Hilo, Hilo, HI, April 23, 2015.

**Crist, N.R.;** Zajda, J.; Colletta, A.; Brownstein, J.; Meyerhoff, M.E Measurement of Exhaled Nasal Breath Nitric Oxide Levels Using Oxy-Hemoglobin Reagent with Nitrate Ion-Selective Electrode Detection. Presented at the 64<sup>th</sup> Annual Pittsburgh Conference, Philadelphia, PA, March 20, 2013.

**Walker, N.R.;** Meyerhoff, M.E Chemiluminescent Detection of S-Nitrosothiols using a Sensitive and Selective Organoselenium Catalyst. Presented at the 61<sup>st</sup> Annual Pittsburgh Conference, Orlando, FL, March 1, 2010.

**Walker, N.R.;** Meyerhoff, M.E. Amperometric Detection of S-Nitrosothiols in Exhaled Breath Condensate. Presented at the 60<sup>th</sup> Annual Pittsburgh Conference, Chicago, IL, March 11, 2009.

**PUBLICATIONS**

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Zajda, J.; **Crist, N.R.;** Malinowska, E.; Meyerhoff, M.E. Asymmetric Anion-Selective Membrane Electrode for Determining Nitric Oxide Release Rates from Polymeric Films/Electrochemical Devices. *Electroanalysis* **2015**, *28*, 277-281.

Park, J.Y.; White, J.B.; **Walker, N.;** Kuo, C-H.; Cha, W.; Meyerhoff, M.E.; Takayama, S. Responses of endothelial cells to extremely slow flows. *Biomicrofluidics* **2011**, *5*, 022211.

**Walker, N.R.;** Linman, M.J.; Timmers, M.M.; Dean, S.L.; Burkett, C.M.; Lloyd, J.A.; Keelor, J.D.; Baughman, B.M.; Edmiston, P.L. Selective Detection of Gas-Phase TNT by Integrated Optical Waveguide Spectrometry using Molecularly Imprinted Sol-gel Sensing Films. *Analytica Chimica Acta* **2007**, *1*, 82-91.

Carlson C.A., Lloyd, J.A., Dean S.L., **Walker, N.R.**, Edmiston, P.L. Sensor for Fluorene Based on the Incorporation of an Environmentally Sensitive Fluorophore Proximal to a Molecularly Imprinted Binding Site. *Analytical Chemistry* **2006**, 78, 3537-3542.

## **SERVICE**

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- Health Professions Advisory Committee member at Trinity College
- Search committees for Biology and Chemistry at UH Hilo
- Judge at Hawaii District Science and Engineering Fair
- Speaker at Waiakea High School Amelia Earhart Girls Engineering Day
- Ad Hoc Committee for the Development of Instructor Promotion to Tenure-Track Assistant Professor Guidelines/Criteria at UH Hilo
- Professional Development Committee at UH Hilo
- Senate Executive Committee for the College of Natural and Health Sciences at UH Hilo

## **GRANTS**

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**Mellon Inclusive Teaching and Advising Grant** “Evaluating Chemistry Department Policies and Practices to Ensure Inclusivity. Natalie Crist, Timothy Curran, Edward Fitzgerald, Michelle Kovarik