

**Telluride science workshop: Enhanced functionalities in 5d transition metal compounds from large spin-orbit coupling
July 15-19, 2013. Telluride Intermediate School at 725 W. Colorado Ave.**

Organizers: Sang-Wook Cheong, David Vanderbilt, and Jan Musfeldt

TSRC Hosts: Exec Director Nana Naisbitt 970-708-0004 and Asst Director Rory Sullivan 970-708-4542

Time	Sunday July 14: Registration-Welcome Reception
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6:00-9:00PM Sunday Night TSRC Welcome Reception for all scientists, New Sheridan Bar, 231 W Colorado Ave, in Telluride. Cash bar, free pool, no food.

Time	Monday July 15: Chalcogenides
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8:00-8:30 Breakfast at TSRC for participants
8:30-8:45 Welcome and announcements
8:45-9:15 Field effect control of superconductivity and spin-orbit interaction in transition metal chalcogenides - Yoshi Iwasa (Tokyo)
9:15-9:45 Inorganic nanotubes and fullerene-like structures: new developments - Reshef Tenne (Weizmann)
9:45-10:15 Tellurides in Telluride - Sang Cheong (Rutgers)
10:30-11:00 **Break**
11:00-11:30 Exotic ordering behaviors in IrTe₂ - Jae Hoon Park (POSTEC)
11:30-12:00 X-ray studies of pure and Pd-doped IrTe₂ - Valery Kiryukhin (Rutgers)

6:00-9:00PM TSRC picnic at Ah Haa - 300 S. Townsend St

Tuesday July 16: Spin-orbit coupling trends in chalcogenides, oxides

8:00-8:30 Breakfast at TSRC for participants
8:30-9:00 5d transition metal oxides and chalcogenides - exotic magnetism, superconductivity and spin-orbit coupling - Hide Takagi (Tokyo)
9:00-9:30 Spin-orbit: Its role on physical properties of 3d sulphides and 3d-5d oxides - Tanusri Saha-Dasgupta (Calcutta)
9:30-10:00 Tunable sub-THz ESR spectroscopy of complex transition metal oxides - Bernd Buechner (Dresden)
10:00-10:30 Field and pressure-tunable spin/orbital order in the spinels MnR₂O₄ (R=Mn,V) - Lance Cooper (Illinois)
10:30-11:00 **Break**
11:00-11:30 Magnetism in double perovskites containing 5d transition metal ions - Pat Woodward (Ohio State)
11:30-12:00 Noncentrosymmetry in rare-earth doped Ruddlesden-Popper titanates - Venkat Gopalan (Penn State)
12:00-12:30 Effects of strong correlations and spin orbit couplings from the Dynamical Mean Field perspective - Kristjan Haule (Rutgers)

6:00-7:15PM TSRC Town talks at the Sheridan Opera House - 110 North Oak St

7:30-9:00PM Joint Discussion Session -Telluride Intermediate School (725 W Colorado) - George Jeckeli and Sang Cheong

Wednesday July 17: Multiferroics

8:00-8:30 Breakfast at TSRC for participants
8:30-9:00 Skyrmion dynamics in chiral magnets - Maxim Mostovoy (Gronigen)
9:00-9:30 Magnetic skyrmions in ultrathin metallic films - Stephan Blugel (Juelich)
9:30-10:00 The crucial role of the magnetocrystalline anisotropy in the complex multiferroic properties of MnWO₄ - Bernd Lorenz (Houston)
10:00-10:30 Magnetic and multiferroic properties of Sr₃NiIrO₆ and family members - Vivien Zapf (Los Alamos)
10:30-11:00 **Break**
11:00-11:30 Spin-density-wave order and slow dynamics in Ca₃Co₂O₆ - Cristian Batista (Los Alamos)
11:30-12:00 STM techniques - Kyle McElroy (Colorado)

Thursday July 18: Iridates, Topological systems

8:00-8:30 Breakfast at TSRC for participants
8:30-9:00 Spin-orbit tuned ground state in single-crystal iridates - Gang Cao (Kentucky)
9:00-9:30 J = 1/2 physics of Ir-oxides: topological phase transition and effective magnetic interactions - Jaejun Yu (Seoul National)
9:30-10:00 Electronic structure of the doped J=1/2 Mott insulator - Dan Dessau (Colorado)
10:00-10:30 Crystals fields, spin-orbit coupling and electronic excitations: Inelastic x-ray scattering of iridates - John Hill (Brookhaven)
10:30-11:00 **Break**
11:00-11:30 Engineering topological phases in digital transition metal oxide heterostructures - Di Xiao (Carnegie Mellon)
11:30-12:00 Thin film engineering for topological insulators - Sean Oh (Rutgers)
12:00-12:30 Quantum anomalous Hall states on decorated magnetic surfaces - David Vanderbilt (Rutgers)

5:30 PM Group dinner at the Chop House, Telluride

Friday July 19: Phase diagrams, domain structure in rare earth manganites

8:00-8:30 Breakfast at TSRC for participants
8:30-9:00 The phase diagrams of the hexagonal manganites - Thomas Palstra (Gronigen)
9:00-9:30 AC conduction of ferroelectric domain walls using a microwave microscope - Eric Ma (Stanford)
9:30-10:00 Spectroscopic signatures of domain walls in multiferroic ErMnO₃ - Jan Musfeldt (Tennessee)
10:00-10:30 Wrap-up discussion - David Vanderbilt (Rutgers)
10:30-11:00 **Break**