

Andrew S. Voyles, Ph.D., EIT

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Nuclear Science Division ◊ Lawrence Berkeley National Laboratory
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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

Assistant Research Engineer

Berkeley, California
June, 2019 – Present

- Led fundamental studies of low-energy nuclear physics at the LBNL 88-Inch Cyclotron as a part of the LBNL/UCB Nuclear Data Program, and supervised M.S./Ph.D. students in these efforts.
- Efforts include the measurement of charged-particle and neutron-induced reaction cross sections relevant to the production of radionuclides for medical applications, and the measurement of independent and cumulative fission yields using cyclical neutron activation analysis,
- As Isotope Production Group leader, responsible for developing the technical vision for these research objectives, and facilitating interactions with other research organizations to promote collaboration and enhance the impact of research results, chiefly with LANL and BNL.
- Compiled all nuclear data produced in experiments into the reaction database EXFOR.

Postdoctoral Scholar

August, 2018 – June, 2019

- Responsible for overseeing the effort to determine novel production routes for ^{225}Ac , ^{212}Pb , ^{68}Ge , and ^{236}Np , through experiments at the LBNL 88-Inch Cyclotron as a part of the LBNL/UCB Nuclear Data Program.
- Developed in-house capabilities for electrodeposition and pressed-powder target fabrication.
- Assisted other members of the group by supervising M.S./Ph.D. student efforts to determine isotope production routes through cross section measurements at LBNL, LANL, and BNL.

Graduate Student Researcher / NRC Fellow

August, 2014 – August, 2018

- 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

Visiting Researcher, Department of Physics

Oslo, Norway
February – 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

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.

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.

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.

TEACHING EXPERIENCE

University of California, Berkeley

Berkeley, California

Graduate Student Instructor

- NE 101 / 210M — Nuclear Reactions and Radiation **Fall 2015**

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**

SELECTED PUBLICATIONS

Jonathan T. Morrell, **Andrew S. Voyles**, M. S. Basunia, Jon C. Batchelder, Eric F. Matthews, Lee A. Bernstein, *Measurement of $^{139}\text{La}(p,x)$ Cross Sections from 35–60 MeV by Stacked-Target Activation*. The European Physical Journal A, *Accepted, in press*.

Lee A. Bernstein, David A. Brown, Arjan J. Koning, Bradley T. Rearden, Catherine E. Romano, Alejandro A. Sonzogni, **Andrew S. Voyles**, and Walid Younes, *Our Future Nuclear Data Needs*. Annual Review of Nuclear and Particle Science, **69.1** (2019) 109–136.
<https://doi.org/10.1146/annurev-nucl-101918-023708>

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. <https://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. <https://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. <https://doi.org/10.1016/j.nimb.2017.08.021>

CERTIFICATIONS

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

April, 2012

COMPUTER SKILLS

Languages

Java, C/C++, Python

Tools

git, svn, CAD, MATLAB, Mathematica, Maple, L^AT_EX, Arduino, shell, bash, SQLite, COMSOL Multiphysics, Aspen, ANSYS Fluent

Nuclear Software

TALYS, EMPIRE, GEANT4, MCNP/MCNPX, FLUKA, EXFOR

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).
- ^1H and ^{13}C NMR , IR characterization and analysis, chromatography.
- Organic laboratory synthesis and purification techniques.

PROFESSIONAL SERVICE

Journal of Radioanalytical and Nuclear Chemistry

- Reviewer

– since 2019

Nuclear Instruments and Methods in Physics Research B

- Reviewer

– since 2017

American Nuclear Society

- Program Chair, Northern California Section
- Executive Committee, Northern California Section
- Webmaster, Utah Student Section

– since 2016

– since 2016

2011 – 2013