HUANG, JINGJING

Experimental Physics:
Atomic, Molecular, and Optical

NC State University, Physics Department,
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SUMMARY

Experimental AMO: Hands-on experience in designing and executing ultracold atoms experiments. Proficient in optical and quantum quantum optics, laser applications, electronics, servo control systems, and ultra-high vacuum system.

Programing: Skilled in programing, adepted at physics model simulation, hardware interfacing, automatic experimental sequence synchronization, automatic data acquisition, real-time data analysis (utilizing MATLAB), and image/large data processing (utilizing MATLAB and Python).

SKILLS

Lasers:	Dye, CO_2, diode, fiber, frequency doubler.
Optical components:	Acousto/electro-optical modulators, spatial light modulators, optical cavities, fibers, and micromirror arrays.
Metrology:	Spectrometers, wavemeters, beam profilers, magnetometers, power supplies, oscilloscopes, function generators.
Programing:	MATLAB (Proficient), Python (Experienced), C++ (Experienced).
Languages:	English (*Proficient*), Chinese (*Native*), Russian (*Basic*).

EDUCATION

06/2020 – 12/2023	**Ph.D.** in Physics (Experimental atomic, molecular, and optical physics)	**North Carolina State University**
08/2018 – 06/2020	**M.S.** in Physics (general)	**Tufts University**
01/2014 – 06/2018	**B.Sc** in Physics (general)	**SUNY, University at Albany**
01/2014 – 06/2018	**B.Sc** in Mathematics (Two sequences: Algebra and Topology)	**SUNY, University at Albany**

PROFESSIONAL EXPERIENCE

06/2020 – Present
Supervisor:
John E. Thomas

Graduate Research Assistant, Postdoctoral Associate — **North Carolina State University**

- Proposed, designed, and implemented experiments aimed at manipulating the spin states and engineering the Hamiltonian of an ultracold ^{6}Li Fermi gas employing the combinations of radiofrequency pulse sequences and magnetic field sweepings. Studied spin density evolution and spin correlation emergence in a nearly collisionless Fermi gas with Heisenberg Hamiltonian. *(During PhD study)*
- Developed and implemented sophisticated physics models using MATLAB to predict spatial and energy-resolved spin density distributions.
- Automated data acquisition and developed custom fitting programs in MATLAB to efficiently process and analyze large volumes of imaging data.
- Upgraded and programmed hardware system in order to implement experiments to explore hydrodynamic transport properties in an ultracold ^{6}Li Fermi gas with imbalanced spin mixtures. *(Ongoing, during postdoctoral study)*
- Provided guidance and mentorship to fellow graduate students in their research activities. Constructed a new ^{6}Li oven to replace the old one which works in ultrahigh vacuum to produce the atomic beam in daily experiments. Contributed to experiment design, data acquisition, and data analysis strategies. Helped the current graduate student in thesis writing.
- Optimized and maintained the optical devices and beam path alignments for laser cooling, atom trapping, and imaging across two laboratory settings.
- Managed equipment procurement and expenses for research activities within the research group.

06/2019 – 06/2020
Supervisor:
Roger G. Tobin

Graduate Research Assistant — **Tufts University**

- Investigated the electrical property change of metallic substrate (Ni and Cu) induced by the adsorption of NiO nanoparticle adsorption.
- Led the design and execution of experiments, including data collection, analysis, and literature review, while also providing instruction to undergraduate students on concepts and theories in solid-state physics and quantum mechanics.
- Operated Volmer-Weber mode thin-film (nanoisland) growth using resistive thermal evaporation in certain gas atmospheres.
- Operated temperature-programmed desorption, surface resistivity measurement, Auger electron spectroscopy, and other experimental techniques.
- Maintained instruments: Vent and bake out the ultra-high vacuum chamber. Additionally, conducted troubleshooting and repairs of pumps and electronics to maintain equipment efficiency and reliability.

TEACHING EXPERIENCE

08/2018 – 06/2020 **Teaching Assistant** **Tufts University**

- Taught undergraduate level physics labs.
- Graded undergraduate level physics classes homework, lab reports, and exams.
- Assisted other learning assistants to hold office hour, teach recitations, proctor exams, etc.

06/2015 – 06/2018 **Physics and Mathematics Tutor** **SUNY University at Albany**

- Provided one-to-one tutoring service for high school and college students.
- Personalized physics and math courses teaching. Offered homework guidance and suggestions for self-learning.

AWARDS AND HONORS

08/2020 – 08/2021 **NC State University Provost's Doctoral Fellowship** **NC State University, the Graduate School**

08/2020 – 08/2021 **Provost Doctoral Fellowship Supplement** **NC State University, Physics Department**

08/2020 – 08/2021 **Sayers Fellowship** **NC State University, Physics Department**

08/2018 – 06/2020 **45% Tuition Scholarship** **Tufts University, the Graduate School**

PUBLICATION

- **J. Huang**, Camen A. Royse, I. Arakelyan, J. E. Thomas, *"Verifying a quasi-classical spin model of perturbed quantum rewinding in a Fermi gas"*. Phys. Rev, A **108**, L041304 (2023), *Letter*.
- **J. Huang**, J. E. Thomas, *'Energy-resolved spin correlation measurements: Decoding transverse spin dynamics in weakly interacting Fermi gases"*. [arXiv:2309.07226]. Submitted to Phys. Rev. Lett., September 2023.
- Camen A. Royse, **J. Huang**, J. E. Thomas, *"Collective dynamical Fermi suppression of optically-induced inelastic scattering"*. [arXiv:2401.15162]. Submitted to Phys. Rev. Lett., January 2024.
- Xiang Li, **J. Huang**, J. E. Thomas, *"Universal Hydrodynamic Transport Times in the Normal Phase of a Unitary Fermi Gas "*. [arXiv:2402.14104]. Submitted to Phys. Rev. Lett., February 2024.