

**Competing Interactions and Colossal Responses in Transition Metal Oxides and Related Compounds**  
**Telluride Intermediate School**  
**725 W. Colorado Ave, Telluride, CO 81435**  
**July 29 – August 2, 2024**

Sunday July 28, 2024

(5:00 - 6:30 p.m. All-Telluride Science Meet and Greet

Location: Alibi – 157 S. Fir Street

*This is a good chance to meet up with fellow participants. TSRC staff member will be on hand to welcome you and distribute badges*

6:00 p.m. No host gathering at New Sheridan Hotel bar

Monday, July 29, 2024

**8:00-8:30 Breakfast at TSRC meeting site.**

**8:30-8:40 Opening Remarks by Organizers**

**8:40-10:10**

**Nickelates I** (Chair: Mike Norman)

**8:40-9:10 M. Wang:** Experimental investigations on the nickelate high- $T_c$  superconductors **(REMOTE)**

**9:10-9:40 L. Sun:** Investigations of key issues on the reproducibility of high- $T_c$  superconductivity emerging from compressed  $\text{La}_3\text{Ni}_2\text{O}_7$  **(REMOTE)**

**9:40-10:10 Weiwei Xie (REMOTE / to be confirmed)**

**10:10-10:40 Coffee Break**

**10:40-12:40**

**Nickelates II** (Chair: Clarina de la Cruz)

**10:40-11:10 A. Botana:** Electronic Structure of Superconducting Nickelates: Similarities and Differences with the Cuprates

**11:10-11:40 C. Ahn:** Superconducting  $\text{Nd}_{1-x}\text{Eu}_x\text{NiO}_2$  (NENO) Thin Films Using In-Situ MBE Synthesis

**11:40-12:10 A. Moreo:** Trends in electronic structures and  $s\pm$ -wave pairing for the rare-earth series in bilayer nickelate superconductor  $\text{R}_3\text{Ni}_2\text{O}_7$

**12:10-12:40 J.F. Mitchell:** New Nickelate Phases: What Can They Tell Us About Superconductivity

Tuesday, July 30, 2024

**8:00-8:30 Breakfast at TSRC meeting site.**

**8:30-10:30**

**Kitaev and Other Quantum Magnets I** (Chair: Stephen Wilson)

**8:30-9:00 R. Valenti:** Probing Kitaev candidate materials with nonlinear optics: a theorist's view

**9:00-9:30 B.J. Kim:** Symmetry breaking orders from quantum entangled states in iridates

**9:30-10:00 L. Li:** Unconventional Quantum Oscillations in a Kagome Mott Insulator

**10:00-10:30 S. Haravifard:** Exploring Exotic States in Frustrated Magnets: Insights from Triangular and Square Lattice Systems

**10:30-11:00 Coffee Break and Group Photo**

**11:00-12:30**

**Kitaev and Quantum Magnets II** (Chair: Paolo Radaelli)

**11:00-11:30 X. Bai:** Spectroscopic evidence of spin nematic phases in a triangular lattice

**11:30-12:00 A. Christianson:** Field-tuned quantum renormalization of spin dynamics in the honeycomb lattice Heisenberg antiferromagnet  $\text{YbCl}_3$

**12:00-12:30 C. Broholm:** Quantum magnetism on honeycomb lattices

6:30-7:15 **TSRC Town Talk, Conference Center in Mountain Village (Speaker: Richard Lowenberg)**

8:00-9:30 **Evening Discussion (Topic TBD)**

Wednesday, July 31, 2024

8:00-8:30 **Breakfast at TSRC meeting site.**

8:30-10:00

**Chirality and Spin Textures I** (Chair: Roser Valenti)

8:30-9:00 **N. Spaldin:** Hidden Magnetoelectric Order

9:00-9:30 **N. Ghimire:** SpinCrafting: Controlling Transport Properties through Spin Texture Manipulation in Kagome Metals

9:30-10:00 **S. Blugel:** From the Fermi surface to topological magnetization textures

10:00-10:30 **Coffee Break**

10:30-12:00

**Chirality and Spin Textures II** (Chair: Antia Botana)

10:30-11:00 **P. Radaelli:** A tensor approach to 'Altermagnetism' (**REMOTE**)

11:00-11:30 **J. Rau:** Landau Theory of Altermagnetism

11:30-12:00 **M. Janoscheck:** Tales of topology as told by neutron scattering — Microscopic Insights into Magnon and Skyrmion Hall Effects

5:30-7:00 **TSRC Picnic, Telluride Intermediate School, 725 W Colorado Ave.**

Thursday, August 1, 2024

8:00-8:30 **Breakfast at TSRC meeting site.**

8:30-10:00

**Kagome Metals I** (Chair: U. Welp)

8:30-9:00 **S. Wilson:** Electronic instabilities in  $AV_3Sb_5$  kagome metals

9:00-9:30 **M. Jovanovic:** Kagome Materials - From Design Rules to Realizations

9:30-10:00 **D. Mandrus:** Complex Phase Diagram in  $LuMn_6Sn_6$

10:00-10:35 **Coffee Break**

10:35-11:35

**Kagome Metals II** (Chair: D. Mandrus)

10:35-11:05 **M. Yi:** Electronic orders in correlated kagome metals **11:00-11:30**

11:05-11:35 **U. Welp:** Fermi Surfaces and Magneto-Transport of Kagome Metals

7:00 – **No Host Workshop Dinner (Rustico TBD)**

Friday, August 2, 2024

8:00-8:30 **Breakfast at TSRC meeting site.**

8:30-10:00

**Multiferroics I** (Chair: Andy Christianson)

8:30-9:00 **H. Cao:** Topology and Magnetism in an Altermagnetic Candidate

9:00-9:30 **C. de la Cruz:** Toroidal transitions and chirality of Dzyaloshinskii-Moriya (DM) interactions

**9:30-10:00 W. Hu:** Ultrafast simultaneous manipulation of multiple ferroic orders through nonlinear phonon excitation

**10:00-10:30 Coffee Break**

**10:30-11:30**

**Multiferroics II** (Chair: John Mitchell)

**10:30-11:00 A. Bhattacharya:** Superconductivity at  $\text{KTaO}_3$  interfaces

**11:00-11:30 M. Norman:** Spintronic THz emission as a probe of quantum paraelectric interfaces

**11:30-11:45 Workshop Wrap-Up**

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**Workshop Organizers**

Andy Christianson, 865-742-1539

Clarina dela Cruz, 832 526 9230

John Mitchell, 312-545-6115

Mike Norman, 630-991-1570

**TSRC Host**

Mark Kozak, 970-708-4426