Exponent®
Engineering & Scientific Consulting

Erik Urban, Ph.D., CFEI

Managing Scientist | Electrical Engineering and Computer Science
Warrenville
+1-630-658-7525 | eurban@exponent.com

Professional Profile

Dr. Erik Urban leverages his expertise with electronics and electrical systems to assist clients working with consumer products, automotive systems, and residential, commercial, and industrial electrical equipment and installations. His work frequently involves matters involving fires, explosions, personal injury, code compliance, potential regulatory action, product reliability, and hazard analyses.

Dr. Urban has experience with a wide variety of industrial equipment and has assisted clients with investigations to evaluate the control systems, sensors, actuators, electrical protective devices, and interlocks that govern the operation of equipment. He is experienced with equipment used for electrical power generation and distribution including generators, transformers, circuit breakers, switchgear, metering, and cabling in both residential settings and large industrial facilities. He is also experienced with electrical components such as motors, lighting, power supplies, chargers, circuit boards, and circuit components. Further, Dr. Urban has assisted clients in investigating and understanding the factors behind unintended exposures to electrical energy through shocks, electrocutions, and arc flashes. Dr. Urban has performed numerous fire and/or explosion investigations in residential, commercial, and industrial settings.

Dr. Urban’s expertise with consumer products includes evaluating risks and hazards as part of new product development and in response to customer feedback. His work has included investigating the design and performance of products as a whole, individual electronic components, and the construction and assembly of products. He has experience performing investigations into products that have experienced reliability issues or failures leading to potential recalls, including matters which involve the Consumer Product Safety Commission, CPSC. This work has included performing root cause investigations and product testing while assisting clients as they evaluate technical factors contributing to a reported issue. Dr. Urban is also familiar with the process of conducting shock, fire, and burn hazard analyses for electrical equipment.

Dr. Urban frequently assists client in understanding how their products and installations may be impacted by national and international standards, including the National Electric Code (NFPA 70) and other standards published by organizations such as Underwriters Laboratories (UL), the Institute of Electrical and Electronics Engineers (IEEE), the International Electrotechnical Commission (IEC), and the National Fire Protection Association (NFPA).

Prior to joining Exponent, Dr. Urban obtained his Ph.D. from the University of California, Berkeley as a National Science Foundation Graduate Research Fellow in the field of experimental atomic physics. His research included design, implementation, and characterization of novel ion traps for the study of fundamental quantum interactions and new quantum controls to aid in the development of quantum technologies. Dr. Urban's doctoral work required the use of radio-frequency electronics, printed circuit board (PCB) debugging and design, precise control of electric fields, electrostatic field simulations, optical lasers, and ultra-high vacuum systems.

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Dr. Urban is familiar with Python, C++, MatLAB, and Fortran and has assisted clients with data analysis and reviews of source code in various applications.

Academic Credentials & Professional Honors

Ph.D., Physics, University of California, Berkeley, 2019

M.A., Physics, University of California, Berkeley, 2017

B.A., Chemical Physics, Hendrix College, 2013

National Science Foundation Graduate Research Fellow, 2014-2019

Goldwater Scholar, 2012-2013

Phi Beta Kappa Honor Society

Licenses and Certifications

Certified Forklift Operator for Sit-Down Counterbalanced Forklifts

Certified Fire and Explosion Investigator (CFEI)

Prior Experience

Graduate Research Assistant, University of California, Berkeley, 2014-2019

Graduate Student Instructor, University of California, Berkeley, 2013-2014

Intern, Jefferson National Laboratory, 2012

Publications

Glikin N, Stickler B, Tollefsen R, Mouradian S, Yadav N, Urban E, Hornberger K, Haeffner H, **Probing Rotational Decoherence with a Trapped-Ion Planar Rotor.** Physical Review Letters 134, 033601 (2025)

An D, Matthiesen C, Urban E, Haeffner H, **Distance scaling and polarization of electric-field noise in a surface ion trap.** Physical Review A 100, 063405 (2019)

Urban E, Glikin N, Mouradian S, Krimmel K, Hemmerling B, Haeffner H, **Coherent control of the rotational degree of freedom of a two-ion coulomb crystal.** Physical Review Letters 123, 133202 (2019)

An D, Matthiesen C, Abdelrahman A, Berlin-Udi M, Gorman D, Möller S, Urban E, Haeffner H, **Surface trap with dc-tunable ion-electrode distance.** Review of Scientific Instruments 89, 093102 (2018)

Li HK*, Urban E*, Noel C, Chuang A, Xia Y, Ransford A, Hemmerling B, Wang Y, Li T, Haeffner H, Zhang X. **Realization of translational symmetry in trapped cold ion rings.** Physical Review Letters 118, 053001 (2017)

Magee et. al. **A novel comparison of Moller and Compton electron-beam polarimeters.** Physics Letters B, Volume 766 (2017)

Presentations

Urban E, Glikin N, Mouradian S, Haeffner H. Coherent Control of Angular Momentum States with a Freely Rotating Coulomb Crystal, Southwest Quantum Information and Technology Workshop, Albuquerque, NM, 2019.

Urban E, Glikin N, Hemmerling B, Haeffner H. Investigating Particle Indistinguishability with a Freely Rotating Coulomb Crystal, International Conference on Atomic Physics, Barcelona, Spain, 2018.

Urban E, Li HK, Hemmerling B, Haeffner H. Transnationally invariant trapped ion rings. Division of Atomic Molecular and Optical Physics APS Meeting, Sacramento, CA, 2017.

Urban E, Haeffner H. Towards a new class of trapped ion experiments with ion rings. Southwest Quantum Information and Technology Workshop, Albuquerque, NM, 2016.

Urban E, Gaskell D. Monte Carlo Studies of the Hall C Compton Polarimeter. The American Physical Society April Meeting, Denver, CO, 2013.