APS March Meeting 2026 Denver, CO

Monday, March 16, 2026

9:24 — 9:36 a.m. Convention Center, Meeting Room 109/111

Ultraviolet Raman spectroscopy characterization of epitaxial (Ba,Sr)TiO3 films grown under adsorption-controlled conditions

Part of MAR-A22 Multiferroics, Magnetoelectrics, Spin-Electric Coupling, and Ferroelectrics I

Variable temperature ultraviolet Raman spectroscopy was applied to characterize (Ba,Sr)TiO3 films grown by molecular-beam epitaxy and pulsed-laser deposition under adsorption-controlled conditions at very high substrate temperatures (≥ 1400 °C). Bulk SrTiO3 has a cubic perovskite structure ...

Cosmin Fologea (presenter), Asher Hansen, Tristan Pinkerton, Brian Zuber, Dylan Sotir, Darrell Schlom, Varun Harbola, Jochen Mannhart, Dmitri Tenne—**External User, Thin Film Facility**

9:24 — 9:36 a.m. Convention Center, Meeting Room 207

Strain Dependence of the Electronic Structure and Ferromagnetic Transition in the Cubic Perovskite BaRuO3

Part of MAR-A27 4d/5d Transition Metal Systems I

... we employ epitaxial strain to study the evolution of the electronic and magnetic properties of 3C BaRuO3 under varying degrees of biaxial strain. Using ozone-assisted molecular-beam epitaxy (MBE) in an adsorption-controlled growth regime, we obtain the first fully commensurately strained 3C BaRuO3 thin films under strain states ranging from -1.2% to +0.4%. ...

Evan Krysko (presenter), Anna Park, Brendan Faeth, Bulat Burganov, Hanjong Paik, Paul Malinowski, Chad Mowers, Xiaoxi Huang, Dylan Sotir, Matthew Barone, Johannes Loock, Tyi Jones, Lawrence Qui, Kyle Shen, Darrell Schlom—**In-House Research**

10:12 — 10:24 a.m. Convention Center, Meeting Room 505

Disorder-broadened topological Hall phase and anomalous Hall scaling in FeGe

Part of MAR-A40 Chiral Spin Textures in 2D and van der Waals Materials

Magnetic skyrmions are topologically protected spin textures ... Here we systematically tune atomic-scale disorder in epitaxial B20 phase 80 nm using 400 keV Ne^{+} irradiation over fluences from 10^{11} to 10^{14} ions cm^{-2} and track the resulting evolution of topological and anomalous Hall responses. Increasing defect density broadens the topological Hall signal from a narrow window near 200 K in pristine films to persist down to 4 K in the most irradiated sample. ...

Chaman Gupta (presenter), Chris Matsumura, Hongbin Yang, Sarah Edwards, Rebeca Gurrola, Jiun-Haw Chu, Hanjong Paik, Yongqiang Wang, David Muller, Robert Streubel, Tzu-Ming Lu, **Serena Eley—External User, Thin Film Facility and Electron Microscopy**

10:24 — 10:36 a.m. Convention Center, Meeting Room 405

Three-Dimensional Chiral Relaxation in Atomically Bonded Oxide Moire Superlattices

Part of MAR-A35 Theory and Experiments in Moiré: Materials Beyond Graphene

Twisted oxides have emerged as a promising platform for strongly correlated states as well as multiferroic and magnetic orders... Here, we reveal three-dimensional chiral relaxation in a strongly bonded, twisted SrTiO3 (STO) moiré superlattice using correlative in-plane and cross-sectional electron ptychography. ...

Ang Tao (presenter), Xinyan Li, Ragib Shahriar, Zishen Tian, Xu Qi, Kaiwen Yang, Ramamoorthy Ramesh, Lane Martin, Hanyu Zhu, **Yimo Han—External User, Electron Microscopy**

12:24 — 12:36 p.m. Convention Center, Meeting Room 401/402

Oxygen tuning in bilayer nickelate thin films

Part of MAR-B32 Superconducting Nickelate Compounds I

Ambient-pressure superconductivity has recently been realized in bilayer nickelate thin films under epitaxial strain, ... we improved the film crystallinity and systematically varied the oxygen content through ozone and vacuum annealing. The results demonstrate that oxygen stoichiometry serves as a key tuning knob for uncovering the relationship between structure, doping, and superconductivity in bilayer nickelates.

Yidi Liu (presenter), Bai Yang Wang, Jiarui Li, Yaoju Tarn, Lopa Bhatt, Berit Goodge, David Muller, Zhixun Shen, **Harold Hwang**, Yijun Yu—**External User, Electron Microscopy**

1:24 — 1:36 p.m. Convention Center, Meeting Room 504

Control of out-of-plane anti-damping spin torque with a canted ferromagnetic spin source

Part of MAR-B39 Spin-Orbit Torque

High-density magnetic random-access memory must be based on magnetic materials with perpendicular magnetic anisotropy, to allow thermal stability and scalability. ... Here we demonstrate a canted magnetic anisotropy stabilized by magnetocrystalline anisotropy for ferromagnetic SrRuO3, and we measure that this canted SrRuO3 can generate an out-of-plane component of the anti-damping torque with efficiency of 0.020+/-0.002. We verify that this out-of-plane anti-damping torque is highly tunable with the orientation of magnetic moment, with significant contributions from both anomalous and planar Hall effects.

Xiaoxi Huang (presenter), Daniel Pharis, ... Chang-Beom Eom, Darrell Schlom, Lane Martin, Ding-Fu Shao, Daniel Ralph —**Local User, Thin Film Facility**

1:36 — 1:48 p.m. Convention Center, Meeting Room 401/402

ARPES on Coherently Strained Ruddelsden-Popper Nickelate Thin Films

Part of MAR-B32 Superconducting Nickelate Compounds I

Since the discovery of high-Tc superconductivity in the Ruddelsden-Popper (RP) Nickelates La3Ni2O7 and La4Ni3O10 under high hydrostatic pressure, there has been great interest in determining the mechanism for this superconductivity. A key difference with cuprate superconductivity is the presence of dz2 bands near the Fermi energy in addition to the dx2-y2 bands, so finding a way to explore these under pressure is critical. It has been shown that the effects of high hydrostatic pressure can be mimicked by in-plane strain, which can be accomplished via epitaxial thin-film growth on various substrates. Here we report ARPES measurements collected on a series of substrate-strained RP nickelate thin films under both

tensile and compressive strain. Quantitative changes are observed in several bands near the Fermi level.
Alexander Ball (presenter), Robert Smith, Aksaj Bharatwaj, Abigail Jiang, Maria Bambrick-Santoyo, Dan Ferenc Segedin, Aaron Bostwick, Christopher Jozwiak, **Julia Mundy**, Daniel Dessau—**External User, Thin Film Facility**

2:00 — 2:12 p.m. Convention Center, Meeting Room 109/111
Temperature tunable electro-optic response in strained KNbO3 thin films
Part of MAR-B22 Multiferroics: Domain Dynamics and Strain Engineering in Thin Films
... Following successful growth of epitaxially strained KNbO3 films via suboxide MBE, we demonstrate strong coupling between strain and ferroelectric structure, owing to a large electrostriction coefficient in KNbO3. ...
Sankalpa Hazra (presenter), Aiden Ross, Albert Suceava, Tobias Schwaigert, Vladimir Stoica, Darrell Schlom, Long-Qing Chen, Venkatraman Gopalan—**External User, Thin Film Facility**

2:12 — 2:24 p.m. Convention Center, Meeting Room 109/111
Atomic-Scale Visualization of Epitaxial Antiferromagnetic Coupling by Multislice Electron Ptychography
Part of MAR-B22 Multiferroics: Domain Dynamics and Strain Engineering in Thin Films
Controlling the anisotropic magnetism in epitaxial antiferromagnets is crucial for developing energy-efficient spintronic thin-film devices ... Here, we elucidate the dual nature of epitaxial coupling in antiferromagnetic $LaFeO_3$/$BiFeO_3$/$LaFeO_3$ heterostructures by employing multislice electron ptychography (MEP). ...
Xinyan Li (presenter), Sergei Prokhorenko, Maya Ramesh, Darrell Schlom, Laurent Bellaiche, **Yimo Han**, Ramamoorthy Ramesh—**External User, Electron Microscopy**

3:54 — 4:06 p.m. Convention Center, Meeting Room 203
Robust Superconductivity Beyond the Pauli Limit at KTaO3 Interfaces
Part of MAR-C25 Thin Film Epitaxy and Heterostructure Engineering
The nature of superconductivity and its interaction with the strong spin–orbit coupling at KTaO3 interfaces remains a topic of debate. To explore this relationship we synthesized high-quality epitaxial $LaMnO_3$/$KTaO_3$(111) and $LaMnO_3$/$KTaO_3$(110) heterostructures using molecular beam epitaxy. Our results reveal that superconductivity in these systems is remarkably robust against in-plane magnetic fields, with the critical field reaching up to 25 T in optimally doped samples. ...
Samuel Poage (presenter), Xueshi Gao, Merve Baski, Athby Al-Tawhid, Jordan McCourt, Ethan Arnault, Gleb Finkelstein, Salva Salmani-Rezaie, David Muller, Divine Kumah, Chun Ning Lau, Jose Lorenzana, Maria Gastiasoro, **Kaveh Ahadi**—**External User, Thin Film Facility and Electron Microscopy**

4:06 — 4:18 p.m. Convention Center, Meeting Room 201
Layer-Resolved Picometer-Scale Lattice Reconstruction in Large Angle Twisted WSe2
Part of MAR-C24 2D Materials: Transition Metals Dichalcogenides
Large-angle twisted moiré materials—including moiré crystals, quasicrystals, and supermoiré lattices—offer a versatile platform for realizing correlated states and topological phases. ... In this

work, using super-resolution, layer-resolved electron ptychography1,2 , we directly observe picometer-scale lattice reconstruction in large-angle twisted WSe2. ...
Yimo Han (presenter), Chuqiao Shi, Yanxing Li, Yi Jiang, Giovanny Espitia, Yiyuan Luo, Xu Qi, Xiaohui Liu, Xiaoqin Elaine Li, Mit Naik, Chih-Kang Shih—**External User, Electron Microscopy**

Tuesday, March 17, 2026

8:12 — 8:24 a.m. Convention Center, Meeting Room 203

Large local spin-sublattice locking in an iron-based superconductor

Part of MAR-F25 Fe-Based Superconductors: New Tuning Knobs I

We present spin-resolved angle-resolved photoemission (SR-ARPES) measurements of the Fe-based superconductor FeSe, a material which has a crystal structure and electronic ground state which preserve both time reversal and spatial inversion symmetry. ...
Paul Malinowski (presenter), Tyler Wu, Chad Mowers, Brendan Faeth, Tomas Arias, Kyle Shen—**In-House Research**

1:00 — 1:12 p.m. Convention Center, Meeting Room 707/709

Integration of Bulk and Thin Film Growth Techniques for Novel Quantum Material Synthesis

Part of MAR-G52 Advances in Quantum Materials Synthesis

The recent remarkable advancement of computational algorithms to predict novel quantum ... we propose a new, easy-to-implement synthesis approach which combines the conventional bulk and thin film growth techniques in a unique way. This approach enables controlled (de-)intercalation of ions within an epitaxial framework akin to soft chemistry methods but at much elevated temperatures, thus establishing an unusual energetic landscape conducive to single-crystal stabilization of novel materials. ...
Kyuho Lee (presenter), Berit Goodge, Maximilien Debbas, Joseph Checkelsky—**External User, Electron Microscopy**

1:24 — 1:36 p.m. Convention Center, Meeting Room 302

Landau-Zener interaction enhanced quantum sensitivity in spin defects of hexagonal boron nitride

Part of MAR-G29 Quantum Optics in Solid-State Platforms

Negatively charged boron vacancy (VB–) in hexagonal boron nitride (hBN) offer promise in quantum sensing as they are optically addressable at room temperature and can be transferred on 2D materials. However, their broad hyperfine-split spin transitions pose challenges for sensitivity to fluctuating magnetic fields with conventional resonant excitation. While isotopically enriched h10B15N exhibits sharper spectral features due to reduced hyperfine splitting, significant broadening remains...
Mohammad Abdullah Sadi (presenter), Tiamike Dudley, Luca Basso, Thomas Poirier, James Edgar, Jacob Henshaw, Yong Chen, Andrew Mounce—**External User, Bulk Crystal Growth**

4:42 — 4:54 p.m. Convention Center, Meeting Room 405

New exciton resonances in a semiconductor monolayer induced by remote moire potential

Part of MAR-J35 Recent Developments in Moiré Systems: MoTe2 and Others

When two atomically thin van der Waals layers are stacked, a two-dimensional moire superlattice emerges. While many experiments have reported new optical resonances in transition metal dichalcogenide (TMD) moire superlattices, the microscopic nature of these many-body excited states remains elusive. ...

Dong Seob Kim, Jiwoong Kim (presenter), Rwik Dutta, Giovanny Espitia, Kaiwen Yang, Fuxiang Chen, Subin Lee, Fan Zhang, Yanxing Li, Kenji Watanabe, Takashi Taniguchi, Chih-Kang Shih, **Yimo Han**, Mit Naik, Xiaoqin Elaine Li—**External User, Electron Microscopy**

4:54 — 5:06 p.m. Convention Center, Meeting Room 503

Optical Studies of RuO2 Thin Films

Part of MAR-J38 Altermagnetism V: Mostly Ruthenium Oxide

Rutile RuO2 was proposed as a textbook room temperature d-wave altermagnet because of its predicted large non-relativistic spin splitting. However, recent results on bulk crystals and epitaxial thin films suggest that bulk RuO2 doesn't magnetically order. Instead, it's proposed that thin films may magnetically order under the right strain and chemical potential. Here, I'll present our optical magnetic circular dichroism and second harmonic generation ...

Benjamin Mead (presenter), Luka Mitrovic, Kyle Shen, Darrell Schlom, Liang Wu—**In-House Research**

4:54 — 5:06 p.m. Convention Center, Meeting Room 401/402

The superconducting diode effect in Josephson junctions fabricated from structurally chiral Mo3Al2C

Part of MAR-J32 Superconducting Diode Effect

... Here, we report the electrical transport properties of right-handed/left-handed and right-handed/right-handed devices fabricated from single crystals of the structurally chiral superconductor Mo3Al2C. ...

Peter Orban (presenter), Gregory Bassen, Evan Crites, Maxime Siegler, Tyrel McQueen—**In-House Research**

5:18 — 5:30 p.m. Convention Center, Meeting Room 106

Fröhlich-Type Polarons in isotopically enriched Hexagonal Boron Nitride

Part of MAR-J19 2D materials: Optoelectronics

Exciton–phonon coupling governs the optical response of hexagonal boron nitride (hBN), yet direct experimental quantification has been lacking. Here we investigate isotopically enriched hBN (10B) using low temperature cathodoluminescence, focusing on the indirect exciton at 5.955 eV and its longitudinal optical phonon replica detuned by approximately 178 meV. ...

Ioannis Chatzakis (presenter), Timur Abdilov, Elliot Walker, Jaime Freitas, James Edgar, Song Liu—**External User, Bulk Crystal Growth**

Wednesday, March 18, 2026

8:00 — 8:36 a.m. Convention Center, Meeting Room 205

Emergent superconductivity and non-reciprocal transport at the interface of the Dirac semimetal (ZrTe2) and an antiferromagnet (FeTe)

Part of MAR-L26 Topological Transport and Magnetism in Thin Films and Heterostructures

Superconductivity (SC) in Dirac semimetals (DSM) has attracted significant interest in recent years because of several exciting theoretical predictions, including topological superconductivity, Majorana modes, unconventional pairing, and monopole superconductivity. ... Here we report the realization of a wafer-scale, van der Waals DSM/antiferromagnet heterostructure (ZrTe2/FeTe) that can serve as an influential platform for pursuing exotic SC states in bulk Dirac bands. ...

Saurav Islam (presenter), Max Stanley, Anthony Richardella, SEUNGJUN LEE, Kalana Halanayake, Sandra Santhosh, **Danielle Hickey**, Tony Low, Nitin Samarth—**External User, Electron Microscopy**

8:12 — 8:24 a.m. Convention Center, Meeting Room 401/402

Resolving the atomic structure of a new variant of bilayer nickelates with electron ptychography

Part of MAR-L32 Superconducting Nickelate Compounds II

... Here, we report the formation of La3Ni2(O, F)9 (329), a new variant of the 327 phase, and its structure determination by real-space imaging. Leveraging the depth resolution of multislice electron ptychography (MEP), we probe the intrinsic structure by differentiating the surface from bulk structure variations. ...

Hongbin Yang (presenter), Yi Wu, Kyle Shen, David Muller—**In-House Research**

8:48 — 9:00 a.m. Convention Center, Meeting Room 401/402

Unconventional Superconductivity in Infinite-Layer Nickelates Probed by Controlled Introduction of Disorder

Part of MAR-L32 Superconducting Nickelate Compounds II

The discovery of superconductivity in thin films of hole-doped infinite-layer (Nd,Sr)NiO2 marked a significant step in the avenue of superconducting oxides, offering a novel platform for investigating the mechanisms of high-temperature superconductivity and sparking widespread scientific interest. ... we employ high-energy electron irradiation to controllably introduce disorder in superconducting infinite-layer nickelates thin-films and examine the effect of pair-breaking defects on superconductivity to elucidate the nature of the superconducting gap. ...

Abhishek Ranna (presenter), Romain Grasset, Martin Gonzalez, Dongxin Zhang, Wenjie Sun, Kyuho Lee, Bai Yang Wang, Edgar Abarca Morales, Florian Theuss, Zuzanna Filipiak, Michal Moravec, Marcin Konczykowski, Manuel Bibes, Yuefeng Nie, Lucía Iglesias, **Harold Hwang**, Andrew Mackenzie, Berit Goodge—**External User Collaboration, Electron Microscopy**

12:00 — 12:36 p.m. Convention Center, Meeting Room 109/111

Uncovering the nature of superconductivity in the geometrically frustrated LiTi2O4

Part of MAR-M22 Multiferroics: Optical, Transport, and Nonreciprocal Phenomena

Geometrically frustrated lattices can display a range of correlated phenomena, ranging from spin frustration and charge order to dispersionless flat bands due to quantum interference. ... Here, we present a multimodal investigation of LiTi2O4, combining ARPES, RIXS, proximate magnetic

probes, and ab-initio many-body theoretical calculations. Our data reveals a novel mobile polaronic ground state with spectroscopic signatures that underlie co-dominant electron-phonon coupling and electron-electron correlations also found in the lightly doped cuprates. ...
Julia Mundy (presenter) —**External User, Thin Film Facility**

1:36 — 1:48 p.m. Convention Center, Meeting Room 201
Tuning Magnetic Ground States through Cation Order in FeReO4
Part of MAR-M24 New Development in Growth of Two-Dimensional Quantum Materials
Magnetism in rutile oxides has recently received strong attention due to their predisposition to host altermagnetism. ... demonstrate the novel synthesis of epitaxial, stoichiometric, single-phase thin films of FeReO4 on TiO2 by MBE, which has hitherto only been synthesized in bulk. Furthermore we report ferromagnetism with a Tc near room-temperature. ...
Luka Mitrovic (presenter), Yorick Birkholzer, Darrell Schlom—**In-House Research**

2:48 — 3:00 p.m. Convention Center, Mile High Ballroom 4D
Reinforcement Learning for Hardware-Aware Reconfigurable Atom Array Compilation
Part of MAR-M16 Hardware and Software Accelerated Quantum Simulation and Compilation
Circuit compilation for reconfigurable neutral-atom arrays (RAA) is challenging due to hardware constraints on the movement of acousto-optic deflectors (AODs) during qubit transport. ... We introduce a reinforcement learning (RL)-based compiler that jointly optimizes placement and routing by learning AOD movement policies directly from hardware constraints. ...
Hyejin Kim (presenter), Yichen Xu, Jin Zhou, Kilian Weinberger, Eun-Ah Kim—**In-House Research**

5:06 — 5:18 p.m. Hyatt Regency,Capitol 1
Quantum sensing using heavy-fermion CeCoIn5 thin films
Part of APR-S80 Missions, Instruments, and Surveys
The development of superconducting single-photon detectors has been driven by the search for materials combining large kinetic inductance with scalable device architectures. Here, we demonstrate a new platform for Microwave Kinetic Inductance Detectors (MKIDs) based on molecular beam epitaxy (MBE)-grown heavy-fermion thin films of CeCoIn5. ...
Pedro Vianez (presenter), Sanu Mishra, Caleb Fink, Jinkyoung Yoo, Yi Wu, Kyle Shen, Sean Thomas, Filip Ronning—**External User, Thin Film Facility**

Thursday, March 19, 2026

8:36 — 8:48 a.m. Convention Center, Meeting Room 503
Spin Hall Angle and Spin Diffusion Length of SrIrO3 via Hanle magnetoresistance
Part of MAR-S38 Novel Materials for Spintronics and Magnetic Dynamics
... The Hanle magnetoresistance provides a way of quantifying θ and λ without the need for neighboring magnetic materials or control over interfacial exchange. We apply this technique to thin films of SrIrO3 with varying thickness (10-30nm) on SrTiO3 substrates. ...
Gage Eichman (presenter), Renjie Luo, Tanner Legvold, Maya Ramesh, Surya Panda, Richa Mudgal, Darrell Schlom, Ramamoorthy Ramesh, Douglas Natelson—**In-House Research, Thin Film Facility**

10:00 a.m. Convention Center, Exhibit Hall D, E & F, Level 2

Creating, Engineering, and Probing 2D Electronic States in Complex Oxides

Part of MAR-T00-03 Poster Session III: Material Physics (10:00AM-1:00PM MT)

... Here we study the synthesis of cubic perovskite KTaO3 and fractionally occupied double perovskite EuTa2O6 via molecular-beam epitaxy, and the control of their 2D electronic states via epitaxial effects such as strain. We also discuss the 2D superconductivity of KTaO3 interfaces and their response to an applied magnetic field in novel superconducting devices, including superconducting field effect transistors.

Eric Biedke (presenter), Younes Ghorbani, Samuel Poage, Kaveh Ahadi—**External User, Thin Film Facility**

10:00 a.m. Convention Center, Exhibit Hall D, E & F, Level 2

Spin dynamics of strongly-interacting, two-dimensional ensembles of VB- defects in hexagonal Boron Nitride

Part of MAR-T00-05 Poster Session III: Quantum Information, Concepts, and Computation (10:00AM-1:00PM MT)

... Here, we investigate the many-body dynamics of ensembles of negatively-charged boron vacancy (VB-) defects in few-layer hBN flakes, where the flake thickness is smaller than the average inter-defect spacing. In this regime, we demonstrate that the emergent spin dynamics are governed by the native dipolar interactions between the VB- defects. ...

Sangha Kim (presenter), Wonjae Lee, Zhelun Zhang, Jonathan Hallén, Vincent Liu, Ruotian Gong, Thomas Poirier, James Edgar, Chong Zu, Norman Yao—**External User, Bulk Crystal Growth**

12:00 — 12:36 p.m. Convention Center, Four Seasons Ballroom 1

Superconductivity in moiré WSe_2

Part of MAR-U04 Superconductivity and Correlation Physics in Transition Metal Dichalcogenides Superlattices

... Twisted WSe_2 ($tWSe_2$) has recently emerged as a new venue for band engineering in moiré semiconductors, where multiple control knobs—including twist angle, carrier density, displacement field, and magnetic field—enable precise manipulation of electronic correlations. This tunability has led to the first observation of superconductivity in a moiré semiconductor. ...

Zhongdong Han (presenter), Yiyu Xia, Yichi Zhang, Jiacheng Zhu, Patrick Knüppel, Kenji Watanabi, Takashi Taniguchi, Jie Shan, Kin Fai Mak—**In-House Research**

12:36 — 12:48 p.m. Convention Center, Meeting Room 110

Controlling the p-type conductivity of α-SnO thin films by potassium doping

Part of MAR-U23 Defects and Dopants in Emerging Oxides

Development of a high-performance, p-type oxide channel is crucial to realize all-oxide complementary metal–oxide semiconductor technology that is amenable to 3D integration. Among p-type oxides, α-SnO is one of the most promising ... Here, we synthesize epitaxial K-doped α-SnO thin films with controlled doping concentrations using suboxide molecular-beam epitaxy. ...

Anna Park (presenter), Sieun Chae, Seungmin Lee, M.K. Indika Senevirathna, Yufan Feng, Venkanna Kanneboina, Viet-Anh Ha, Chaojie Du, Matthew Barone, Vladmir Protasenko, Evan Li,

Nikolas Podraza, Kedar Johnson, Debdeep Jena, Huili Xing, Xiaoqing Pan, Feliciano Giustino, Michael Williams, Darrell Schlom—**In-House Research**

12:48 — 1:00 p.m. Convention Center, Meeting Room 403

Spectroscopic investigation of frustrated ground states in mixed-valence spinel oxides

Part of MAR-U33 Unconventional Superconductors Above Tc - Spectroscopy and Transport

... The interplay of the geometric and charge degrees of freedom have led to non-trivial ground states like unconventional superconductivity in LiTi2O4 and unusual *d*-electron heavy fermion behavior in LiV2O4. ...

Zubia Hasan (presenter), Grace Pan, Harrison LaBollita, Antia Botana, Brendan Faeth, Alberto de la Torre Durran, Julia Mundy—**External User, Thin Film Facility**

1:00 — 1:12 p.m. Convention Center, Mile High Ballroom 4AB

Sub-Ångstrom imaging and 3D characterization of interface dislocations in epitaxial superconducting nitride films on sapphire using multislice electron ptychography

Part of MAR-U14 Superconducting Materials: Metal Nitrides and Interface Studies

... With the development of aberration-corrected scanning transmission electron microscopy (STEM), we can routinely resolve projected atomic structure of materials with sub-Ångstrom precision. Even higher spatial resolution while reliably resolving light elements such as oxygen and nitrogen, not just in projection, but in 3 dimensions, is now possible using multislice electron ptychography (MEP) [3]. ...

Eegene Chung (presenter), Anand Ithepalli, Naomi Pieczulewski, Steven Zeltmann, Chia-Hao Lee, Keun-yeol Park, Celesta Chang, Debdeep Jena, David Muller—**In-House Research**

Friday, March 20, 2026

8:24 — 8:36 a.m. Convention Center, Meeting Room 407

Long-distance remote epitaxy

Part of MAR-Y37 Thin Films and Reaction Kinetics II

... Here we show that it is possible to achieve remote epitaxy when the epilayer–substrate distance is as large as 2–7 nm. We experimentally demonstrate long-distance remote epitaxy of CsPbBr3 film on an NaCl substrate, KCl film on a KCl substrate and ZnO microrods on GaN, ...

Jian Shi (presenter)—**External User, Thin Film and Bulk Crystal Growth**

10:48 — 11:00 a.m. Convention Center, Meeting Room 109/111

A Multipolar Approach to Understanding Sliding Ferroelectricity

Part of MAR-Y22 Multiferroics, Magnetoelectrics, Spin-Electric Coupling, and Ferroelectrics II

Despite studies which separately address the symmetry changes and the local electron density distortions that accompany the sliding ferroelectric transition, theoretical approaches toward understanding what drives the transition have yet to fully unite these two pictures. Here, we develop an approach for doing so by relating distortions of the electron density to symmetry-adapted combinations of local basis functions. ...

Matthew Dykes (presenter), Craig Fennie—**In-House Research**

12:00 — 12:36 p.m. Convention Center, Four Seasons Ballroom 1

Structural Basis for Superconductivity in Strain-Engineered Bilayer Nickelate Thin Films

Part of MAR-Z04 Fermiology and Cooper-pairing in Bilayer Nickelates: From Bulk to Strained Thin Films

Multislice electron ptychography (MEP) to quantitatively investigate a full series of epitaxial thin films spanning compressive to tensile strain. We track the strain-dependent evolution of key structural parameters such as Ni-O bond lengths, bond angles, and octahedra. ...

Berit Goodge (presenter)—**External User Collaboration, Electron Microscopy**