

Shukun Li

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Address: 189 Lower Sheep Pasture Rd, East Setauket, NY 11733

Education

Stony Brook University, Stony Brook, NY

Expected Degree in May. 2025

Bachelor of Science in Physics and Applied Mathematics & Statistics

Research Experience

Advanced Energy Materials Group, Brookhaven National Laboratory (BNL)

Upton, NY

Advisor: Dr. Qiang Li

[March, 2024] – Present

Project 1: Polycrystalline NbSb₂ Synthesis and Physical Property Analysis

- Prepared NbSb₂: sealed samples, performed furnace treatments, and utilized Spark Plasma Sintering (SPS).
- Characterized samples with X-ray diffraction (XRD) and scanning electron microscopy - energy dispersive X-ray spectroscopy (SEM-EDS); refined data with Rietica and FullProf.
- Conducted resistivity, Hall effect, Seebeck, and Nernst effect measurements with a Physical Property Measurement System (PPMS), followed by data analysis and visualization with Origin software.

Project 2. Single Crystal GdAlSi Electronic Structure and Physical Properties

- Managed cryogenic system operations and grew Ge-doped GdAlSi single crystals.
- Verified crystal structure and purity using XRD and EDS;
- Performed magnetic transport and property measurements in PPMS (standard six-probe method) and Magnetic Property Measurement System (MPMS); conducted ARPES experiments at NSLS-II.

Engineered Microstructures and Radiation Effects Laboratory (EMREL) Group

Stony Brook University, Stony Brook, NY

Advisors: Dr. David Sprouster and Dr. Lance L. Snead

[August, 2023] – Present

Characterization of Dislocation Structures in Reactor Pressure Vessel (RPV) Steels

- Collaborated with the University of California, Santa Barbara (UCSB), and Idaho National Laboratory
- Conducted XRD analysis at NSLS-II's XPD beamline and collected XRD patterns
- Performed background corrections and refined data using Topas software.
- Developed and implemented Python-based scripts in Maud for batch analysis of XRD data.

Characterization of Sintered Nanostructured Alloys (SNA)

- Utilized Direct Current Sintering (DCS) to fabricate dense nanostructured alloy samples.
- Performed microstructural analysis using Scanning Electron Microscopy (SEM).

Professor Xuegang Chen's group, Anhui University

Hefei, China

Advisor: Dr. Xuegang Chen

[June, 2022] – [September, 2022]

Ceramic Target Preparation and Oxide Thin Film Deposition

- Prepared dense polycrystalline ceramic targets (e.g., CuCo₂O₄, ZnCo₂O₄, LaNiO₃, FeCo₂O₄, etc.): mixed, heated, and pressed powders with polyvinyl alcohol (PVA).
- Utilized sputtering techniques to prepare silicon wafers and deposit NiCo₂O₄ and CuCo₂O₄ thin films.
- Characterized the electrical properties of NiCo₂O₄ samples and analyzed XRD data using FullProf software.

Technical Skills

- **Programming:** Python, MATLAB, LaTeX, C++
- **Software:** Maud, FullProf, Topas, Rietica, OriginLab
- **Laboratory Techniques:** XRD, SEM-EDS, SPS, PPMS, MPMS, ARPES, Sputtering

Publications and Presentations

- **Publication:** M. Ouyang, S. Li, T. Yamamoto, G. R. Odette, D.J. Sprouster, "On The Evolution of Dislocation Structures in Irradiated Reactor Pressure Vessel Steels: A High Throughput X-ray Diffraction Line Profile Analysis Investigation" (in preparation).
- **Poster:** S. Li, A. Laha and Q. Li "Electronic and Thermal Transport Properties of a Compensated Semimetal NbSb₂", presented at Brookhaven National Laboratory (BNL).

Extracurricular Activities

- **Student Assistant**, International Student Center, Stony Brook University, [August, 2024] – Present
- **Bronze Medalist**, 2024 Intramural 5-on-5 Basketball Tournament, Stony Brook University