

# CAMERON LEE TRACY

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## POSITIONS

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<b>University of California, Berkeley</b> , Goldman School of Public Policy Senior Research Scholar	2025 - current
<b>Stanford University</b> , Center for International Security and Cooperation (CISAC) Research Scholar	2021 - 2025
<b>Union of Concerned Scientists</b> , Global Security Program Global Security Fellow	2019 - 2021
<b>Harvard University</b> , Belfer Center for Science and International Affairs Nuclear Security Postdoctoral Fellow	2018 - 2019
<b>Stanford University</b> , Department of Geological Sciences Postdoctoral Research Fellow	2015 - 2018
<b>Stanford University</b> , Center for International Security and Cooperation (CISAC) Nuclear Security Postdoctoral Fellow	2015 - 2017
<b>Los Alamos National Laboratory</b> , Materials Science and Technology Division Research Assistant	2009 - 2010

## EDUCATION

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<b>University of Michigan</b> , Ann Arbor, Michigan PhD, Materials Science and Engineering	2015
<b>University of Michigan</b> , Ann Arbor, Michigan MS, Materials Science and Engineering	2013
<b>University of California, Davis</b> , California BS, Materials Science and Engineering	2011

## SCHOLARLY PUBLICATIONS (SECURITY, TECHNOLOGY, & POLICY)

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- C.L. Tracy**, “Technological surprise and normalization through use: The tactical and discursive effects of new precision strike weapons in the Russo-Ukrainian War,” *Texas National Security Review* 9, (2026)
- C.L. Tracy**, “Sociotechnical risks posed by the geologic disposal of weapons plutonium,” *Bulletin of the Atomic Scientists* 81, 36 (2025)
- C.L. Tracy**, “Weapons design, engineering ethics, and the duty to inform: A case study on US hypersonic missile development,” *IEEE Technology & Society* 43, 83 (2024)
- D. Wright, **C.L. Tracy**, “Hypersonic cruise missiles,” *Science & Global Security* 32, 219 (2024)
- D. Wright, **C.L. Tracy**, “Hypersonic weapons: Vulnerability to missile defenses and comparison to MaRVs,” *Science & Global Security* 31, 68 (2023)
- S. Park, **C.L. Tracy**, R.C. Ewing, “Reimagining US rare earth production: Domestic failures and the decline of US rare earth production dominance — lessons learned and recommendations,” *Resources Policy* 85, 104022 (2023)
- C.L. Tracy**, D. Wright, “‘Computational fluid dynamics analysis of the infrared emission from a generic hypersonic glide vehicle’—A response,” *Science & Global Security* 31, 41 (2023)

- C.L. Tracy**, R.C. Ewing, “Mining for the bomb: The vulnerability of buried plutonium to clandestine recovery,” *Science & Global Security* 30, 131 (2022)
- C.L. Tracy**, “Disposal, destruction, and disarmament: Comparative analysis of US chemical weapon and weapons plutonium stockpile reductions,” *Central European Journal of International and Security Studies* 17, 36 (2022)
- C.L. Tracy**, S. Park, M. Plevaka, E. Bogdanova, D. Popovich, “Opportunities for US-Russian collaboration on the safe disposal of nuclear waste,” *Bulletin of the Atomic Scientists* 77, 146 (2021)
- C.L. Tracy**, D. Wright, “Modeling the performance of hypersonic boost-glide missiles,” *Science & Global Security* 28, 135 (2020)
- S. Park, A. Puccioni, **C.L. Tracy**, E. Serbin, R.C. Ewing, “Geologic analysis of the Democratic People’s Republic of Korea’s uranium resources and mines,” *Science & Global Security* 28, 89 (2020)
- N. Ulibarri, **C.L. Tracy**, R.J. McCarty, “Cleanup and complexity: Nuclear and industrial contamination at the Santa Susana Field Laboratory, California,” *Environmental Management* 65, 257 (2020)
- C.L. Tracy**, M.K. Dustin, R.C. Ewing, “Reassess New Mexico’s nuclear-waste repository,” *Nature* 529, 149 (2016)

## SCHOLARLY PUBLICATIONS (PHYSICS, CHEMISTRY, & ENGINEERING)

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- S. Zhao, H. Xiao, Y. Li, Z. Zhang, Y. Wang, Q. Huang, L. Cao, F. Gao, **C.L. Tracy**, R.C. Ewing, C. Wang, “Multi-stage phase transformation pathways in MAX phases,” *Nature Communications* 16, 1554 (2025)
- E.C. O’Quinn, A.P. Solomon, C. Corbridge, C. Overstreet, **C.L. Tracy**, A.F. Fuentes, D.J. Sprouster, M.K. Lang, “Response of lanthanide sesquioxides to high-energy ball milling,” *Advanced Engineering Materials* 27, 2401251 (2024)
- E.C. O’Quinn, **C.L. Tracy**, W.F. Cureton, R. Sachan, J.C. Neuefeind, C. Trautmann, M.K. Lang, “Multi-scale investigation of heterogeneous swift heavy ion tracks in stannate pyrochlore,” *Journal of Materials Chemistry A* 9, 16982 (2021)
- A.P. Solomon, **C.L. Tracy**, E.C. O’Quinn, D. Severin, M.K. Lang, “Transformations to amorphous and X-type phases in swift heavy ion-irradiated  $\text{Ln}_2\text{O}_3$  and  $\text{Mn}_2\text{O}_3$ ,” *Journal of Applied Physics* 129, 225903 (2021)
- W.F. Cureton, **C.L. Tracy**, M. Lang, “Review of swift heavy ion irradiation effects in  $\text{CeO}_2$ ,” *Quantum Beam Science* 5, 19 (2021)
- C. Wang, **C.L. Tracy**, R.C. Ewing, “Radiation effects in  $\text{M}_{n+1}\text{AX}_n$  phases,” *Applied Physics Reviews* 7, 041311 (2020)
- C. Wang, T. Yang, **C.L. Tracy**, C. Lu, H. Zhang, Y.J. Hu, L. Wang, L. Qi, L. Gu, Q. Huang, J. Zhang, J. Wang, J. Xue, R.C. Ewing, Y. Wang, “Disorder in  $\text{M}_{n+1}\text{AX}_n$  phases at the atomic scale,” *Nature Communications* 10, 622 (2019)
- C. Wang, **C.L. Tracy**, S. Park, J. Liu, F. Ke, F. Zhang, T. Yang, S. Xia, C. Li, Y. Wang, Y. Zhang, W.L. Mao, R.C. Ewing, “Phase transformations of Al-bearing high-entropy alloys  $\text{Al}_x\text{CoCrFeNi}$  ( $x = 0, 0.1, 0.3, 0.75, 1.5$ ) at high pressure,” *Applied Physics Letters* 114, 091902 (2019)
- W.F. Cureton, R.I. Palomares, **C.L. Tracy**, E.C. O’Quinn, J. Walters, M. Zdorovets, R.C. Ewing, M. Toulemonde, M. Lang, “Effects of irradiation temperature on the response of  $\text{CeO}_2$ ,  $\text{ThO}_2$ , and  $\text{UO}_2$  to highly ionizing radiation,” *Journal of Nuclear Materials* 525, 83 (2019)
- C.L. Tracy**, C. Chen, S. Park, M.L. Davisson, R.C. Ewing, “Measurement of  $\text{UO}_2$  surface oxidation using grazing-incidence x-ray diffraction: Implications for nuclear forensics,” *Journal of Nuclear Materials* 502, 68 (2018)

- C. Chen, **C.L. Tracy**, C. Wang, M. Lang, R.C. Ewing, "Initial stages of ion beam-induced phase transformations in  $\text{Gd}_2\text{O}_3$  and  $\text{Lu}_2\text{O}_3$ ," *Applied Physics Letters* 112, 073904 (2018)
- W.F. Cureton, R.I. Palomares, J. Walters, **C.L. Tracy**, C. Chen, R.C. Ewing, G. Baldinozzi, J. Lian, C. Trautmann, M. Lang, "Grain size effects on irradiated  $\text{CeO}_2$ ,  $\text{ThO}_2$ , and  $\text{UO}_2$ ," *Acta Materialia* 160, 47 (2018)
- S. Park, D.R. Rittman, **C.L. Tracy**, K.W. Chapman, F. Zhang, C. Park, S.N. Tkachev, E. O'Quinn, J. Shamblin, M. Lang, W.L. Mao, R.C. Ewing, " $\text{A}_2\text{TiO}_5$  ( $\text{A} = \text{Dy}, \text{Gd}, \text{Er}, \text{Yb}$ ) at high pressure," *Inorganic Chemistry* 57, 2269 (2018)
- S. Park, **C.L. Tracy**, F. Zhang, C. Park, C. Trautmann, S.N. Tkachev, M. Lang, W.L. Mao, R.C. Ewing, "Radiation-induced disorder in compressed lanthanide zirconates," *Physical Chemistry Chemical Physics* 20, 6187 (2018)
- D.R. Rittman, **C.L. Tracy**, C. Chen, J.M. Solomon, M. Asta, M.L. Mao, S.M. Yalisove, R.C. Ewing, "Phase transformation pathways of ultrafast-laser-irradiated  $\text{Ln}_2\text{O}_3$  ( $\text{Ln} = \text{Er-Lu}$ )," *Physical Review B* 97, 024104 (2018)
- S. Park, **C.L. Tracy**, F. Zhang, R.I. Palomares, C. Park, C. Trautmann, M. Lang, W.L. Mao, R.C. Ewing, "Swift-heavy ion irradiation response and annealing behavior of  $\text{A}_2\text{TiO}_5$  ( $\text{A} = \text{Nd}, \text{Gd}$ , and  $\text{Yb}$ )," *Journal of Solid State Chemistry* 258, 108 (2018)
- C.L. Tracy**, M. Lang, F. Zhang, S. Park, R.I. Palomares, R.C. Ewing, "Review of recent experimental results on the behavior of actinide-bearing oxides and related materials in extreme environments," *Progress in Nuclear Energy* 104, 342 (2018)
- J.S. Shamblin, **C.L. Tracy**, R.I. Palomares, E.C. O'Quinn, R.C. Ewing, J. Neufeind, M. Feygenson, J. Behrens, C. Trautmann, M. Lang, "Similar local order in disordered fluorite and aperiodic pyrochlore structures," *Acta Materialia* 144, 60 (2018)
- C. Wang, T. Yang, **C.L. Tracy**, J. Xiao, S. Liu, Y. Fang, Z. Yan, W. Ge, J. Xue, J. Zhang, J. Wang, Q. Huang, R.C. Ewing, Y. Wang, "Role of the X and n factors in ion-irradiation induced phase transformations of  $\text{M}_{n+1}\text{AX}_n$  phases," *Acta Materialia* 144, 432 (2018)
- C.L. Tracy**, S. Park, D.R. Rittman, S.J. Zinkle, H. Bei, M. Lang, R.C. Ewing, W.L. Mao, "High pressure synthesis of a hexagonal close-packed phase of the high-entropy alloy  $\text{CrMnFeCoNi}$ ," *Nature Communications* 8, 15634 (2017)
- K.M. Turner, **C.L. Tracy**, W.L. Mao, R.C. Ewing, "Lanthanide stannate pyrochlores ( $\text{Ln}_2\text{Sn}_2\text{O}_7$ ;  $\text{Ln} = \text{Nd}, \text{Gd}, \text{Er}$ ) at high pressure," *Journal of Physics: Condensed Matter* 29, 504005 (2017)
- R.I. Palomares, J. Shamblin, **C.L. Tracy**, J. Neufeind, R.C. Ewing, C. Trautmann, M. Lang, "Defect accumulation in swift heavy ion-irradiated  $\text{CeO}_2$  and  $\text{ThO}_2$ ," *Journal of Materials Chemistry A* 5, 12193 (2017)
- K.M. Turner, D.R. Rittman, R.A. Heymach, **C.L. Tracy**, M.L. Turner, A.F. Fuentes, W.L. Mao, R.C. Ewing, "Pressure-induced structural modifications of rare-earth hafnate pyrochlore," *Journal of Physics: Condensed Matter* 29, 255401 (2017)
- R.I. Palomares, **C.L. Tracy**, J. Neufeind, R.C. Ewing, C. Trautmann, M. Lang, "Thermal defect annealing of swift heavy ion irradiated  $\text{ThO}_2$ ," *Nuclear Instruments and Methods in Physics Research B* 405, 15 (2017)
- D.R. Rittman, S. Park, **C.L. Tracy**, L. Zhang, R.I. Palomares, M. Lang, A. Navrotsky, W.L. Mao, R.C. Ewing, "Structure and bulk modulus of  $\text{Ln}$ -doped  $\text{UO}_2$  ( $\text{Ln} = \text{La}, \text{Nd}$ ) at high pressure," *Journal of Nuclear Materials* 490, 28 (2017)
- F.X. Zhang, **C.L. Tracy**, J. Shamblin, R.I. Palomares, M. Lang, S. Park, C. Park, S. Tkachev, R.C. Ewing, "Pressure-induced phase transitions of  $\beta$ -type pyrochlore  $\text{CsTaWO}_6$ ," *RSC Advances* 6, 94287 (2016)

- C.L. Tracy**, J. Shamblin, S. Park, F. Zhang, C. Trautmann, M. Lang, R.C. Ewing, "Role of composition, bond covalency, and short-range order in the disordering of stannate pyrochlores by swift heavy ion irradiation," *Physical Review B* 94, 064102 (2016)
- J. Shamblin, **C.L. Tracy**, R.C. Ewing, F. Zhang, W. Li, C. Trautmann, M. Lang, "Structural response of titanate pyrochlores to swift heavy ion irradiation," *Acta Materialia* 117, 207 (2016)
- J. Shamblin, M. Feygenson, J. Neuefeind, **C.L. Tracy**, F. Zhang, S. Finkeldei, D. Bosbach, H. Zhou, R.C. Ewing, M. Lang, "Probing disorder in isometric pyrochlore and related complex oxides," *Nature Materials* 15, 507 (2016)
- C.L. Tracy**, M. Lang, D. Severin, M. Bender, C. Trautmann, R.C. Ewing, "Anisotropic expansion and amorphization of  $\text{Ga}_2\text{O}_3$  irradiated with 946 MeV Au ions," *Nuclear Instruments and Methods in Physics Research B* 374, 40 (2016)
- F.X. Zhang, **C.L. Tracy**, M. Lang, R.C. Ewing, "Stability of fluorite-type  $\text{La}_2\text{Ce}_2\text{O}_7$  under extreme conditions," *Journal of Alloys and Compounds* 674, 168 (2016)
- C.L. Tracy**, M. Lang, F. Zhang, C. Trautmann, R.C. Ewing, "Phase transformations in  $\text{Ln}_2\text{O}_3$  materials irradiated with swift heavy ions," *Physical Review B* 92, 174101 (2015)
- M.K. Lang, **C.L. Tracy**, R.I. Palomares, F.X. Zhang, D. Severin, M. Bender, C. Trautmann, C. Park, V. Prakapenka, V.A. Skuratov, R.C. Ewing, "Characterization of ion-induced radiation effects in nuclear materials using synchrotron x-ray techniques," *Journal of Materials Research* 30, 1366 (2015)
- D.R. Rittman, **C.L. Tracy**, A.B. Cusick, M.J. Abere, B. Torralva, R.C. Ewing, S.M. Yalisove, "Ultrafast laser and swift heavy ion irradiation: Response of  $\text{Gd}_2\text{O}_3$  and  $\text{ZrO}_2$  to intense electronic excitation," *Applied Physics Letters* 106, 171914 (2015)
- S. Park, M. Lang, **C.L. Tracy**, J. Zhang, F. Zhang, C. Trautmann, M.D. Rodriguez, P. Kluth, R.C. Ewing, "Response of  $\text{Gd}_2\text{Ti}_2\text{O}_7$  and  $\text{La}_2\text{Ti}_2\text{O}_7$  to swift-heavy ion irradiation and annealing," *Acta Materialia* 93, 1 (2015)
- R.I. Palomares, **C.L. Tracy**, F. Zhang, C. Park, D. Popov, C. Trautmann, R.C. Ewing, M. Lang, "In situ defect annealing of swift heavy ion irradiated  $\text{CeO}_2$  and  $\text{ThO}_2$  using synchrotron X-ray diffraction and a hydrothermal diamond anvil cell," *Journal of Applied Crystallography* 48, 711 (2015)
- C.L. Tracy**, M. Lang, J.M. Pray, F. Zhang, D. Popov, C. Park, C. Trautmann, M. Bender, D. Severin, V.A. Skuratov, R.C. Ewing, "Redox response of actinide materials to highly-ionizing radiation," *Nature Communications* 6, 6133 (2015)
- S. Park, M. Lang, **C.L. Tracy**, F. Zhang, C. Trautmann, Z. Wang, R.C. Ewing, "Synchrotron x-ray diffraction analysis of gadolinium and lanthanum titanate oxides irradiated by xenon and tantalum swift heavy ions," *MRS Proceedings* 1743, (2015)
- M. Lang, M. Toulemonde, J. Zhang, F. Zhang, **C.L. Tracy**, J. Lian, Z. Wang, W.J. Weber, D. Severin, M. Bender, C. Trautmann, R.C. Ewing, "Swift heavy ion track formation in  $\text{Gd}_2\text{Zr}_{2-x}\text{Ti}_x\text{O}_7$  pyrochlore: Effect of electronic energy loss," *Nuclear Instruments and Methods in Physics Research B* 336, 102 (2014)
- F.X. Zhang, M. Lang, **C.L. Tracy**, R.C. Ewing, D.J. Gregg, G.R. Lumpkin, "Incorporation of uranium in pyrochlore oxides and pressure-induced phase transitions," *Journal of Solid State Chemistry* 219, 49 (2014)
- C.L. Tracy**, J.M. Pray, M. Lang, D. Popov, C. Park, C. Trautmann, R.C. Ewing, "Defect accumulation in  $\text{ThO}_2$  irradiated with swift heavy ions," *Nuclear Instruments and Methods in Physics Research B* 326, 169 (2014)
- S. Park, M. Lang, **C.L. Tracy**, J. Zhang, F. Zhang, C. Trautmann, P. Kluth, M.D. Rodriguez, R.C. Ewing, "Swift heavy ion irradiation-induced amorphization of  $\text{La}_2\text{Ti}_2\text{O}_7$ ," *Nuclear Instruments and Methods in Physics Research B* 326, 145 (2014)

M. Lang, F. Zhang, J. Zhang, **C.L. Tracy**, A.B. Cusick, J. VonEhr, Z. Chen, C. Trautmann, R.C. Ewing, “Swift heavy ion-induced phase transformation in  $\text{Gd}_2\text{O}_3$ ,” *Nuclear Instruments and Methods in Physics Research B* 326, 121 (2014)

**C.L. Tracy**, M. Lang, J. Zhang, F. Zhang, Z. Wang, R.C. Ewing, “Structural response of  $\text{A}_2\text{TiO}_5$  ( $\text{A} = \text{La}, \text{Nd}, \text{Sm}, \text{Gd}$ ) to swift heavy ion irradiation,” *Acta Materialia* 60, 4477 (2012)

## OP-EDS AND COMMENTARY

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D. Wright, **C.L. Tracy**, “Hypersonic weapons are mediocre. It’s time to stop wasting money on them,” *Bulletin of the Atomic Scientists*, 12 March 2024

D. Wright, **C.L. Tracy**, “Drag race: Hypersonic threats are slow enough for US missile defenses,” *Defense News*, 8 December 2023

D. Wright, **C.L. Tracy**, “Over-hyped: The physics and hype of hypersonic weapons,” *Scientific American* (translated to Spanish in *Investigación y Ciencia*), August 2021

D. Wright, **C.L. Tracy**, “Why hypersonic weapons cannot live up to their hype,” *The Hill*, 2 March 2021

**C.L. Tracy**, D. Wright, “Don’t believe the hype about hypersonic missiles,” *IEEE Spectrum*, 5 February 2021

M. Polleri, **C.L. Tracy**, E. Likhacheva, E. Stepnykh, “Improving the communication of risks before, during, and after a nuclear accident,” *Bulletin of the Atomic Scientists*, 31 August 2020

V. Kostikov, A. Kudriavtseva, **C.L. Tracy**, “The future of global nuclear power” *Bulletin of the Atomic Scientists*, 20 June 2019

## INVITED PRESENTATIONS

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**Institute for Peace Research and Security Policy (IFSH), University of Hamburg**, Dec. 2025  
“New sensors and seekers for the Golden Dome missile defense system”

**University of Bridgeport, School of Engineering Colloquium Series**, Nov. 2025  
“Hypersonic hype: The performance and security implications of hypersonic glide missiles”

**University of California, Berkeley, Goldman School of Public Policy**, Nov. 2025  
“The integration of artificial intelligence in strategic early warning systems”

**UK Student/Young Pugwash**, Oct. 2025  
“Golden Dome and hypersonic missile defense”

**International Studies Association Annual Meeting**, Chicago, USA, Mar. 2025  
“Emerging technologies and security studies: A research agenda to counter hype”

**Shield Capital, NatSec Tech Talk Series**, Feb. 2025  
“Hypersonic hype: The performance and security implications of hypersonic glide missiles”

**George Mason University, Schar School of Public Policy**, Jan. 2025  
“Controversy at the technology/security interface: From hypersonic missiles to nuclear waste repositories”

**Plutonium Futures—The Science 2024**, Charleston, USA, Sep. 2024  
“The sociotechnical challenges of the geologic disposition of weapons plutonium”

**Institute for Peace Research and Security Policy (IFSH), University of Hamburg**, Aug. 2024  
“Hypersonic hype? Technical analysis of hypersonic missile capabilities”

**Xiamen University, School of Management**, May 2024  
“US-China technology competition and cooperation”

**IEEE International Symposium on Ethics in Engineering, Science, and Technology**, West Lafayette, USA, May 2023

“The ethics of weapons technology development”

**Technical University of Darmstadt, Department of Physics**, May 2023

“Controversy at the science/security interface: From hypersonic missiles to geologic repositories”

**Institute for International and Strategic Studies, Missile Dialogue Initiative**, Apr. 2023

“A taxonomy of missile technologies”

**Naval Postgraduate School, Meyer Scholar Seminar**, Aug. 2022

“Missile hype: Modelling the performance of hypersonic boost-glide weapons”

**Global Governance Institution, Beijing**, May 2022

“A hypersonic revolution? Implications of hypersonic missile use in the Russo-Ukrainian War”

**Center for Strategic and International Studies (CSIS), Project on Nuclear Issues**, Apr. 2022

“Emerging technologies: Hypersonic weapons”

**German Physical Society (DPG) Spring Meeting**, Erlangen, Germany, Mar. 2022

“Missile hype: Modelling the performance of hypersonic boost-glide weapons”

**Sandia National Laboratory, Bay Area Strategic Engagement Seminar**, Feb. 2022

“Missile hype: Modelling the performance of hypersonic boost-glide weapons”

**University of Hawai’i, Mānoa, Department of Physics and Astronomy**, Apr. 2021

“Hype and the hypersonic arms race: Modelling the performance of hypersonic boost-glide missiles”

**Stanford University, Center for International Security and Cooperation**, Apr. 2021

“Controversy at the technology/policy interface: From hypersonic weapons to geologic repositories”

**University of Cincinnati, Science Policy Ambassadors Series**, Mar. 2021

“Working as a scientist at the science/policy interface”

**Aerospace Corporation, Center for Space Policy and Strategy**, Feb. 2021

“The hypersonic missile debate”

**University of Massachusetts, Amherst, Department of Physics**, Feb. 2021

“Missile hype and the hypersonic arms race: Modelling the performance of hypersonic boost-glide missiles”

**Cato Institute, Restraint and Emergent Technology Series**, Feb. 2021

“Missile hype and the hypersonic arms race: Modelling the performance of hypersonic boost-glide missiles”

**Carnegie Mellon University, Department of Engineering and Public Policy**, Nov. 2020

“Missile hype and the hypersonic arms race: Computational modelling of hypersonic missile performance”

**Princeton University, Program on Science & Global Security**, Sep. 2020

“Modelling the performance of hypersonic boost-glide missiles”

**Pugwash Conferences on Science and World Affairs, Workshop on Hypersonic Weapons**, Geneva, Switzerland, Dec. 2019

“Hypersonic weapons: Defining the technology and technical challenges”

**Middlebury Institute of International Studies, Center for Nonproliferation Studies**, July 2019

“Dropping the bomb: The challenges of US chemical and nuclear weapon stockpile reductions”

**Massachusetts Institute of Technology, Lab. for Nuclear Security and Policy**, Jan. 2019

“Atomic structure as a signature for nuclear forensics and archaeology”

**Plutonium Futures—The Science 2018**, San Diego, USA, Sep. 2018

“Effects of irradiation-induced electronic excitation on simple and complex oxides”

**29th Internat. Summer Symposium on Science and World Affairs**, Darmstadt, Germany, July 2017  
“Feasibility of the clandestine recovery of weapons plutonium from a geological repository”

**19th International Conference on Radiation Effects in Insulators**, Versailles, France, July 2017  
“Synthesis of metastable oxide phases by dense electronic excitation”

**University of California, Berkeley, Department of Nuclear Engineering**, Apr. 2017  
“Phase stability of complex materials in extreme environments”

**23rd International Conference on the Applications of Accelerators in Research and Industry**, San Antonio, USA, May 2014  
“Effects of composition on the response of oxides to highly ionizing radiation”

## **CONTRIBUTED CONFERENCE PRESENTATIONS**

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**International Studies Association Annual Meeting**, San Francisco, USA, April 2024  
“Issue salience, casualty aversion, and US public opinion on nuclear weapons governance”

**21st International Conference on Radiation Effects in Insulators**, Fukuoka, Japan, September 2023  
“Formation of X-type phases in binary and ternary oxides irradiated with swift heavy ions”

**Materials Research Society Spring Meeting**, Phoenix, USA, April 2018  
“Measurement of UO<sub>2</sub> surface oxidation using grazing-incidence x-ray diffraction: Implications for nuclear forensics”

**Materials Research Society Spring Meeting**, Phoenix, USA, April 2018  
“Role of composition, bond covalency, and short-range order in the disordering of stannate pyrochlores by swift heavy ion irradiation”

**Materials Research Society Spring Meeting**, Phoenix, USA, April 2017  
“High pressure phase stability of transition metal high-entropy alloys”

**20th International Conference on Ion Beam Modification of Materials**, Wellington, New Zealand, November 2016  
“Synthesis of metastable lanthanide sesquioxide phases by irradiation with swift heavy ions”

**Geological Society of America Annual Meeting**, Baltimore, USA, November 2015  
“Redox response of actinide oxides and oxyhydroxides to highly ionizing radiation”

**9th International Symposium on Swift Heavy Ions in Matter**, Darmstadt, Germany, May 2015  
“Systematic study of the phase behavior of *f*-block oxides irradiated with swift heavy ions”

**European Materials Research Society Spring Meeting**, Lille, France, May 2015  
“Response of lanthanide and actinide oxides to swift heavy ion irradiation”

**Plutonium Futures—The Science 2014**, Las Vegas, USA, September 2014  
“Structural transformations in actinide oxides under extreme conditions”

**Materials Research Society Spring Meeting**, San Francisco, USA, April 2014  
“Redox response of actinide materials to highly ionizing radiation”

**Fuel Cycle Technologies Annual Review Meeting, DOE Office of Nuclear Energy**, Argonne, USA, November 2013  
“Structural and chemical response of actinide materials to highly ionizing radiation”

**17th International Conference on Radiation Effects in Insulators**, Helsinki, Finland, July 2013  
“Swift heavy ion irradiation of ceria and thoria”

**8th International Symposium on Swift Heavy Ions in Matter**, Kyoto, Japan, October 2012  
“Compositional effects on track formation in A<sub>2</sub>TiO<sub>5</sub> (A = La, Nd, Sm, Gd) irradiated with swift heavy ions”

## POLICY BRIEFINGS

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**Netherlands Ministry of Defence: Arms Procurement and Personnel**, Berkeley, USA, Apr 2025  
“Hypersonic missiles: Performance, implications, and limitations”

**Consulate-general of the Netherlands in San Francisco, United States**, Berkeley, USA, Mar 2025  
“Hypersonic missiles: Performance, implications, and limitations”

**UK Foreign, Commonwealth & Development Office**, London, UK, Mar 2025  
“Towards a quantitative treatment of emerging technologies, risk, and governance”

**Pacific Center for Island Security**, Hagåtña, Guam, Aug 2023  
“Missile defense in Guam”

**Council for Security Cooperation in the Asia-Pacific, Nuclear Energy Experts Group**, Stanford, USA, September 2022  
“Safeguarding spent nuclear fuel”

**UK Ministry of Defense: Development, Concepts and Doctrine Centre, Chief of the Defence Staff Strategy Forum**, Cambridge, UK, Feb 2022  
“Hypersonics – Implications for UK Defence?”

**US Congressional Military Legislative Assistant Workshop**, Washington, DC, USA, October 2020  
“The hype on hypersonic weapons”

**United Nations First Committee: 74th session, UN Office of Disarmament Affairs**, New York, USA, October 2019  
“Hypersonic weapons: A challenge and opportunity for strategic arms control”

**The National Academies of Sciences, Engineering, and Medicine: Committee on Disposal of Surplus Plutonium in the Waste Isolation Pilot Plant**, Washington, DC, USA, April 2019  
“Feasibility and risks of human intrusion in the Waste Isolation Pilot Plant”

## TEACHING

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**Technology, Risk, and Security Colloquium** Fall, Spring 2025-26  
University of California, Berkeley, Goldman School of Public Policy: PUBPOL 118

**Blueprint to Battlefield: Weapons Technology and Sociotechnical Change** Fall 2022-24  
Stanford University, Master’s in International Policy Program: INTLPOL 296

**Honors Program in International Security Studies** Fall, Winter, Spring 2021-25  
Stanford University, Institute for International Studies: IIS 198 and 199

**Materials Laboratory II** Winter 2014  
University of Michigan, Department of Materials Science & Engineering: MSE 365

**Research Problems in Materials Science and Engineering** Winter 2013  
University of Michigan, Department of Materials Science & Engineering: MSE 490

## GUEST LECTURES

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**Space Technology and National Security Policy** Fall 2025  
University of California, Berkeley, School of Public Policy: PUBPOL 151/AEROENG C193P

**Physics and Politics of Missile Defense** Fall 2024  
University of Hamburg, Institute for Peace Research and Security Policy: 96-5.09

**Technology & Strategic Planning** Winter 2022  
Naval Postgraduate School, Department of National Security Affairs: NS 4253

**Sustainable Energy Systems**

Fall 2021

Pennsylvania State University, Department of Nuclear Engineering: NUCE 497

**International Security in a Changing World**

Winter 2016

Stanford University, Department of Political Science: PS 114S

**DISSERTATION COMMITTEES**


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<b>Alex Solomon, PhD:</b> University of Tennessee, Knoxville, Department of Nuclear Engineering “Investigating metastable phases in ion-irradiated binary oxides”	2023
<b>William Cureton, PhD:</b> University of Tennessee, Knoxville, Department of Nuclear Engineering “Nuclear fuel materials under extremes: Redox behavior and resulting defect structure”	2021

**SERVICE**


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<b>Risk &amp; Security Seminar organizer</b> University of California, Berkeley, Goldman School of Public Policy	2025-26
<b>Fellowship Selection Committee</b> Stanford University, Center for International Security and Cooperation (CISAC)	2025
<b>Book reviewer</b> Cambridge University Press	2025
<b>Fellowship Program Review Committee</b> Stanford University, Center for International Security and Cooperation (CISAC)	2024
<b>Nuclear Security Fellowship Selection Committee</b> Stanford University, Center for International Security and Cooperation (CISAC)	2023-24
<b>Undergrad Honors Program Selection Committee</b> Stanford University, Center for International Security and Cooperation (CISAC)	2022-24
<b>Social Science Fellowship Selection Committee</b> Stanford University, Center for International Security and Cooperation (CISAC)	2022
<b>Research report reviewer</b> UK Parliamentary Office of Science and Technology (POST)	2022
<b>Research proposal reviewer</b> Stanford Synchrotron Radiation Lightsource (SSRL), SLAC National Accelerator Laboratory	2021
<b>Research Proposal Reviewer</b> National Centre of Science and Technology Evaluation, Kazakhstan	2017

**JOURNAL REFEREEING**


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<i>Acta Materialia</i>	<i>Journal of Alloys and Compounds</i>
<i>American Mineralogist</i>	<i>Journal of Applied Physics</i>
<i>Applied Physics Letters</i>	<i>Journal of the European Ceramic Society</i>
<i>Chemical Communications</i>	<i>Journal of Materials Science &amp; Technology</i>
<i>Corrosion Science</i>	<i>Journal of Nuclear Materials</i>
<i>Crystals</i>	<i>Journal of Physical Chemistry</i>
<i>Inorganic Chemistry Frontiers</i>	<i>Journal of Radioanalytical &amp; Nuclear Chemistry</i>
<i>International Journal of Hydrogen Energy</i>	<i>Journal of the Australian Ceramic Society</i>
<i>International Security</i>	<i>Nuclear Instruments and Methods in Physics Res.</i>
<i>Journal for Peace and Nuclear Disarmament</i>	<i>Philippine Journal of Science</i>

*Physica Status Solidi*  
*Physical Chemistry Chemical Physics*  
*Radiation Physics and Chemistry*

*Science & Global Security*  
*Scripta Materialia*

## HONORS AND AWARDS

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<b>Mid-Career Cadre</b> , Center for Strategic and International Studies (CSIS)	2022
<b>Kendall Fellowship</b> , Union of Concerned Scientists	2019
<b>Stanton Nuclear Security Fellowship</b> , Stanton Foundation	2018
<b>Nuclear Security Postdoctoral Fellowship</b> , MacArthur Foundation	2015
<b>Young Scientist Award</b> , European Materials Research Society (E-MRS)	2015
<b>Innovations in Fuel Cycle Research Award</b> , US Department of Energy (DOE)	2013
<b>Graduate Research Fellowship</b> , US National Science Foundation (NSF)	2012
<b>Rackham Merit Fellowship</b> , University of Michigan	2011
<b>1st Place, Science and Energy Research Challenge</b> , US Department of Energy (DOE)	2009