

# Eva C. Uribe

Citizenship: U.S.A

Phone: (925) 294 6566 | Email: euribe@sandia.gov

Address: 3400 Stevenson Blvd., Apt. B31, Fremont, CA 94538

## EDUCATION

### University of California, Berkeley

2011 – 2016

Ph.D. Chemistry

GPA: 3.952

### Yale University, New Haven, CT

2007 – 2011

B. S. Chemistry and Political Science

*Distinction in both majors, cum laude, GPA: 3.82*

## EXPERIENCE

### Systems Research Analyst, Sandia National Laboratories

2017 – current

- + Technical lead for the Civilian Cyber Strategic Initiative
- + Developing and applying systems research and analysis tools for a broad spectrum of national security challenges, including risk perception, nuclear deterrence, and cybersecurity

### Stanton Nuclear Security Postdoctoral Fellow

2016 – 2017

#### Center for International Security and Cooperation, Stanford University

- + Investigated proliferation attributes of thorium fuel cycle facilities
- + Identified proliferation pathways inherent to nuclear spent fuel reprocessing in the thorium fuel cycle
- + Researched impact of irradiated thorium reprocessing on fissile materials stockpiles and consequences for international nonproliferation efforts

### Graduate Student Researcher, University of California, Berkeley

2011 – 2016

Affiliate, Lawrence Berkeley National Laboratory

2011 – 2016

Guest Graduate Student Researcher, Lawrence Livermore National Laboratory

2014 – 2016

- + Synthesized, characterized, and tested solid-phase, organically-modified mesoporous silica materials for actinide sequestration from aqueous solutions
- + Mastered synthesis of ordered mesoporous silica materials (SBA-15) using surfactant-based templates, and functionalization using trialkoxysilane-bearing organic ligands
- + Mastered materials characterization techniques: solid-state nuclear magnetic resonance spectroscopy, infrared spectroscopy, nitrogen adsorption. Gained familiarity with electron microscopy, x-ray absorption spectroscopy, atomic emission spectroscopy, electrospray ionization mass spectrometry, gas chromatography-mass spectrometry
- + Gained proficiency in manipulation of actinide (plutonium, neptunium) oxidation states in aqueous solutions using electrochemistry and measurement of oxidation state using spectrophotometry
- + Mastered basic radioanalytical chemistry techniques: alpha/beta/gamma spectroscopy, radiochemical separations for stock purifications, and batch sorption experiments, including working in a negative pressure glove box environment

- + Investigated formation of self-assembled ligand monolayers for functionalized silica surfaces using nuclear magnetic resonance spectroscopy
- + Investigated sorption of uranium, plutonium, and europium on functionalized mesoporous silica materials from mineral acid solutions
- + Investigated sorption of plutonium on ordered mesoporous carbon materials from mineral acid solutions
- + Completed coursework in analytical nuclear chemistry techniques, nuclear security technology and policy, U.S. national security policy, quantum mechanics
- + Conducted policy analysis research to investigate the role of cross-domain deterrence in historical case studies in U.S. foreign policy

### **Graduate Student Instructor and Teaching Assistant**

**2010 – 2015**

University of California, Berkeley (GSI)

2011 – 2015

Yale University (TA)

2010

- + Radiochemical Methods in Nuclear Technology and Forensics, Spring 2015
  - Supervised graduate and undergraduate laboratory exercises, conducted laboratory lectures, held discussion sections, developed and graded homework and exam materials, graded laboratory reports, performed maintenance and diagnostics on instruments (HPGe gamma spectrometers, Geiger-Müller counters, NaI detectors, surface barrier detectors for alpha spectroscopy, electrodeposition cells for alpha plating)
- + Nuclear Security: The Nexus between Policy and Technology, Spring 2014
  - Conducted discussion sections and tutoring sessions, mentored student projects, graded exams, facilitated group learning for students with technical and non-technical public policy backgrounds
- + Instrumental Methods in Analytical Chemistry, Fall 2012
  - Supervised advanced undergraduate laboratory exercises for the following instruments: GC-MS, ICP-AES, CE; held discussion sections, advised students on independent research projects, developed and graded exams, graded laboratory reports
- + General Chemistry, Fall 2011
  - Supervised introductory laboratory exercises for Freshman, graded laboratory reports, exams, and homework, conducted discussion sections
- + Freshman Organic Chemistry, Fall 2010
  - Conducted discussion sections, held individual tutoring sessions for students having particular difficulties succeeding in the course

### **Undergraduate Student Researcher, Yale University**

**2010 – 2011**

- + Applied cryogenic ion vibrational predissociation spectroscopic techniques to study transient structure and reaction mechanisms of protein-derived catalysts
- + Assisted in optimizing an ion cyclotron resonance mass spectrometer to study the kinetics of van der Waals cluster formation of gaseous molecular ions

### **Next Generation Safeguards Initiative Student Intern, LANL**

**2008 – 2009**

- + Worked with the Safeguards and Security Group in the Nonproliferation Division to support U.S. DOE laboratories for the Entry into Force of the Additional Protocol, and to investigate the international nonproliferation benefits of implementing the Additional Protocol in the nuclear weapons states

## PUBLICATIONS

- + **E. Uribe** et al. "Elimination of Pathways Producing Uranium-232 in the Thorium Fuel Cycle," in preparation, 2019
- + M. Nacht, P. Schuster, **E. Uribe**, "Cross-Domain Deterrence in American Foreign Policy," in *Cross-Domain Deterrence: Strategy in an Era of Complexity*, Ed. Erik Gartzke and Jon R. Lindsay, Oxford University Press, 2019
- + **E. Uribe**, "Protactinium Presents a Challenge for Safeguarding Thorium Reactors," proceedings from the Symposium on International Safeguards: Building Future Safeguards Capabilities, International Atomic Energy Agency, November 2018
- + **E. Uribe**, "Thorium Power has a Protactinium Problem," *Bulletin of the Atomic Scientists*, 2018
- + H. E. Mason, **E. Uribe**, J. A. Shusterman, "Rapid Acquisition of Data Dense Solid-state CPMG NMR Spectral Sets using Multi-dimensional Statistical Analysis," *Phys. Chem. Chem. Phys.*, 2018, **20**, 18082
- + **E. Uribe**, H. E. Mason, J. A. Shusterman, W. W. Lukens, "Monolayer Formation and Sorption of U(VI) on Acetamide Diethylphosphonate-Functionalized Mesoporous Silica," *Dalton Transactions*, 2017, **46**, 5441
- + **E. Uribe**, H. E. Mason, J. A. Shusterman, A. Bruchet, H. Nitsche, "Probing the Interaction of U(VI) with phosphonate-functionalized mesoporous silica using solid-state NMR spectroscopy," *Dalton Transactions*, 2016, **45**, 10447
- + T. Parsons-Moss, S. Jones, J. Wang, Z. Wu, **E. Uribe**, D. Zhao, H. Nitsche, "Reduction of Plutonium in Acidic Solutions by Mesoporous Carbons," *Journal of Radioanalytical and Nuclear Chemistry*, 2016, **307**, 2593
- + J. A. Shusterman, H. E. Mason, J. Bowers, A. Bruchet, **E. Uribe**, A. B. Kersting, H. Nitsche, "Development and Testing of Diglycolamide Functionalized Mesoporous Silica for Sorption of Trivalent Actinides and Lanthanides," *Applied Materials & Interfaces*, 2015, **7**, 20591
- + **E. Uribe**, "The Role of Nuclear Engineers in Society," in *Reflections on the Fukushima Daiichi Nuclear Accident: Toward Social-Scientific Literacy and Engineering Resilience*, ed. Joonhong Ahn, et al., Springer Open, 2015, 338
- + J. M. Gates, K. E. Gregorich, O. R. Gothe, **E. C. Uribe**, G. K. Pang, et al., "Decay spectroscopy of element 115 daughters:  $^{280}\text{Rg} \rightarrow ^{276}\text{Mt}$  and  $^{276}\text{Mt} \rightarrow ^{272}\text{Bh}$ ," *Physical Review C* **92**, 021301(R), 2015
- + **E. Uribe**, M. A. Sandoval, M. N. Sandoval, R. M. Leitch, B. D. Boyer, "A Comparison of the Additional Protocols of the Five Nuclear Weapon States and the Ensuing Safeguards Benefits for International Nonproliferation Efforts," INMM 50<sup>th</sup> Annual Meeting Proceedings, July 2009
- + M. A. Sandoval, **E. Uribe**, B. Boyer, R. Stevens, "NGSI Student Activities in Open Source Information Analysis in Support of the Training Program to Prepare the U.S. DOE Laboratories for the Entry into Force of the Additional Protocol," INMM 50<sup>th</sup> Annual Meeting Proceedings, July 2009
- + B. Boyer, R. Stevens, **E. Uribe**, M. A. Sandoval, "Training Program to Prepare the U.S. DOE Laboratories for Entry into Force for the Protocol Additional to the Agreement Between the United States of America and the International Atomic Energy Agency for the Application of Safeguards in the United States of America," INMM 50<sup>th</sup> Annual Meeting Proceedings, July 2009

## PRESENTATIONS AND POSTERS

- + E. Uribe, "The Impact of Protactinium on the Proliferation Resistance of Thorium Power," invited talk at the 2019 Spring Meeting of the European Materials Research Society, Nice, France, May 2019
- + **E. Uribe**, "Protactinium Presents a Challenge for Safeguarding Thorium Reactors," poster at the Symposium for International Safeguards: Building Future Safeguards Capabilities, International Atomic Energy Agency, Vienna, Austria, November 2018
- + E. Uribe, "Nuclear Power: Has the True Renaissance Arrived?" seminar at the New Research Ideas Forum, Sandia National Laboratories, Albuquerque, NM, October 2018
- + **E. Uribe**, "Confront Catastrophe Confidently," presented at Sandia National Laboratories' TED-like Talk Series, Livermore, California, June 2018. Also presented at the Bay Area Science and Innovation Consortium Board Meeting, June 2019
- + **E. Uribe**, "Thorium reactors: Silver bullet, or proliferation hazard?" Science Seminar presentation at the Center for International Security and Cooperation, Stanford University, February 2017
- + **E. Uribe**, "Proliferation Vulnerabilities of the Thorium Fuel Cycle," invited seminar presentation at the Program on Science and Global Security, Princeton University, October 2016
- + **E. Uribe**, "Proliferation Risks of Thorium Reactors," oral presentation at the Stanton Foundation Nuclear Security Fellows Seminar, Washington, D.C., October 2016
- + **E. Uribe**, H. Mason, J. Shusterman, A. Bruchet, H. Nitsche, "Evaluating phosphonate-modified mesoporous silica for the sequestration of U(VI)," oral presentation at the 251<sup>st</sup> American Chemical Society National Meeting and Exposition, San Diego, CA, March 2016
- + **E. Uribe**, T. Parsons-Moss, J. Shusterman, H. Mason, H. Nitsche, "Fundamental Study of U(VI) Sorption on Phosphonate-modified Mesoporous Silica," oral presentation at the International Chemical Congress of Pacific Basin Societies 2015, Honolulu, HI, December 2015
- + **E. Uribe**, "Protactinium and the Proliferation Risks of Thorium Reactors" Invited talk at the 27<sup>th</sup> International Summer Symposium on Science and World Affairs, Nagasaki, Japan, July 2015. Also presented as a webinar in the Global Security Webinar Series in September, 2015
- + **E. Uribe**, J. Shusterman, A. Bruchet, H. Mason, and H. Nitsche, "Interactions of Uranium and Plutonium with Phosphonate-Functionalized Mesoporous Silica," oral presentation at the 249<sup>th</sup> American Chemical Society National Meeting and Exposition, Denver, CO, March 2015
- + M. Nacht, P. Schuster, and **E. Uribe**, "Cross Domain Deterrence: Cases from American Foreign Policy," Paper presented at the Conference on Cross Domain Deterrence at the Institute on Global Conflict and Cooperation, University of California, San Diego, November 2014. Also presented at the Cross Domain Deterrence Seminar at Lawrence Livermore National Laboratory, November 2014 and at the "New Look at the 21<sup>st</sup> Century Cross Domain Deterrence Initiative" at the George Washington University, May 2016
- + **E. Uribe**, J. Shusterman, A. Bruchet, H. Nitsche, "From the ACS Nuclear Chemistry Summer School to Actinide Chemistry at UC Berkeley" Talk at the W. Frank Kinard Memorial Symposium, 248<sup>th</sup> ACS National Meeting and Exposition, San Francisco, CA, August 2014
- + **E. Uribe**, "Challenges of Safeguarding Nuclear Reprocessing Facilities" Invited talk at the 26<sup>th</sup> International Summer Symposium on Science and World Affairs, Princeton, NJ, July 2014

- + **E. Uribe**, “Novel Solid-Phase Extraction Materials for Actinide Separations and Nuclear Fuel Cycle Security: A Multidisciplinary Approach” Oral presentation at the University Industry Technical Interchange in Walnut Creek, CA, June 2014
- + K. Kmak, W. Krantz, **E. Uribe**, E. Suzuki, B. Goldblum, “India and the Thorium Fuel Cycle: Implications for the Nonproliferation Regime” Poster at the University Industry Technical Interchange in Walnut Creek, CA, June 2014
- + J. Shusterman, **E. Uribe**, A. Bruchet, T. Parsons-Moss, H. Nitsche, “Solid Phase Extraction Materials for Separations of Actinides and Fission Products,” Poster at Actinides 2013 in Karlsruhe, Germany, July 2013
- + **E. Uribe**, T. Parsons-Moss, H. Nitsche, “Functionalized Mesoporous Materials for Radionuclide Separations,” Poster at the University Industry Technical Interchange in Lansing, MI, June 2013
- + **E. Uribe** “Functionalized Mesoporous Materials for the Separation of Trivalent Actinides and Lanthanides,” Presentation at the Graduate Research Conference at the University of California, Berkeley, April 2013

## WORKSHOPS AND SUMMER SCHOOLS

- + Information Design Assurance Red Team (IDART™) Methodology Course, Albuquerque, NM (2019)
- + Strategic Competition in Cyberspace: Challenges and Implications, Center for Global Security Research, Lawrence Livermore National Laboratory, California (2019)
- + Workshop on Safeguards Analytical Services, Seibersdorf, Austria (2018)
- + 2018 CYBERWARCON, Washington, D.C. (2018)
- + Cyberspace, Information Strategy, and International Security, Center for Global Security Research, Lawrence Livermore National Laboratory, California (2018)
- + The Stanton Foundation Nuclear Security Fellows Seminar, Washington, D.C. (2016)
- + 27<sup>th</sup> International Summer Symposium on Science and World Affairs, Union of Concerned Scientists, Nagasaki University (2015)
- + 26<sup>th</sup> International Summer Symposium on Science and World Affairs, Union of Concerned Scientists, Princeton University (2014)
- + Sather Center Workshop on the Thorium Fuel Cycle and Nuclear Data, UC Berkeley (2013)
- + Summer School on Actinide Science and Applications, Joint Research Center Institute for Transuranium Elements/Karlsruhe Institute of Technology (2013)
- + International Nuclear Safeguards Policy and Information Analysis Course, Monterey Institute of International Studies (June 2012)
- + Public Policy Nuclear Threats Winter Conference, UCDC Conference Center, Washington, D.C. (February 2012)
- + Advanced Summer School of Nuclear Engineering and Management with Social Scientific Literacy: Reflections on the Fukushima Nuclear Accident, University of California, Berkeley (August 2011)
- + ACS Summer School in Nuclear Chemistry, San Jose State University (June-July 2012)
- + Global Issues Seminar: Islam and the West, University of Notre Dame (2006)

## AWARDS

- + Stanton Nuclear Security Postdoctoral Fellowship, Center for International Security and Cooperation (2016-2017)
- + Outstanding Graduate Student Instructor Award (2015-2016)
- + National Science Foundation Graduate Research Fellow (2012-2016)
- + Phi Beta Kappa Society Inductee (2011)
- + J. Robert Oppenheimer Scholarship, outstanding promise in the arts or sciences (2007)