Austin Hoover

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Education

Ph.D. in Physics — August 2018 - May 2022
University of Tennessee — *Knoxville, Tennessee, USA*

- Dissertation: "Towards the production of a self-consistent phase space distribution".
- Advisor: Sarah Cousineau.

B.S. in Physics — August 2014 - May 2018
Wheaton College — *Wheaton, Illinois, USA*

Research interests

Intense beam dynamics in linear and circular accelerators

High-dimensional phase space reconstruction and analysis

Phase space painting

Nonlinear dynamics

Research experience

Postdoctoral Research Associate — April 2022 - Present
Oak Ridge National Laboratory — *Oak Ridge, Tennessee, USA*

- Advancing accelerator beam modeling via high-dimensional phase space diagnostics at the Spallation Neutron Source (SNS) Beam Test Facility (BTF).
- PI: Kiersten Ruisard.

Graduate Research Assistant — August 2019 - April 2022
University of Tennessee — *Knoxville, Tennessee, USA*

- Development of a novel method to produce intense, uniform-density hadron beams with small four-dimensional emittance.
- PI: Nick Evans.

REU Research Fellow — May 2017 - August 2017
Baylor University — *Waco, Texas, USA*

- Normal mode analysis of dusty plasma crystal dynamics.
- PI: Truell Hyde.

Teaching experience

Teaching Assistant — January 2021
United States Particle Accelerator School — *Virtual*

- Graded assignments and ran help sessions for the course "Fundamentals of Accelerator Physics and Technology".

Graduate Teaching Assistant — August 2018 - August 2019
Department of Physics, University of Tennessee — *Knoxville, Tennessee, USA*

- Taught hybrid introductory physics labs (1/3 lecture, 2/3 experiment) for undergraduate health science students.
- Supervisor: Christine Cheney

Teaching Assistant — August 2016 - May 2018
Department of Physics, Wheaton College — *Wheaton, Illinois, USA*

- Assisted with lab setup, answered questions during lab, and graded assignments.
- Supervisor: Darren Craig

Publications and presentations

Journal articles

- A. Hoover, K. Ruisard, A. Aleksandrov, S. Cousineau, A. Zhukov. "Analysis of a hadron beam in five-dimensional phase space". Physical Review Accelerators and Beams 26.6 (2023): 064202.
- A. Hoover, N. Evans. "Four-dimensional emittance measurement at the Spallation Neutron Source". Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment 1041 (2022): 167376.
- A. Hoover, N. Evans, J. Holmes. "Computation of the matched envelope of the Danilov distribution". Physical Review Accelerators and Beams 24.4 (2021): 044201.

Newsletter articles

- K. Ruisard, A. Aleksandrov, A. Hoover. "Six Dimensional Distributions at the SNS Beam Test Facility". APS Division of Physics of Beams Annual Newsletter (2022).

Conference and workshop proceedings

- A. Hoover, K. Ruisard, A. Aleksandrov, S. Cousineau, A. Zhukov. "Detailed characterization of a five-dimensional phase space distribution". International Particle Accelerator Conference (2023).
- K. Ruisard, A. Hoover, A. Aleksandrov, A. Zhukov, S. Cousineau. "Measurements at peak operational beam current in the SNS beam test facility". International Particle Accelerator Conference (2023).
- N. Evans, A. Hoover, T. Gorlov, V. Morozov. "Phase Space Painting of a Self-Consistent Danilov Distribution in the SNS Ring". International Particle Accelerator Conference (2023).

- A. Hoover. "Self-consistent, angular-momentum-dominated hadron beams for space charge mitigation". ICFA Mini-Workshop on Space Charge (2022).
- K. Ruisard, A. Aleksandrov, S. Cousineau. A. Hoover, A. Zhukov (2022). "Observation of current- driven features of 2.5 MeV ion bunch with complete and efficient 5D measurements at the SNS Beam Test Facility". International Linear Accelerator Conference (2022).
- A. Hoover, K. Ruisard, A. Aleksandrov, S. Cousineau, and A. Zhukov. "Measurements of the five-dimensional phase space distribution of an intense ion beam". North American Particle Accelerator Conference (2022).
- K. Ruisard, A. Aleksandrov, S. Cousineau, A. Hoover, A. Zhukov. "Model/measurement comparison of the transverse phase space distribution of an RFQ-generated bunch at the SNS BTF". North American Particle Accelerator Conference (2022).
- A. Zhukov, A. Hoover, A. Shishlo, J. F. Esteban Müller, E. Laface, Y. Levinsen, N. Milas. "Open XAL Status Report 2022". International Particle Accelerator Conference (2022).
- A. Hoover, N. Evans, T. Gorlov, J. Holmes. "Development of an injection-painted self-consistent beam at the Spallation Neutron Source". ICFA Advanced Beam Dynamics Workshop on High-Intensity and High-Brightness Hadron Beams (2021). Invited.
- A. Hoover, N. Evans. "Simulation of 4D Emittance Measurement at the Spallation Neutron Source". International Particle Accelerator Conference (2021).
- A. Hoover, N. Evans, J. Holmes. "Computation of the matched envelope of the Danilov distribution". APS April Meeting (2021).

Lectures

- A. Hoover. "Accelerator research and development at the Spallation Neutron Source". Lecture in Particle Accelerators: Technology and Applications course at the University of Tennessee Nuclear Engineering Graduate School (2022).

Internal reviews and technical notes

- A. Hoover, K. Ruisard, A. Aleksandrov, S. Cousineau, A. Zhukov. "High-dimensional phase space measurements at the SNS Beam Test Facility". ORNL Triennial Review (2023).
- A. Hoover, K. Ruisard, A. Aleksandrov, S. Cousineau, A. Zhukov. "Measuring the six-dimensional phase space distribution of an ion beam for improved accelerator performance". ORNL Neutron Science Advisory Board (2022).
- A. Hoover. "Painting a self-consistent beam". Spallation Neutron Source Accelerator and Target Advisory Committee Review (2021).

Dissertation

- A. Hoover. "Towards the production of a self-consistent phase space distribution". Ph.D. Dissertation, University of Tennessee (2022).

References

Sarah Cousineau (scousine@ornl.gov)

Nick Evans (evansnj@ornl.gov)
Sasha Aleksandrov (sasha@ornl.gov)