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

Transferred from Anhui University

Research Experience

Advanced Energy Materials Group, Brookhaven National Laboratory (BNL) — Upton, NY

Advisor: Dr. Qiang Li — [March, 2024] – Present

Project 1: Polycrystalline $NbSb_2$ Synthesis and Physical Property Analysis

- Prepared $NbSb_2$: 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**).

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., $CuCo_2O_4$, $ZnCo_2O_4$, $LaNiO_3$, $FeCo_2O_4$, etc.): mixed, **heated**, and **pressed** powders with polyvinyl alcohol (PVA).
- Utilized **sputtering** techniques to prepare silicon wafers and deposit $NiCo_2O_4$ and $CuCo_2O_4$ thin films.
- Characterized the electrical properties of $NiCo_2O_4$ 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 $NbSb_2$", 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