Jeff Terry

Vice Provost for Research · Research Office

Professor · Department of Physics

Professor · Department of Mechanical, Materials, and Aerospace Engineering

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Summary

- Illinois Institute of Technology Leadership Roles
  - Research Office
    - Vice Provost for Research (Current)
    - University Liaison to the National Laboratories (1.5 years)
  - Lewis College of Science and Letters
    - Associate Dean For Graduate Studies and Research (1.5 years)
    - Interim Chair, Department of Biology (1 year term)
    - Interim Chair, Department of Social Sciences (3 year term)
  - Making Push for R1 Status
    - Increased Research Grants >$10M to $46M
    - Research Expenditures expected to increase similarly to > $40M
    - Focus on Partnerships
      - Air Force Research Laboratory; CHIPS Act; DOE Labs including LANL, PNNL, INL, ANL, Fermilab, ORNL, NREL; Minority Serving Institutions
    - Wrote Illinois Tech Contribution to Awarded FermiForward Fermilab Operations Contract
  - SMART USA Strategic Governing Council (SGC)
    - OMB-3145 Current and Pending Support Form Requires Listing $285,000,000 for SMART USA
  - SMART USA Roadmap Executive Committee (REXCOM)
  - SMART USA Digital, Technical, and Manufacturing Advisory Committee (DTMAC)
- External Leadership Roles
  - Stakeholder Review Committee (SRC) of DOE Advanced Post-Irradiation Capabilities (APIEC) Project
  - Scientific Director of Advanced Test Reactor National Scientific User Facility
  - Chair of the Prairie Chapter of AVS: Science and Technology of Materials, Interfaces, and Processing
  - E42 Committee of American Society for Testing and Materials (ASTM) International
- Political Advising on Energy, Nuclear Energy, Nuclear Waste, and Fukushima
  - United States
    - Indiana and Illinois State Legislature
    - State of Georgia Public Service Commission
    - Members of US House and Senate
    - Illinois Congressional Delegation on Fukushima
- 2024 Fellow of AVS: Science and Technology of Materials, Interfaces, and Processing
  - For pioneering inventions and significant contributions advancing the study of nuclear materials physics including the development of artificial intelligence analysis tools for materials characterization analysis
- Research Funding Portfolio
  - Managed $31M portfolio between the University and National Laboratory Roles
  - Worked to arrange $50M Match From Illinois State Government for CHIPS Act SMART USA Proposal

- Teaching
  - Lewis College Excellence in Teaching Award, Two-time 3M Champion of Science

Recent Administrative Achievements

- Vice Provost for Research, Research Office
- University Liaison to the National Laboratories, Research Office
  - Lead the development of Illinois Tech's contribution to the FermiForward Team awarded the operations contract for Fermi National Accelerator Laboratory.
    - Fermilab $1.0B annual budget (awarded Oct 2024).
    - Illinois Tech as one of the 20 major FermiForward partners receives 10 joint faculty positions with Fermilab (2 per year); 2 joint postdocs; 10 joint graduate students in exchange for providing Engineering Support to the Fermi Forward team.
  - Developed new National Laboratory collaboration initiatives including Faculty/Staff meet and greets; joint appointments; and joint seminars.
    - Worked with LANL, AFRL, NREL, ANL, FNAL, Amesla, LLNL, ANL, ORNL, PNNL, INL.
  - Formulated and implemented internal proposal reviews to ensure compliance with funding calls.
    - Research Expenditures Expected > $40M; within $10M of R1 status as we exceed Ph. D. production requirements.
  - Expanded role to partnerships beyond National Laboratories.
    - Managing all CHIPS act related proposals.
      - Member of Leadership Group (Oct. 2025) SMART USA Digital Twins $285M Consortium
      - First CHIPS Act Award (Sept. 2024) Illinois Semiconductor Workforce Network (ISWN) as part of Innovate Illinois Team
    - Chicago Quantum Exchange
    - Innovate Illinois Team
    - Midwest Microelectronics Consortium (MMEC)
    - Quantum Science Center at Oak Ridge National Laboratory
    - Fundraising for CHIPS-related Proposal Matching Funds.
    - Established strategic partnerships with minority-serving institutions (MSI); important as Illinois Tech obtains MSI status.
    - Worked with Argonne National Laboratory to implement Southside STEM Opportunity Landscape.
- Associate Dean of Graduate Studies and Research, Lewis College of Science and Letters
  - Helped form an advisory board, and set strategic priorities for research funding, and graduate programs in a college with operational budget of approximately $1.6 million (excludes faculty salary, fundraising, etc).
  - Assisted research programs of eight academic units (Biology, Chemistry, English Langauge Services, Food Science and Nutrition, Humanities, Social Science, Physics, Psychology) with 136 fulltime faculty and an average of 96 adjunct faculty.
  - Managed external partnerships and research relationships with National Laboratories and Federal Agencies including Department of Energy, Food and Drug Agency, National Institutes of Health, Department of Commerce, Department of Defense, National Science Foundation.
  - Developed framework for first operational recharge centers.
  - Supported assessment and accreditation (Higher Learning Commission (HLC), Council for Accreditation of Counseling & Related Educational Programs (CACREP), Accreditation Board for Engineering and Technology (ABET).
  - Attended University Board of Trustees Retreats To Support President and Provost as necessary.
  - Obtained funding to endow Summer Undergraduate Research in Lewis College
- Interim Chair, Biology (1 Year)

  - Hired One Tenured Chair, One Tenure-track Faculty Member.

- Interim Chair, Social Sciences (3 Years)
  - Hired One Tenured Chair, One Associate Chair, Two Teaching-track Faculty Members.
  - Created the Great Problems, Great Minds Seminar Series to tackle the social science problems caused by modern technology.
  - Created environment that led to faculty receiving two Fulbright Fellowships and increasing research funding from $0 to $0.75M.
  - Administered Promotion and Tenure Cases.

Education

Los Alamos National Laboratory *Los Alamos NM*
Postdoctoral Researcher *09/1997 – 11/1998*
- Advisors: Dr. Roland Schulze, Dr. Mary Neu

Northwestern University *Evanston IL*
Postdoctoral Researcher *12/1996 – 09/1997*
- Advisor: Dr. Michael J. Bedzyk

Stanford University *Stanford CA*
Ph. D. Chemical Physics *1997*
- Advisor: Dr. Piero Pianetta

University of Chicago *Chicago IL*
S. B. Chemistry *1990*
- Advisor: Dr. Laurie J. Butler

Professional Experience

05/2014-present	**Professor**, Physics, Illinois Institute of Technology
05/2020-present	**Professor**, Mechanical, Materials, and Aerospace Engineering, Illinois Institute of Technology
08/2011 – 05/2014	**Associate Professor**, Physics, Illinois Institute of Technology
08/2005 – 07/2011	**Assistant Professor**, Physics, Illinois Institute of Technology
12/2002 – 08/2005	**Research Assistant Professor**, Physics, Illinois Institute of Technology
08/2000 – 12/2002	**Senior Research Associate**, Physics, Illinois Institute of Technology
11/1998 – 07/2000	**Staff Scientist**, Nuclear Materials Technology, Los Alamos National Laboratory

Administrative Experience

01/2025-present	**Vice Provost for Research**, Research Office, Illinois Institute of Technology
06/2023-12/2024	**University Liaison to the National Laboratories**, Research Office, Illinois Institute of Technology
08/2023-12/2024	**Associate Dean of Graduate Studies and Research**, Lewis College of Science and Letters, Illinois Institute of Technology
10/2023-present	**Member-At-Large**, E42 Committee, ASTM International
01/2022-01/2024	**Past Chair**, Prairie Chapter, American Vacuum Society
11/2021-present	**Director**, Materials Characterization Center, Illinois Institute of Technology
01/2023-08/2023	**Interim Chair**, Biology, Illinois Institute of Technology
08/2020-08/2023	**Interim Chair**, Social Sciences, Illinois Institute of Technology
08/2011-present	**International Steering Committee**, Nuclear Science Week, National Museum of Nuclear Science & History
01/2020-12/2021	**Chair**, Prairie Chapter, American Vacuum Society
01/2018-12/2019	**Vice Chair**, Prairie Chapter, American Vacuum Society
08/2013 – 08/2018	**Board of Directors**, eXtreme MATerials Beamline, Argonne National Laboratory
08/2013 – 1/2014	**Director**, Advanced Test Reactor National Scientific User Facility, Idaho National Laboratory
05/2011 – 6/2013	**Chair**, Advanced Test Reactor Users Organization, Idaho National Laboratory
05/2011 – 12/2011	**Interim Director**, Health Physics Program, Illinois Institute of Technology

Honors and Awards

11/2024	**Fellow of AVS**, AVS: Science and Technology of Materials, Interfaces, and Processing; formerly American Vacuum Society: "For pioneering inventions and significant contributions advancing the study of nuclear materials physics including the development of artificial intelligence analysis tools for materials characterization analysis"
10/2024	**Keynote Speaker**, ATAS-AnXAS 2024
8/2024	**2023 JVSTA Editor's Choice Articles**, Lun Lau, Miu, Abraham Burleigh, Jeff Terry, and Min Long, Materials Characterization: Can AI be used to address reproducibility challenges?, Journal of Vacuum Science & Technology A 41, 060801 (2023).
8/2024	**2023 JVSTA Editor's Choice Articles**, Major, George, B. Maxwell Clark, Kevin Cayabyab, Nathan Engel, Christopher D. Easton, Jan Čehal, Donald Baer, Jeff Terry, and Matthew Linford, Insufficient reporting of x-ray photoelectron spectroscopy instrumental and peak fitting parameters (metadata) in the scientific literature, Journal of Vacuum Science & Technology A 41, 043201 (2023).
7/2024	**Keynote Speaker**, Gordon Research Conference (GRC) on Solid State Chemistry: Diverse Approaches to Functional Materials: Synthesis, Characterization, and Data-Driven Discoveries
4/2022	**Keynote Speaker**, Fifth International Conference on Applied Surface Science 2022
8/2021	**Plenary Speaker**, Advanced Light Source Users Meeting 2021
3/2021	**Lewis College of Science and Letters Excellence in Teaching Award**, Illinois Institute of Technology
3/2019	**Champion of Science**, 3M, Inc.
3/2018	**Champion of Science**, 3M, Inc.
10/2012	**Plenary Speaker**, NuMat 2012
8/2006	**Science Profile Subject**, Apple, Inc.
5/2003	**Best University Interprofessional Studies Project**, Illinois Institute of Technology
9/1999	**Science and Technology Award Recipient**, Los Alamos National Laboratory
12/1995	**Student Prize Winner in Physical Chemistry**, International Chemical Congress of Pacific Basin Societies: Pacifichem 1995
5/1990	**Honorable Mention**, NSF Graduate Research Fellowship

Philanthropy

I have worked with two organizations to strengthen outreach programs. These two entities figure prominently in our NSF broader impacts efforts.

Nuclear Science Week, National Museum of Nuclear Science and History (8/2011 – present), I have been on the International Steering Committee for Nuclear Science Week for over a decade. Over this time, I have worked on procuring venues, event organization, fund raising, and outcome reporting. This has involved work with NGOs, Nuclear Industry members, Universities, and Government Agencies. For Nuclear Science Week 2022, I raised funds to bring the Art of the Reactor Exhibit to Illinois Tech from its creators at the National Museum of Nuclear Science and History in Albuquerque NM. The exhibit was on display from November 4, 2022 to December 4, 2022. The event featured a Gala reception on November 18, 2022.

Athletes For Charity (1/2018 – present), I have worked with the NGO, Athletes For Charity, to improve education in Northwest Indiana. Together we work to provide opportunities to underprivileged school districts to include STEM and Reading programs in K-12 education. We raise funds for undergraduate students to travel with Illinois Tech faculty to teach STEM programs and computer programming at predominantly minority schools in Northwest Indiana. The students are often accompanied by a professional athlete who leads a section. This has been very effective in increasing student interest. I have worked on event organization, fund raising, and outcome reporting in this work.

Publications

Academic

Bajaj, Ashima, Harry Ramanantoanina, Bianca Schacherl, Sven Schenk, Tim Pruessmann, Agost Tasi, David Fellhauer, Alaina Humiston, Jeff Terry, Xiaoyu Wang, Eva Zurek, Tonya Vitova, Paul S. Bagus, and Jochen Autschbach, *Actinide 5f Occupations: The Case of PuO_2*, Inorganic Chemistry 64, 12297 (2025).

Humiston, Alaina, Miu Lun Lau, Tim Stack, Evan Restuccia, Alberto Herrera-Gomez, Min Long, Daniel T. Olive, and Jeff Terry, *Analysis of x-ray emission spectroscopy (XES) data using artificial intelligence techniques included in the XES Neo package*, Journal of Vacuum Science & Technology A 43, 043411 (2025).

Lizarbe, Alvaro J., Kristopher S. Wright, Garrett Lewis, Gavin Murray, Daniel E. Austin, Jeff Terry, David E. Aspnes, and Matthew R. Linford, *The case for denoising/smoothing X-ray photoelectron spectroscopy data by Fourier analysis*, Journal of Vacuum Science & Technology A 43, 033401 (2025).

Pinder, Joshua W, Braxton Kulbacki, Donald Baer, Mark Biesinger, James Castle, David Castner, Christopher D. Easton, John Grant, Grzegorz Greczynski, Sarah Harmer, Anthony Hughes, Mark Isaacs, László Kövér, George Major, David Morgan, Cedric Powell, Peter Sherwood, William Skinner, Kara Stowers, Jeff Terry, and Matthew R Linford, *What's in a Name?"ESCA" or "XPS"? A discussion of comments made by Kai Siegbahn more than four decades ago regarding the name of the technique*, Surface and Interface Analysis 57, 368 (2025).

Burleigh, Abraham, Kavin Ammigan, Sujit Bidhar, Frederique Pellemoine, Ovidiu Toader, Thomas Kubley, Kai Sun, and Jeff Terry, *Radiation damage study of POCO ZXF-5Q graphite for neutrino production targets using 4.5 MeV helium ions*, Journal of Nuclear Materials 605, 155545 (2025).

Philipps, Joseph Caleb, and Jeff Terry, *Influence of neutron decay on nuclear reactor materials* [version 1; peer review: 2 approved, 1 approved with reservations], Nuclear Science and Technology Open Research 2, 51 (2024)

Thompson, Alaina, William Limestall, Art J. Nelson, Daniel T. Olive, and Jeff Terry, *A Review of Actinide Core Level Photoemission*, Journal of Vacuum Science & Technology A 42, 050802 (2024).

Jafari, Samira, Gregory Snow, Jeff Terry, and Matthew R. Linford, *New method for collecting XPS and other spectra: A thought (Gedanken) experiment*, Hybrid Advances 5, 100157 (2024).

Pinder, Joshua W., George H. Major, Don Baer, Jeff Terry, James Whitten, Jan Čechal, Jacob D. Crossman, Jonas Baltrusaitis, Mattijs van Sprosen, Matthew R. Linford, Chris Easton, and Neal Fairley, *Avoiding Common Errors in X-ray Photoelectron Spectroscopy Data Collection and Analysis, and Properly Reporting Instrument Parameters*, Applied Surface Science Advances 19, 100534 (2024).

Delpazir, Melody H , Mohammadreza Asherloo, Sajjad Nasiri Khalil Abad, Alaina Thompson, Victor Guma, Sourabh D Bagi, Keerthi Kumar Sreenivas, Muktesh Paliwal, Jeff Terry, Anthony D Rollett, and Amir Mostafaei, *Microstructure and corrosion behavior of differently heat-treated Ti-6Al-4V alloy processed by laser powder bed fusion of hydride-dehydride powder*, Corrosion Science 224, 111495 (2023).

Ding, Yujia , Raymond P. Conley, Carlo U. Segre, Bing Shi, Jeff Terry, and Ali M. Khounsary. *High-reflectivity x-ray mirror with suppressed absorption edges over a wide energy range*, Proceedings SPIE PC12694, Advances in X-Ray/EUV Optics and Components XVIII, PC126940A https://doi.org/10.1117/12.2682020, (2023).

Lun Lau, Miu, Abraham Burleigh, Jeff Terry, and Min Long, *Materials Characterization: Can AI be used to address reproducibility challenges?*, Journal of Vacuum Science & Technology A 41, 060801 (2023).

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Major, George, Joshua Pinder, Daniel Austin, Donald Baer, Steven Castle, Jan Čehal, B. Maxwell Clark, Hagai Cohen, Jonathan Counsell, Alberto Herrera-Gomez, Pavitrav Govindan, Seong H. Kim, David Morgan, Robert Opila, Cedric Powell, Stanislav Prusa, Adam Roberts, Mario Rocca, Naoto Shirahata, Tomáš Šikola, Emily Smith, Regina So, John E. Stovall, Jennifer Strunk, Andrew Teplyakov, Jeff Terry, Stephen Weber, and Matthew Linford, *Perspective on improving the quality of surface and material data analysis in the scientific literature with a focus on X-ray Photoelectron Spectroscopy (XPS)*, Journal of Vacuum Science & Technology A 41, 038501 (2023).

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Terry, Jeff, *Radioactive Samples,* in "International Tables For Crystallography, Volume I: X-ray Absorption Spectroscopy and Related Techniques," Eds.: Chantler, C., Boscherini, F., and Bunker, B., https://doi.org/10.1107/97809553602060000116 (2022).

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Ganegoda, Hasitha, Soham Mukherjee, Beihai Ma, Daniel T. Olive, James H. McNeely, James A. Kaduk, Jeff Terry, Håkan Rensmo, and Carlo U. Segre, *Role of Fe Doping on Local Structure and Electrical and Magnetic Properties of $PbTiO_3$,* Journal of Physical Chemistry C 125, 12342 (2021).

Wen, Chunyang, Libin Sun, Wenhua Zhang, Wenbo Liu, Jeff Terry, Joshua Wright, Adbellatif M. Yacout, Xinfu He, Di Yun, and Long Gu, *Combined EXAFS and MD study to elucidate defect behaviors and stage IV recovery mechanism in heavy ion irradiated molybdenum,* Materialia 16, 101058 (2021).

Terry, Jeff, Miu Lun Lau, Jiateng Sun, Chang Xu, Bryan Hendricks, Julia Kise, Mrinalini Lnu, Sanchayni Bagade, Shail Shah, Priyanka Makhijani, Adithya Karantha, Travis Boltz, Max Oellien, Matthew Adas, Shlomo Argamon, Min Long, and Donna Post Guillen, *Analysis of Extended X-ray Absorption Fine Structure (EXAFS) Data Using Artificial Intelligence Techniques,* Applied Surface Science 547, 149059 (2021).

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Linford, Matthew R., Vincent S. Smentkowski, John T. Grant, C. Richard Brundle, Peter M.A. Sherwood, Mark C. Biesinger, Jeff Terry, Kateryna Artyushkova, Alberto Herrera- Gómez, Sven Tougaard, William Skinner, Jean-Jacques Pireaux, Christopher F. McConville, Christopher D. Easton, Thomas R. Gengenbach, George H. Major, Paul Dietrich, Andreas Thissen, Mark Engelhard, Cedric J. Powell, Karen J. Gaskell, and Donald R. Baer, *Proliferation of Faulty Materials Data Analysis in the Literature,* Microscopy and Microanalysis, doi:10.1017/S1431927619015332 (2020).

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Kaplan, D. M., K. Kirch, D. Mancini, J. D. Phillips, T. J. Phillips, R. D., Reasenberg, T. J. Roberts, and J. Terry, *Progress toward a muonium gravity experiment,* Proceedings of the Seventh Meeting on CPT and Lorentz Symmetry, 247 (2017).

Linford, M. R., B. Singh, D. Velázquez, J. Terry, J. D. Bagley, D. H. Tolley, A. Diwan, V. Jain, A. Herrera-Gomez, *Uniqueness Plots: A simple graphical tool for identifying poor fits in x-ray photoelectron spectroscopy,* Applied Surface Science 387,

155 (2016).

Olive, D., H. Ganegoda, Y. Yang, C. Dickerson, T. Allen, and J. Terry, *Using a Spherical Crystallite Model With Vacancies to Relate Local Atomic Structure and Irradiation Defects in ZrC and ZrN,* Journal of Nuclear Materials 475, 123 (2016).

Linford, M. R., B. Singh, D. Velázquez, J. Terry, J. D. Bagley, D. H. Tolley, A. Diwan, V. Jain, A. Herrera-Gomez, *New Data Analysis Tools for X-ray Photoelectron Spectroscopy (XPS) and Spectroscopic Ellipsometry (SE): Uniqueness Plots and Width Functions in XPS, and Distance, Principal Component, and Cluster Analyses in SE,* Microscopy and Microanalysis 22, 344 (2016).

Velazquez, D., R. Seibert, H. Man, L. Spentzouris, and J. Terry, *Pulsed laser deposition of single layer, hexagonal boron nitride (white graphene, h-BN) on fiber-oriented Ag(111)/ $SrTiO_3$(001),* Journal of Applied Physics 119, 095306 (2016).

Liu, X., K. Mo, Y. Miao, K.-C. Lan, G. Zhang, W.-Y. Chen, C. Tomchik, R. Seibert, J. Terry, and J. F. Stubbins, *Investigation of thermal aging effects on the tensile properties of Alloy 617 by in-situ synchrotron wide-angle X-ray scattering,* Materials Science and Engineering: A 651, 55 (2016).

Velazquez, D., R. Seibert, H. Ganegoda, D. Olive, A. Rice, K. Logan, Z. Yusof, L. Spentzouris, and J. Terry, *Tailoring the emissive properties of photocathodes through materials engineering: Ultra-thin multilayers,* Applied Surface Science 360B, 762 (2016).

Kaplan, D. M., K. Kirch, D. Mancini, J. D. Phillips, T. J. Phillips, T. J. Roberts, and J. Terry, *Measuring antimatter gravity with muonium,* Proceedings of the 3rd International Conference on New Frontiers in Physics, EPJ Web of Conferences 95, 05008 (2015).

Velazquez, D., R. Seibert, Z. Yusof, J. Terry, and L. Spentzouris *Synthesis of Ultra-Thin Single Crystal MgO/Ag/MgO Multilayer for Controlled Photocathode Emissive Properties,* 6th International Particle Accelerator Conference IPAC2015, Richmond, VA, USA JACoW Publishing, doi:10.18429/JACoW-IPAC2015-TUPMA004, 1846 (2015).

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Singh, B., D. Velazquez, J. Terry, and M. R. Linford, *The Equivalent Width as a Figure of Merit for XPS Narrow Scans,* Journal of Electron Spectroscopy and Related Phenomenon 197, 56 (2014).

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Terry, J., *Synchrotron radiation, Illinois Tech, and the Nuclear Science User Facilities,* Nuclear News 61(2), 62 (2018).

Terry, J., *The research warrants a significant increase in nuclear power,* Commentary made under "The experts on nuclear power and climate change," http://thebulletin.org/ commentary/research-warrants-significant-increase-nuclear-power, Bulletin of the Atomic Scientists, December 21, 2015.

Terry, J., *Indiana should consider public-private model in meeting CO_2 rules,* The Times of Northwest Indiana, July 15, 2014.

Terry, J., *NM welcomes nuclear waste,* Battle Creek, MI Enquirer, August 24, 2011.

Terry, J., S. McDeavitt, D. Senor, K. L. Murty, D. Beller, P. Xu, and T. Allen, *Advanced Test Reactor Users Week – Meeting the needs of the nuclear community,* Nuclear News 54(9), 50 (2011).

Terry, J., *Don't raise taxes to lower energy use,* Chicago Tribune, October 19, 2006.

J. Terry, *Not Bulletin Material,* Bulletin of the Atomic Scientists 60, 5 (2004).

Presentations

Plenary and Keynote Lectures

October 9, 2024. *Using our artificial intelligence tools for analysis of materials characterization data pertaining to nuclear systems: Corrosion and radiation damage.* Keynote Lecture: Advanced Techniques in Actinide Spectroscopy; Speciation, Techniques, and Facilities for Radioactive Materials at Synchrotron Light Sources (ATAS-AnXAS 2024) — Karlsruhe, Germany.

July 25, 2024. *Power is Everything: using solid state chemistry to enable the clean energy transition.* Keynote Lecture: Gordon Research Conference (GRC) on Solid State Chemistry: Diverse Approaches to Functional Materials: Synthesis, Characterization, and Data-Driven Discoveries — New London, New Hampshire.

April 28, 2022. *The role of artificial intelligence in minimizing analysis errors: EXAFS, core level photoemission, nanoindentation, x-ray astronomy.* Keynote Lecture: International Conference on Applied Surface Science (ICASS) 2022 — Palma, Mallorca, Spain.

August 10, 2021. *The Role of Artificial Intelligence in Minimizing Analysis Errors, Illustrated with EXAFS and Core-Level Photoemission.* Plenary Lecture: ALS User Meeting 2021, Advanced Light Source — Berkeley, California.

October 23, 2012. *Synchrotron Radiation Studies of Advanced Nuclear Energy Materials.* Plenary Lecture: NuMat 2012: The Nuclear Materials Conference — Osaka, Japan.

Invited Talks

September 21, 2025. *Beyond the Surface: Multidimensional Probing with XPS and XAFS. Experimental Frontiers and Data Challenges Across Synchrotron and Laboratory Platforms*. Invited Talk: Quantitative Surface Analysis (QSA) - 19 — Charlotte, North Carolina.

September 12, 2025. *Technology Translation at Illinois Tech*. Invited Talk: Sixth Discovery Partners Institute (DPI) Partners' Council Meeting at Cardiff University — Cardiff, United Kingdom.

January 17, 2025. *Materials Research Capabilities at Illinois Tech*. Invited Talk: EMERGE for Impact at Samsung Semiconductor Headquarters — San Jose, California.

November 7, 2024. *Curve Fitting XPS Curve-Fitting Best Practices*. Invited Talk: Seventieth National Symposium of the American Vacuum Society — Tampa, Florida.

March 19, 2024. *Use of Artificial Intelligence To Analyze Materials Characterization Data From Actinide Containing Materials*. Invited talk: Seaborg Distinguished Speaker Series — Los Alamos, New Mexico.

November 7, 2023. *X-ray Photoelectron Spectroscopy as a Useful Tool to Study Surfaces and Model Systems for Heterogeneous Catalysts*. Invited talk: Sixty-ninth National Symposium of the American Vacuum Society — Portland, Oregon (invited replacement for Hans-Joachim Freund).

September 27, 2023. *Professor Alberto Herrera-Gomez: A life of photoemisison from SSRL to Machine Learning.* Invited talk: International Conference of Surfaces, Materials, and Vacuum 2023 — Zacatecas, Mexico.

June 10, 2023. *The Role of Artificial Intelligence in Minimizing Analysis Errors, Illustrated with EXAFS, Nanoindentation, X-ray astronomy, and Core Level Photoemission.* Invited talk: Interfacial and Surface Science Seminar, National Renewable Energy Laboratory — Golden, Colorado.

November 18, 2022. *Power is Everything: Can living in a high energy world be sustainable and equitable?* Invited talk: Art of the Reactor Exhibit Gala Opening Seminar, Illinois Institute of Technology — Chicago, Illinois.

November 7, 2022. *A Community Forum on Rigor and Reproducibility in Surface Analysis*. Invited Talk: Sixty-eight National Symposium of the American Vacuum Society — Pittsburgh, Pennsylvania.

October 28, 2022. *The Role of Artificial Intelligence in Minimizing Analysis Errors, Illustrated with EXAFS, Nanoindentation, X-ray astronomy, and Core Level Photoemission.* Invited talk: Department of Physics and Astronomy Seminar, University of Texas, San Antonio — San Antonio, Texas.

April 6, 2022. *Power is Everything: Can living in a high energy world be sustainable and equitable?* Invited talk: College of Aviation Science & Technology Incoming Student Seminar, Lewis University — Romeoville, Illinois.

January 27, 2022. *Using Fundamental Surface Science Measurements on Lab Grown Thin Films to Understand The Behavior Of Barrier Layers in TRISO Nuclear Fuels.* Invited talk: Chemistry Department Seminar, Loyola University — Chicago, Illinois.

November 16, 2021. *Use of Artificial Intelligence Techniques to Automate the Analysis of XAFS spectra (And Other Materials Characterization Techniques.* Invited talk: Joint Conference of the African Light Source, African Physical Society, and African Crystallographic Association — Johannesburg, South Africa.

November 3, 2021. *Materials Characterization, Thin Film Growth, and Applications.* Invited talk: Chemical and Materials Engineering Seminar, New Mexico State University — Las Cruces, New Mexico.

November 1, 2021. *Hard X-ray Photoemission and Artificial Intelligence Based Analysis At MRCAT.* Invited talk: MRCAT Review Seminar, Advanced Photon Source — Argonne, Illinois.

October 13, 2021. *Materials Characterization, Thin Film Growth, and Applications.* Invited talk: Carlsbad Environment Monitoring and Research Center, New Mexico State University — Carlsbad, New Mexico.

September 14, 2021. *The Role of Artificial Intelligence in Minimizing Analysis Errors, Illustrated with EXAFS and Core-Level Photoemission.* Invited talk: Chemistry Department Seminar, Illinois Institute of Technology — Chicago, Illinois.

May 20, 2021. *Analysis of Synchrotron Extended X-ray Absorption Fine Structure (EXAFS) Data Using Artificial Intelligence*. Invited talk: NSLS-II and CFN Users' Meeting 2021: Machine Learning Augmented X-ray Scattering and Spectroscopies, National Synchrotron Light Source - II — Brookhaven, New York.

February 11, 2021. *EXAFS Analysis Using Artificial Intelligence Techniques*. Invited talk: Global XAS Journal Club, University of Washington — Seattle, Washington.

January 12, 2021. *Potential For the Use of Compton Imaging In Nuclear Energy Applications*. Invited talk: Bright Future for In Situ and Operando Structural Science at APS (-U) Workshop, Argonne National Laboratory — Argonne, Illinois.

November 24, 2020. *Analysis of Synchrotron Extended X-ray Absorption Fine Structure (EXAFS) Data Using Artificial Intelligence*. Invited talk: Advanced XAS Workshop 2020: AI and Machine Learning in EXAFS Analysis, Canadian Light Source — Saskatoon, Canada.

July 20, 2020. *Analysis of Synchrotron Extended X-ray Absorption Fine Structure (EXAFS) Data Using Artificial Intelligence*. Invited talk: APS Scientific Computation Seminar Series, Argonne National Laboratory — Argonne, Illinois.

January 26, 2020. *Future of the Prairie Chapter of the AVS: Science and Technology of Materials, Interfaces, and Processing.*. Invited talk: American Vacuum Society Board Meeting — Cary, North Carolina.

November 21, 2019. *When Science Goes Bad: Reproducibility and the Black Boxing of Science*. Invited talk: Physics Department Seminar, Illinois Institute of Technology — Chicago, Illinois.

November 13, 2019. *Undergrads In Academic Research: Computational Physics*. Invited talk: Faculty Online Learning Community (FOLC) — Tuscaloosa, Alabama.

October 24, 2019. *XPS for the Non-Analyst: Curve Fitting the Good, the Bad, and the Awful*. Invited talk: Sixty-sixth National Symposium of the American Vacuum Society — Columbus, Ohio.

September 28, 2019. *Transient followup of Astronomical Events: Cognitive Telescope Network*. Invited talk: IBM Watson Bootcamp, IBM — Chicago, Illinois.

September 11, 2019. *Using Fundamental Characterization Tools to Understand The Chemistry Of Accident Tolerant Nuclear Fuels*. Invited talk: Department of Nuclear Engineering Seminar, Idaho State University — Idaho Falls, Idaho.

August 25, 2019. *Applications of Machine Learning for the EXAFS Analysis of Nuclear Materials*. Invited talk: Modeling and Simulation Seminar, Idaho National Laboratory — Idaho Falls, Idaho.

May 22, 2019. *Reactivity of SiC and ZrN with H_2O Probed with Ambient Pressure Photoelectron Spectroscopy*. Invited talk: 5^{th} Workshop on HTGR SiC Material Properties — Oak Ridge, Tennessee.

April 18, 2019. *Tailoring the properties of materials using multilayer thin films*. Invited talk: Materials Science Program, Oregon State University — Corvallis, Oregon.

April 10, 2019. *Moving to a clean energy economy*. Invited talk: Open Table For Science, IBM — Chicago, Illinois.

April 3, 2019. *Using Fundamental Characterization Tools to Understand The Chemistry Of Accident Tolerant Nuclear Fuels*. Invited talk: Department of Engineering Physics and the Department of Materials Science & Engineering (joint seminar), University of Wisconsin, Madison — Madison, Wisconsin.

February 25, 2019. *The Future of Nuclear Energy: Developing New Materials, Closing the Fuel Cycle, Developing Better Economic Modeling*. Invited talk: Department of Civil and Environmental Engineering, University of Utah — Salt Lake City, Utah.

January 14, 2019. *Synchrotron radiation studies of advanced nuclear energy materials*. Invited talk: School of Nuclear Science and Engineering, Oregon State University — Corvallis, Oregon.

December 14, 2018. *Living in a High Energy World: can it be sustainable and equitable?* Invited talk: Energy Systems Division Seminar, Argonne National Laboratory — Argonne, Illinois.

November 20, 2018. *Living in a High Energy World: can it be sustainable and equitable?* Invited talk: Physics Department Seminar, Illinois Institute of Technology — Chicago, Illinois.

October 29, 2018. *Synchrotron Radiation Studies of Advanced Nuclear Energy Materials*. Invited talk: Accelerator Physics and Technology Seminar, Fermi National Accelerator Laboratory — Batavia, Illinois.

August 1, 2017. *Nuclear energy research at MRCAT*. Invited talk: Nuclear Science User Facility Technical Review — Idaho Falls, Idaho.

June 15, 2017. *Getting Undergrads Involved In Research*. Invited talk: Faculty Online Learning Community (FOLC) — Cleveland, Ohio.

June 13, 2017. *Nuclear energy research at MRCAT*. Invited talk: American Nuclear Society Summer 2017 National Meeting — San Francisco, California.

April 17, 2017. *Carbon In Nuclear Reactors: From CP1 to the Present*. Invited talk: High Energy Physics Seminar, University of Chicago — Chicago, Illinois.

March 6, 2017. *Nuclear energy research at MRCAT*. Invited talk: MRCAT Review Seminar, Advanced Photon Source — Argonne, Illinois.

December 19, 2016. *Synchrotron radiation studies of advanced nuclear energy materials*. Invited talk: Chemistry Department Seminar, Brigham Young University — Provo, Utah.

November 28, 2016. *Materials, Economics, and the Future: Where is Nuclear Energy Heading in the Next 20 Years*. Invited talk: Department of Nuclear Engineering, Purdue University — West Lafayette, Indiana.

September 12, 2016. *Surface Science in the Wild: Using Synchrotron Radiation and Lab Grown Thin Films to Understand the Behavior of SiC in Accident Tolerant Nuclear Fuels*. Invited talk: Department of Civil & Environmental Engineering & Earth Sciences Seminar, University of Notre Dame — Notre Dame, Indiana.

August 23, 2016. *Tailoring the properties of surfaces using thin films*. Invited talk: Two Hundred Fifty–Second American Chemical Society National Meeting and Exposition — Philadelphia, Pennsylvania.

August 23, 2016. *Synchrotron radiation studies of advanced nuclear energy materials*. Invited talk: Two Hundred Fifty–Second American Chemical Society National Meeting and Exposition — Philadelphia, Pennsylvania.

June 15, 2016. *Materials Characterization using the Facilities of the Center for Synchrotron Radiation Research and Instrumentation (CSRRI): A NSUF Partner Facility*. Invited talk: American Nuclear Society Summer 2016 National Meeting — New Orleans, Louisiana.

June 6, 2016. *Nuclear Research at MRCAT*. Invited talk: Advanced Test Reactor Users Week, Idaho National Laboratory — Idaho Falls, Idaho.

November 16, 2015. *Nuclear Security: After the Iran Deal, What's Next for Nuclear Security?* Invited talk: The Bulletin of the Atomic Scientists' 6th Annual Clock Symposium — Chicago, Illinois.

October 28, 2015. *Surface Science in the Wild: Using Synchrotron Radiation and Lab Grown Thin Films to Understand the Behavior of SiC in Accident Tolerant Nuclear Fuels*. Invited talk: Canadian Light Source Seminar — Saskatoon, Saskatchewan.

October 22, 2015. *Surface Science in the Wild: Using Synchrotron Radiation and Lab Grown Thin Films to Understand the Behavior of SiC in Accident Tolerant Nuclear Fuels*. Invited talk: Sixty-Second National Symposium of the American Vacuum Society — San Jose, California.

June 22, 2015. *Nuclear Research at MRCAT*. Invited talk: Advanced Test Reactor Users Week, Idaho National Laboratory — Idaho Falls, Idaho.

March 12, 2015. *Photoelectron Spectroscopy: From Surface Chemistry to Thin Films*. Invited talk: PITTCON 2015 — New Orleans, Louisiana.

February 26, 2015. *Monitoring Radiation Damage in Material For Accident-Tolerant Nuclear Fuels*. Invited talk: National Superconducting Cyclotron Laboratory (NSCL) Seminar, Michigan State University — East Lansing, Michigan.

February 9, 2015. *Monitoring Radiation Damage in Material For Accident-Tolerant Nuclear Fuels*. Invited talk: Chemistry Department Seminar, Washington State University — Pullman, Washington.

February 4, 2015. *Monitoring Radiation Damage in Material For Accident-Tolerant Nuclear Fuels*. Invited talk: Institute of Materials Engineering Seminar, Australian Nuclear Science and Technology Organization (ANSTO) — Lucas Heights, Australia.

February 2, 2015. *Small Modular Nuclear Reactors: Parametric Modeling of Integrated Reactor Vessel Manufacturing Within A Factory Environment*. Invited talk: Climate and Ecology Centre Seminar, University of Adelaide — Adelaide, Australia.

November 18, 2014. *Understanding US Energy Policy*. Invited talk: Physics Department Seminar, Google Hangout, University of Central Arkansas — Conway, Arkansas.

October 29, 2014. *Teaching Physics: Is it 1814 or 2014?* Invited talk: Global Physics Department Seminar, Hamline University — St. Paul, Minnesota.

July 31, 2014. *X-ray Absorption Spectroscopy and Photoelectron Spectroscopy of Nuclear Materials*. Invited talk: Denver X-ray Conference: Sixty-Third Annual Conference on Application of X-ray Analysis — Big Sky, Montana.

March 26, 2014. *Characterization of Nuclear Materials With Synchrotron Radiation*. Invited talk: World Nuclear Association Seminar — London, United Kingdom.

March 24, 2014. *Characterization of Nuclear Materials With Synchrotron Radiation*. Invited talk: Birmingham Centre of Nuclear Education and Research Seminar, University of Birmingham — Birmingham, United Kingdom.

March 18, 2014. *Small modular reactors: Can they be built in a timely, cost effective manner?* Invited talk: Two Hundred Forty–Seventh American Chemical Society National Meeting and Exposition — Dallas, Texas.

March 3, 2014. *Characterization of Nuclear Materials With Synchrotron Radiation*. Invited talk: Nuclear Materials Science and Technology Seminar, Oak Ridge National Laboratory — Oak Ridge, Tennessee.

February 11, 2014. *Monitoring Radiation Damage in Material For Accident-Tolerant Nuclear Fuels*. Invited talk: Chemistry Department Seminar, University of Missouri, Columbia — Columbia, Missouri.

November 14, 2013. *SMR Manufacturing/Modular Construction Processes*. Invited talk: American Nuclear Society Winter 2013 National Meeting — Washington, D. C..

September 26, 2013. *Small Modular Nuclear Reactors: Parametric Modeling of Integrated Reactor Vessel Manufacturing Within A Factory Environment*. Invited talk: Physics Department Seminar, Illinois Institute of Technology — Chicago, Illinois.

September 10, 2013. *Vision for the Advanced Test Reactor National Scientific User Facility*. Invited talk: ATR NSUF Industry Advisory Committee Meeting, Electric Power Research Institute — Charlotte, North Carolina.

August 29, 2013. *Small Modular Nuclear Reactors: Parametric Modeling of Integrated Reactor Vessel Manufacturing Within A Factory Environment*. Invited talk: Energy Policy Institute at Chicago Seminar, University of Chicago — Chicago, Illinois.

July 8, 2013. *The Future of U. S. Energy Policy*. Invited talk: Boeing Scholars Seminar, Illinois Institute of Technology — Chicago, Illinois.

June 10, 2013. *State of The Advanced Test Reactor Users Organization*. Invited talk: Advanced Test Reactor Users Week, Idaho National Laboratory — Idaho Falls, Idaho.

April 17, 2013. *Synchrotron Radiation Studies of Advanced Nuclear Energy Materials*. Invited talk: American Nuclear Society, Chicago Chapter Meeting — Chicago, Illinois.

March 14, 2013. *Synchrotron Radiation Studies of Advanced Nuclear Energy Materials*. Invited talk: Physics Department Seminar, Illinois Institute of Technology — Chicago, Illinois.

March 1, 2013. *Synchrotron Radiation Studies of Advanced Nuclear Energy Materials*. Invited talk: Materials Science and Engineering Department Colloquium, Columbia, University — New York, New York.

October 19, 2012. *Synchrotron Radiation Characterization of ZrC and ZrN*. Invited talk: EInternational Workshop On Scattering Techniques For Nuclear Materials 2012 — Berkeley, California.

June 22, 2012. *The Future of U. S. Energy Policy*. Invited talk: Advanced Test Reactor Users Week, Idaho National Laboratory — Idaho Falls, Idaho.

June 21, 2012. *State of The Advanced Test Reactor Users Organization*. Invited talk: Advanced Test Reactor Users Week, Idaho National Laboratory — Idaho Falls, Idaho.

June 7, 2011. *Radiation Damage In ZrC and ZrN*. Invited talk: Advanced Test Reactor Synchrotron Radiation Workshop, Idaho National Laboratory — Idaho Falls, Idaho.

June 6, 2011. *State of The Advanced Test Reactor Users Organization*. Invited talk: Advanced Test Reactor Synchrotron Radiation Workshop, Idaho National Laboratory — Idaho Falls, Idaho.

March 23, 2011. *Nuclear Power and Fukushima*. Invited talk: Chemistry Department Seminar, Illinois Institute of Technology — Chicago, Illinois.

October 14, 2010. *Synchrotron Radiation and Nuclear Energy*. Invited talk: Physics Department Seminar, Illinois Institute of Technology — Chicago, Illinois.

September 30, 2010. *Synchrotron Radiation and Nuclear Energy*. Invited talk: Chemical Engineering Seminar, University of Missouri, Columbia — Columbia, Missouri.

September 15, 2010. *Investigation of Iron Corrosion Products from Brines Using XAFS*. Invited talk: Actinide and Brine Chemistry in a Salt Repository Workshop — Carlsbad, New Mexico.

July 29, 2010. *Nuclear Research at Synchrotron Radiation Facilities*. Invited talk: Nuclear Engineering Seminar, University of Michigan — Ann Arbor, Michigan.

June 14, 2010. *Nuclear Research at Synchrotron Radiation Facilities*. Invited talk: American Nuclear Society Summer 2010 National Meeting — San Diego, California.

June 8, 2010. *Synchrotron Radiation Characterization of Carbide Samples*. Invited talk: Advanced Test Reactor Synchrotron Radiation Workshop, Idaho National Laboratory — Idaho Falls, Idaho.

April 30, 2010. *The Nuclear Option*. Invited talk: Sargent and Lundy Officers' Workshop 2010 — Chicago, IL.

March 22, 2010. *Characterization of arsenic adsorption by Fe_2O_3 supported on granular activated carbon (GAC)*. Invited talk: Two Hundred Thirty–Ninth American Chemical Society National Meeting and Exposition — San Francisco, California.

March 8, 2010. *Electronic Structure of PLZT Thin Films*. Invited talk: Surface Analysis 2010 — Orlando, Florida.

March 6, 2010. *X-ray studies of the Daya Bay Liquid Scintillator*. Invited talk: Midwest Meeting of Daya Bay Collaborators — Chicago, Illinois.

March 4, 2010. *Antineutrino Detection At Daya Bay and Polar Stationary Phase Functionalized Porous Graphite*. Invited talk: Physics Department Seminar, Illinois Institute of Technology — Chicago, Illinois.

October 23, 2009. *Electronic Structure of PLZT Thin Films*. Invited talk: Synchrotron Radiation Center Users' Meeting, Synchrotron Radiation Center — Stoughton, Wisconsin.

September 22, 2009. *Probing Radiation Damage In Solids At The Millimeter Scale Using Synchrotron Radiation Techniques*. Invited talk: Characterization of Activated Samples at Neutron and X–ray User Facilities Workshop, Los Alamos National Laboratory — Santa Fe, New Mexico.

June 3, 2009. *Examination of Radiation Damage In Solids Using Synchrotron Radiation Techniques*. Invited talk: Advanced Test Reactor Synchrotron Radiation Workshop, Idaho National Laboratory — Idaho Falls, Idaho.

March 16, 2009. *Examination of Radiation Damage In Solids Using Synchrotron Radiation Techniques*. Invited talk: Advanced Test Reactor National Scientific User Facility Seminar, Idaho National Laboratory — Idaho Falls, Idaho.

January, 21, 2009. *Nuclear and Radiological Research Collaborative Access Team*. Invited talk: Advanced Photon Source Scientific Advisory Committee Seminar, Argonne National Laboratory — Argonne, Illinois.

October 20, 2008. *Hard X-ray Photoemission*. Invited talk: Condensed Matter and Materials Physics Seminar, Advanced Photon Source Renewal — Lisle, Illinois.

July 31, 2008. *Charting the Heavens With An iPhone™*. Invited talk: Show and Tell: An Evening of New Ideas, School of Design, Illinois Institute of Technology — Chicago, IL.

November 7, 2007. *Synchrotron Radiation Studies of Environmental Chemistry*. Invited talk: Chemistry Department Seminar, Brigham Young University — Provo, Utah.

April 4, 2007. *Synchrotron Radiation 101: Introduction to Synchrotron Radiation*. Invited talk: Physics Department Seminar, Spelman College — Atlanta, Georgia.

November 9, 2006. *iCCD For Image Processing and Image Collection*. Invited talk: Physics Division Seminar, Illinois Institute of Technology — Chicago, Illinois.

January 27, 2005. *Synchrotrons, X-rays, and Energy-Related Research*. Invited talk: Nuclear Engineering Seminar, University of Texas, Austin — Austin, Texas.

November 20, 2003. *Radiopharmaceutical Studies at MR-CAT*. Invited talk: Advanced Photon Source Seminar, Argonne National Laboratory — Argonne, Illinois.

October 25, 2003. *Chemistry and Space Exploration*. Invited talk: National Chemistry Day Seminar, American Chemical Society, Chicago Chapter — Chicago, Illinois.

October 7, 2003. *Structure of Nanosystems*. Invited talk: Chemistry Department Seminar, University of Missouri, Columbia — Columbia, Missouri.

April 4, 2003. *Energy and XAFS*. Invited talk: Stanford Synchrotron Radiation Laboratory Colloquium, Stanford University — Stanford, California.

February 13, 2003. *Local Structure of Radiolytically-Synthesized Nanoclusters*. Invited talk: Physics Department Colloquium, University of Missouri, Rolla — Rolla, Missouri.

October 24-25, 2000. *Spin and Orbital Magnetism in 5f Materials*. Invited talk: Physics Department Colloquium, University of Toledo — Toledo, Ohio.

September 24, 2000. *Synchrotron Radiation Investigations of Actinides and Radiation Damage*. Invited talk: Biological, Chemical, and Physical Sciences Seminar, Illinois Institute of Technology — Chicago, Illinois.

April 24-25, 2000. *Synchrotron Radiation Investigations of Actinides and Radiation Damage*. Invited talk: Radiochemistry/Nuclear Engineering Seminar, University of Missouri, Columbia — Columbia, Missouri.

April 7, 2000. *Principal Component Analysis of X-ray Absorption Spectra from Pu Alloys*. Invited talk: BESSRC CAT 2000 Workshop, Argonne National Laboratory — Argonne, Illinois.

March 22, 2000. *Spin and Orbital Magnetism in 5f Materials*. Invited talk: American Physical Society March Meeting 2000 — Minneapolis, Minnesota (invited replacement for G. van der Laan).

March 2, 2000. *Electronic and Geometric Structure of Pu Alloys*. Invited talk: Materials Engineering Seminar, Colorado School of Mines — Golden, Colorado.

February 10-11, 2000. *Synchrotron Radiation Investigations of Plutonium Alloys and Compounds*. Invited talk: Inorganic Chemistry Seminar, Florida State University — Tallahassee, Florida.

May 10, 1999. *Electronic Structure of Pu Metal Allotropes*. Invited talk: Nuclear Materials and Technology Division Review, Los Alamos National Laboratory — Los Alamos, New Mexico.

April 1, 1999. *Introduction to Synchrotron Radiation*. Invited talk: American Vacuum Society (NM Chapter), 35th Annual Symposium — Albuquerque, New Mexico.

June 28, 1996. *Application of X–ray Photoelectron Diffraction and Extended X–ray Absorption Fine Structure Spectroscopy to Chemically Modified Silicon(111) Surfaces*. Invited talk: Nuclear Materials and Technology Division Seminar, Los Alamos National Laboratory — Los Alamos, New Mexico.

April 11,1996. *Characterization of Pentyl–Terminated Si(111) Using Synchrotron Radiation*. Invited talk: Solid State Physics Seminar, University of Wisconsin, Madison — Madison, Wisconsin.

Contributed Presentations

September 22, 2025. *Digital Twins Meet Materials Science: Real-Time AI Analysis for Advanced Manufacturing*. Talk: Seventy-first National Symposium of the American Vacuum Society — Charlotte, North Carolina.

December 11, 2024. *Sputter Depth Profile Study of ZrN as a Barrier to Silver Migration in TRISO Fuels Using the XPS Neo Artificial Intelligence Fitting Package*. Talk: PacSurf 2024 — Kohala Coast, Hawaii.

November 7, 2024. *XPS Study of ZrN as a Barrier to Silver Migration in TRISO Fuels*. Talk: Seventieth National Symposium of the American Vacuum Society — Tampa, Florida.

November 9, 2023. *Use of Artificial Intelligence To Analyze Materials Characterization Data From Actinide Containing Materials*. Talk: Sixty-ninth National Symposium of the American Vacuum Society — Portland, Oregon.

June 5, 2023. *Use of Artificial Intelligence To Analyze Materials Characterization Data From Actinide Containing Materials*. Talk: Actinides 2023 — Golden, Colorado.

December 13, 2022. *Hard X-ray Photoemission Spectroscopy (HAXPES) at the Advanced Photon Source: A Legacy of Charles S. Fadley*. Talk: PacSurf 2022 — Kohala Coast, Hawaii.

November 6, 2022. *Probing the Oxidation Chemistry of TRISO Nuclear Fuels Using Depth Profiled XPS and Ambient Pressure XPS: A Talk in Memory of Charles S. Fadley*. Talk: Sixty-eight National Symposium of the American Vacuum Society — Pittsburgh, Pennsylvania.

December 20, 2021. *Calculating Overlap Integrals: Revisited. Using Quantum Mechanics and Computational Physics For Experiential Learning*. Talk: Eighth International Chemical Congress of Pacific Basin Societies — New York, New York.

December 18, 2021. *Reactivity of SiC and ZrN with H_2O Probed with Ambient Pressure Photoelectron Spectroscopy*. Talk: Eighth International Chemical Congress of Pacific Basin Societies — New York, New York.

October 25, 2021. *Use of Artificial Intelligence Techniques to Automate the Analysis of XAFS Spectra*. Talk: Sixty-seventh National Symposium of the American Vacuum Society — New York, New York.

October 25, 2019. *Reactivity of SiC and ZrN with H_2O Probed with Ambient Pressure Photoelectron Spectroscopy*. Talk: Sixty-sixth National Symposium of the American Vacuum Society — Columbus, Ohio.

June 18, 2019. *Using Fundamental Surface Science Measurements on Lab Grown Thin Films To Understand the Behavior of Barrier Layers in TRISO Fuels*. Talk: International Conference on Applied Surface Science (ICASS) 2019 — Pisa, Italy.

December 5, 2018. *The Effect of Interface Structure on MgO/Al/MgO Multilayer Photocathodes*. Talk: PacSurf 2018 — Waikoloa Beach, Hawaii.

September 25, 2018. *XAFS studies of fission products in the SiC layer of irradiated TRISO fuel*. Talk: Sixty-fifth National Symposium of the American Vacuum Society — Long Beach, California.

September 10, 2018. *Plutonium and Uranium Coordination in the SiC Layer of Irradiated TRISO Fuel*. Talk: Plutonium Futures–The Science 2018: A Topical Conference on Plutonium and Actinides — San Diego, California.

July 26, 2018. *XAFS studies of fission products and fuel components in the SiC layer of irradiated TRISO fuel*. Talk: XAFS2018: 17th International Conference on X-Ray Absorption Fine Structure — Krakow, Poland.

December 14, 2016. *Hard X-ray Photoelectron Spectroscopy: Applications To Energy Materials*. Talk: PacSurf 2016 — Kohala Coast, Hawaii.

November 9, 2016. *ulsed laser deposition of single layer, hexagonal boron nitride on fiber-oriented Ag(111)/$SrTiO_3$(001)*. Talk: Sixty-third National Symposium of the American Vacuum Society — Nashville, Tennessee.

December 17, 2015. *Controlled Growth of Planar Boron Nitride on Tailored Thin Film Substrates Using Pulsed Laser Deposition*. Talk: Seventh International Chemical Congress of Pacific Basin Societies — Honolulu, Hawaii.

December 10, 2014. *Ag/MgO is a Good Substrate for Epitaxial Deposition of Thin Films or Things You Discover When You Are Trying To Make Ultra-thin Multilayered MgO/Ag/MgO Films For Use As Photocathodes*. Talk: PacSurf 2014 — Kohala Coast, Hawaii.

June 28, 2012. *Radiation Damage In ZrC and ZrN*. Talk: American Nuclear Society Summer 2012 National Meeting — Chicago, Illinois.

June 26, 2012. *Status of the Advanced Test Reactor National Scientific User Facility*. Talk: American Nuclear Society Summer 2012 National Meeting / Advanced Test Reactor Users Organization Meeting — Chicago, Illinois.

May 1, 2012. *ATR NSUF partner experience and MRCAT beamline experiments*. Talk: ATR NSUF Industry Advisory Committee Meeting, Electric Power Research Institute — Charlotte, North Carolina.

March 26, 2012. *Status of the Advanced Test Reactor National Scientific User Facility*. Talk: UTANS Seminar, University of Tennessee, Knoxville — Knoxville, Tennessee.

February 21, 2012. *Status of the Advanced Test Reactor National Scientific User Facility*. Talk: INEST Fuel Cycle COR Meeting — Corvallis, Oregon.

January 25, 2012. *Shaping the Future of US Nuclear Energy*. Talk: National Nuclear Science Day 2012 — Chicago, Illinois.

November 1, 2011. *Status of the Advanced Test Reactor National Scientific User Facility*. Talk: American Nuclear Society Winter 2011 National Meeting / Advanced Test Reactor Users Organization Meeting — Washington, D. C..

April 19, 2011. *Nuclear Power and Fukushima*. Talk: Physics Department Seminar, New Mexico State University — Las Cruces, New Mexico.

December 19, 2010. *Synchrotron Radiation Characterization of In-Reactor Irradiated Materials*. Talk: Sixth International Chemical Congress of Pacific Basin Societies — Honolulu, Hawaii.

January 22, 2010. *Examples of Synchrotron Radiation Studies: Thin Films and Surface Chemistry*. Talk: Chemistry and Materials Science Joint Department Seminar, University of Texas, El Paso — El Paso, Texas.

January 21, 2010. *Power is Everything*. Talk: Chemical Engineering Department Seminar, New Mexico State University — Las Cruces, New Mexico.

April 6, 2007. *Synchrotron Radiation 101: Introduction to Synchrotron Radiation*. Talk: Physics Department Seminar, University of Texas, El Paso — El Paso, Texas.

April 2, 2007. *Synchrotron Radiation 101: Introduction to Synchrotron Radiation*. Talk: Physics Department Seminar, Jackson State University — Jackson, Mississippi.

December 19, 2005. *Reduction of Tc and U in the Environment with S^{2-}*. Talk: Fifth International Chemical Congress of Pacific Basin Societies — Honolulu, Hawaii.

April 11, 2003. *Determination of Local Atomic Structure in Tc Compounds and Radiopharmaceuticals*. Talk: Marc VI Confernce on Radioanalytical Chemistry — Kona, Hawaii.

December 15, 2000. *Recent Advances in Actinide EXAFS*. Talk: Fourth International Chemical Congress of Pacific Basin Societies — Honolulu, Hawaii.

July 14, 1999. *Electronic and Geometric Structure of Pu Alloys*. Talk: Rare Earth Research Conference, Argonne National Laboratory — Argonne, Illinois.

October, 1998. *Synchrotron Radiation Studies of Plutonium Compounds*. Talk: International Conference on Spectromicroscopy — Stoughton, Wisconsin.

November 21, 1996. *Atomic and Electronic Structures of Novel Silicon Surface Structures*. Talk: Doctoral Dissertation Defense, Stanford University — Stanford, California.

September, 1996. *Application of X–ray Photoelectron Diffraction to Chemically Modified Silicon(111) Surfaces*. Talk: SIRM Meeting of the Northern California Chapter of the American Vacuum Society — Stanford, California.

July–August, 1996. *Measurement of the Electronic Structure of Solids with a Display Spectrometer*. Talk: First International Conference on Synchrotron Radiation in Materials Science — Chicago, Illinois.

July–August, 1996. *Synchrotron Radiation Studies of Chemically Modified Si(111) Surfaces*. Talk: First International Conference on Synchrotron Radiation in Materials Science — Chicago, Illinois.

December, 1995. *Characterization of Alkyl–Terminated Silicon(111) Surfaces*. Talk: Third International Chemical Congress of Pacific Basin Societies — Honolulu, Hawaii.

November, 1993. *Photoemission study of Au, Ge, and O_2 deposition on NH_4F etched Si(111)*. Talk: Fortieth National Symposium of the American Vacuum Society — Orlando, Florida.

November, 1992. *Near Edge X–Ray Absorption of Light Emitting Porous Silicon*. Talk: Thirty-Ninth National Symposium of the American Vacuum Society — Chicago, Illinois.

April, 1992. *A Photoemission Study of Electrochemically Etched Light Emitting Silicon*. Talk: Chemical Surface Preparation, Passivation and Cleaning for Semiconductor Growth and Processing Symposium, Materials Research Society Spring Meeting — San Francisco, California.

Teaching Experience

Philosophy

My courses utilize a significant amount of experiential leaning. This is fairly easy to ensure during laboratory courses. Even my more conventional lecture style courses involve a great deal of student participation. I have a discussion with students during class in upper division courses. From these inquiries, I learn how the course is progressing and can modify the direction of the course based on my assessment of how well the students currently understand the material being covered. I find that this greatly enhances student learning.

Instructor, Illinois Institute of Technology; Chicago, Illinois — 01/2001 – present

Physics

PHYS 200: Basic Physics For Architects.

PHYS 221: General Physics II (Electricity and Magnetism).

PHYS 304: Kinetic Theory and Thermodynamics.

PHYS 348: Modern Physics for Scientists and Engineers.

PHYS 361: Observational Astrophysics.

PHYS 427: Advanced Physics Laboratory I.

PHYS 437: Solid State Physics.

PHYS 440: Computational Physics.

PHYS 537: Solid State Physics I.

PHYS 538: Solid State Physics II.

PHYS 539: Physical Methods of Characterization.

PHYS 770: Instrumentation for Health Physics.

Chemistry

CHEM 321: Instrumental Methods of Analysis.

CHEM 344: Physical Chemistry II.

CHEM 509: Physical Methods of Characterization.

CHEM 510: Electronics and Instrumentation.

CHEM 512: Spectrochemical Methods II.

Interprofessional Projects (IPRO)

IPRO 497: Design and Construction of an 0.6 m Newtonian Telescope.

IPRO 497: Galilean Test of the Einstein Principle of Equivalence.

IPRO 497: Implementation of a Remote Observatory for Interconnected Telescopes Using IBM Watson.

Guest Instructor, Michigan State University; East Lansing, Michigan — 06/2019

We developed materials for physics courses that are part of the majors program at most institutions (intro physics, modern physics, classical, E&M, quantum, and statistical mechanics). The development utilized both Python and Glowscript for the 2019 Computational Physics Development Hack-A-Thon.

Guest Instructor, University of Missouri, Columbia; Columbia, Missouri — 07/2001 and 07/2002

Nuclear Engineering

Nuclear Engineering 310: X-ray Absorption Applications in Engineering.

Teaching Assistant, Stanford University; Stanford, California — 09/2000 – 06/1996

Chemistry

Undergraduate Physical Chemistry Laboratory I

Undergraduate Physical Chemistry Laboratory II

Undergraduate General Chemistry

Applied Physics

Graduate Solid State Physics

Graduate Electronic Structure of Solids

Funded Research

10/2024 - 09/2026 Hold Natcast	**Illinois Semiconductor Workforce Network (ISWN)**, Natcast (National Semiconductor Technology Center (NSTC) by the Department of Commerce)	*co-PI*
02/2024 - 01/2028 Terminated DEI	**ART: IL-Tech Forward Initiative**, National Science Foundation (Multidisciplinary Activities)	*co-PI*
05/2023 - 08/2026	**Development of Machine Learning Analysis Programs For XPS Data Analysis, Graduate Student Funding**, Department of Energy (Los Alamos National Laboratory)	*PI*

12/2021 - 08/2025	**Characterization of Radiation Damage in Nuclear Fuels, Graduate Student Funding**, Department of Energy (Argonne National Laboratory)	*PI*
12/2021 - 10/2022	**Characterization of Radiation Damage in Accelerator Targets Using Synchrotron Radiation Techniques, Student Travel**, Department of Energy (Fermi National Laboratory Subcontract)	*PI*
7/2022 - 6/2035	**Integrated University Program: Scholarship and Fellowship Support for Nuclear Energy Research at IIT**, Department of Energy (Integrated University Program)	*PI*
7/2021 - 7/2022	**Understanding the role of intragranular strain during deformation and processing of high temperature structural metals**, AFOSR - Air Force Office of Scientific Research	*co-PI*
6/2021 - 8/2024	**REU Site: Characterization of Materials Using Synchrotron X-ray Based Tools**, National Science Foundation (Physics)	*co-PI*
3/2021 - 5/2022	**Forging of High Strength, High Toughness Martensitic Stainless Steels**, FIERF-Forging Foundation	*co-PI*
3/2021 - 5/2022	**Characterization of Alloy RR0173**, Rolls Royce	*co-PI*
8/2020 - 7/2023	**Characterization of Radiation Damage in Accelerator Targets Using Synchrotron Radiation Techniques, Student Support**, Department of Energy (Fermi National Laboratory Subcontract)	*PI*
10/2019 - 8/2020	**Characterization of Radiation Damage in Accelerator Targets Using Synchrotron Radiation Techniques**, Department of Energy (Fermi National Laboratory Subcontract)	*PI*
6/2019 - 10/2019	**Characterization of Radiation Damage in Accelerator Targets Using Synchrotron Radiation Techniques**, Department of Energy (Fermi National Laboratory Subcontract)	*PI*
8/2018 - 9/2019	**Deep-learning approaches for the analysis of synchrotron data of materials used in energy and environmental applications**, Department of Energy (Idaho National Laboratory Subcontract)	*PI*
9/2017 - 5/2022	**Design of Ni-Base Superalloys for Additive Manufacturing**, National Science Foundation (Civil, Mechanical and Manufacturing Innovation)	*co-PI*
10/2017 - 9/2018	**Procurement of Micro-Autoclave for X-Ray Diffraction Measurements**, Department of Energy (NEUP)	*PI*
6/2017 - 9/2019	**Materials Characterization Using the Facilities Operated by the Center For Synchrotron Radiation and Instrumentation (CSRRI) at the Advanced Photon Source (APS): Duplex Stainless Steels**, Department of Energy (Idaho National Laboratory Subcontract)	*PI*
2/2017 - 1/2018	**Materials Characterization Using the Facilities Operated by the Center For Synchrotron Radiation and Instrumentation (CSRRI) at the Advanced Photon Source (APS): AlHF alloys**, Department of Energy (Idaho National Laboratory Subcontract)	*PI*

10/2016 - 9/2019	**Understand the phase transformation of thermally aged and neutron irradiated duplex stainless steels used in LWRs**, Department of Energy (NEET)	*PI*
7/2016 - 9/2018	**Materials Characterization Using the Facilities Operated by the Center For Synchrotron Radiation and Instrumentation (CSRRI) at the Advanced Photon Source (APS): Illinois Structural Samples**, Department of Energy (Idaho National Laboratory Subcontract)	*PI*
2/2016 - 5/2018	**Materials Characterization Using the Facilities Operated by the Center For Synchrotron Radiation and Instrumentation (CSRRI) at the Advanced Photon Source (APS): Purdue University Samples**, Department of Energy (Idaho National Laboratory Subcontract)	*PI*
8/2015 - 8/2020	**Advanced Accelerator Research: Photocathode Sources**, National Science Foundation (Physics)	*co-PI*
7/2015 - 7/2017	**Study of Irradiated TRISO Particles**, Department of Energy (Oak Ridge National Laboratory Subcontract)	*PI*
11/2014 - 9/2016	**Materials Characterization Using the Facilities Operated by the Center For Synchrotron Radiation and Instrumentation (CSRRI) at the Advanced Photon Source (APS): TRISO**, Department of Energy (Idaho National Laboratory Subcontract)	*PI*
6/2014 - 8/2015	**WISER: Quantum Chemistry Based Determination of Oxidative-Aging Pathway of Asphalt and Development of Bio-Based Sustainable Solutions**, WISER 2014 Interdisciplinary Seed Funding Grants (ISFG) Program	*co-PI*
6/2014 - 9/2014	**Materials Characterization Using the Facilities Operated by the Center For Synchrotron Radiation and Instrumentation (CSRRI) at the Advanced Photon Source (APS): Technetium**, Department of Energy (Idaho National Laboratory Subcontract)	*PI*
10/2013 - 9/2016	**Microstructural Evolutions in Irradiated UO_2**, Department of Energy (Idaho National Laboratory Subcontract)	*PI*
8/2013 - 10/2014	**Characterization of Irradiated Fuels and Claddings**, Department of Energy (Idaho National Laboratory Subcontract)	*PI*
8/2013 - 1/2014	**Advanced Test Reactor Support**, Department of Energy (Idaho National Laboratory Subcontract)	*PI*
5/2013 - 9/2016	**Materials Characterization Using the Facilities Operated by the Center For Synchrotron Radiation and Instrumentation (CSRRI) at the Advanced Photon Source (APS) for the Nuclear Energy Community**, Department of Energy (Idaho National Laboratory Subcontract)	*PI*
6/2012 - 7/2013	**Determination of Microstructure and Chemical State Changes in Ion-irradiated Fuels and Structural Components With A High Kinetic Energy Electron Detector**, Department of Energy (Nuclear Energy)	*PI*
4/2012 - 8/2013	**Economic Study – Phase II – the Economics of Mass Manufacturing of Small Modular Reactors**, Department of Energy (Argonne National Laboratory Subcontract)	*PI*

11/2010 - 12/2010	**Fuel Pellet Tomography**, Department of Energy (Los Alamos National Laboratory Subcontract)	*PI*
7/2010 - 8/2011	**Stress–Strain Measurements Using Illinois Institute of Technology Beamlines With A Two-Dimensional X-ray Area Detector Coupled To Both Radioactive and Non-Radioactive Tensile Stages**, Department of Energy (Nuclear Energy)	*PI*
7/2010 - 6/2014	**Advanced Accelerator Physics Research on Electron Beam Sources**, National Science Foundation (Physics)	*co-PI*
7/2009 - 8/2023	**Graduate Fellowships for Research at NRRCAT**, Department of Energy (Nuclear Energy)	*PI*
1/2009 - 3/2011	**Solids Characterization of Actinide Environmental Samples**, Department of Energy (Los Alamos National Laboratory Subcontract)	*PI*
10/2009 - 9/2014	**Characterization of Irradiated Structural Materials Utilizing Synchrotron X–ray Techniques**, Department of Energy (Idaho National Laboratory Subcontract)	*PI*
10/2009 - 6/2010	**Photoelectrochemical Analysis of Zr and Ni Alloys using the MRCAT Beamline at the Advanced Photon Source**, Electric Power Research Institute	*PI*
3/2009 - 5/2009	**Photoelectrochemical Analysis of Zr and Ni Alloys using the MRCAT Beamline at the Advanced Photon Source**, Electric Power Research Institute	*PI*
1/2009 - 6/2009	**Support For The Nuclear and Radiological Research CAT**, Department of Energy (Argonne National Laboratory Subcontract)	*PI*
4/2007 - 12/2008	**Solids Characterization of Actinide Environmental Samples Utilizing The MRCAT Beamline**, Department of Energy (Los Alamos National Laboratory Subcontract)	*PI*
1/2005 - 12/2008	**In-Situ Spectroscopic Studies of the Fundamental Chemistry of Pb and Pb-Bi Corrosion Processes at High Temperatures: Development and Assessment of Composite Corrosion Resistant Materials**, Department of Energy (Nuclear Energy)	*co-PI*
2/2004 - 12/2004	**X-ray Absorption Studies of Cu Impurities in CdTe**, University of Toledo (subcontract)	*PI*
6/2003 - 12/2003	**Speciation of Uranium in Spent Fuel Waste**, Department of Energy (Savannah River Subcontract)	*co-PI*
9/2003 - 12/2007	**Interfacial Reduction-Oxidation Mechanisms Governing Fate and Transport of Contaminants in the Vadose Zone**, Department of Energy (Environmental Molecular Sciences Program	*co-PI*
9/2003 - 5/2005	**Scientific Support of the MR-CAT Beamline**, Department of Energy (Basic Energy Sciences)	*co-PI*

Outreach & Professional Development

Professional Service

SMART USA Strategic Governing Council (SGC) (10/2025 – present), I am a member of the SGC, the principal decision-making body for SMART USA. I work with other senior leaders to align initiatives with national objectives and advance U.S. leadership in semiconductor innovation.

SMART USA Roadmap Executive Committee (REXCOM) (10/2025 – present), As a member of REXCOM, I help shape the strategic direction of SMART USA's semiconductor roadmap, advising on national priorities and fostering collaboration across industry, government, and academia.

SMART USA Digital, Technical, and Manufacturing Advisory Committee (DTMAC) (10/2025 – present), As a member of DTMAC, I am responsible for providing recommendations to the Chief Digital Officer related to the needs, challenges, and priorities for digital twin development and advancement, particularly as it applies to semiconductor manufacturing, education, and workforce development.

Proposal Review Committee, Canadian Light Source (7/2015 – present), I am a member of the committee that reviews all proposals submitted to the Canadian Light Source. We ensure fair and proper allocation of beam time at the facility.

Editor, Applied Surface Science (5/2016 – present), I was selected to join the editorial board of the journal Applied Surface Science in 2016. I handle reviewer assignments and make final publication decisions for approximately 200 papers per year.

CAMCOPT Rep, Physics (08/2020 – present), I was one of two Physics Department representatives on the campus committee for tenure and promotion at the Illinois Institute of Technology. In this role, I review tenure and promotion packages at the campus level.

Program Chair — Quantitative Surface Analysis 19 (11/2023 - 9/2025), I was selected to be the Program Chair for the QSA19 meeting sponsored by the American Vacuum Society. I am responsible for organization of the workshop to be held in Sept 2025.

Topical Chair — Sustainable Semiconductor Manufacturing, AVS71 (11/2023 - 9/2025), I was selected to organized the topical session on Sustainable Semiconductor Manufacturing for AVS71 sponsored by the American Vacuum Society. I am responsible for organization of the sessions to be held in Sept 2025.

Dean of Engineering Search Committee (08/2024 – 4/2025), I was selected by the Provost to serve on the search committee to select a new Dean of the College of Engineering.

Dean of Engineering Search Committee (08/2023 – 11/2023), I was selected by the Provost to serve on the search committee to select a new Dean of the College of Engineering.

Provost Search Committee (09/2022 – 05/2023), I was selected by the University President to serve on the search committee for a new Provost.

Workshop Organizer — Workshop on Radiation Damage in Accelerator Materials and the Potential Use of the Versatile Test Reactor For The Study of Accelerator Materials (6/2022), I organized a workshop to investigate the overlapping interest in radiation damage and characterization between the nuclear energy (NE) and high energy physics (HEP) communities. We looked at how the Versatile Test Reactor (VTR) could provide an irradiation testbed to assist in determining radiation effects in accelerator materials. `http://plutonium.phys.iit.edu/~vtrhep/index.html`

AUCOPT Chair, Physics (06/2018 – 08/2020), I was responsible for tenure and promotions for the Physics Department at the Illinois Institute of Technology. In this role, I guided and mentored faculty through the tenure and promotion process. I arranged for all letters and put together the department package for the candidates.

Promotion Chair — PacSurf2024, PacSurf 2022, PacSurf2020, PacSurf2018 (5/2018 - 12/2024), I was chosen to be the Promotion Chair for the PacSurf meetings sponsored by the American Vacuum Society. I am responsible for promoting the meeting to potential sponsors and attendees.

Program Chair — American Chemical Society Fall Meetings (1/2015 - 8/2017), I was the Program Chair for the Division of Nuclear Chemistry and Technology (NUCL) for the 250^{th}, 252^{nd}, and 254^{th} Annual Meetings of the American Chemical Society. I was responsible for developing the conference program prior to and the executing the NUCL sessions at the meeting.

Conference Chair — Annual Meeting of the Prairie Chapter of the American Vacuum Society (9/2023, 9/2016), I organized the 2023 and 2016 Prairie Chapter Meetings of the American Vacuum Society held at the Illinois Institute of Technology on September 13, 2023 and September 8, 2016.

Session Organizer — 234^{th}, 247^{th}, 248^{th}, 251^{st} Annual Meeting of the American Chemical Society, I organized the sessions entitled Chemical Imaging: Applications, Advances, and Challenges in 2016; Young Researchers in Nuclear

and Radiochemistry in 2014; Global Status of Nuclear Energy in 2014; and the Analytical Chemistry in Nuclear Technology: Innovative Techniques and Analytical Applications in Material Science, Separation Science, and Nuclear Materials Processing in 2007.

Stakeholder Review Committee, U. S. DOE Advanced Post-Irradiation Capabilities (APIEC) Project (2012), I represented the academic community on the project to set the construction priorities for the U. S. DOE post-irradiation examination capabilities.

Neutronics Chair, Nuclear Materials Compatibility Workshop (9/2011), I chaired the neutronics committee of the task force charged with determining reporting standards of materials research in the field of nuclear energy at the Colorado School of Mines.

University Safety Committee (5/2011 - 6/2012), I was a member of the University Safety Committee at the Illinois Institute of Technology.

Member — Daya Bay Antineutrino Experiment Collaboration (7/2008 – 5/2015), I was elected to the collaboration and worked on low–background detector design and fission–rate calculations.

Committee On Laboratories — American Association Of Physics Teachers (1/2008 – 1/2010), I was appointed to the committee by the 2008 AAPT Nominating Committee. The Committee on Laboratories has the responsibility of guiding future directions of laboratory experiments in both General Physics and Advance Physics courses.

Editorial Board Member — The Open Inorganic Chemistry Journal (12/2007 – 6/2010), I joined the editorial board of the Open Inorganic Chemistry Journal to promote open publication.

Chair, Laser Safety Committee (09/2007 – 06/2012), I chaired the laser safety committee at the Illinois Institute of Technology. I was responsible for monitoring all laser work on campus.

Department Safety Officer, Department of Biological, Chemical, and Physical Sciences (03/2006 – 08/2011), I was appointed to be the Safety Officer for the Biological, Chemical, and Physical Sciences Department at the Illinois Institute of Technology. In this position, I was responsible for overseeing the faculty compliance to OSHA rules and regulations.

Session Chair — American Nuclear Society Summer 2010 Meeting (6/2010), I led a session on nuclear materials that focused on radiation damage in structural materials.

Session Chair — Millimeter Scale Characterization of Activated Samples at Neutron and X–ray User Facilities Workshop (6/2009), I led the session on millimeter scale characterization of activated samples using synchrotron and neutron beams at the Characterization of Activated Samples at Neutron and X–ray User Facilities Workshop held to support the proposed Matter–Radiation Interactions In Extremes (MaRIE) facility.

Workshop Organizer — Advanced Test Reactor National Scientific Users' Week (6/2009), I organized the workshop on Synchrotron Radiation Studies of Irradiated Materials at the $2nd$ Annual Advanced Test Reactor National Scientific User Facility Users' Week.

Judge (Physics) — 57^{th} Annual Intel International Science Fair (5/2006), I judged the Physics Science Projects at the International Science Fair in Indianapolis, Indiana.

Molecular Environmental Science Working Group to Decide the Scientific Direction of the Advanced Light Source (3/1998), I was a member of the group tasked with determining the Scientific Direction of Environmental Research at the Advanced Light Source. This group strongly recommended that actinide research be allowed on the low energy beamlines at the Advanced Light Source.

Actinide Safety Review Committee at the Advanced Light Source (1/1999 - 9/2000), I was a member of the group in charge of reviewing actinide proposals at the Advanced Light Source to ensure that they could be safely conducted.

Outreach

Bulletin of the Atomic Scientists (1/2016 - present), I write a column for the Bulletin of the Atomic Scientists. This allows me to explain both nuclear weapons and nuclear energy issues to the general public.

Political Advisor (3/2011 - present), I have consulted for a number of politicians in the US, UK, Australia, on issues related to nuclear energy and nuclear waste policy. I have worked with the Indiana State Legislature, the Illinois State Legislature,

the State of Georgia Public Service Commission, and Members of the US House and Senate on Energy Issues. I was responsible for providing the Illinois Congressional Delegation information on Nuclear Energy after Fukushima at the request of U. S. Rep. Bobby Rush because of the presence of similar nuclear reactors in Illinois.

Co-Organizer of the 2012 National Nuclear Science Big Event (1/25/2012), I co-organized the National Nuclear Science Day Workshops held at the Illinois Institute of Technology for National Nuclear Science Week 2012. The workshop brought together speakers, sponsored by The National Museum of Nuclear Science and History, to discuss nuclear science with students throughout the US with the assistance of the National Science Teachers Association.

Media Appearances (5/05 - present), I have made many media appearances to explain technical material to the general public in print, radio, and television on WSRB, WERS, WIBC, NPR, PBS, ABC, CBS, and FOX.) These appearances have been related to Fukushima, Nuclear Energy, Chemical Safety, and the War in Ukraine.

Co-Organizer, 2010 Midwest Astroimaging Conference and Macintosh Astronomy Workshop (7/22-24/2010), I co-organized the 2010 Midwest Astroimaging Conference and Macintosh Astronomy Workshop at Northern Illinois University. The conference was a three day seminar on the state of the art techniques in astrophotography and image processing.

Co-Organizer, 2007 Midwest Astroimaging Conference (7/13-14/2007), I co-organized the 2007 Midwest Astroimaging Conference at St. Joseph's College. The conference was a two day seminar on the state of the art techniques in astrophotography and image processing.

Organizer, The Macintosh Astronomy Workshop I (9/8/2005), I co-organized the First Macintosh Astronomy Workshop at the Illinois Institute of Technology. The workshop was held in conjunction with the Chicago Astronomical Society's annual Astrofest. The workshop featured speakers describing and demoing the features of numerous mac-based astronomy programs. Featured areas included image collection and processing, planetarium and planning programs, and telescope control programs.

Proposal Review

NSF Division of Materials Research
NSF Graduate Research Fellowship Program
U. S. Department of Energy
American Chemical Society
Air Force Research Laboratory

Peer Review

American Chemical Society
Journal of Vacuum Science and Technology
Environmental Science and Technology
Applied Physics Letters
Journal of Applied Physics

Professional Memberships

AVS: Science and Technology of Materials, Interfaces, and Processing, formerly American Vacuum Society
American Chemical Society
American Nuclear Society
American Physical Society
The American Society of Mechanical Engineers
American Association of Physics Teachers
International X-ray Absorption Society
ASTM International, formerly American Society for Testing and Materials

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