Seth S. Shields
Enterprise for Research, Innovation, and Knowledge
The Ohio State University
shields.239@osu.edu
314-956-9578

EDUCATION

Dec 2022	Ph.D. Physics	The Ohio State University
May 2019	M.S. Physics	The Ohio State University
May 2016	B.A. Physics - College Honors	Washington University in St. Louis
May 2016	B.A. German - College Honors	Washington University in St. Louis
Fall 2014	Study Abroad	University College London, UK
Summer 2013	German	Goethe Institute, Göttingen Germany

PUBLICATIONS

1. Thaddeus J. Asel, Warren Huey, Brenton Noesges, Egle Molotokaite, Yaxian Wang, Aldriel Barnum, Chris McPherson, Shishi Jiang**, Seth Shields**, Cosimo D'Andrea, Wolfgang Windl, Eugenio Cinquanta, Leonard J. Brillson, and Joshua E. Goldberger., *The Influence of Surface Chemistry on Water Absorption in Functionalized Germanane*, *Chem. Mater*. 2020, 32, 4, 1537–1544.
2. Micah S. Haseman, Brenton A. Noesges, **Seth Shields**, John S. Cetnar, Amber N. Reed, Hayder A. Al-Atabi, James H. Edgar, and Leonard J. Brillson., *Cathodoluminescence and x-ray photoelectron spectroscopy of ScN: Dopant, defects, and band structure,* APL Mater. **8**, 081103 (2020).
3. **Seth Shields**, Jay A. Gupta, *STM study of surface restructuring of oxidized Cu(100),* Surface Science. 740 (2024).
4. L. Robert Baker, Louis F. DiMauro, Claudia Turro, Jay A. Gupta, Roland K. Kawakami, Thomas K. Allison, Theodore J. Ronningen, Timothy D. Scarborough, Vyacheslav Leshchenko, **Seth S. Shields,** John E. Beetar. *NSF NeXUS: A New Model for Accessing the Frontiers of Ultrafast Science, ACS Cent. Sci.* 2025, 11, 1, 12–18.

RESEARCH EXPERIENCE

The Ohio State University- National Extreme Ultrafast Science Facility

Research Scientist
October 2024 - Present

Design, Integration, and Operation of Ultrafast Extreme Ultraviolet Micro-focusing Beamline and Scanning Tunneling Microscopy End Station
Designing and Leading Time and Element Resolved Commissioning Experiments
Interfacing and Coordinating with External Users for User Experiments

Applied Research Scientist
July 2023 - October 2024

Postdoctoral Researcher; Advisor: Jay Gupta
January 2023 - July 2023

The Ohio State University
Department of Physics
Graduate Research Assistant; Advisor: Jay Gupta
July 2018 - December 2022, Scanning Tunneling Microscopy Studies on Copper Oxide Films

The Ohio State University
Department of Physics
Graduate Research Assistant; Advisor: Leonard Brillson
Feb 2017-July 2018, Cathodoluminescence Studies of Defects in Semiconductors

Washington University in St. Louis
Department of Physics
Undergraduate Student Researcher; Advisor: Ramanath Cowsik
May 2015-August 2015, Equivalence Principle Investigations with a Torsion Balance

TEACHING EXPERIENCE

The Ohio State University
August 2017 - August 2020, Tutor, Introductory Mechanics, Introductory Electricity and Magnetism

The Ohio State University
August 2017 - August 2018, Graduate Teaching Assistant, Introductory Mechanics, Introductory Electricity and Magnetism
Cumulative Student Evaluation Score: 4.8/5.0

MENTORING

The Ohio State University- Ohio Five-Ohio State University Summer Undergraduate Research Experience
May 2022 - July 2022
May 2023 - July 2023
Mentor for undergraduate summer research interns from liberal arts colleges in the state of Ohio

CONFERENCE PRESENTATIONS

Invited Speaker: **Shields, S**., The NSF National Extreme Ultrafast Science (NeXUS) Facility. American Vacuum Society Ohio Chapter Symposium, Columbus, OH, July 2024.

Shields, S., Gupta, J.A. Atomic Resolution Scanning Tunneling Microscopy Studies of Oxidized Cu(100) Surfaces. Electronic Materials Conference, Columbus, OH, June 2022.

Shields, **S**., Dongjoon, K., Gupta, J.A., Asthagiri, A. Growth of Oxidized Copper Films and Characterization With Scanning Tunneling Microscopy. APS March Meeting, March 2021.

Tjung, S., Repicky, J., Zhang, Q., Santagata, N., Nie, X., Yuk, S., **Shields**, **S**., Asthagiri, A., Gupta, J.A. Fundamentals of CO_2 Adsorption on Model Copper Oxide Surfaces. American Vacuum Society International Symposium and Exhibition, Columbus, OH, October 2019.

Shields, **S**., Reed, A., Look, D., Noesges, B., Cetner, J., Brillson, L. Spatially-Resolved Cathodoluminescence Spectroscopy of ScN on MgO Grown by Reactive Magnetron Sputtering. Electronic Materials Conference, Santa Barbara, CA, June 2018.

Poster: **Shields, S.,** Beetar, J., Cheng, S., Leshchenko, V., Madugula, N. M., Scarborough, T., Allison, T., Baker, R., DiMauro, L., Gupta, J., Kawakami, R., Turro, C.
Ultrafast Materials Characterization at the NSF National eXtreme Ultrafast Science Facility. Multiphoton GRC, Bryant University, Smithfield, Rhode Island, June 2024.

Poster: Tjung, S., Repicky, J., Zhang, Q., Santagata, N., Nie, X., Yuk, S., **Shields**, **S**., Asthagiri, A., Gupta, J.A. Fundamentals of CO_2 Adsorption on Model Copper Oxide Surfaces. The Ohio State University Materials Week, The Ohio State University, Columbus, OH, May 2019.

Poster: **Shields**, **S**., Reed, A., Look, D., Noesges, B., Cetner, J., Brillson, L. Spatially-Resolved Cathodoluminescence Spectroscopy of ScN on MgO Grown by Reactive Magnetron Sputtering. The Ohio State University Materials Week, The Ohio State University, Columbus, OH, May 2018.

AWARDS

1. American Vacuum Society, Ohio Chapter, Early Career Scholar Award, July 2024
2. Materials Week Best Poster Presentation, May 2019
3. Hazel Brown Outstanding Teaching Assistant Award, April 2018
4. The Ohio State University Fellowship, August 2016-May 2017
5. Robert N. Varney Prize Finalist, September 2014, Washington University in St. Louis
    - Awarded for Excellence in Introductory Physics
    - 1 winner, 5 finalists
6. National Merit Scholarship, August 2012-May 2016
7. Delta Phi Alpha German Honor Society, Washington University in St. Louis, 2015
8. German Summer Study Scholarship, June-August 2013
    - Awarded to students of merit to offset Goethe Institute tuition

SERVICE

Abstract Judge, Edward F. Hayes Advanced Research Forum, The Ohio State University

- January 2024, January 2025

Volunteer, Young Scholars Program, The Ohio State University

- August 2018, Two-week physics prep program for incoming freshman from urban school districts (~20 students)
- Assist students with group work

Volunteer, Each One Teach One, Washington University in St. Louis

- August 2014 - December 2014, Semester-long teaching program for students at underprivileged urban schools
- Assisting band teacher with small group and individual instruction

AWARDED FUNDING:

Institute for Materials and Manufacturing Research Kickstart Facility Grant. "Preparation and Characterization of Electrochemically Etched Tips for Ultrafast Element-Resolved Scanning Tunneling Microscopy." PI: Ronningen, T.J. Co-PI: **Shields, S**,. May 15, 2024 - May 14, 2025. Total Award: $2,500.

REFERENCES

TJ Ronningen
NSF NeXUS Facility Manager
The Ohio State University, Columbus, OH
ronningen.1@osu.edu
(614)-746-2398

Professor Jay Gupta
The Ohio State University, Columbus, OH
gupta.208@osu.edu
(614) 247-8457

Professor Joseph Perry Corbett
Miami University, Oxford, OH
corbetj5@MiamiOH.edu
(513) 529-5628

Professor Ciriyam Jayaprakash
The Ohio State University, Columbus, OH
jay@physics.osu.edu