Daniel Hellfeld

CONTACT INFORMATION

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OBJECTIVE

To conduct scientific research in the field of nuclear engineering, specifically in the areas of radiation detection and nuclear nonproliferation.

EDUCATION

Doctor of Philosophy (PhD), Nuclear Engineering — **Aug 2015 - Present**
University of California, Berkeley — *Berkeley, CA*

- Cumulative GPA: 4.0.
- Member of the Nuclear Science and Security Consortium (NSSC).

Master of Science (MS), Nuclear Engineering — **Aug 2013 - May 2015**
Texas A&M University — *College Station, TX*

- Cumulative GPA: 4.0.
- Member of the Nuclear Security Science and Policy Institute (NSSPI).
- Thesis Title: *Feasibility of Remote Nuclear Reactor Antineutrino Directionality via Elastic Electron Scattering in the WATer CHerenkov Monitor of ANtineutrinos (WATCHMAN).*

Bachelor of Science (BS), Physics — **Sep 2009 - June 2013**
University of California, Santa Barbara — *Santa Barbara, CA*

- Cumulative GPA: 3.87.
- Graduated *Summa Cum Laude*.

RESEARCH EXPERIENCE

NSSC Graduate Research Fellow — **Aug 2015 - Present**
Nuclear Science and Security Consortium — *Berkeley, CA*
University of California, Berkeley

- Perform research in collaboration with UC Berkeley and Lawrence Livermore National Laboratory in the areas of radiation detection and nuclear security/safeguards.

Graduate Student Intern — **June 2015 - July 2015**
Lawrence Livermore National Laboratory — *Livermore, CA*
Nuclear and Chemical Sciences Division, Rare Event Detection Group

- Performed GEANT4 simulations and analysis for the WATCHMAN project.
- Completed and submitted a paper to a peer reviewed physics journal on nuclear reactor antineutrino directional sensitivity of water Cherenkov detectors.

NSSC Graduate Research Fellow — **Nov 2014 - May 2015**
Nuclear Science and Security Consortium — *Berkeley, CA*
University of California, Berkeley

- Performed master's thesis research on antineutrino detection for nuclear safeguards in collaboration with Lawrence Livermore National Laboratory.

Graduate Research Assistant — **Sep 2013 - Nov 2014**
Texas A&M University — *College Station, TX*
Department of Nuclear Engineering

- Performed various research tasks in the fields of nuclear security and radiation detection instrumentation development.
- Assisted in the teaching and grading associated with the graduate radiation detection laboratory course.

Graduate Student Intern **June 2014 - Aug 2014**
Lawrence Livermore National Laboratory *Livermore, CA*
Nuclear and Chemical Sciences Division, Rare Event Detection Group

- Performed simulations on the proposed WATer CHerenkov Monitor of AntiNeutrinos (WATCHMAN) detector using the Monte Carlo particle transport toolkit, GEANT4.
- Studied the feasibility of nuclear reactor directionality using antineutrino-electron elastic scattering in the WATCHMAN detector.

SCIENTIFIC COMPUTING SKILLS

Languages:	C++, C, Python, bash
Mathematical Software:	ROOT, Mathematica, Matlab
Monte Carlo Particle Transport Software:	MCNP5/MCNPX, GEANT4, Serpent
Gamma Spectroscopy Software:	GENIE-2000, MAESTRO
Nuclear Burnup Software:	ORIGEN2, CINDER-90, TransLAT
Build Systems:	Make, CMake
Operating Systems:	Mac, Linux, MS Windows
Version Control:	git, svn
Other Software:	MS Office, LaTeX

PROFESSIONAL SOCIETY MEMBERSHIPS

Institute of Nuclear Materials Management	**2014 - Present**
American Nuclear Society	**2013 - Present**
National Society of Collegiate Scholars	**2009 - 2013**
Golden Key International Honor Society	**2009 - 2013**

AWARDS

Nuclear Science and Security Consortium Fellowship, UC Berkeley	**Aug 2015**
JD Williams Best Poster Award, INMM 56th Annual Meeting	**July 2015**
Nuclear Science and Security Consortium Fellowship, UC Berkeley	**Nov 2014**
Graduate Enhancement Fellowship, Texas A&M University	**Aug 2013**
Highest Academic Honor Award, UC Santa Barbara, Physics Dept.	**May 2013**

WORKSHOPS & SEMINARS

Applied Antineutrino Physics Workshop **December 2015**
Center for Neutrino Physics, Virginia Tech University *Arlington, CA*

Public Policy and Nuclear Threats Summer Boot Camp **June 2015**
Institute on Global Conflict and Cooperation, UC San Diego *San Diego, CA*

Nuclear Safety in the Post-Fukushima Era **Feb 2015**
Tokyo Institute of Technology *Tokyo, Japan*

NDA Fundamentals for Nuclear Safeguards **Nov 2014**
Oak Ridge National Laboratory *Oak Ridge, TN*

CERTIFICATIONS

General Radiation Safety Training **Feb 2014**
Environmental Health and Safety Office, Texas A&M University *College Station, TX*

CONFERENCE PROCEEDINGS

D. Hellfeld, A. Bernstein, S. Dazeley, C. Marianno, in: Proceedings of the 56th Institute of Nuclear Materials Management Annual Meeting, "Nuclear Reactor Antineutrino Directionality via Elastic Electron Scattering in a Gd-Doped Water Chereknov Detector", Indian Wells, CA, 2015.

PUBLICATIONS

[1] D. Hellfeld, S. Dazeley, A. Bernstein, C. Marianno, "Reconstructing the Direction of Reactor Antineutrinos via Electron Scattering in Gd-Doped Water Cherenkov Detectors", Physical Review D, Currently in review.

[2] D. Hellfeld, C. Marianno, W. Charlton, R. Webb, "Feasibility of Nuclear Reactor Antineutrino Directionality via Elastic Electron Scattering in the WATer CHerenkov

Monitor of ANtineutrinos (WATCHMAN)", Master's Thesis, Texas A&M University, 2015.

[3] M. Askins, M. Bergevin, A. Bernstein, S. Dazeley, S. T. Dye, T. Handler, A. Hatzikoutelis, D. Hellfeld, P. Jaffke, Y. Kamyshkov, B. J. Land, J. G. Learned, P. Marleau, C. Mauger, G. D. Orebi Gann, C. Roecker, S. D. Rountree, T. M. Shokair, M. B. Smy, R. Svoboda, M. Sweany, M. R. Vagins, K. A. van Bibber, R. B. Vogelaar, M. J. Wetstein, M. Yeh, "The Physics and Nuclear Nonproliferation Goals of WATCHMAN: A WATer CHerenkov Monitor for ANtineutrinos", arXiv:1502.01132 (2015).

RELEVANT COURSEWORK

University of California, Berkeley

- Analytical Methods for Nonproliferation (NE230)
- Advanced Concepts in Radiation Detection and Measurement (NE204)
- Charged Particle Source and Beam Technology (NE282)
- Nuclear Reactions and Interaction of Radiation with Matter (NE201)
- Special Topics (NE290)
- Nuclear Reactor Theory (NE250)
- Introduction to Nuclear Reactor Theory (NE150)
- Nuclear Reactions and Radiation (NE101)
- Nuclear Materials (NE120)

Texas A&M University

- Radiation Interactions and Shielding (NUEN604)
- Radiation Detection and Nuclear Materials Measurement (NUEN605)
- Reactor Theory (NUEN601)
- Nuclear Fuel Cycles and Nuclear Materials Safeguards (NUEN 651)
- Nuclear Reactor Analysis and Experimentation (NUEN606)
- Nuclear Nonproliferation and Arms Control (NUEN650)
- Monte Carlo Computational Particle Transport (NUEN630)
- Special Topics: Introduction to GEANT4 Monte Carlo Transport (NUEN689)
- Statistical Analysis (STAT601)

University of California, Santa Barbara

- Classical Mechanics (PHYS105A/105B)
- Electromagnetism (PHYS110A/110B)
- Quantum Mechanics (PHYS115A/115B/115C)
- Mathematical Methods for Theoretical Physics (PHYS100A/100B)
- Thermodynamic and Statistical Physics (PHYS119A)
- Particle Physics (PHYS125)
- Analog Electronics (PHYS127AL)
- Advanced Physics Laboratory (PHYS128AL/128BL)
- Nuclear Physics (PHYS150)
- Differential Equations and Linear Algebra (MATH3C/5A)
- Vector Calculus (MATH5B/5C)

REFERENCES

Dr. Steven Dazeley
Staff Scientist
Lawrence Livermore National Laboratory, Livermore, CA
Nuclear and Chemical Sciences Division, Rare Event Detection Group
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Dr. Craig Marianno
Visiting Assistant Professor, Senior Research Engineer
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