

# 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

*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 Bay Area 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.
- Mentored M.S./Ph.D. students' research for cross section measurements and evaluations at LBNL, LANL, and BNL.
- As Isotope Production technical 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.
- Developed stable and radioactive target fabrication capabilities in support of these objectives.
- Compiled all nuclear data produced in experiments into the reaction database EXFOR.
- Led OJT, Integrated Safety Management, EHS, and safety controls for experimental activities in the Bay Area Nuclear Data Program.

### *Postdoctoral Scholar*

**August, 2018 – June, 2019**

- Responsible for overseeing the effort to determine novel production routes for  $^{225}\text{Ac}$ ,  $^{212}\text{Pb}$ ,  $^{68}\text{Ge}$ , and  $^{236}\text{Np}$ , 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**

- 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

**February – May, 2018**

- Studied preparation of a chelate-conjugated biomolecule carrying a radionuclide, in the Nuclear and Energy Physics group.
- Focus on the radiolanthanide  $^{161}\text{Tb}$  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**  
*Assistant Research Engineer*

Berkeley, California

- International Nuclear Data and Analytical Techniques (INDAT) **21–29 June 2023**  
Lecturer for 3 days of the 2023 INDAT Summer School, based on reviews from the 2022 NSSC Summer School, teaching 20 graduate student attendees with a similar curriculum. Designed and led a lab practical for attendees at the UC Davis Crocker Cyclotron, for a stacked-foil measurement of the production cross sections for the  $^{nat}\text{Mo}(p,x)^{93,94,95,96}\text{Tc}$  and  $^{nat}\text{Ni}(\alpha,x)^{62,63,65}\text{Zn}$  reactions, as new monitor reactions for high-energy accelerator facilities, culminating in a peer-reviewed publication (*currently in preparation*).
- Nuclear Data Summer School 2022 **01–12 August 2022**  
Lecturer for 3 days of the 2022 NSSC Nuclear Data Summer School, teaching 25 graduate student attendees about nuclear medicine, isotope production, predictive codes for nuclear reaction calculations, gamma spectroscopy, data analysis, and scientific writing. Led a lab practical for attendees at the UC Davis Crocker Cyclotron, for a stacked-foil measurement of the production cross sections for  $^{177,180m}\text{Ta}$ , a pair of emerging Auger emitters for therapeutic applications. Responsible for designing and carrying out the lab practical, lectures, analysis of the collected data, and manuscript preparation, culminating in a peer-reviewed publication (*currently in preparation*). This module was by far the highest-rated of the summer school.

*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**  
*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
Yun-Hsuan (Abby) Lee	UC Berkeley, Nuclear Engineering Ph.D. (2023 – Present, <i>research mentor</i> )
Elise Martinsen	University of Oslo, Nuclear Physics M.S. (2022 – 2024) University of Oslo, Nuclear Physics Ph.D. (2024 – Present)
Hannah Ekeberg	University of Oslo, Nuclear Physics M.S. (2018 – 2020) <a href="http://urn.nb.no/URN:NBN:no-82944">http://urn.nb.no/URN:NBN:no-82944</a> University of Oslo, Nuclear Physics Ph.D. (2024 – Present)
Catherine Apgar	UC Berkeley, Nuclear Engineering M.Eng., Ph.D. (2018 – 2024, <i>research mentor</i> )
Nora Pettersen	University of Oslo, Nuclear Physics M.S. (2018 – 2021) <a href="http://urn.nb.no/URN:NBN:no-87091">http://urn.nb.no/URN:NBN:no-87091</a>
Morgan Fox	UC Berkeley, Nuclear Engineering M.Eng., Ph.D. (2017 – 2021, <i>research mentor</i> ) <a href="https://escholarship.org/uc/item/4k69r77p">https://escholarship.org/uc/item/4k69r77p</a>
Jon Morrell	UC Berkeley, Nuclear Engineering Ph.D. (2017 – 2021, <i>research mentor</i> ) <a href="https://escholarship.org/uc/item/1cj6716s">https://escholarship.org/uc/item/1cj6716s</a>
Haleema Zaneb	Gvmt. College University Lahore, visiting Physics Ph.D. student (2016 – 2017, <i>research mentor</i> ) <a href="http://repository.pastic.gov.pk/jspui/handle/123456789/11250">http://repository.pastic.gov.pk/jspui/handle/123456789/11250</a>
Alexander Springer	Karlsruhe Institute of Technology, visiting Physics M.S. student (2016 – 2017, <i>research mentor</i> ) <a href="https://arxiv.org/abs/1707.05908">https://arxiv.org/abs/1707.05908</a>

### FUNDED PROPOSALS

<b>STARFIRE: Nuclear Irradiation and Assay</b>	FY25–FY28
<i>PI</i>	Lawrence Livermore National Security

- Three years at \$100,000.
- As a collaborative member of the STARFIRE Hub, the goal of this work is to perform real-time irradiation of the final-stage optics and other critical optical components for inertial fusion energy at the National Ignition Facility.

<b>Building a Nuclear Data Pipeline for Isotope Production</b>	FY24–FY25
<i>Co-PI</i>	Isotope R&D and Production (DOE Isotope Program)

- Two years at \$305,143.
- The goal of this work is to develop an online isotope production planning tool incorporating research and development of AI/ML-augmented reaction evaluations, to advance production techniques, increasing the efficiency of radioisotope production.
- Collaborative project with LANL, BNL, and TAMU.

<b>Nuclear Data for Microcalorimetry</b>	FY25–FY26
<i>Co-PI</i>	NNSA Office of International Nuclear Safeguards (NA-241)

- Three years at \$1,471,000/year.
- The goal of this work is to re-determine key gamma-ray emission probabilities for Pu, Am, and U in the 50-208 keV energy range in order for microcalorimeter gamma spectroscopy to reach uncertainty limits in analysis of safeguards samples.
- We will design and conduct experimental campaigns using complementary detection methods and advanced sample preparation to measure this data.

**Data Evaluation for Nuclear Science (DEANS)**

FY22–FY27

*Collaborator, Subaward PI*

U.S. Nuclear Data Program

- Five years at \$750,850, serving as UC Berkeley Campus PI.
- Research group tasked with providing nuclear data to help meet the missions of the Lawrence Berkeley National Laboratory component of the US Nuclear Data Program (LBNL-USNDP).
- UCB members of the DEANS team work under the leadership of Campus PI Voyles to carry out targeted nuclear data compilation, evaluation and measurement activities at both LBNL and UC Berkeley as a part of the Bay Area Nuclear Data Group.

**Optimized Deuteron Target Fabrication for Radionuclide Production**

FY21–FY23

*Collaborator*

NorthStar RadioIsotopes, LLC

- Three years at \$803,464.
- The goal of this project is to design a target capable of producing multiple medical radionuclides simultaneously using a combination of fast neutrons from thick target deuteron breakup and deuteron-induced fusion evaporation reactions.

**Measurement of charged particle-induced nuclear reaction cross sections important to the Isotope Program at LBNL, LANL, and BNL**

FY19–FY23

*Collaborator*

Isotope R&amp;D and Production (DOE Isotope Program)

- Five years at \$750,000.
- Our goal is to measure proton-induced reaction cross sections for the accelerator-driven production of radioisotopes for medical and national security applications.

SELECTED  
PUBLICATIONS

Sinthia Binte Kholil, M. Shuza Uddin, M. Mehedi Hasan, A. Kumer Chakraborty, M. Asad Shariff, **Andrew S. Voyles**, and Ingo Spahn, *Excitation functions of proton-induced nuclear reactions on titanium*. *Radiochimica Acta*, **aop** (2024). <https://doi.org/10.1515/ract-2024-0347>

J.M. Gordon, J.A. Brown, B.L. Goldblum, T.A. Laplace, J.C. Batchelder, D.L. Bleuel, B. Buckley, A. Georgiadou, C. Henderson, T. Johnson, J.W. Lee, K. Myers, T. Nagel, J.R. Sebastian, **A.S. Voyles**, and L.A. Bernstein,  *$^{12}C(n, n'_1 \gamma)$  partial  $\gamma$ -ray cross section measured using the GENESIS array*. *Physical Review C*, (submitted).

Jonathan T. Morrell, Ellen M. O'Brien, Michael Skulski, **Andrew S. Voyles**, Dmitri G. Medvedev, Veronika Mocko, Lee A. Bernstein, and C. Etienne Vermeulen, *Measurement of Proton-Induced Reactions on Lanthanum from 55–200 MeV by Stacked-Foil Activation*. *Physical Review C*, (submitted).

Md. Shuza Uddin, Sándor Sudár, M. Shamsuzzoha Basunia, Ingo Spahn, **Andrew S. Voyles**, Alex Hermanne, Lee A. Bernstein, Bernd Neumaier, and Syed. M. Qaim, *Cross sections for the formation of  $^{84}Rb^{m,g}$ ,  $^{83}Rb$  and  $^{82}Rb^m$  in  $^{86}Sr(d,x)$ -reactions up to deuteron energies of 49 MeV: competition between  $\alpha$ -particle and multi-nucleon emission processes*. *Physical Review C*, (submitted).

Md. Shuza Uddin, Sándor Sudár, M. Shamsuzzoha Basunia, Bernhard Scholten, Stefan Spellerberg, **Andrew S. Voyles**, Jonathan T Morrell, Ingo Spahn, Alex Hermanne, Lee A. Bernstein, Bernd Neumaier, and Syed. M. Qaim, *Excitation functions and isomeric cross-section ratios of  $(d, xn)$  reactions on  $^{86}Sr$* . *The European Physical Journal A*, **60** (2024) 128. <https://doi.org/10.1140/epja/s10050-024-01330-6>

N. Burahmah, J.R. Griswold, L.H. Heilbronn, L.A. Bernstein, **A.S. Voyles**, J.T. Morrell, M. Zach, and R. Copping,  *$^{229}Pa$  cross section measurements via deuteron irradiation of  $^{232}Th$* . *Physical Review C*, **108** (2023) 024609. <https://doi.org/10.1103/PhysRevC.108.024609>

Jonathan T. Morrell, **Andrew S. Voyles**, Jon C. Batchelder, Joshua A. Brown, and Lee A. Bernstein, *Secondary Neutron Production from Thick Target Deuteron Breakup*. *Physical Review C*, **108** (2023) 024616. <https://doi.org/10.1103/PhysRevC.108.024616>

F. Pogliano, F. L. Bello Garrote, A. C. Larsen, H. C. Berg, D. Gjestvang, A. Görgen, M. Guttormsen, V. W. Ingeberg, T. W. Johansen, K. L. Malatji, E. F. Matthews, M. Markova, J. E. Midtbø, V.

- Modamio, L. G. Pedersen, E. Sahin, S. Siem, T. G. Tornyi, and **A. S. Voyles**, *Observation of a candidate for the M1 scissors resonance in odd-odd  $^{166}\text{Ho}$* . Physical Review C, **107** (2023) 034605. <https://doi.org/10.1103/PhysRevC.107.034605>
- Denise Neudecker, C. Romano, Nathan A. Gibson, Robert C. Little, Lee Bernstein, R. Bostelmann, D. Brown, R.J. Casperson, Stephen Croft, S. Dewji, L. Greenwood, P. Griffin, L. Kyriazidis, A. Lewis, M. Pigni, B. Pritychenko, B. Rearden, J. Ressler, T. Slaba, M. Smith, V. Sobes, A. Sonzogno, Scott A. Vander Wiel, N. Vassh, **A. Voyles**, and K. Wendt, *5–10 Years Cross-cutting Priorities on the Topic of Nuclear Data Covariances and Uncertainty Quantification for Users*. Technical Report LA-UR-22-32080 (2023). <https://doi.org/10.2172/1958970>
- Andrew S. Voyles**, Morgan B. Fox, Jonathan T. Morrell, Michael P. Zach, Evan K. Still, Lee A. Bernstein, Wesley D. Frey, and Burton J. Mehciz, *Preparation and Characterization of Thin Arsenic Targets for Stacked-Target Experiments*. Nuclear Instruments and Methods in Physics Research B, (*in preparation*). <https://arxiv.org/abs/2106.05524>
- Sarah Stevenson, Andrew Dong, Yujun Xie, Jon Morrell, **Andrew S. Voyles**, Jeff Bickel, Lee Bernstein, S.A. Maloy, and Peter Hosemann, *The effects of high energy deuteron ion beam irradiation on the tensile behavior of HT-9*. Nuclear Instruments and Methods in Physics Research B, **531** (2022) 65–73. <https://doi.org/10.1016/j.nimb.2022.09.001>
- M. S. Uddin, M. S. Basunia, S. Sudár, B. Scholten, S. Spellerberg, **A. S. Voyles**, J. T. Morrell, M. B. Fox, I. Spahn, O. Felden, R. Gebel, L. A. Bernstein, B. Neumaier, and S. M. Qaim, *Excitation functions of proton-induced nuclear reactions on  $^{86}\text{Sr}$ , with particular emphasis on the formation of isomeric states in  $^{86}\text{Y}$  and  $^{85}\text{Y}$* . The European Physical Journal A, **58** (2022) 67. <https://doi.org/10.1140/epja/s10050-022-00714-w>
- Karolina Kolos, Vladimir Sobes, Ramona Vogt, Catherine E. Romano, Michael S. Smith, Lee A. Bernstein, David A. Brown, Mary T. Burke, Yaron Danon, Mohamed A. Elawi, Bethany L. Goldblum, Lawrence H. Heilbronn, Susan L. Hogle, Jesson Hutchinson, Ben Loer, Elizabeth A. McCutchan, Matthew R. Mumpower, Ellen M. O'Brien, Catherine Percher, Patrick N. Peplowski, Jennifer J. Ressler, Nicolas Schunck, Nicholas W. Thompson, **Andrew S. Voyles**, William Wieselquist, and Michael Zerkle, *Current nuclear data needs for applications*. Physical Review Research, **4** (2022) 021001. <https://doi.org/10.1103/PhysRevResearch.4.021001>
- Morgan B. Fox, **Andrew S. Voyles**, Jonathan T. Morrell, Lee A. Bernstein, Jon C. Batchelder, Eva R. Birnbaum, Cathy S. Cutler, Arjan J. Koning, Amanda M. Lewis, Dmitri G. Medvedev, Francois M. Nortier, Ellen M. O'Brien, and Christiaan Vermeulen, *Measurement and modeling of proton-induced reactions on arsenic from 35 to 200 MeV*. Physical Review C, **104** (2021) 064615. <https://doi.org/10.1103/PhysRevC.104.064615>
- Stephan Friedrich, Geon-Bo Kim, Dongwon Lee, J. Ad Hall, Robin Cantor, **Andrew Voyles**, Ruslan Hummatov, and Stephen P.T. Boyd, *Ultra-High Resolution Magnetic Microcalorimeter Gamma-Ray Detectors for Non-Destructive Assay of Uranium and Plutonium*. Journal of Nuclear Materials Management, **49** (2021), 114–122.
- Ryan K. Chapman, **Andrew S. Voyles**, Narek Gharibyan, Lee A. Bernstein, and James E. Bevins, *Measurement of the  $^{160}\text{Gd}(p,n)^{160}\text{Tb}$  excitation function from 4–18 MeV using stacked-target activation*. Applied Radiation and Isotopes, **171** (2021) 109647. <https://doi.org/10.1016/j.apradiso.2021.109647>
- D.L. Bleuel, L.A. Bernstein, R.A. Marsh, J.T. Morrell, B. Rusnak, and **A.S. Voyles**, *Precision measurement of relative  $\gamma$ -ray intensities from the decay of  $^{61}\text{Cu}$* . Applied Radiation and Isotopes, **170** (2021) 109625. <https://doi.org/10.1016/j.apradiso.2021.109625>
- D. Gjestvang, S. Siem, F. Zeiser, J. Randrup, R. Vogt, J.N. Wilson, F. Bello-Garrote, L.A. Bernstein, D.L. Bleuel, M. Guttormsen, A. Görgen, A.C. Larsen, K.L. Malatji, E.F. Matthews, A. Oberstedt, S. Oberstedt, T. Tornyi, G.M. Tveten, and **A.S. Voyles**, *Excitation energy dependence of prompt fission  $\gamma$ -ray emission from  $^{241}\text{Pu}^*$* . Physical Review C, **103** (2021) 034609. <https://doi.org/10.1103/PhysRevC.103.034609>

- Morgan B. Fox, **Andrew S. Voyles**, Jonathan T. Morrell, Lee A. Bernstein, Amanda M. Lewis, Arjan J. Koning, Jon C. Batchelder, Eva R. Birnbaum, Cathy S. Cutler, Dmitri G. Medvedev, Francois M. Nortier, Ellen M. O'Brien, and Christiaan Vermeulen, *Investigating high-energy proton-induced reactions on spherical nuclei: Implications for the preequilibrium exciton model*. Physical Review C, **103** (2021) 034601. <https://doi.org/10.1103/PhysRevC.103.034601>
- Andrew S. Voyles**, Amanda M. Lewis, Jonathan T. Morrell, M. Shamsuzzoha Basunia, Lee A. Bernstein, Jonathan W. Engle, Stephen A. Graves, and Eric F. Matthews, *Proton-induced reactions on Fe, Cu, & Ti from threshold to 55 MeV*. The European Physical Journal A, **57** (2021) 94. <https://doi.org/10.1140/epja/s10050-021-00401-2>
- M. Shuza Uddin, Bernhard Scholten, M. Shamsuzzoha Basunia, Sandor Sudár, Stefan Spellerberg, **Andrew S. Voyles**, Jonathan T. Morrell, Haleema Zaneb, Jesus A. Rios, Ingo Spahn, Lee A. Bernstein, Bernd Neumaier, and Syed M. Qaim, *Accurate Determination of Production Data of the Non-Standard Positron Emitter  $^{86}\text{Y}$  via the  $^{86}\text{Sr}(p,n)$ -Reaction*. Radiochimica Acta, **108** (2020) 747-756. <https://doi.org/10.1515/ract-2020-0021>
- M.S. Basunia, J.T. Morrell, M.S. Uddin, **A.S. Voyles**, C.D. Nesaraja, L.A. Bernstein, E. Browne, M.J. Martin, and S.M. Qaim, *Resolution of a discrepancy in the  $\gamma$ -ray emission probability from the  $\beta$  decay of  $^{137}\text{Ce}^g$* . Physical Review C, **101** (2020) 064619. <https://doi.org/10.1103/PhysRevC.101.064619>
- G.B. Kim, S.T.P. Boyd, R.H. Cantor, **A.S. Voyles**, J.T. Morrell, L.A. Bernstein, and S. Friedrich, *A New Measurement of the 60 keV Emission from Am-241 Using Metallic Magnetic Calorimeters*. Journal of Low Temperature Physics, (2020) 1-7. <https://doi.org/10.1007/s10909-020-02412-7>
- Jonathan T. Morrell, **Andrew S. Voyles**, M. S. Basunia, Jon C. Batchelder, Eric F. Matthews, and 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, **56** (2020) 13. <https://doi.org/10.1140/epja/s10050-019-00010-0>
- 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**, *Nuclear Excitation Functions for the Production of Novel Medical Radionuclides*, University of California, Berkeley, (2018). <https://search.proquest.com/docview/2135771326>
- 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>
- 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>
- Andrew 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>

- A.S. Voyles, “Methods for Preparation and Characterization of Thin Arsenic Targets for Stacked Target Experiments (aka: What Works, and What Doesn’t).” 31<sup>st</sup> Conference of the International Nuclear Target Development Society, Knoxville, Tennessee. 20 August 2024.
- A.S. Voyles, “Nuclear Data for Isotope Production: Target Fabrication and Reaction Evaluation in the Berkeley Nuclear Data Group.” ORNL Radioisotope Portfolio Seminar, Oak Ridge, Tennessee. 15 August 2024. (invited)
- A.S. Voyles, “How the Pølse Gets Made: Target Fabrication for Nuclear and Medical Physics.” Oslo Nuclear Physics Workshop, Oslo, Norway. 14 December 2023. (invited)
- A.S. Voyles, “TR-4: Isotope Production Capabilities at Berkeley.” Norwegian Nuclear Research Centre Kickoff Meeting, Oslo, Norway. 11 December 2023. (invited)
- A.S. Voyles, “Review of the LBNL Measurement Program.” CSEWG Annual Meeting, Upton, New York. 17 November 2023. (invited)
- A.S. Voyles, “Nuclear Data Needs for High-Energy (p,x) Isotope Production & Evaluation.” IAEA Technical Meeting on Nuclear Data for Medical Applications, Vienna, Austria. 28 August 2023. (invited)
- A.S. Voyles, “Methods for preparation and characterization of thin arsenic targets for stacked-target experiments.” American Chemical Society Fall 2023 Meeting, San Francisco, CA. 17 August 2023.
- A.S. Voyles, “<sup>169</sup>Yb Gamma Calibration Source Production.” Microcalorimetry and Nuclear Data (MiND 2023), Washington, D.C.. 28 June 2023. (invited)
- A.S. Voyles, “Nuclear Data Needs for Auger Electrons.” Microcalorimetry and Nuclear Data (MiND 2023), Washington, D.C.. 27 June 2023. (invited)
- A.S. Voyles, “Investigating high-energy proton-induced reactions: Implications for level densities and the preequilibrium exciton model.” 16<sup>th</sup> Varenna Conference on Nuclear Reaction Mechanisms, Varenna, Italy. 13 June 2023.
- A.S. Voyles, “Investigating high-energy proton-induced reactions: Implications for level densities and the preequilibrium exciton model.” Ohio University Institute of Nuclear & Particle Physics Seminar Series, Athens, OH. 18 October 2022. (invited)
- A.S. Voyles, “Isotope Production Needs for Uncertainty Quantification.” Nuclear Data Uncertainty Quantification Working Meeting, *online*. 12 October 2022. (invited)
- A.S. Voyles, “Isotope Production Activities at LBNL: The Tri-Lab Effort in Nuclear Data (TREND), and Novel Production Pathways for <sup>225</sup>Ac.” 18<sup>th</sup> International Workshop on Targetry and Target Chemistry, Whistler, Canada. 24 August 2022.
- A.S. Voyles, “Investigating High-Energy Proton-Induced Reactions: Implications for Level Densities and the Preequilibrium Exciton Model.” 8<sup>th</sup> Workshop on Nuclear Level Density and Gamma Strength, Oslo, Norway. 10 May 2022.
- A.S. Voyles, “Nuclear data for isotope production: From Level Densities to the Bedside.” Lawrence Berkeley National Laboratory Nuclear Science Division Staff Meeting, Berkeley, CA. 29 June 2021. (invited)
- A.S. Voyles, “Nuclear data for isotope production.” Symposium on Radiotherapeutics: From Isotope Production to Targeted Delivery, American Chemical Society Spring 2021 Meeting, *online*. 06 April 2021. (invited)
- A.S. Voyles, “<sup>238</sup>U(p,xn) and <sup>235</sup>U(d,xn) <sup>235–237</sup>Np Nuclear Reaction Cross Sections Relevant to the Production of <sup>236g</sup>Np.” Workshop for Applied Nuclear Data Activities, *online*. 03 February 2021.
- A.S. Voyles, “Nuclear Data 101: Predictive Codes for Isotope Production.” Workshop for Applied Nuclear Data Activities, *online*. 27 January 2021. (invited)
- A.S. Voyles, “Targetry Fabrication for Nuclear Data Measurements.” Workshop for Applied Nuclear Data Activities, Washington, D.C.. 04 March 2020. (invited)

- A.S. Voyles, “Using New Radiopharmaceuticals to Treat Disease.” Nerd Nite East Bay, Oakland, CA. 24 June 2019. (invited)
- A.S. Voyles, “Novel Production Methods for  $^{225}\text{Ac}$ .” Lawrence Berkeley National Laboratory Nuclear Science Division Staff Meeting, Berkeley, CA. 05 March 2019. (invited)
- A.S. Voyles, “Capabilities for Isotope Production Nuclear Data Measurements at LBNL.” Workshop for Applied Nuclear Data Activities, Washington, D.C.. 23 January 2019. (invited)
- A.S. Voyles, “Isotope Production Activities at LANSCE-IPF: Development of a new Nb(p,x) $^{90}\text{Mo}$  Monitor Reaction and La(p,x) Production Cross-Section Measurements.” 2018 LANSCE User Group Meeting, Santa Fe, NM. 05 November 2018. (invited)
- 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  $^{\text{nat}}\text{Fe}(\text{p},\alpha\text{n})$ .” 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.

#### ORGANIZATION OF CONFERENCES AND SYMPOSIA

- Co-Chair, Microcalorimetry and Nuclear Data (MiND 2023) Workshop, 27–28 June 2023.
- Session Chair, “Department of Energy Isotope Programs”, Workshop for Applied Nuclear Data Activities, 27 February – 02 March 2023.
- Session Chair, “Predictive Codes for Isotope Production”, Workshop for Applied Nuclear Data Activities, 25 January – 03 February 2021.

#### PATENTS

- Lee Bernstein, Dajie Sun, **Andrew Voyles**. 2023. Deuteron breakup neutron target for isotope production. WO2024054607A3, filed 08 September 2023. Patent pending.
- Lee Bernstein, Jon Batchelder, Jonathan T Morrell, **Andrew Voyles**. 2020. Systems and methods for producing actinium-225. US20220199276A1 / EP3953949A1 / WO2020210147A1, filed 06 April 2020. Patent pending.



CERTIFICATIONS	<ul style="list-style-type: none"> <li>Licensed in Utah as Engineer in Training (EIT, ID# 13-802-04)</li> </ul>	April, 2012
COMPUTER SKILLS	<p><b>Languages</b> Java, C/C++, Python, Javascript, HTML, Fortran</p> <p><b>Tools</b> git, svn, CAD, MATLAB, Mathematica, Maple, L<sup>A</sup>T<sub>E</sub>X, Arduino, RPi, shell, bash, node, pug, SQLite, COMSOL Multiphysics, Aspen, Cura, Lychee Slicer, ANSYS Fluent, OpenCV</p> <p><b>Nuclear Software</b> TALYS, EMPIRE, CoH, ALICE, GEANT4, MCNP/MCNPX, Curie, FLUKA, EXFOR</p>	
LAB SKILLS	<ul style="list-style-type: none"> <li>3D Printing (FDM, SLA)</li> <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><sup>1</sup>H and <sup>13</sup>C NMR , IR characterization and analysis, chromatography.</li> <li>Organic laboratory synthesis and purification techniques.</li> </ul>	
PROFESSIONAL SERVICE	<p>NNSA, DNN R&amp;D (NA-22)</p> <ul style="list-style-type: none"> <li>Independent Assessments Panel Member &amp; SME – since 2023</li> </ul> <p>Journal Referee</p> <ul style="list-style-type: none"> <li>IEEE Transactions on Nuclear Science – since 2023</li> <li>Applied Radiation and Isotopes – since 2022</li> <li>Materials – since 2020</li> <li>Journal of Radioanalytical and Nuclear Chemistry – since 2019</li> <li>Nuclear Instruments and Methods in Physics Research B – since 2017</li> </ul> <p>Bay Area Nuclear Data Group</p> <ul style="list-style-type: none"> <li>Webmaster – since 2021</li> </ul> <p>American Nuclear Society</p> <ul style="list-style-type: none"> <li>Program Chair, Northern California Section – since 2016</li> <li>Executive Committee, Northern California Section – since 2016</li> <li>Webmaster, Utah Student Section 2011 – 2013</li> </ul>	
PROFESSIONAL SOCIETY MEMBERSHIPS	<p>International Nuclear Target Development Society – since 2024</p> <p>International Carnivorous Plant Society – since 2022</p> <p>American Physical Society – since 2016</p> <p>American Nuclear Society – since 2011</p> <p>Alpha Nu Sigma Nuclear Engineering Honor Society – since 2011</p> <p>Tau Beta Pi National Engineering Honor Society – since 2010</p> <p>Phi Eta Sigma National Honor Society – since 2010</p> <p>American Institute of Chemical Engineers – since 2009</p>	
HONORS AND AWARDS	<p><i>University of California, Berkeley</i></p> <ul style="list-style-type: none"> <li>Marie Sklodowska-Curie Actions Seal of Excellence 2018</li> <li>Department of Nuclear Engineering Outstanding Service Award 2016</li> <li>Nuclear Regulatory Commission Graduate Fellowship 2015 – 2018</li> </ul> <p><i>University of Utah</i></p> <ul style="list-style-type: none"> <li>Undergraduate Research Scholar Award May, 2013</li> <li>University of Utah President's Club (Full Ride) Scholarship 2009 – 2013</li> <li>Dean's List 2009 – 2013</li> <li>Neil R. Mitchell Scholarship in Engineering 2012</li> <li>Chevron Scholarship in Engineering 2011</li> <li>Theodore Verender Hanks Scholarship in Science &amp; Engineering 2011</li> <li>Don Dahlstrom Scholarship in Chemical Engineering 2010</li> <li>College of Science Dean's Scholarship, University of Utah 2010</li> </ul> <p>International Baccalaureate Diploma Recipient July, 2009</p> <p>Finalist: Intel International Science and Engineering Fair May, 2009</p>	

3<sup>rd</sup> Place: Florida State Science Fair

April, 2009