Andrew S. Voyles, EIT

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Education

University of California, Berkeley — Berkeley, California
Ph.D. Candidate, Nuclear Engineering — Expected Graduation: **May, 2018**
Nuclear Regulatory Commission Graduate Fellowship

- Dissertation : "Nuclear Excitation Functions for Production of Novel Medical Radionuclides"
- Research Advisor: Lee A. Bernstein

University of Utah, Honors College — Salt Lake City, Utah
B.S., *cum laude*, Chemical Engineering — **May, 2013**
Minors: Nuclear Engineering, Chemistry
University of Utah President's Club Scholarship, Dean's List, 2009 - 2013

Research Experience

University of California, Berkeley — Berkeley, California
Graduate Student Researcher / NRC Fellow — **August, 2014 – Present**

- Researched "Nuclear Excitation Functions for Production of Novel Medical Radionuclides" — measurement of cross-sections for neutron-induced and charged particle-induced reaction pathways for the production of emerging novel therapeutic and diagnostic medical radionuclides, with high specific activity.
- Developed intense mono-energetic neutron source capabilities for production of novel therapeutic radionuclides.
- Research carried out at the Lawrence Berkeley National Laboratory's 88-Inch Cyclotron and the Los Alamos National Laboratory's Isotope Production Facility at LANSCE.

University of Oslo — Oslo, Norway
Visiting Researcher, Department of Physics — **April – May, 2018**

- Studied preparation of a chelate-conjugated biomolecule carrying a radionuclide, in the Nuclear and Energy Physics group.
- Focus on the radiolanthanide ^{161}Tb and a peptidomimetic displaying dual-receptor targeting through the endothelial growth factor receptor and the HER2/neu antigen.

Institute for Laser Engineering, Osaka University — Osaka, Japan
Visiting Researcher — **February – March, 2015**

- Research and evaluation of solid debris collection diagnostics in search of evidence of nuclear-plasma interactions.

University of Utah — Salt Lake City, Utah
Undergraduate Researcher, Nuclear Engineering — **August, 2010 – August, 2011**

- Developed simulation of Neutron Activation Analysis, an analytical technique using neutron irradiation of matter to determine highly precise compositions of samples.
- Simulation optimizes irradiation times of samples to minimize resulting radioactivity.
- Presented paper at 2011 ANS Student Conference, 2011 2nd Utah Detection Conference.

Undergraduate Researcher, Chemistry — **August, 2009 – May, 2010**

- Synthesis and characterization of metal-doped Cadmium-Selenium quantum dots used to produce photonic crystals structured after iridescent scales of several Brazilian beetles.
- Applications include fully-optical circuitry and tunable, customizable photoluminescent sensors for desired molecules and/or cells.
- Later research involved sol-gel dip-coating quantum dots for use in geothermal wells.

University of West Florida Pensacola, Florida
Visiting Researcher, Department of Physics **May, 2008 – January, 2009**

- Modeled specific heat capacity anomalies of 4'-octyl-4-biphenyl-carbonitrile liquid crystals, due to the effect of mesophase transitions.
- Research proceeded to place third in the 2009 Florida State Science Fair, and as a finalist in the 2009 Intel International Science and Engineering Fair.

Teaching Experience

University of California, Berkeley Berkeley, California
Graduate Student Instructor

- NE 101 / 210M — Nuclear Reactions and Radiation **Fall 2015**
  Wrote and graded homework sets for class of 41 undergraduate and graduate students, and led weekly discussion sections for entire class on supplementary material and applications of course material. Mentored students through semester in their coursework, and helped doctoral-track graduate students prepare for their departmental screening exams in this topic.

University of Utah Salt Lake City, Utah
National Science Foundation Outreach Mentor **May, 2010 – May, 2013**

- Created and presented hands-on demos to local schools, to advocate engineering and science careers, focusing on historically underrepresented demographics.

Teaching Assistant

- CH EN 2300 — Thermodynamics I **Spring 2013**
- NUCL 3000 / 5030 — Nuclear Principles in Engineering **Fall 2011**
  Designed semester-long computational simulation projects using GEANT4 for class of 63 undergraduate and graduate students, after teaching GEANT4 programming to class. Mentored students through semester in developing their projects, as well as coursework.

Selected Publications

Andrew S. Voyles, Lee A. Bernstein, Eva R. Birnbaum, Jonathan W. Engle, Stephen A. Graves, Toshihiko Kawano, Amanda M. Lewis, and Francois M. Nortier, *Measurement of nuclear excitation functions for proton induced reactions (E_p = 40–90 MeV) on natural Nb.* Nuclear Instruments and Methods in Physics Research B, (Submitted 2018).

Mauricio Ayllon, Parker A. Adams, Joseph D. Bauer, Jon C. Batchelder, Tim A. Becker, Lee A. Bernstein, Su-Ann Chong, Jay James, Leo E. Kirsch, Ka-Ngo Leung, Eric F. Matthews, Jonathan T. Morrell, Paul R. Renne, Andrew M. Rogers, Daniel Rutte, **Andrew S. Voyles**, Karl Van Bibber, and Cory S. Waltz, *Design, construction, and characterization of a compact DD neutron generator designed for $^{40}Ar/^{39}Ar$ geochronology.* Nuclear Instruments and Methods in Physics Research A, (Submitted 2018).

A.S. Voyles, M.S. Basunia, J.C. Batchelder, J.D. Bauer, T.A. Becker, L.A. Bernstein, E.F. Matthews, P.R. Renne, D. Rutte, M.A. Unzueta, and K.A. van Bibber, *Measurement of the ^{64}Zn,^{47}Ti(n,p) Cross Sections using a DD Neutron Generator for Medical Isotope Studies.* Nuclear Instruments and Methods in Physics Research B **410** (2017) 230–239. `http://dx.doi.org/10.1016/j.nimb.2017.08.021`

Contributed Talks

A.S. Voyles, "Isotope production cross section measurements at the HFNG, LANL-IPF, and LBNL." 14th Nordic Meeting on Nuclear Physics, Longyearbyen, Norway. ??? May 2018.

A.S. Voyles, "Cross-Section Measurements for Novel Medical Radionuclides at UCB/LBNL: The Challenge of 'Simple' Experiments." UC Berkeley NE Dept. Graduate Colloquium, Berkeley, CA. 12 February 2018. (invited)

A.S. Voyles, "Medical Isotope Production at Berkeley." University of Oslo Nuclear Physics Summer School, Oslo, Norway. 19 May 2017. (invited)

A.S. Voyles, "Spin Distribution of Excited Nuclear States in ^{nat}Fe(p,αn)." 6th Workshop on Nuclear Level Density and Gamma Strength, Oslo, Norway. 08 May 2017.

A.S. Voyles, "Experimental Activities in Berkeley." US National Nuclear Data Week 2016 (CSEWG), Upton, NY. 14 November 2016.

A.S. Voyles, "^{64}Cu and ^{47}Sc (n,p) Cross-Section Measurements for Medical Radionuclide Production." 16th International Workshop on Targetry and Target Chemistry, Santa Fe, NM. 30 August 2016.

A.S. Voyles, "Neutron Cross-Sections for Radionuclide Production." University & Industry Technical Interchange 2016 Review Meeting, Raleigh, NC. 07 June 2016.

A.S. Voyles, "GEANT4 Simulation of Irradiation Facilities and Neutron Sources at University of Utah TRIGA for Nuclear Forensics and Detection." AICHE Annual Meeting, Minneapolis, MN. 19 October 2011.

A.S. Voyles, "GEANT4 Simulation of Irradiation Facilities and Neutron Sources at University of Utah TRIGA for Nuclear Forensics and Detection." 2nd National Conference in Advancing Tools and Solutions for Nuclear Material Detection, Salt Lake City, UT. 02 May 2011.

A.S. Voyles, "GEANT4 Simulation of Irradiation Facilities at University of Utah TRIGA (2011)." ANS Student Conference, Atlanta, GA. 15 April 2011.

Certifications

- Licensed in Utah as Engineer in Training (EIT, ID# 13-802-04) **April, 2012**

Computer Skills

Languages	Java, C/C++, Python
Tools	git, MATLAB, Mathematica, Maple, LaTeX, Arduino, shell, bash, SQLite, COMSOL Multiphysics, Aspen, ANSYS Fluent
Nuclear Software	EXFOR, GEANT4, MCNP/MCNPX radiation simulation codes

Lab Skills

- Radionuclide labeling via chelate-conjugated biomolecules.
- Radio-HPLC, radio-TLC, and solid-phase extraction radiochemical purification.
- HPGe Gamma spectroscopy, radiation detection and measurement.
- Design and implementation of PID process control systems.
- Operation of heat exchanger, distillation column, ebulliometer (classroom experience).
- ^{1}H and ^{13}C NMR , IR characterization and analysis, chromatography.
- Organic laboratory synthesis and purification techniques.

Professional Service

American Nuclear Society

- Program Chair, Northern California Section – since 2016
- Executive Committee, Northern California Section – since 2016
- Webmaster, Utah Student Section 2011 – 2013

Professional Society Memberships

American Physical Society	– since 2016
American Nuclear Society	– since 2011
Alpha Nu Sigma Nuclear Engineering Honor Society	– since 2011
Tau Beta Pi National Engineering Honor Society	– since 2010
Phi Eta Sigma National Honor Society	– since 2010
American Institute of Chemical Engineers	– since 2009

Honors and Awards

University of California, Berkeley

- Department of Nuclear Engineering Outstanding Service Award — 2016
- Nuclear Regulatory Commission Graduate Fellowship — – since 2015

University of Utah

- Undergraduate Research Scholar Award — May, 2013
- University of Utah President's Club (Full Ride) Scholarship — 2009 – 2013
- Dean's List — 2009 – 2013
- Neil R. Mitchell Scholarship in Engineering — 2012
- Chevron Scholarship in Engineering — 2011
- Theodore Verender Hanks Scholarship in Science & Engineering — 2011
- Don Dahlstrom Scholarship in Chemical Engineering — 2010
- College of Science Dean's Scholarship, University of Utah — 2010

International Baccalaureate Diploma Recipient — July, 2009

Finalist: Intel International Science and Engineering Fair — May, 2009

3rd Place: Florida State Science Fair — April, 2009