

**Quantum Materials for Emergent Applications in Quantum Science**  
**June 15-19, 2024**  
**2024 Telluride Intermediate School 725 W. Colorado Ave, Telluride, CO 81435**

Organizers: Matt Brahlek, Jiaqiang Yan, Priscila Rosa, Gabor Halasz

**Friday, June 14, 2024**

5:00pm to 6:30pm: All-Telluride Science Meet and Greet

- Location: Alibi – 157 S. Fir Street
- This is a good chance to meet up with fellow participants before your meeting. A staff member will be on hand to welcome you and distribute badges.

**Saturday, June 15, 2024**

**8:00-8:30 Breakfast and Registration (Intermediate School, 725 W. Colorado Ave.)**

**8:30-8:40 Welcome – Organizers**

Early Morning Session:

Chair: Mina Yoon

8:40-9:15 am Alan Tennant- *Cooper-Pair Localization in the Magnetic Dynamics of a Cuprate Ladder*

9:15-9:50 am Minseong Lee- *Electric field on Quantum Spin Liquid*

9:50-10:25 am Filip Ronning- *Challenges and Opportunities for Heavy Fermions*

**10:25-10:45 am Coffee Break**

Late Morning Session:

Chair: Rob Moore

10:45-11:20 am Allen Scheie- *Entanglement and Two-dimensionality Probed with Neutron Scattering*

11:20-11:55 am Joel Moore- *The Evolving Boundary Between Classical and Quantum Hardware for Studying Low-Dimensional Correlated Materials*

11:55-12:20 am Round table discussion-Kirstin Alberti

**Break for lunch (not provided)**

**Afternoon Activity: Self-organized outside activities**

**Sunday, June 16, 2024**

**8:00-8:30 Breakfast**

**8:30-8:40 Flash Talk – Heda Zhang**

Early Morning Session:

Chair: Matt Brahlek

8:40-9:15 am Jukka Vayrynen- *Introduction to Topological Quantum Impurity Models*

9:15-9:50 am Rob Moore- *The Quantum Boundary Condition: Interfacing Quantum Properties and Device Functionality*

9:50-10:25 am Leonid Rokhinson- *Experimental Studies of TI/Superconductor Josephson Junctions*

**10:25-10:45 am Coffee Break**

Late Morning Session:

Chair: Wen-Han Kao

10:45-11:20 am Roman Lutchyn- *Interferometric Single-Shot Parity Measurement in an InAs-Al Hybrid Device*

11:20-11:55 am Ivar Martin- *Majorana Fermions with Charge Conservation*

11:55-12:20 am Round table discussion-Cristian Batista

**Break for lunch (not provided)**

**Afternoon Activity: Self-organized outside activities**

**Monday, June 17, 2024**

**8:00-8:30 Breakfast**

**8:30-8:40 Flash Talk – Matt Brahlek**

Early Morning Session:

Chair: Chris Palmstrom

8:40-9:15 am Binghai Yan- *Hybrid-order topology in unconventional magnets of Eu-based Zintl compounds with surface-dependent quantum geometry*

9:15-9:50 am Rob McQueeney- *Magnetism of the RT<sub>6</sub>Sn<sub>6</sub> Kagome Metals*

9:50-10:25 am Kirstin Alberti- *Elucidating and Controlling the Behavior of Defects and Disorder in Topological Semimetals*

**10:25-10:45 am Coffee Break**

Late Morning Session:

Chair: Filip Ronning

10:45-11:20 am Katja Nowack- *Understanding Electronic Transport with a Local Magnetic Probe*

11:20-11:55 am Katherine Harmon- *Toward Precision Synthesis of Heteropolytypism in Silicon Carbide*

11:55-12:20 am Round table discussion- Joel Moore

**Break for lunch (not provided)**

## **Afternoon Activity: Self-organized outside activities**

5:30pm - 7:30pm: All Telluride Science Picnic

- Free BBQ, Beer, Wine, and Non-Alcoholic Beverages. Friends and Family are invited free of charge.
- Location: Tent behind the Intermediate School (which is the location for all workshops - 725 W Colorado Ave)

## **Tuesday, June 18, 2024**

**8:00-8:30 Breakfast**

**8:30-8:40 Flash Talk – Priscila Rosa**

Early Morning Session:

Chair: Katherine Harmon

8:40-9:15 am Yue Cao- *Fluctuations in Heterogeneous Quantum Materials: an Operando Perspective*

9:15-9:50 am Ryotaro Okabe - *Structure-Constrained Generative Model of Magnetic Quantum Materials*

9:50-10:25 am Zaher Salman- *A Local Spin Probe Perspective of Exotic Superconducting States at Buried Interfaces*

**10:25-10:45 am Coffee Break**

Late Morning Session:

Chair: Alan Tennant

10:45-11:20 am Cristian Batista- *Dynamics of Quantum Spin Systems*

11:20-11:55 am Wen-Han Kao- *Vacancy Spectroscopy of Non-Abelian Kitaev Spin Liquids*

11:55-12:20 am Round table discussion- Chris Palmstrom

**Break for lunch (not provided)**

## **Afternoon Activity: Self-organized outside activities**

**6:30pm to 7:30pm Telluride Science Town Talk**

- Location: Telluride Conference Center in Mountain Village
- Cash Bar, Doors Open at 6:00pm

## **Wednesday, June 19, 2024**

**8:00-8:30 Breakfast**

**8:30-8:40 Flash Talk – Gabor Halasz**

Early Morning Session:

Chair: Kirstin Alberti

8:40-9:15 am Jane Chen- *Interface Driven Superconductivity in Topological Insulator Fe-Based Superconductor Heterostructures*

9:15-9:50 am Jason Alicea- *Internally Engineered Topological Superconductivity in Graphene Multilayers*

9:50-10:25 am Ammar Jahin-TBD

**10:25-10:45 am Coffee Break**

Late Morning Session:

Chair: Jane Chen

10:45-11:20 am Chris Palmstrom- *Molecular Beam Epitaxial Growth and Tuning Properties of Quantum Material Thin Films*

11:20-11:55 am Mina Yoon- *First-Principles Materials by Design for Quantum Materials - Delafossites*

11:55-12:20 am **Workshop Wrap Up**

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**TSRC Hosts**

Mark Kozak, 970-708-4426

Cindy Fusting, 970-708-5069

Sara Friedberg, 970-708-0622