

February 25, 2025

- 9:00 - 9:05 Opening Remarks
- 9:05 - 9:45 Sabre Kais, North Carolina State Univ.
Quantum Machine Learning for Complex Many-Body Systems
- 9:45 - 10:25 Abhinav Kandala, IBM
Evidence for the Utility of Quantum Computing Before Fault Tolerance
Coffee Break
- 10:50 - 11:10 He Zhao, FSU Physics
Atomic Engineering of Cuprate $\text{La}_{2-x}\text{Sr}_x\text{CuO}_4$ Tunnel Junctions
- 11:10 - 11:50 Eduardo Mucciolo, Univ. of Central Florida
Fast Scrambling with Quantum Circuits
- 11:50 - 12:10 Xiuwen Liu, FSU Computer Science
Recovering Signals from Noisy Quantum Outputs Using Machine Learning
Lunch & Posters
- 1:35 - 2:15 Hanna Terletska, Middle Tennessee St. Univ.
Quantum in Middle Tennessee "R2-HBCU Consortium"
- 2:15 - 2:55 Alexander Kemper, North Carolina St. Univ.
Quantum Computing for Quantum Materials
Coffee Break
- 3:20 - 4:00 Alejandro Lopez-Bezanilla, Los Alamos National Laboratory
Scientific Applications of Quantum Annealer Hardware
- 4:00 - 4:20 Ilias Magoulas, Emory University
Symmetry Projection: Shaping the Future of Heuristic Ansätze
- 4:20 - 5:00 Igor Zutic, University of Buffalo, SUNY
Topological Superconductivity in Planar Josephson Junctions
- 5:00 - 6:00 *Poster Session & Reception*

February 26, 2025

- 9:00 - 9:40 Ezekiel Johnston-Halperin, Ohio St. Univ.
A General & Modular Approach to Solid-state Integration & Readout of Zero-dimensional Quantum Systems
- 9:40 - 10:20 Tian Li, Univ. of Tennessee Chattanooga
Quantum Sensing and Quantum Control on a Deployed Metro-Scale Quantum Network
Coffee Break
- 10:45 - 11:05 Luis Balicas, NHMFL & FSU Physics
Ferrimagnetism, Local Lack of Inversion Symmetry, & Nearly Quantized Anomalous Hall Effect in Fe_3GaTe_2
- 11:05 - 11:45 Linda Doerrer, Boston University
Heterobimetallic Complexes with 4f Elements for Potential QIS and Qubits
- 11:45 - 12:05 Jakub Hruby, NHMFL
Hi Field EPR in Lanthanides
Lunch & Posters
- 1:35 - 2:15 Joseph Zadrozny, Ohio State University
Tuning Environmental Sensitivity in Molecular Spin Qubits
- 2:15 - 2:35 Luis Soriano, FSU Physics
Structured Ground States of Randomly Interacting Fermions
- 2:35 - 2:55 Alexander Volya, FSU Physics
Dynamics & Relaxation in Quantum Many-Body Systems
Coffee Break
- 3:20 - 4:00 Andrei Rogalev, European Synchrotron Research Facility
X-ray Directional Dichroism – an Element Selective Probe of Magnetoelectric Coupling
- 4:00 - 5:00 Round Table Discussion
- 5:00 - 6:00 *Poster Session & Reception*

February 27, 2025

- 9:00 - 9:40 Steven Girvin, Yale University
Quantum Signal Processing: How to Make a Schrödinger Cat with Microwaves
- 9:40 - 10:20 Christopher Wang, University of Chicago
Cavity Quantum Electrodynamics with Electrons on Helium
Coffee Break
- 10:45 - 11:05 Phong Vo, FSU Physics
Anomalous Chern Insulators in Twisted M+N multilayer graphene
- 11:05 - 11:45 TBD
- 11:45 - 12:05 Charles Peretti, FSU Mech. Engineering
Study of Quantum Vortex Dynamics in He II and Particle/Vortex Interaction by Direct Visualization
- 12:05 - 12:35 *Poster Prizes & Closing Remarks*
Special Thanks
This symposium is made possible through the generous contributions of our Speakers and Poster Presenters, and the FSU Office of the Vice President of Research, and dedicated staff and faculty of the National High Magnetic Field Laboratory

Poster Presentations

1. Ferdous Ara, NHMFL, *EPR Studies of Ho Dimer: Towards Scaling Up Molecular Clock Qubit*
2. Sebastian Atwood, NHMFL, *Observing Multiphoton Charge Carrier Spin Transitions Between Floquet States in Organic Light-Emitting Diodes*
3. Shubham Bisht, FSU, *Investigation of Magnetoelectric Coupling in Cr, Fe, and Cu-Based Molecular Triangles*
4. Somnath Das, FSU Chemistry, *Towards Vibrational Quantum Sensing of Radical Reaction Dynamics*
5. Brittany Grimm, FSU Physics, *EPR Characterization of a Photo-Responsive Fe(III) Spin-Crossover Complex*
6. Eduardo Hernandez, FSU Chemistry, *Synthesis and Characterization of a Dinuclear Ho(III) Molecular Electron Spin Qubit*
7. Zhenqi Hua, FSU Physics, *Charge-Spin Interconversion in Nonmagnetic Chiral Semiconductor Tellurium*
8. Mohammad Irfan, FSU Physics, *Development of MgO Tunnel Barrier to Probe the Pairing Mechanism in 1-1.5 Heavy Fermions*
9. Sandeep Joy, FSU Physics, *The Nature of the Quantum Liquid-Solid Transition for 2D Electrons*
10. Shyam Raj Karullithodi, NHMFL, *Topological Hall Signal in the Bulk Antiferromagnet $\text{Co}_{0.65}\text{Fe}_{2.35}\text{GaTe}_2$ Crystals*
11. Huiyang Ma, FSU Physics, *Upper Critical In-Plane Field of Spin-Orbit Proximitized Bilayer Graphene*
12. Xian Mallory, FSU Computer Science, *Using Quantum Computing to Infer Copy Number Alterations on the Spatial Transcriptome Data*

Posters cont.

13. Dibya Mondal, FSU Chemistry, *Investigation of High Symmetry Dinuclear Complexes as Platforms or the Design of Molecular Two-Qubit Gates*
14. Saradmoni Mondal, FSU Biomedical Eng. *Single Molecule Detection*
15. Quang Nguyen, FSU Physics, *High-field Cavity-Based EPR with In Situ Two-Axis Crystal Rotation Capability*
16. Varuna Pathirage, FSU Chemistry, *Modeling Molecular Spin Qubits w/ Equation of Motion Coupled Cluster Theory*
17. Jennifer Reid, FSU Physics, *Angle-Resolved Torque Magnetometry of Epitaxial $\text{Pr}_2\text{Hf}_2\text{O}_7$ Thin Films*
18. Jake Scally, FSU Computer Science, *Noise Reduction in Quantum Outcomes Using a Richardson-Lucy Deconvolution Algorithm for Quantum State Graphs*
19. Gang Shi, Physics, *Charge Transport in 2D Halide Perovskite (PEA) $_2\text{PbI}_4$*
20. Kavipriya Thangavel, NHMFL, *High-field EPR Analysis of Co- & Fe-Based Metal Complexes: Unraveling Electronic & Geometric Properties*
21. Phat Tran, FSU Computer Science, *An Effective Analysis-by-Synthesis Framework for Recovering Signals from Noisy Quantum Outputs*
22. Johan van Tol, NHMFL, *Pulsed EPR of Qubit Candidates*
23. Ronghe Wang, FSU Physics, *High-field EPR Study of $\text{Mn}(\text{acac})_3$ and $\text{Mn}(\text{mesacac})_3$ and Assessment of Coherence Properties*
24. Yan Xin, NHMFL, *Microstructure of Materials Studied by Transmission Electron Microscopy at Atomic Resolution*
25. Xiaotao Xu, FSU, *Atomic Engineering of Cuprate $\text{La}_{2-x}\text{Sr}_x\text{CuO}_4$ Tunnel Junctions*
26. Stephen Yuwono, FSU Chemistry, *Relativistic equation-of-motion coupled-cluster theory for open-shell systems*
27. Zihan Zhang, FSU Physics, *Bulk photovoltaic effect in two-dimensional halide perovskite*

FSU | **QUANTUM INITIATIVE**

Dirac Quantum Discussions

@FSU

February 25 - 27, 2025

Theoretical physicists accept the need for mathematical beauty as an act of faith... For example, the main reason why the theory of relativity is so universally accepted is its mathematical beauty.

Paul A. M. Dirac