

# Andrew S. Voyles, Ph.D., EIT

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## EDUCATION

### University of California, Berkeley

Ph.D., Nuclear Engineering  
Nuclear Regulatory Commission Graduate Fellowship

Berkeley, California  
**August, 2018**

### University of Utah, Honors College

B.S., *cum laude*, Chemical Engineering  
Minors: Nuclear Engineering, Chemistry  
University of Utah President's Club Scholarship, Dean's List, 2009 - 2013

Salt Lake City, Utah  
**May, 2013**

## RESEARCH EXPERIENCE

### University of California, Berkeley

*Graduate Student Researcher / NRC Fellow*

Berkeley, California  
**August, 2014 – Present**

- Dissertation Title: “Nuclear Excitation Functions for the 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.
- Dissertation Advisor: Dr. Lee A. Bernstein, University of California, Berkeley
- 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

*Visiting Researcher, Department of Physics*

Oslo, Norway  
**April – May, 2018**

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

### Institute for Laser Engineering, Osaka University

*Visiting Researcher*

Osaka, Japan  
**February – March, 2015**

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

### University of Utah

*Undergraduate Researcher, Nuclear Engineering*

Salt Lake City, Utah  
**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 2<sup>nd</sup> 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***Visiting Researcher, Department of Physics*

Pensacola, Florida

**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***Graduate Student Instructor*

Berkeley, California

- 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***National Science Foundation Outreach Mentor*

Salt Lake City, Utah

**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.

GRADUATE  
SUPERVISION:**Advisee Name****Organizational Affiliation**

Nora Pettersen

University of Oslo, M.S. student

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, *Excitation functions for  $(p,x)$  reactions of niobium in the energy range of  $E_p = 40\text{--}90$  MeV*. Nuclear Instruments and Methods in Physics Research B, **429** (2018) 53–74. <http://dx.doi.org/10.1016/j.nimb.2018.05.028>

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  $^{40}\text{Ar}/^{39}\text{Ar}$  geochronology*. Nuclear Instruments and Methods in Physics Research A, **903** (2018) 193–203. <http://dx.doi.org/10.1016/j.nima.2018.04.020>

**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  $^{64}\text{Zn}, ^{47}\text{Ti}(n,p)$  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 Activities at LBNL and LANSCE-IPF: Development of a new Nb(p,x) $^{90}\text{Mo}$  Monitor Reaction and Fe,La(p,x) Production Cross-Section Measurements.” 17<sup>th</sup> International Workshop on Targetry and Target Chemistry, Coimbra, Portugal. 30 August 2018.

A.S. Voyles, “Isotope production cross section measurements at the HFNG, LANL-IPF, and LBNL.” 14<sup>th</sup> Nordic Meeting on Nuclear Physics, Longyearbyen, Norway. 24 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  $^{nat}\text{Fe}(p,\alpha n)$ .” 6<sup>th</sup> 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 (CSEWG), Upton, NY. 14 November 2016.
- A.S. Voyles, “ $^{64}\text{Cu}$  and  $^{47}\text{Sc}$  (n,p) Cross-Section Measurements for Medical Radionuclide Production.” 16<sup>th</sup> International Workshop on Targetry and Target Chemistry, Santa Fe, NM. 30 August 2016.
- A.S. Voyles, “Neutron Cross-Sections for Radionuclide Production” (Poster). 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.” 2<sup>nd</sup> 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	<ul style="list-style-type: none"> <li>Licensed in Utah as Engineer in Training (EIT, ID# 13-802-04)</li> </ul>	<b>April, 2012</b>
COMPUTER SKILLS	<p><b>Languages</b>                      Java, C/C++, Python</p> <p><b>Tools</b>                                git, MATLAB, Mathematica, Maple, L<sup>A</sup>T<sub>E</sub>X, Arduino, shell, bash, SQLite, COMSOL Multiphysics, Aspen, ANSYS Fluent</p> <p><b>Nuclear Software</b>            EXFOR, TALYS, EMPIRE, GEANT4, MCNP/MCNPX</p>	
LAB SKILLS	<ul style="list-style-type: none"> <li>Radionuclide labeling via chelate-conjugated biomolecules.</li> <li>Radio-HPLC, radio-TLC, and solid-phase extraction radiochemical purification.</li> <li>HPGe Gamma spectroscopy, radiation detection and measurement.</li> <li>Design and implementation of PID process control systems.</li> <li>Operation of heat exchanger, distillation column, ebulliometer (classroom experience).</li> <li><math>^1\text{H}</math> and <math>^{13}\text{C}</math> NMR , IR characterization and analysis, chromatography.</li> <li>Organic laboratory synthesis and purification techniques.</li> </ul>	
PROFESSIONAL SERVICE	<p>Nuclear Instruments and Methods in Physics Research B</p> <ul style="list-style-type: none"> <li>Reviewer</li> </ul> <p>American Nuclear Society</p> <ul style="list-style-type: none"> <li>Program Chair, Northern California Section</li> <li>Executive Committee, Northern California Section</li> <li>Webmaster, Utah Student Section</li> </ul>	<p>– since 2017</p> <p>– since 2016</p> <p>– since 2016</p> <p>2011 – 2013</p>

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	<i>University of California, Berkeley</i>	
	• Department of Nuclear Engineering Outstanding Service Award	2016
	• Nuclear Regulatory Commission Graduate Fellowship	– since 2015
	<i>University of Utah</i>	
	• 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
	3 <sup>rd</sup> Place: Florida State Science Fair	April, 2009