CHRIS FECHISIN

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EDUCATION

University of Maryland 2021 - 2027 (Expected)
PhD in Physics
Research Areas: Condensed Matter Theory and Quantum Information

Harvard University 2017 - 2021
A.B. in Physics and Mathematics
Honors: *magna cum laude* with highest honors in Physics and Mathematics

RESEARCH

Interests: quantum phases of matter, topological order, quantum optics

Department of Physics, University of Maryland College Park, MD
Albert Group *August 2021 - Present*

· Studying generalized cluster state – defined on a group-valued Hilbert space as in Kitaev's quantum double model – as an SPT phase protected by a fusion category symmetry and resource state for measurement-based quantum computing

Gorshkov Group *May 2021 - Present*

· Designed and assessed the performance of a quantum non-demolition photon counting protocol using Rydberg atom arrays

Department of Physics, Harvard University Cambridge, MA
Demler Group *May 2020 - May 2021*

· Studied scattering of spin waves in magnetic thin films for application to experiments carried out by the Yacoby Group at Harvard University

Heller Group *December 2018 - May 2020*

· Developed semiclassical methods for studying inelastic scattering in solid-state systems

Department of Physics, Virginia Tech Blacksburg, VA
Vogelaar Group *May - August 2018*

· Assisted in the design and construction of the NuLat antineutrino detector and began development of a Python simulation of the Borexino detector for internal radioactive background discernment

PUBLICATIONS

Christopher Fechisin, Kunal Sharma, Przemyslaw Bienias, Steven L. Rolston, J. V. Porto, Michael J. Gullans, Alexey V. Gorshkov, *Non-Demolition Photon Counting in a Two-Dimensional Rydberg Atom Array*, arXiv:2210.10798.

Christopher Fechisin, Nathanan Tantivasadakarn, Victor V. Albert, *Fusion Category SPT Order in the Generalized 1d Cluster State*, In Preparation.

PRESENTATIONS

Talks

"Non-Demolition Photon Counting in a Two-Dimensional Rydberg Atom Array." Gorshkov Group Meeting, 19 August 2022.

"Mesoscopic Material Properties from Magnon Scattering in Thin Films." American Physical Society March Meeting, 18 March 2021.

"Dipole-Exchange spin waves in magnetic thin films." Demler Group Meeting, Harvard University, August 2020.

"From Coherent State Statistics to the Frozen Phonon Model." American Physical Society March Meeting, March 2020. (Cancelled due to COVID-19)

Posters

"Non-Demolition Photon Counting in a Two-Dimensional Rydberg Atom Array."

· 25th Annual Conference on Quantum Information Processing, 11 March 2022.

· Advanced SRitp and GiRYD School on Giant Interactions in Rydberg Systems, 18 September 2022.

Outreach

"Atomic Clocks for Fundamental Physics: Harvard Physics Pre-Colloquium." YouTube, February 2020.

ORGANIZATIONS

Harvard-Radcliffe Society of Physics Students June 2018 - May 2021

Co-President *April 2020 - April 2021*

· Created and organized *Chilloquium* speaker series featuring world-renowned physicists from research groups around the United States and the world; attended by as many as 75 students per week

· Developed *Polaris*, a collaborative mentorship program for beginning physics students operated by Harvard-Radcliffe SPS, Harvard Women in Physics, and several faculty for ∼150 participants

· Designed branding for the organization and for the initiatives here listed, including the Harvard-Radcliffe SPS logo seen above

AWARDS

Joint Quantum Institute Graduate Fellowship

Herchel Smith Undergraduate Science Research Fellowship

Harvard College Research Program Term-Time and Summer Research Awards

Virginia Tech Department of Physics Raghavan Fellowship