SAMI HAKANI

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Research Interests

Low-dimensional quantum systems, spin dynamics of strongly correlated electronic systems, topological and entangled phases of matter in model systems (frustrated quantum magnets, ultracold atoms and molecules, topological semimetals, etc.)

Education

2025 (expected)	Ph.D. in Physics Advisor: Itamar Kimchi	Georgia Institute of Technology
2018	B.S. in Physics, Electrical Engineering Advisor: Nir Navon	Yale University

Positions

2019-present	Graduate Student Researcher	Georgia Tech
2019-present	Graduate Teaching Assistant	Georgia Tech
2018-2019	Postgraduate Research Associate	Yale University

Fellowships and Awards

2023	[1]Amelio Travel Grant ($500)	Georgia Tech
2022	Amelio Travel Grant ($1000)	Georgia Tech
2022	[2]Rice Fellowship ($2500)	Georgia Tech
2022	Amelio Travel Grant ($500)	Georgia Tech
2018	Distinction in the Major	Yale University
2017	[3]PFCU Academic Scholarship ($2500)	
2015	PFCU Academic Scholarship ($2500)	
2014-2018	[4]H. G. Bessent Scholarship	Yale University
2014-2018	QuestBridge Scholar	Yale University

[1] Amelio Endowment and the Weatherly Fund Graduate Student Travel Grant
[2] Bonnie B. and Charles K. Rice Jr. Fellowship
[3] External scholarship awarded by Platinum Federal Credit Union
[4] Funded by the Mr. Scott K. H. Bessent and the Bessent Foundation

Publications

1. Sokolik, A., Hakani, S., Roy, S., Pellatz, N., Zhao, H., Cao, G., Kimchi, I., & Reznik, D. (2022). Spinons and damped phonons in the spin-1/2 quantum liquid $Ba_4Ir_3O_{10}$ observed by Raman scattering. *Physical Review B*, *106*(7), 075108. https://doi.org/10.1103/PhysRevB.106.075108
2. Zhang, Y., Ni, Y., Zhao, H., Hakani, S., Ye, F., DeLong, L., Kimchi, I., & Cao, G. (2022). Control of chiral orbital currents in a colossal magnetoresistance material. *Nature*, 1–6. https://doi.org/10.1038/s41586-022-05262-3
3. Hakani, S. and Kimchi, I (2023). Topological Defects in a response theory. (in preparation)

Presentations

Poster Presentations

June 2023	Dynamics and Quantum Information in Many-body Systems University of Minnesota, Minneapolis, MN *"Topological Defects in a Response Theory"*
May 2023	Topology and Fractionalization in Magnetic Materials (TopoMag23) The Ohio State University, Columbus, OH *"Topological Defects in a Response Theory"*
Jan 2022	MagLab Winter Theory School National High Magnetic Field Laboratory, Tallahassee, FL (Virtual) *"Spinons and damped phonons in spin-1/2 quantum-liquid $Ba_4Ir_3O_{10}$ observed by Raman scattering"*

Oral Presentations

July 2022	Yale Young Global Scholars Research Showcase, New Haven CT (Virtual)
Dec 2022	A Quantum Many-Body Handshake Weizmann Institute of Science, Rehovot, Israel *"Raman Responses with and without Topological Defects"*
May 2022	Georgia Tech Quantum Alliance Workshop Georgia Institute of Technology, Atlanta, GA *"Optical Signatures for Fractional Excitations in Quantum Liquid Candidate $Ba_4Ir_3O_{10}$"*
Mar 2022	APS March Meeting, Chicago, IL *"Raman Response via 4-Spinon Continuum in Spin-1/2 Quantum Liquid $Ba_4Ir_3O_{10}$"*
July 2021	Yale Young Global Scholars Research Showcase, New Haven CT (Virtual)
Jun 2019	Yale Young Global Scholars Research Showcase, New Haven, CT

Conferences and Schools Attended

July 2023	Princeton Summer School on Condensed Matter Physics

	Princeton University, Princeton, NJ (Virtual)
June 2023	Dynamics and Quantum Information in Many-body Systems
	University of Minnesota, Minneapolis, MN
May 2023	Topology and Fractionalization in Magnetic Materials (TopoMag23)
	The Ohio State University, Columbus, OH
Dec 2022	A Quantum Many-Body Handshake
	Weizmann Institute of Science, Rehovot, Israel
Mar 2022	APS March Meeting, Chicago, IL
Jan 2022	MagLab Winter Theory School
	National High Magnetic Field Laboratory, Tallahassee, FL (Virtual)
Aug 2021	International conference on theoretical physics
	Landau Institute for Theoretical Physics (Virtual)
	"From quasi-classics to Bose condensation and everything in between" dedicated to Valery Pokrovsky's 90th anniversary
Aug 2021	Bad Honnef School on Ultracold Quantum Gases
	German Physical Society, Bad Honnef, Germany (Virtual)
Mar 2021	APS March Meeting (Virtual)
June 2020	APS DAMOP (Virtual)

Teaching Experience

Guest Lectures

Spring 2023	PHYS 6106 Graduate Quantum Mechanics II	Georgia Tech

Graduate Teaching Assistantships

Summer 2023	PHYS 2211 Intro Physics I	Georgia Tech
Spring 2023	PHYS 6106 Graduate Quantum Mechanics II	Georgia Tech
Summer 2021	PHYS 2211 Intro Physics I	Georgia Tech
Fall 2021	PHYS 6105 Graduate Quantum Mechanics I	Georgia Tech
Spring 2021	PHYS 6106 Graduate Quantum Mechanics II	Georgia Tech
Fall 2020	PHYS 6101 Graduate Classical Mechanics	Georgia Tech
Summer 2020	PHYS 2211 Intro Physics I	Georgia Tech
Fall 2019	PHYS 2211 Intro Physics I	Georgia Tech

Undergraduate Teaching Assistantships

Spring 2018	MATH 222 Linear Algebra with Applications	Yale University
Fall 2017	MATH 118 Intro to Functions of Several Variables	Yale University
Spring 2017	MATH 222 Linear Algebra with Applications	Yale University

Other Teaching Positions

Summer 2018	Yale Young Global Scholars	Yale University

Summer 2017	Yale Young Global Scholars	Yale University

Leadership and Service

2022-2023	President, Graduate Association of Physicists (GAP)	Georgia Tech
2022-2023	Member, School of Physics Graduate Committee	Georgia Tech
2022	Organizer, GAP Graduate Student Panel	Georgia Tech
2022-2023	College of Sciences Dean's Advisory Council	Georgia Tech
2022-2023	Equity in Graduate Education Consortium	Georgia Tech
2021-2023	Organizer, weekly Quantum Café	Georgia Tech
2021	Organizer, weekly Quantum Journal Club	Georgia Tech

Students Supervised

High School Students

2020-2021 Samad Hakani
Won Regional and National Junior Science and Humanities Symposium
Subsequently: Undergraduate Student, Yale University

Professional Memberships

2020-present American Physical Society

Skills Summary

Languages

English (native), Urdu (native), Spanish (conversational)

Programming Languages

Python (proficient), MATLAB, Mathematica, C++ (novice), LaTeX

Python Frameworks

TeNPy, Scikit-learn, Tensorflow, NumPy, Pandas, Matplolib, Seaborn, Beautifulsoup

Platforms

Linux, Windows, Arduino