JAMES E. BEVINS

jbevins@afit.edu ◇ (937) · 255 · 3636 ext. 4767
Department of Engineering Physics ◇ Air Force Institute of Technology
Wright Patterson Air Force Base, Ohio 45433

EDUCATION

Ph.D.	**University of California, Berkeley** Nuclear Engineering, with a minor in Nuclear Policy	2017
M.S.	**Air Force Institute of Technology** Nuclear Engineering	2011
B.S.	**University of Tennessee** Nuclear Engineering	2009

PROFESSIONAL HISTORY

Air Force Institute of Technology Aug. 2017 - Present
Assistant Professor of Nuclear Engineering *WPAFB, OH*

- Researching detector development, nuclear weapon effects, and neutron spectroscopy with an emphasis on optimized design of systems
- Applications in nuclear security and nonproliferation, shielding, medical isotope production, and technical nuclear forensics

University of California, Berkeley Aug. 2014 - Aug. 2017
Graduate Student/National Science Foundation Fellow *Berkeley, CA*

- Researched "Targeted Neutron Spectrum Modification for National Security Applications": Developed an energy tuning assembly (ETA) concept that was designed to modify the NIF neutron energy spectrum to a more "weapon-like" neutron spectrum
- Developed a novel metaheuristic optimization algorithm, Gnowee, that was implemented in a new nuclear design software, Coeus
- Performed neutron spectroscopy experiments at the 88-Inch Cyclotron to characterize the ETA performance

Sandia National Laboratory Mar. 2013 - Feb. 2014
Weapon Intern *Albuquerque, NM*

- Comprehensive technical, historical, and nuclear policy curricula designed to develop next generation of nuclear weapons experts and leaders through multi-agency interaction in coursework, site visits, and research projects
- Research Project Titled: Criticality Analysis of US Pits under Accident Scenarios
- Research Project Titled: An Automated Solid Model and MCNP Materials Import Scheme

Air Force Nuclear Weapons Center Apr. 2011 - Aug. 2014
Nuclear Engineer/Physicist *Kirtland AFB, NM*

- Organized, conducted, and led multi-agency Air Force Nuclear Weapons Center efforts to review, update, improve, and develop nuclear hardness models and mission planning guidance used for nuclear weapons delivery
- Planned, directed, performed, and reviewed nuclear weapon effects and survivability assessments in support of AF, DoD, and DOE acquisition efforts through analysis, simulation, and test for systems to include the Long Rang Stand-off (LRSO) missile, B61-12 nuclear bomb, Ground Based Strategic Deterrent (GBSD), and others

- Designed, developed, reviewed, and implemented new analysis software and capabilities to address gaps and/or improve fidelity in AF efforts to model different operational concepts and threats thereby improving the effectiveness of new acquisitions while reducing costs
- Conducted, developed, managed, and reviewed program planning, Statements of Work (SOWs), Independent Government Cost Estimate (IGCEs), cost and technical proposals, deliverables, and performance reports
- Technical advisor to senior nuclear policy makers and acquisition officials

Air Force Institute of Technology Jul. 2009 - Mar. 2011
Graduate Student *WPAFB, OH*

- Researched "Characterization of a Boron Carbide Heterojuction Neutron Detector": Developed an optimized semi-conducting boron carbide neutron detector
- Tested the degradation of sample devices in neutron fields at the Ohio State Research Reactor

Oak Ridge National Laboratory Aug. 2008 - Jun. 2009
Nuclear Research Intern *Oak Ridge, TN*

- Conducted modeling validation of liquid scintillator neutron coincidence detection scheme designed for security applications involving storage of highly enriched uranium
- Developed and modified existing energy deposition to detection event post-processing codes for MCNP-POLIMI

URS May. 2008 - Aug. 2008
UXO Tech II *Beale AFB, CA*

EODT Dec. 2007 - Jan. 2008
UXO Tech II *Camp Ellis, IL*

Tetra Tech (FW), Inc. Dec. 2006 - Aug. 2007
UXO Tech II *Fort Sill, OK/Iraq*

BWXT-Y12 Jun. 2006 - Sep. 2006
Criticality Safety Intern *Oak Ridge, TN*

- Performed criticality safety analysis for processes involving uranium milling, dissolution, storage, transport, etc.
- Reviewed manufacturing procedures and practices for compliance with criticality safety guidelines and procedures
- Conducted material surveys to track and monitor build-up and loss of uranium

Tetra Tech (FW), Inc. May 2005 - Aug. 2006
UXO Tech II *Beaumont, CA/Abilene, TX*

ATI Dec. 2004 - Jan. 2005
UXO Tech II *Herlong, CA*

Tetra Tech (FW), Inc. May 2004 - Aug. 2004
UXO Tech II *Vallejo, CA/Anniston, AL*

ISSI UXO, Inc. Apr. 2004 - May 2004
UXO Tech II *Redstone Arsenal, AL*

Alabama Army National Guard Sep. 2001 - Aug. 2004
Explosive Ordnance Disposal Technical *Multiple Locations*

- Deployment to Bosnia: June 2003- April 2004
- Naval School EOD: Sep 2002 - June 2003
- Basic Training: July 2002- Sep 2002

SELECTED HONORS AND AWARDS

Military:

Air Force Meritorious Service Medal	2014
Squadron Officer School Distinguished Graduate, Outstanding Contributor, Top 1%	2014
USAF Modeling & Simulation Cross-Functional Team Award	2012
AFMC Analytic Team of the Year Award	2012
Nuclear Capabilities Directorate Company Grade Officer of the Year	2012
Nuclear Capabilities Directorate Company Grade Officer of the Quarter	2012
Exceptional Performer, Air Space Basic Course	2009
Global War on Terrorism Service Medal	2004
Army Commendation Medal	2004
Army Achievement Medal (x2)	2003, 2004
Honor Graduate, Explosive Ordnance Disposal School	2003

Academic:

National Science Foundation Graduate Fellowship	2014-2017
Best Paper, NNSA University and Industry Technical Interchange	2016
Selected participant, Public Policy and Nuclear Threats Bootcamp	Jun.-Jul. 2015
IEEE Nuclear and Plasma Sciences Society Graduate Scholar Award	2011
Louis F. Polk Finalist	2011
Tau Beta Pi Honor Society	2010
Chancellors Academic Achievement Award	2007
Nuclear Engineering Outstanding Freshman, Sophomore, and Junior Awards	2005-2007

PUBLICATIONS

Archived Journals in Print

2017:

1. M. K. Covo, R. A. Albright, et al., "The 88-Inch Cyclotron: A One-Stop Facility for Electronics Radiation and Detector Testing," *Journal of the International Measurement Confederation.* (Accepted October 2017)

2016:

1. N. Benczer-Koller, G. J. Kumbartzki, et al., "Magnetic moment and lifetime measurements of Coulomb-excited states in 106Cd," *Physical Review C*, Vol. 94, 2016.

2. G. J. Kumbartzki, N. Benczer-Koller, et al., "Z = 50 core stability in 110Sn from magnetic-moment and lifetime measurements," *Physical Review C*, Vol. 93, 2016.

Limited Distribution Journal Articles, in Print

2012:

1. **J. Bevins**, K. Dahl, J. McClory, J. Petrosky, A. Caruso, and S. Karki, "Bulk Radiation Damage Effects of a p-type B5C:Hx Thin Film on n-Si Heterojunction Diode," *Journal of Radiation Effects, Research and Engineering*, Vol. 30, No1, 2012.

Refereed, In Process

1. Bethany L. Goldblum, Thomas C. Hickey, **James E. Bevins**, Elie Katzenson, Sarah Laderman, Nathaniel Mahowald, Yara Mubrak, Andrew W. Reddie, and Austin P. Wright, "Networks and Nukes: Multiplex Network Analysis for Interconnected Systems," *Political Analysis*. (Submitted 2017)

2. K. P. Harrig, B. L. Goldblum, J. A. Brown, D. L. Bleuel, L. A. Bernstein, **J. Bevins**, M. Harasty, T. A. Laplace, E. F. Matthews, "Neutron Spectroscopy for Pulsed Beams with Frame Overlap using a Double Time-of-Flight Technique," *Nuclear Instrumentation and Methods in Physics Research Section A*. (Accepted September 2017)

3. M. Kireeff Covo, R. A. Albright, et al., "The 88-Inch Cyclotron: A One-Stop Facility for Electronics Radiation and Detector Testing," *Journal of the International Measurement Confederation*. (Accepted October 2017)

4. **James E. Bevins**, R.N. Slaybaugh, "Gnowee: A Metaheuristic Optimization Algorithm for Solving Engineering Problems Containing Continuous and Discrete Design Parameters," *IEEE Transactions on Evolutionary Computation*. (Submitted 2017)

5. **James E. Bevins**,Elie Katzenson, James Kendrick, Rebecca Krentz-Wee, Sarah Laderman, Yubing Tian, "A Framework for Assessing Alternate Proliferation Pathways in the Age of Non-State Actors," *Nuclear Posture Review*. (Accepted September 2017)

Publications in Conference Proceedings

1. **James E. Bevins**, Bethany L. Goldblum, Elie Katzenson, James Kendrick, Rebecca Krentz-Wee, Sarah Laderman, Yubing Tian, "Alternate Nuclear Proliferation Pathways in the Age of Non-State Actors," in Proceedings of the American Nuclear Society Winter Meeting and Technology Expo, Washington, D.C., October 2017. (invited)

2. M. K. Covo et al., "88-Inch Cyclotron: The one-stop facility for electronics radiation testing," in 2017 IEEE International Workshop on Metrology for AeroSpace (MetroAeroSpace), Padua, 2017, pp. 484-488.

3. **James E. Bevins**, Bethany L. Goldblum, Tom Hickey, Elie Katzenson, James Kendrick, Rebecca Krentz-Wee, Sarah Laderman, Yubing Tian, Collin Ting, Alexa J Wehsener, "Alternate Nuclear Proliferation Pathways in the Age of Non-State Actors," in Proceedings of the Advances in Nuclear Nonproliferation Technology and Policy Conference, Santa Fe, NM, September 2016.

4. **J. Bevins**, R. Slaybaugh, L. Bernstein, E. Henry, W. Dunlop, "Targeted Modification of Neutron Energy Spectra for National Security Applications," Proceedings of the 2016 Hardened Electronics And Radiation Technology Technical Interchange Meeting in Monterey, CA, April 2016.

5. **J. Bevins**, R. Slaybaugh, L. Bernstein, W. Dunlop, E. Henry, "Application of Metaheuristic Optimization Methods for Neutron Spectral Shaping Applications," Proceedings of the Conference on Data Analysis 2016 in Santa Fe, NM, March 2016.

6. A. Stevenson and **J. Bevins**, "Project Nimble Elder: Investigation of Practical Solutions for Active Interrogation," in Proceedings of the HEART Conference 2013, Albuquerque, NM.

7. A. Stevenson, J. St. Ledger, and **J. Bevins**, "The AFNWC Nuclear Dust Cloud Modeling Initiative," in Proceedings of the HEART Conference 2012, Monterey, CA.

8. S. Karki, **J. E. Bevins**, Joseph Sandstrom, C. Clayton, M. S. Driver, B. Nordell, J. W. McClory, J. C. Petrosky , K. I. Pokhodnya and A. N. Caruso, "Fabrication and transport properties of a-B5C:Hx to n-type Si heterojunction diodes", American Physical Society March Meeting 2011, 15 Mar 11, Dallas TX.

9. Abigail A. Bickley, **James Bevins**, Anthony Caruso, James Petrosky, John McClory, Peter Dowben, and William Miller, " Design and testing of a boron carbide based neutron spectrometer for homeland security applications," in Abstracts Of Papers Of The American Chemical Society, vol. 242. 1155, 2011.

10. **James Bevins**, John McClory, James Petrosky, and Anthony Caruso, "Theoretical Performance of a p-type B5C:Hx Thin Film on n-Si Neutron Detector", Transactions of the American Nuclear Society, vol. 103, pp. 212-216, November 2010.

11. **J. Bevins**, J. P. Hayward, J. Mihalczo, "Monte Carlo simulations of passive time correlation measurements for monitoring HEU in large storage arrays," Proceedings of 50th INMM Annual Meeting, Tucson, AZ, July 2009.

Conference Presentations (not including publications listed above)

1. T. A. Laplace, J. A. Brown, B. L. Goldblum, D. L. Bleuel, K. P. Harrig, **J. Bevins**, M. Harasty, "Low Energy Light Yield of Organic Scintillators," University Program Review, 2017, Walnut Creek, CA.

2. **J. Bevins**, "Modification of the NIF Neutron Spectrum for Forensics Applications," University and Industry Technical Interchange Review Meeting, 2016, Raleigh, NC.

3. **James E. Bevins**, Bethany L. Goldblum, Tom Hickey, Elie Katzenson, James Kendrick, Rebecca Krentz-Wee, Sarah Laderman, Yubing Tian, Collin Ting, Alexa J Wehsener, "Alternate Nuclear Proliferation Pathways in the Age of Non-State Actors," University and Industry Technical Interchange Review Meeting, 2016, Raleigh, NC.

4. **James Bevins**, Elie Katzenson, Tom Hickey, Erika Suzuki, James Kendrick, Nils Haneklaus, Yubing Tian, Bethany L. Goldblum, "Rethinking the Proliferation Paradigm: Alternate Nuclear Weapon Paths in the Age of Non-State Actors and Technology Democratization," 2015 Winter Project on Nuclear Issues Conference, Washington DC, 2015.

5. **J. Bevins**, "NIF Fission-Enhanced Tailored-Spectrum Irradiator," Sather Workshop, 2014, Berkeley, CA.

6. **J. Bevins**, B. Kowash, and J. McClory, "Calibration of AFIT Graphite Pile to Account for 241Am Ingrowth in the 239PuBe13 Source," ANS National Student Conference, 2010, Ann Arbor, MI.

Other Works

1. **James Bevins**, Youdong Zhang, and Rachel Slaybaugh. "Coeus." Software. (released 2017) `https://github.com/SlaybaughLab/Coeus`

2. **James Bevins**, Youdong Zhang, and Rachel Slaybaugh. "Gnowee." Software. (released 2017) `https://github.com/SlaybaughLab/Gnowee`

COMPUTER SKILLS

Languages	Python, JAVA, Fortran 90/95/2003, C++, PERL
Versioning and Testing	git, nose
Tools	Doxygen, LaTeX, Jupyter, MatLab, Mathematica, shell, vim
Nuclear Software	MCNP, ADVANTG, PyNE, SCALE