Stanford



Harold Hwang

Director, Stanford Institute for Materials and Energy Sciences (SIMES), Shadi and Omid Farokhzad Professor in the School of Humanities and Sciences, Professor of Photon Science and Senior Fellow at the Precourt Institute for Energy

Applied Physics

Bio

BIO

Harold Y. Hwang is the Shadi and Omid Farokhzad Professor in the School of Humanities and Sciences, of Applied Physics (Stanford University), of Photon Science (SLAC National Accelerator Laboratory), Senior Fellow of the Precourt Institute for Energy, and Director of the Stanford Institute for Materials and Energy Sciences. He received a BS in Physics, BS and MS in Electrical Engineering from MIT (1993), and a PhD in Physics from Princeton University (1997). He was formerly a Member of Technical Staff at Bell Laboratories (1996-2003) and on the faculty at the University of Tokyo (2003-2010). His research is in condensed matter and materials physics, with a focus on correlated electrons and emergent phenomena in quantum materials, and heterostructures for energy applications and devices.

ACADEMIC APPOINTMENTS

- Professor, Applied Physics
- Professor, Photon Science Directorate
- Senior Fellow, Precourt Institute for Energy
- Director, Stanford Institute for Materials and Energy Sciences

HONORS AND AWARDS

- Member, National Academy of Sciences (2024)
- Fellow, American Academy of Arts and Sciences (2024)
- James C. McGroddy Prize, American Physical Society (2024)
- Europhysics Prize, European Physical Society (2014)
- Ho-Am Prize in Science, Ho-Am Foundation (2013)
- Fellow, American Physical Society (2011)
- Japan Science Prize, IBM (2008)
- Outstanding Young Investigator Award, Materials Research Society (2005)

PROFESSIONAL EDUCATION

- PhD, Princeton University , Physics (1997)
- BS,MS, Massachusetts Institute of Technology , Electrical Engineering (1993)
- BS, Massachusetts Institute of Technology , Physics (1993)

Teaching

COURSES

2026-27

- Solid State Physics II: APPPHYS 273 (Win)

2025-26

- Solid State Physics II: APPPHYS 273 (Aut)

2024-25

- Solid State Physics II: APPPHYS 273 (Aut)

2023-24

- Solid State Physics II: APPPHYS 273 (Aut)

STANFORD ADVISEES

Doctoral Dissertation Reader (AC)

Emma Cuddy, Aviv Simchony

Postdoctoral Faculty Sponsor

Zhongxun Guo, Yu Han, Jiarui Li, Jiayue Wang, Chenhang Xu

Doctoral Dissertation Advisor (AC)

Ella Blake, Kevin Crust, Martin Gonzalez, Levi Hoogendoorn, Aarushi Khandelwal, Yonghun Lee, Yidi Liu, Joonseo Song, Yaoju Tarn, Ashley Thorshov, Xin Wei, Blake Wendland

Doctoral Dissertation Co-Advisor (AC)

Anne Ruperto

Doctoral (Program)

Henry Bell, Omer Hazon, Patrick Liu, Yannick Pleimling, Liam Storan, Emily Thierstein, Alexander Won, Ocean Zhou

Postdoctoral Research Mentor

Paulina Majchrzak

Publications

PUBLICATIONS

- **Discovering Underpotentially Deposited Crystalline Sodium Metal Nanoparticles on the Surface of Hard Carbon Anodes.** *Journal of the American Chemical Society*
  Liu, Z., Serrao, C., Li, J., Cooney, I., Pintilie, G., Lee, J. H., Lee, J. K., Shuchi, S. B., Sarkar, P., Li, Y., Xu, X., Cui, Y., Yuan, et al
  2026; 148 (44): 47856-47866
- **Ultrathin SrTiO₃ Capping Stabilizes the Surface Chemistry of Brownmillerite Ferrites during Reduction** *NANO LETTERS*
  Wang, J., Khandelwal, A., Gonzalez, M., Liu, Y., Waluyo, I., Hunt, A., Hwang, H. Y.
  2026
- **Bend contour electron tomography (BCET): Quantitative strain and topography mapping** *PHYSICAL REVIEW MATERIALS*
  Bell, H. G., Xu, C., McCray, A., Han, M., Zhuang, Y., Hwang, H. Y., Ophus, C., Zong, A.
  2026; 10 (11)
- **Discovering Underpotentially Deposited Crystalline Sodium Metal Nanoparticles on the Surface of Hard Carbon Anodes** *JOURNAL OF THE AMERICAN CHEMICAL SOCIETY*

Liu, Z., Serrao, C., Li, J., Cooney, I., Pintilie, G., Lee, J., Lee, J. K. J., Shuchi, S., Sarkar, P., Li, Y., Xu, X., Yuan, X., Zheng, et al
2026

- **Selective Strain Tuning of Nonequilibrium Multiferroic Dynamics in BiFeO3** *PHYSICAL REVIEW LETTERS*
  Xu, C., Liu, P., Zhang, B., Han, M., Bell, H. G., Duncan, C. J. R., Liu, Y., Kramer, P. L., Lemons, R., Koralek, J. D., Reid, A. H., Qian, D., Hwang, et al
  2026; 137 (17)
- **Selective Strain Tuning of Nonequilibrium Multiferroic Dynamics in BiFeO_{3}.** *Physical review letters*
  Xu, C., Liu, P., Zhang, B., Han, M., Bell, H. G., Duncan, C. J., Liu, Y., Kramer, P. L., Lemons, R., Koralek, J. D., Reid, A. H., Qian, D., Hwang, et al
  2026; 137 (17): 176901
- **Nearly isotropic magnon transport in epitaxial lithium aluminum ferrite thin films** *APPLIED PHYSICS LETTERS*
  Li, Y., Mikhailova, K., Takana, L., O'Mahoney, D., Alaei, S. P., Qu, G., Petruzzi, D., Crossley, S., Hwang, H. Y., Fisher, I. R., Yu, C. C., Suzuki, Y.
  2026; 129 (14)
- **Superconducting Weak Links at Substrate Steps in Bilayer Nickelate Films.** *Nano letters*
  Liu, Y., Tarn, Y., Bhatt, L., Zhang, P., Song, J., Goodge, B. H., Muller, D. A., Hwang, H. Y., Yu, Y.
  2026; 26 (37): 12409-12416
- **Superconducting Weak Links at Substrate Steps in Bilayer Nickelate Films** *NANO LETTERS*
  Liu, Y., Tarn, Y., Bhatt, L., Zhang, P., Song, J., Goodge, B. H., Muller, D. A., Hwang, H. Y., Yu, Y.
  2026
- **Electronic Structure of Compressively Strained Bilayer Nickelate Thin Film** *PHYSICAL REVIEW X*
  Wang, B., Abadi, S. N., Liu, Y., Zhang, Y., Zhong, Y., Yu, Y., Goodge, B. H., Zhang, X., Wu, Y., Wang, R., Li, J., Tarn, Y., Ko, et al
  2026; 16 (3)
- **Pressure-Induced Metal-like Transport and Magnetoresistance in a Au2+-Au3+ Halide Perovskite.** *ACS central science*
  Deschene, C. R., Eghdami, A., Yu, Y., Smith, A., Liu, Z., Marlton, F. P., Mao, W. L., Hwang, H. Y., Neaton, J. B., Karunadasa, H. I.
  2026; 12 (8): 1132-1145
- **Spin Stripes and Superconductivity in Bilayer Nickelates.** *Physical review letters*
  Wang, H. X., Oh, H., Helbig, T., Wang, B. Y., Li, J., Yu, Y., Hwang, H. Y., Jiang, H. C., Wu, Y. M., Raghu, S.
  2026; 137 (8): 086502
- **Spin Stripes and Superconductivity in Bilayer Nickelates** *PHYSICAL REVIEW LETTERS*
  Wang, H., Oh, H., Helbig, T., Wang, B., Li, J., Yu, Y., Hwang, H. Y., Jiang, H., Wu, Y., Raghu, S.
  2026; 137 (8)
- **Defect-Engineered Scaling of Lead-Free Ferroelectrics with Ultra-Low-Voltage Switching.** *Nano letters*
  Ghanbari, R., Wang, J., Kp, H., Shi, Z., Khandelwal, A., Koons, K., Rodrigues, E., Zhou, T., Holt, M., Muller, D. A., Hwang, H. Y., Xu, R.
  2026
- **Universal four-fold symmetry in infinite-layer nickelates** *COMMUNICATIONS MATERIALS*
  Matzliach, A., Wallerstein, I. S., Mairovich, Y., Dakua, H. R., Luger, R., Gonzalez, M., Hwang, H. Y., Maniv, E., Grosfeld, E., Naamneh, M.
  2026; 7 (1)
- **Pressure-Induced Metal-like Transport and Magnetoresistance in a Au²⁺-Au³⁺ Halide Perovskite** *ACS CENTRAL SCIENCE*
  Deschene, C. R., Eghdami, A., Yu, Y., Smith, A., Liu, Z., Marlton, F. P., Mao, W. L., Hwang, H. Y., Neaton, J. B., Karunadasa, H. I.
  2026
- **Freestanding Ordered Intermetallic Nanomembranes Released from Etchable Oxide Templates.** *Journal of the American Chemical Society*
  Wang, J., Cui, Y., Blake, E., Li, J., Wei, X., Khandelwal, A., Hoogendoorn, L., Yu, Y., Theuss, F., Han, Y., Wang, T. C., Zhang, G., Wu, et al
  2026
- **Reconfigurable Strain Gradient Polarity in Crystalline Oxide Nanomembranes for Controlled Bending of Functional Materials** *ACS APPLIED NANO MATERIALS*
  Wang, T. C., Han, M., Harbola, V., Hwang, H. Y.
  2026

- **Structural modifications in strain-engineered bilayer nickelate thin films.** *Nature*
  Bhatt, L., Abarca Morales, E., Jiang, A. Y., Ko, E. K., Zhao, Y. F., Schnitzer, N., Pan, G. A., Ferenc Segedin, D., Liu, Y., Yu, Y., Brooks, C. M., Botana, A. S., Hwang, et al
  2026
- **Author Correction: Signatures of ambient pressure superconductivity in thin film La3Ni2O7.** *Nature*
  Ko, E. K., Yu, Y., Liu, Y., Bhatt, L., Li, J., Thampy, V., Kuo, C. T., Wang, B. Y., Lee, Y., Lee, K., Lee, J. S., Goodge, B. H., Muller, et al
  2026
- **Fermi-liquid transport beyond the upper critical field in superconducting La2PrNi2O7 thin films.** *Nature communications*
  Hsu, Y. T., Liu, Y., Kohama, Y., Kotte, T., Sharma, V., Tarn, Y., Wang, B. Y., Shen, Z. X., Yu, Y., Hwang, H. Y.
  2026
- **Mind the Gap-Imaging Buried Interfaces in Twisted Oxide Moirés.** *Advanced materials (Deerfield Beach, Fla.)*
  Kp, H., Wei, X., Lee, C. H., Yoon, D., Lee, Y., Crust, K. J., Shao, Y. T., Xu, R., Kang, J. H., Liang, C., Park, J., Hwang, H. Y., Muller, et al
  2026: e21189
- **Atomic-Scale Moiré and Electronic Structure Analysis of Twisted Epitaxial MoS2-Au-MoS2 Heterostructures.** *Nano letters*
  Cui, Y., Xu, K., Ren, P., Yuan, L., Czaja, P., Barnum, A., Sarkar, P., Altman, A., Bustillo, K., Kundu, S., Ramdas, A., Wang, X., Wan, et al
  2026
- **Reducing the Strain Required for Ambient-Pressure Superconductivity in Ruddlesden-Popper Bilayer Nickelates.** *Advanced materials (Deerfield Beach, Fla.)*
  Tarn, Y., Liu, Y., Theuss, F., Li, J., Wang, B. Y., Bhatt, L., Wang, J., Song, J., Thampy, V., Goodge, B. H., Muller, D. A., Shen, Z. X., Yu, et al
  2026: e20724
- **High spin, low spin, or gapped spins: Magnetism in the bilayer nickelates** *PHYSICAL REVIEW B*
  Oh, H., Wu, Y., May-Mann, J., Yu, Y., Hwang, H. Y., Zhang, Y., Raghu, S.
  2026; 113 (2)
- **Freestanding SrNbO₃ membranes as flexible transparent conductors** *APL MATERIALS*
  Ko, E., Wang, B., Lee, J., Wang, J., Crust, K. J., Hwang, H. Y.
  2026; 14 (1)
- **Evidence for nodal superconductivity in infinite-layer nickelates.** *Proceedings of the National Academy of Sciences of the United States of America*
  Harvey, S. P., Wang, B. Y., Fowlie, J., Osada, M., Lee, K., Lee, Y., Li, D., Hwang, H. Y.
  2025; 122 (48): e2427243122
- **Controllable dynamic magnetism in reconfigurable ferroelastic domain-wall networks engineered via nanocavities** *PHYSICAL REVIEW B*
  Lu, G., Rabkin, S., Liu, W., Li, S., Dong, G., Yoon, H., Hwang, H. Y., Kalisky, B., Salje, E. K. H.
  2025; 112 (24)
- **Coexisting Phases in NaNbO3Thin Films Influenced by Epitaxial Strain and Size Effects.** *Advanced science (Weinheim, Baden-Wurttemberg, Germany)*
  Khandelwal, A., Crust, K. J., Ghanbari, R., Yu, Y., Xu, R., Hwang, H. Y.
  2025: e10099
- **Author Correction: Superconductivity and normal-state transport in compressively strained La2PrNi2O7 thin films.** *Nature materials*
  Liu, Y., Ko, E. K., Tarn, Y., Bhatt, L., Li, J., Thampy, V., Goodge, B. H., Muller, D. A., Raghu, S., Yu, Y., Hwang, H. Y.
  2025
- **Effects of stoichiometry and epitaxial strain on the stabilization of infinite-layer nickelates** *APL MATERIALS*
  Lee, K., Goodge, B. H., Lee, Y., Kim, W., Osada, M., Wang, B., Wang, T. C., Hwang, H. Y.
  2025; 13 (10)
- **Disorder-Induced Suppression of Superconductivity in Infinite-Layer Nickelates.** *Physical review letters*
  Ranna, A., Grasset, R., Gonzalez, M., Lee, K., Wang, B. Y., Abarca Morales, E., Theuss, F., Filipiak, Z. H., Moravec, M., Konczykowski, M., Hwang, H. Y., Mackenzie, A. P., Goodge, et al
  2025; 135 (12): 126501

- **Disorder-Induced Suppression of Superconductivity in Infinite-Layer Nickelates** *PHYSICAL REVIEW LETTERS*
  Ranna, A., Grasset, R., Gonzalez, M., Lee, K., Wang, B., Morales, E., Theuss, F., Filipiak, Z. H., Moravec, M., Konczykowski, M., Hwang, H. Y., Mackenzie, A. P., Goodge, et al
  2025; 135 (12)
- **Superconductivity in compressed quasi-one-dimensional face-sharing hexagonal perovskite chalcogenides.** *Science advances*
  Ke, F., Niu, S., Feng, J., Yin, K., Han, M., Yang, H., Wang, B. Y., Celeste, A., Jia, C., Chen, B., Wang, L., Hwang, H. Y., Tian, et al
  2025; 11 (37): eadv1894
- **Spin-glass state in nickelate superconductors** *NPJ QUANTUM MATERIALS*
  Saykin, D. R., Gonzalez, M., Fowlie, J., Kivelson, S. A., Hwang, H. Y., Kapitulnik, A.
  2025; 10 (1)
- **Strain-induced lead-free morphotropic phase boundary.** *Nature communications*
  Ghanbari, R., Kp, H., Patel, K., Zhou, H., Zhou, T., Liu, R., Wu, L., Khandelwal, A., Crust, K. J., Hazra, S., Carroll, J., Meyers, C. J., Wang, et al
  2025; 16 (1): 7766
- **Dynamic Doping of Nickelates with Lithium Reveals a Widely Tunable Insulator-Metal Transition with Charge Filling and Band Renormalization Regimes.** *ACS nano*
  Zhang, A. C., Álvarez-Chico, A., Salagre, E., Gonzalez, M., Spataru, C. D., Sugar, J. D., Gross, A. L., González-Barrio, M. A., Segovia, P., Tallarida, M., Dai, J., Kumar, S., Talin, et al
  2025
- **Surface preparation method for investigating the three-dimensional electronic structure of perovskite nickelates** *PHYSICAL REVIEW B*
  Zhong, Y., Lee, K., Bhatta, R., Zhang, Y., Lee, Y., Gonzalez, M., Li, J., Wang, R., Hashimoto, M., Lu, D., Mo, S., Jia, C., Hwang, et al
  2025; 112 (3)
- **Orbital inversion and emergent lattice dynamics in infinite layer CaCoO_{<bold>2</bold>}** *NPJ QUANTUM MATERIALS*
  Jost, D., Lomeli, E. G., Kim, W., Been, E. M., Rossi, M., Agrestini, S., Zhou, K., Jia, C., Moritz, B., Shen, Z., Hwang, H. Y., Devereaux, T. P., Lee, et al
  2025; 10 (1)
- **Superconductivity and normal-state transport in compressively strained La2PrNi2O7 thin films.** *Nature materials*
  Liu, Y., Ko, E. K., Tarn, Y., Bhatt, L., Li, J., Thampy, V., Goodge, B. H., Muller, D. A., Raghu, S., Yu, Y., Hwang, H. Y.
  2025
- **The classical-to-quantum crossover in the strain-induced ferroelectric transition in SrTiO3 membranes.** *Nature communications*
  Li, J., Lee, Y., Choi, Y., Kim, J. W., Thompson, P., Crust, K. J., Xu, R., Hwang, H. Y., Ryan, P. J., Lee, W. S.
  2025; 16 (1): 4445
- **Compact in situ probe for magnetotransport measurements of 2D materials under variable tensile strain.** *The Review of scientific instruments*
  Wang, B. Y., Wei, X., Yu, Y., Simchony, A., Hwang, H. Y.
  2025; 96 (5)
- **Electron ptychography reveals a ferroelectricity dominated by anion displacements.** *Nature materials*
  Kp, H., Xu, R., Patel, K., Crust, K. J., Khandelwal, A., Zhang, C., Prosandeev, S., Zhou, H., Shao, Y. T., Bellaiche, L., Hwang, H. Y., Muller, D. A.
  2025
- **Deviation from Debye-Waller behavior in single crystalline freestanding NiO membranes studied via ultrafast electron diffraction** *PHYSICAL REVIEW APPLIED*
  Wisser, J. J., Reid, A., Harbola, V., Luo, D., Shen, X., Kramer, P. L., Lindgren, E. R., Xia, C., Hoffmann, M. C., Lindenberg, A. M., Hwang, H., Suzuki, Y.
  2025; 23 (3)
- **Observation of cupratelike nonlinear terahertz responses in superconducting infinite-layer nickelates via two-dimensional coherent spectroscopy** *PHYSICAL REVIEW B*
  Cheng, B., Cheng, D., Lee, K., Mootz, M., Huang, C., Luo, L., Chen, Z., Lee, Y., Wang, B., Perakis, I. E., Shen, Z., Hwang, H. Y., Wang, et al
  2025; 111 (1)
- **Freestanding infinite-layer nickelate super-conductors** *NATURE SYNTHESIS*
  Lee, Y., Hwang, H. Y.

2025

- **Fermi Level Equilibration and Charge Transfer at the Exsolved Metal-Oxide Interface.** *Journal of the American Chemical Society*
  Wang, J., Yang, J., Wardini, J. L., Waluyo, I., Hunt, A., Crumlin, E. J., Fairley, N., Bowman, W. J., Hwang, H. Y., Yildiz, B.
  2025
- **Molecular H2as the Reducing Agent in Low-Temperature Oxide Reduction Using Calcium Hydride.** *Journal of the American Chemical Society*
  Wang, J., Yu, Y., Abdelkawy, A., Li, J., Li, J., Yang, J., Ko, E. K., Lee, Y., Thampy, V., Cui, Y., Todorova, M., Neugebauer, J., Hwang, et al
  2025
- **Synthesis of superconducting freestanding infinite-layer nickelate heterostructures on the millimetre scale** *NATURE SYNTHESIS*
  Lee, Y., Wei, X., Yu, Y., Bhatt, L., Lee, K., Goodge, B. H., Harvey, S. P., Wang, B., Muller, D. A., Kourkoutis, L. F., Lee, W., Raghu, S., Hwang, et al
  2025
- **Signatures of ambient pressure superconductivity in thin film La3Ni2O7.** *Nature*
  Ko, E. K., Yu, Y., Liu, Y., Bhatt, L., Li, J., Thampy, V., Kuo, C. T., Wang, B. Y., Lee, Y., Lee, K., Lee, J. S., Goodge, B. H., Muller, et al
  2024
- **Transport phase diagram and anomalous metallicity in superconducting infinite-layer nickelates.** *Nature communications*
  Hsu, Y., Lee, K., Badoux, S., Duffy, C., Cuoghi, A., Wang, B. Y., Kool, A., Haik-Dunn, I., Hwang, H. Y., Hussey, N. E.
  2024; 15 (1): 9863
- **Author Correction: Highly confined epsilon-near-zero and surface phonon polaritons in SrTiO3membranes.** *Nature communications*
  Xu, R., Crassee, I., Bechtel, H. A., Zhou, Y., Bercher, A., Korosec, L., Rischau, C. W., Teyssier, J., Crust, K. J., Lee, Y., Gilbert Corder, S. N., Li, J., Dionne, et al
  2024; 15 (1): 8545
- **Flexoelectric Enhancement of Strain Gradient Elasticity Across a Ferroelectric-to-Paraelectric Phase Transition.** *Nano letters*
  Harbola, V., Pesquera, D., Xu, R., Ashby, P. D., Martin, L. W., Hwang, H. Y.
  2024
- **Tuning Exciton Emission via Ferroelectric Polarization at a Heterogeneous Interface between a Monolayer Transition Metal Dichalcogenide and a Perovskite Oxide Membrane.** *Nano letters*
  Choi, J., Crust, K. J., Li, L., Lee, K., Luo, J., So, J. P., Watanabe, K., Taniguchi, T., Hwang, H. Y., Mak, K. F., Shan, J., Fuchs, G. D.
  2024
- **Highly confined epsilon-near-zero and surface phonon polaritons in SrTiO3 membranes.** *Nature communications*
  Xu, R., Crassee, I., Bechtel, H. A., Zhou, Y., Bercher, A., Korosec, L., Rischau, C. W., Teyssier, J., Crust, K. J., Lee, Y., Gilbert Corder, S. N., Li, J., Dionne, et al
  2024; 15 (1): 4743
- **Superionic fluoride gate dielectrics with low diffusion barrier for two-dimensional electronics.** *Nature nanotechnology*
  Meng, K., Li, Z., Chen, P., Ma, X., Huang, J., Li, J., Qin, F., Qiu, C., Zhang, Y., Zhang, D., Deng, Y., Yang, Y., Gu, et al
  2024
- **Scanning SQUID study of ferromagnetism and superconductivity in infinite-layer nickelates** *PHYSICAL REVIEW MATERIALS*
  Shi, R. A., Wang, B., Iguchi, Y., Osada, M., Lee, K., Goodge, B. H., Kourkoutis, L. F., Hwang, H. Y., Moler, K. A.
  2024; 8 (2)
- **Interlayer engineering of Fe3GeTe2: From 3D superlattice to 2D monolayer.** *Proceedings of the National Academy of Sciences of the United States of America*
  Wu, Y., Wang, B. Y., Yu, Y., Li, Y., Ribeiro, H. B., Wang, J., Xu, R., Liu, Y., Ye, Y., Zhou, J., Ke, F., Harbola, V., Heinz, et al
  2024; 121 (4): e2314454121
- **Twisted epitaxy of gold nanodisks grown between twisted substrate layers of molybdenum disulfide.** *Science (New York, N.Y.)*
  Cui, Y., Wang, J., Li, Y., Wu, Y., Been, E., Zhang, Z., Zhou, J., Zhang, W., Hwang, H. Y., Sinclair, R., Cui, Y.
  2024; 383 (6679): 212-219
- **Evidence for d-wave superconductivity of infinite-layer nickelates from low-energy electrodynamics.** *Nature materials*
  Cheng, B., Cheng, D., Lee, K., Luo, L., Chen, Z., Lee, Y., Wang, B. Y., Mootz, M., Perakis, I. E., Shen, Z. X., Hwang, H. Y., Wang, J.
  2024

- **Delamination-Assisted Ultrafast Wrinkle Formation in a Freestanding Film.** *Nano letters*
  Su, Y., Zong, A., Kogar, A., Lu, D., Hong, S. S., Freelon, B., Rohwer, T., Wang, B. Y., Hwang, H. Y., Gedik, N.
  2023
- **Electronic band sculpted by oxygen vacancies and indispensable for dilute superconductivity** *PHYSICAL REVIEW RESEARCH*
  Fauque, B., Collignon, C., Yoon, H., Ravi, X., Lin, X., Mazin, I. I., Hwang, H. Y., Behnia, K.
  2023; 5 (3)
- **Visualizing Polar Distortions and Interface Effects with Multislice Ptychography.** *Microscopy and microanalysis : the official journal of Microscopy Society of America, Microbeam Analysis Society, Microscopical Society of Canada*
  Harikrishnan, K. P., Li, Y. E., Crust, K. J., Khandelwal, A., Shao, Y. T., Chen, Z., Zhang, C., Guguschev, C., Xu, R., Hwang, H. Y., Schlom, D. G., Muller, D. A.
  2023; 29 (Supplement_1): 1626-1627
- **Publisher Correction: Geometric frustration of Jahn-Teller order in the infinite-layer lattice.** *Nature*
  Kim, W. J., Smeaton, M. A., Jia, C., Goodge, B. H., Cho, B. G., Lee, K., Osada, M., Jost, D., Ievlev, A. V., Moritz, B., Kourkoutis, L. F., Devereaux, T. P., Hwang, et al
  2023
- **Linear-in-temperature resistivity for optimally superconducting (Nd,Sr)NiO2.** *Nature*
  Lee, K., Wang, B. Y., Osada, M., Goodge, B. H., Wang, T. C., Lee, Y., Harvey, S., Kim, W. J., Yu, Y., Murthy, C., Raghu, S., Kourkoutis, L. F., Hwang, et al
  2023; 619 (7969): 288-292
- **Electrostatic modulation of the lateral carrier density profile in field effect devices with nonlinear dielectrics** *PHYSICAL REVIEW B*
  Persky, E., Yoon, H., Xie, Y., Hwang, H. Y., Ruhman, J., Kalisky, B.
  2023; 107 (19)
- **Effects of rare-earth magnetism on the superconducting upper critical field in infinite-layer nickelates.** *Science advances*
  Wang, B. Y., Wang, T. C., Hsu, Y. T., Osada, M., Lee, K., Jia, C., Duffy, C., Li, D., Fowlie, J., Beasley, M. R., Devereaux, T. P., Fisher, I. R., Hussey, et al
  2023; 9 (20): eadf6655
- **Resolving the polar interface of infinite-layer nickelate thin films.** *Nature materials*
  Goodge, B. H., Geisler, B., Lee, K., Osada, M., Wang, B. Y., Li, D., Hwang, H. Y., Pentcheva, R., Kourkoutis, L. F.
  2023
- **Emergent chirality in a polar meron to skyrmion phase transition.** *Nature communications*
  Shao, Y. T., Das, S., Hong, Z., Xu, R., Chandrika, S., Gómez-Ortiz, F., García-Fernández, P., Chen, L. Q., Hwang, H. Y., Junquera, J., Martin, L. W., Ramesh, R., Muller, et al
  2023; 14 (1): 1355
- **Observation of Coulomb blockade and Coulomb staircases in superconducting Pr0.8Sr0.2NiO2 films** *PHYSICAL REVIEW B*
  Wang, R., Xiong, Y., Yan, H., Hu, X., Osada, M., Li, D., Hwang, H. Y., Song, C., Ma, X., Xue, Q.
  2023; 107 (11)
- **Geometric frustration of Jahn-Teller order in the infinite-layer lattice.** *Nature*
  Kim, W. J., Smeaton, M. A., Jia, C., Goodge, B. H., Cho, B., Lee, K., Osada, M., Jost, D., Ievlev, A. V., Moritz, B., Kourkoutis, L. F., Devereaux, T. P., Hwang, et al
  2023
- **Size-Induced Ferroelectricity in Antiferroelectric Oxide Membranes.** *Advanced materials (Deerfield Beach, Fla.)*
  Xu, R., Crust, K. J., Harbola, V., Arras, R., Patel, K. Y., Prosandeev, S., Cao, H., Shao, Y. T., Behera, P., Caretta, L., Kim, W. J., Khandelwal, A., Acharya, et al
  2023: e2210562
- **Electrostatic gating and intercalation in 2D materials** *NATURE REVIEWS MATERIALS*
  Wu, Y., Li, D., Wu, C., Hwang, H. Y., Cui, Y.
  2022
- **Intrinsic magnetism in superconducting infinite-layer nickelates** *NATURE PHYSICS*

Fowlie, J., Hadjimichael, M., Martins, M. M., Li, D., Osada, M., Wang, B., Lee, K., Lee, Y., Salman, Z., Prokscha, T., Triscone, J., Hwang, H. Y., Suter, et al
2022

- **A broken translational symmetry state in an infinite-layer nickelate** *NATURE PHYSICS*
  Rossi, M., Osada, M., Choi, J., Agrestini, S., Jost, D., Lee, Y., Lu, H., Wang, B., Lee, K., Nag, A., Chuang, Y., Kuo, C., Lee, et al
  2022
- **Heat Conductor-Insulator Transition in Electrochemically Controlled Hybrid Superlattices.** *Nano letters*
  Zhou, J., Wu, Y., Kwon, H., Li, Y., Xiao, X., Ye, Y., Ma, Y., Goodson, K. E., Hwang, H. Y., Cui, Y.
  2022
- **Theory of superconductivity in doped quantum paraelectrics** *NPJ QUANTUM MATERIALS*
  Yu, Y., Hwang, H. Y., Raghu, S., Chung, S.
  2022; 7 (1)
- **Electronic structure of superconducting nickelates probed by resonant photoemission spectroscopy** *MATTER*
  Chen, Z., Osada, M., Li, D., Been, E. M., Chen, S., Hashimoto, M., Lu, D., Mo, S., Lee, K., Wang, B., Rodolakis, F., McChesney, J. L., Jia, et al
  2022; 5 (6)
- **Observation of an intermediate state during lithium intercalation of twisted bilayer MoS2.** *Nature communications*
  Wu, Y., Wang, J., Li, Y., Zhou, J., Wang, B. Y., Yang, A., Wang, L., Hwang, H. Y., Cui, Y.
  2022; 13 (1): 3008
- **Disentangling Coexisting Structural Order Through Phase Lock-In Analysis of Atomic-Resolution STEM Data.** *Microscopy and microanalysis : the official journal of Microscopy Society of America, Microbeam Analysis Society, Microscopical Society of Canada*
  Goodge, B. H., El Baggari, I., Hong, S. S., Wang, Z., Schlom, D. G., Hwang, H. Y., Kourkoutis, L. F.
  2022: 1-8
- **Insulator-to-metal crossover near the edge of the superconducting dome in Nd1-xSrxNiO2** *PHYSICAL REVIEW RESEARCH*
  Hsu, Y., Wang, B., Berben, M., Li, D., Lee, K., Duffy, C., Ottenbros, T., Kim, W., Osada, M., Wiedmann, S., Hwang, H. Y., Hussey, N. E.
  2021; 3 (4)
- **Nickelate Superconductivity without Rare-Earth Magnetism: (La,Sr)NiO2.** *Advanced materials (Deerfield Beach, Fla.)*
  Osada, M., Wang, B. Y., Goodge, B. H., Harvey, S. P., Lee, K., Li, D., Kourkoutis, L. F., Hwang, H. Y.
  2021: e2104083
- **Fracture and fatigue of thin crystalline SrTiO3 membranes** *APPLIED PHYSICS LETTERS*
  Harbola, V., Xu, R., Crossley, S., Singh, P., Hwang, H. Y.
  2021; 119 (5)
- **Charge order textures induced by non-linear couplings in a half-doped manganite.** *Nature communications*
  El Baggari, I., Baek, D. J., Zachman, M. J., Lu, D., Hikita, Y., Hwang, H. Y., Nowadnick, E. A., Kourkoutis, L. F.
  2021; 12 (1): 3747
- **Understanding Degradation Mechanisms in SrIrO3 Oxygen Evolution Electrocatalysts: Chemical and Structural Microscopy at the Nanoscale** *ADVANCED FUNCTIONAL MATERIALS*
  Ben-Naim, M., Liu, Y., Stevens, M., Lee, K., Wette, M. R., Boubnov, A., Trofimov, A. A., Ievlev, A. V., Belianinov, A., Davis, R. C., Clemens, B. M., Bare, S. R., Hikita, et al
  2021
- **Non-universal current flow near the metal-insulator transition in an oxide interface.** *Nature communications*
  Persky, E., Vardi, N., Monteiro, A. M., van Thiel, T. C., Yoon, H., Xie, Y., Fauque, B., Caviglia, A. D., Hwang, H. Y., Behnia, K., Ruhman, J., Kalisky, B.
  2021; 12 (1): 3311
- **Stabilization of Sr3Al2O6 Growth Templates for Ex Situ Synthesis of Freestanding Crystalline Oxide Membranes.** *Nano letters*
  Li, D., Adamo, C., Wang, B. Y., Yoon, H., Chen, Z., Hong, S. S., Lu, D., Cui, Y., Hikita, Y., Hwang, H. Y.
  2021
- **Epitaxial Stabilization and Oxygen Evolution Reaction Activity of Metastable Columbite Iridium Oxide** *ACS APPLIED ENERGY MATERIALS*
  Lee, K., Flores, R. A., Liu, Y., Wang, B., Hikita, Y., Sinclair, R., Bajdich, M., Hwang, H. Y.

2021; 4 (4): 3074-3082

- **Highly Efficient Surface Charge Transfer in Fe2TiO5 Epitaxial Thin Film Photoanodes** *ACS APPLIED ENERGY MATERIALS*
  Osada, M., Nishio, K., Lee, K., Colletta, M., Goodge, B. H., Kim, W., Kourkoutis, L. F., Hwang, H. Y., Hikita, Y.
  2021; 4 (3): 2098-2106
- **Electronic Structure Trends Across the Rare-Earth Series in Superconducting Infinite-Layer Nickelates** *PHYSICAL REVIEW X*
  Been, E., Lee, W., Hwang, H. Y., Cui, Y., Zaanen, J., Devereaux, T., Moritz, B., Jia, C.
  2021; 11 (1)
- **Strain Gradient Elasticity in SrTiO3 Membranes: Bending versus Stretching.** *Nano letters*
  Harbola, V., Crossley, S., Hong, S. S., Lu, D., Birkholzer, Y. A., Hikita, Y., Hwang, H. Y.
  2021
- **Universal Bound to the Amplitude of the Vortex Nernst Signal in Superconductors.** *Physical review letters*
  Rischau, C. W., Li, Y., Fauqué, B., Inoue, H., Kim, M., Bell, C., Hwang, H. Y., Kapitulnik, A., Behnia, K.
  2021; 126 (7): 077001
- **Universal behavior of the bosonic metallic ground state in a two-dimensional superconductor** *NPJ QUANTUM MATERIALS*
  Chen, Z., Wang, B., Swartz, A. G., Yoon, H., Hikita, Y., Raghu, S., Hwang, H. Y.
  2021; 6 (1)
- **Universal Bound to the Amplitude of the Vortex Nernst Signal in Superconductors** *PHYSICAL REVIEW LETTERS*
  Rischau, C., Li, Y., Fauque, B., Inoue, H., Kim, M., Bell, C., Hwang, H. Y., Kapitulnik, A., Behnia, K.
  2021; 126 (7)
- **Doping evolution of the Mott-Hubbard landscape in infinite-layer nickelates.** *Proceedings of the National Academy of Sciences of the United States of America*
  Goodge, B. H., Li, D., Lee, K., Osada, M., Wang, B. Y., Sawatzky, G. A., Hwang, H. Y., Kourkoutis, L. F.
  2021; 118 (2)
- **Isotropic Pauli-limited superconductivity in the infinite-layer nickelate Nd0.775Sr0.225NiO2** *NATURE PHYSICS*
  Wang, B., Li, D., Goodge, B. H., Lee, K., Osada, M., Harvey, S. P., Kourkoutis, L. F., Beasley, M. R., Hwang, H. Y.
  2021
- **Phase diagram of infinite layer praseodymium nickelate Pr1-xSrxNiO2 thin films** *PHYSICAL REVIEW MATERIALS*
  Osada, M., Wang, B., Lee, K., Li, D., Hwang, H. Y.
  2020; 4 (12)
- **Beyond Substrates: Strain Engineering of Ferroelectric Membranes.** *Advanced materials (Deerfield Beach, Fla.)*
  Pesquera, D., Parsonnet, E., Qualls, A., Xu, R., Gubser, A. J., Kim, J., Jiang, Y., Velarde, G., Huang, Y., Hwang, H. Y., Ramesh, R., Martin, L. W.
  2020: e2003780
- **Superconducting Dome in Nd_{1-x}Sr_{x}NiO_{2} Infinite Layer Films.** *Physical review letters*
  Li, D., Wang, B. Y., Lee, K., Harvey, S. P., Osada, M., Goodge, B. H., Kourkoutis, L. F., Hwang, H. Y.
  2020; 125 (2): 027001
- **Superconducting Dome in Nd1-xSrxNiO2 Infinite Layer Films** *PHYSICAL REVIEW LETTERS*
  Li, D., Wang, B., Lee, K., Harvey, S. P., Osada, M., Goodge, B. H., Kourkoutis, L. F., Hwang, H. Y.
  2020; 125 (2)
- **A Superconducting Praseodymium Nickelate with Infinite Layer Structure.** *Nano letters*
  Osada, M., Wang, B. Y., Goodge, B. H., Lee, K., Yoon, H., Sakuma, K., Li, D., Miura, M., Kourkoutis, L. F., Hwang, H. Y.
  2020
- **Aspects of the synthesis of thin film superconducting infinite-layer nickelates** *APL MATERIALS*
  Lee, K., Goodge, B. H., Li, D., Osada, M., Wang, B., Cui, Y., Kourkoutis, L. F., Hwang, H. Y.
  2020; 8 (4)
- **Robust dx2-y2-wave superconductivity of infinite-layer nickelates** *PHYSICAL REVIEW B*
  Wu, X., Di Sante, D., Schwemmer, T., Hanke, W., Hwang, H. Y., Raghu, S., Thomale, R.

2020; 101 (6)

- **Electrochemical generation of liquid and solid sulfur on two-dimensional layered materials with distinct areal capacities.** *Nature nanotechnology*
  Yang, A. n., Zhou, G. n., Kong, X. n., Vilá, R. A., Pei, A. n., Wu, Y. n., Yu, X. n., Zheng, X. n., Wu, C. L., Liu, B. n., Chen, H. n., Xu, Y. n., Chen, et al
  2020
- **Extreme tensile strain states in La0.7Ca0.3MnO3 membranes.** *Science (New York, N.Y.)*
  Hong, S. S., Gu, M. n., Verma, M. n., Harbola, V. n., Wang, B. Y., Lu, D. n., Vailionis, A. n., Hikita, Y. n., Pentcheva, R. n., Rondinelli, J. M., Hwang, H. Y.
  2020; 368 (6486): 71–76
- **Strain-induced room-temperature ferroelectricity in SrTiO3 membranes.** *Nature communications*
  Xu, R. n., Huang, J. n., Barnard, E. S., Hong, S. S., Singh, P. n., Wong, E. K., Jansen, T. n., Harbola, V. n., Xiao, J. n., Wang, B. Y., Crossley, S. n., Lu, D. n., Liu, et al
  2020; 11 (1): 3141
- **Electrochemical generation of liquid and solid sulfur on two-dimensional layered materials with distinct areal capacities** *Nature Nanotechnology*
  Yang, A., Zhou, G., et al
  2020
- **Magnetism and Conductivity Along Structural Domain Walls of SrTiO3** *JOURNAL OF SUPERCONDUCTIVITY AND NOVEL MAGNETISM*
  Frenkel, Y., Xie, Y., Hwang, H. Y., Kalisky, B.
  2020; 33 (1): 195–97
- **Magnetism and Conductivity Along Structural Domain Walls of SrTiO3 (vol 71, pg 451, 2019)** *JOURNAL OF SUPERCONDUCTIVITY AND NOVEL MAGNETISM*
  Frenkel, Y., Xie, Y., Hwang, H. Y., Kalisky, B.
  2020; 33 (1): 199
- **Electrotunable liquid sulfur microdroplets.** *Nature communications*
  Zhou, G. n., Yang, A. n., Wang, Y. n., Gao, G. n., Pei, A. n., Yu, X. n., Zhu, Y. n., Zong, L. n., Liu, B. n., Xu, J. n., Liu, N. n., Zhang, J. n., Li, et al
  2020; 11 (1): 606
- **Heteroepitaxial vertical perovskite hot-electron transistors down to the monolayer limit.** *Nature communications*
  Kim, B. S., Hikita, Y., Yajima, T., Hwang, H. Y.
  2019; 10 (1): 5312
- **Superconductivity in an infinite-layer nickelate.** *Nature*
  Li, D., Lee, K., Wang, B. Y., Osada, M., Crossley, S., Lee, H. R., Cui, Y., Hikita, Y., Hwang, H. Y.
  2019; 572 (7771): 624–27
- **Large-Area Crystalline BaSnO3 Membranes with High Electron Mobilities** *ACS APPLIED ELECTRONIC MATERIALS*
  Singh, P., Swartz, A., Lu, D., Hon, S., Lee, K., Marshall, A. F., Nishio, K., Hikita, Y., Hwang, H. Y.
  2019; 1 (7): 1269–74
- **Freestanding crystalline YBa2Cu3O7-x heterostructure membranes** *PHYSICAL REVIEW MATERIALS*
  Chen, Z., Wang, B., Goodge, B. H., Lu, D., Hong, S., Li, D., Kourkoutis, L. F., Hikita, Y., Hwang, H. Y.
  2019; 3 (6)
- **Delta-doped SrTiO3 top-gated field effect transistor** *APPLIED PHYSICS LETTERS*
  Inoue, H., Yoon, H., Merz, T. A., Swartz, A. G., Hong, S., Hikita, Y., Hwang, H. Y.
  2019; 114 (23)
- **Oxygen Evolution Reaction Activity in IrOx/SrIrO3 Catalysts: Correlations between Structural Parameters and the Catalytic Activity** *JOURNAL OF PHYSICAL CHEMISTRY LETTERS*
  Lee, K., Osada, M., Hwang, H. Y., Hikita, Y.
  2019; 10 (7): 1516-1522
- **Oxygen Evolution Reaction Activity in IrO x/SrIrO3 Catalysts: Correlations between Structural Parameters and the Catalytic Activity.** *The journal of physical chemistry letters*

Lee, K., Osada, M., Hwang, H. Y., Hikita, Y.
2019: 1516–22

- **A termination-insensitive and robust electron gas at the heterointerface of two complex oxides.** *Nature communications*
  Zhang, M. n., Du, K. n., Ren, T. n., Tian, H. n., Zhang, Z. n., Hwang, H. Y., Xie, Y. n.
  2019; 10 (1): 4026
- **A Two-Dimensional MoS2 Catalysis Transistor by Solid-State Ion Gating Manipulation and Adjustment (SIGMA).** *Nano letters*
  Wu, Y. n., Ringe, S. n., Wu, C. L., Chen, W. n., Yang, A. n., Chen, H. n., Tang, M. n., Zhou, G. n., Hwang, H. Y., Chan, K. n., Cui, Y. n.
  2019
- **Freestanding Oxide Ferroelectric Tunnel Junction Memories Transferred onto Silicon.** *Nano letters*
  Lu, D. n., Crossley, S. n., Xu, R. n., Hikita, Y. n., Hwang, H. Y.
  2019
- **Publisher Correction: Carrier density and disorder tuned superconductor-metal transition in a two-dimensional electron system.** *Nature communications*
  Chen, Z., Swartz, A. G., Yoon, H., Inoue, H., Merz, T. A., Lu, D., Xie, Y., Yuan, H., Hikita, Y., Raghu, S., Hwang, H. Y.
  2018; 9 (1): 4570
- **Carrier density and disorder tuned superconductor-metal transition in a two-dimensional electron system (vol 9, 4008, 2018)** *NATURE COMMUNICATIONS*
  Chen, Z., Swartz, A. G., Yoon, H., Inoue, H., Merz, T. A., Lu, D., Xie, Y., Yuan, H., Hikita, Y., Raghu, S., Hwang, H. Y.
  2018; 9
- **Superconducting Tunneling Spectroscopy of Spin-Orbit Coupling and Orbital Depairing in Nb :SrTiO3** *PHYSICAL REVIEW LETTERS*
  Swartz, A. G., Cheung, A. K. C., Yoon, H., Chen, Z., Hikita, Y., Raghu, S., Hwang, H. Y.
  2018; 121 (16): 167003
- **Carrier density and disorder tuned superconductor-metal transition in a two-dimensional electron system** *NATURE COMMUNICATIONS*
  Chen, Z., Swartz, A. G., Yoon, H., Inoue, H., Merz, T. A., Lu, D., Xie, Y., Yuan, H., Hikita, Y., Raghu, S., Hwang, H. Y.
  2018; 9
- **Measurement of elastoresistivity at finite frequency by amplitude demodulation** *REVIEW OF SCIENTIFIC INSTRUMENTS*
  Hristov, A. T., Palmstrom, J. C., Straquadine, J. A. W., Merz, T. A., Hwang, H. Y., Fisher, I. R.
  2018; 89 (10)
- **Measurement of elastoresistivity at finite frequency by amplitude demodulation.** *The Review of scientific instruments*
  Hristov, A. T., Palmstrom, J. C., Straquadine, J. A., Merz, T. A., Hwang, H. Y., Fisher, I. R.
  2018; 89 (10): 103901
- **Carrier density and disorder tuned superconductor-metal transition in a two-dimensional electron system.** *Nature communications*
  Chen, Z., Swartz, A. G., Yoon, H., Inoue, H., Merz, T. A., Lu, D., Xie, Y., Yuan, H., Hikita, Y., Raghu, S., Hwang, H. Y.
  2018; 9 (1): 4008
- **Observation of signatures of subresolution defects in two-dimensional superconductors with a scanning SQUID** *PHYSICAL REVIEW B*
  Noad, H., Watson, C. A., Inoue, H., Kim, M., Sato, H. K., Bell, C., Hwang, H. Y., Kirtley, J. R., Moler, K. A.
  2018; 98 (6)
- **Ultralow Damping in Nanometer-Thick Epitaxial Spinel Ferrite Thin Films** *NANO LETTERS*
  Emori, S., Yi, D., Crossley, S., Wisser, J. J., Balakrishnan, P. P., Khodadadi, B., Shafer, P., Klewe, C., N'Diaye, A. T., Urwin, B. T., Mahalingam, K., Howe, B. M., Hwang, et al
  2018; 18 (7): 4273–78
- **Spontaneous Ionic Polarization in Ammonia-Based Ionic Liquid** *ACS APPLIED ENERGY MATERIALS*
  Kim, K., Yuan, H., Jang, H., Kim, B., Seoung, D., Hikita, Y., Hwang, H. Y., Lee, J.
  2018; 1 (6): 2717–20
- **Synthesis and electronic properties of Fe2TiO5 epitaxial thin films** *APL MATERIALS*
  Osada, M., Nishio, K., Hwang, H. Y., Hikita, Y.
  2018; 6 (5)

- **Tuning of Plasmons in Transparent Conductive Oxides by Carrier Accumulation** *ACS PHOTONICS*
  Liu, X., Kang, J., Yuan, H., Park, J., Cui, Y., Hwang, H. Y., Brongersma, M. L.
  2018; 5 (4): 1493–98
- **Gate-Induced Metal-Insulator Transition in MoS2 by Solid Superionic Conductor LaF3** *NANO LETTERS*
  Wu, C., Yuan, H., Li, Y., Gong, Y., Hwang, H. Y., Cui, Y.
  2018; 18 (4): 2387–92
- **Atomically engineered epitaxial anatase TiO2 metal-semiconductor field-effect transistors** *APPLIED PHYSICS LETTERS*
  Kim, B. S. Y., Minohara, M., Hikita, Y., Bell, C., Hwang, H. Y.
  2018; 112 (13)
- **Strain Tuning in Complex Oxide Epitaxial Films Using an Ultrathin Strontium Aluminate Buffer Layer** *PHYSICA STATUS SOLIDI-RAPID RESEARCH LETTERS*
  Lu, D., Hikita, Y., Baek, D. J., Merz, T. A., Sato, H., Kim, B., Yajima, T., Bell, C., Vailionis, A., Kourkoutis, L. F., Hwang, H. Y.
  2018; 12 (3)
- **Polaronic behavior in a weak-coupling superconductor** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Swartz, A. G., Inoue, H., Merz, T. A., Hikita, Y., Raghu, S., Devereaux, T. P., Johnston, S., Hwang, H. Y.
  2018; 115 (7): 1475–80
- **Gate-Induced Interfacial Superconductivity in 1T-SnSe2** *NANO LETTERS*
  Zeng, J., Liu, E., Fu, Y., Chen, Z., Pan, C., Wang, C., Wang, M., Wang, Y., Xu, K., Cai, S., Yan, X., Wang, Y., Liu, et al
  2018; 18 (2): 1410–15
- **Imaging and tuning polarity at SrTiO3 domain walls** *NATURE MATERIALS*
  Frenkel, Y., Haham, N., Shperber, Y., Bell, C., Xie, Y., Chen, Z., Hikita, Y., Hwang, H. Y., Salje, E. K. H., Kalisky, B.
  2017; 16 (12): 1203-+
- **Two-dimensional limit of crystalline order in perovskite membrane films** *SCIENCE ADVANCES*
  Hong, S., Yu, J., Lu, D., Marshall, A. F., Hikita, Y., Cui, Y., Hwang, H. Y.
  2017; 3 (11)
- **Gated tuned superconductivity and phonon softening in monolayer and bilayer MoS2** *NPJ QUANTUM MATERIALS*
  Fu, Y., Liu, E., Yuan, H., Tang, P., Lian, B., Xu, G., Zeng, J., Chen, Z., Wang, Y., Zhou, W., Xu, K., Gao, A., Pan, et al
  2017; 2
- **Electrical tuning of a quantum plasmonic resonance** *NATURE NANOTECHNOLOGY*
  Liu, X., Kang, H., Yuan, H., Park, J., Kim, S., Cui, Y., Hwang, H. Y., Brongersma, M. L.
  2017; 12 (9): 866-+
- **Mapping cation diffusion through lattice defects in epitaxial oxide thin films on the water-soluble buffer layer Sr3Al2O6 using atomic resolution electron microscopy** *APL MATERIALS*
  Baek, D. J., Lu, D., Hikita, Y., Hwang, H. Y., Kourkoutis, L. F.
  2017; 5 (9)
- **Enhancing the barrier height in oxide Schottky junctions using interface dipoles** *APPLIED PHYSICS LETTERS*
  Tachikawa, T., Hwang, H. Y., Hikita, Y.
  2017; 111 (9)
- **Se.** *Nature nanotechnology*
  Wu, J., Yuan, H., Meng, M., Chen, C., Sun, Y., Chen, Z., Dang, W., Tan, C., Liu, Y., Yin, J., Zhou, Y., Huang, S., Xu, et al
  2017; 12 (6): 530-534
- **High electron mobility and quantum oscillations in non-encapsulated ultrathin semiconducting Bi2O2Se** *NATURE NANOTECHNOLOGY*
  Wu, J., Yuan, H., Meng, M., Chen, C., Sun, Y., Chen, Z., Dang, W., Tan, C., Liu, Y., Yin, J., Zhou, Y., Huang, S., Xu, et al
  2017; 12 (6): 530-+
- **Ubiquitous strong electron-phonon coupling at the interface of FeSe/SrTiO3** *NATURE COMMUNICATIONS*

Zhang, C., Liu, Z., Chen, Z., Xie, Y., He, R., Tang, S., He, J., Li, W., Jia, T., Rebec, S. N., Ma, E. Y., Yan, H., Hashimoto, et al
2017; 8

- **.** *Nature communications*
  Zhang, C., Liu, Z., Chen, Z., Xie, Y., He, R., Tang, S., He, J., Li, W., Jia, T., Rebec, S. N., Ma, E. Y., Yan, H., Hashimoto, et al
  2017; 8: 14468-?
- **Ultrathin Epitaxial Barrier Layer to Avoid Thermally Induced Phase Transformation in Oxide Heterostructures** *ACS APPLIED MATERIALS & INTERFACES*
  Baek, D. J., Lu, D., Hikita, Y., Hwang, H. Y., Kourkoutis, L. F.
  2017; 9 (1): 54-59
- **Two-dimensional limit of crystalline order in perovskite membrane films.** *Science advances*
  Hong, S. S., Yu, J. H., Lu, D. n., Marshall, A. F., Hikita, Y. n., Cui, Y. n., Hwang, H. Y.
  2017; 3 (11): eaao5173
- **Orientation-resolved domain mapping in tetragonal SrTiO3 using polarized Raman spectroscopy** *PHYSICAL REVIEW B*
  Gray, D. J., Merz, T. A., Hikita, Y., Hwang, H. Y., Mabuchi, H.
  2016; 94 (21)
- **Variation in superconducting transition temperature due to tetragonal domains in two-dimensionally doped SrTiO3** *PHYSICAL REVIEW B*
  Noad, H., Spanton, E. M., Nowack, K. C., Inoue, H., Kim, M., Merz, T. A., Bell, C., Hikita, Y., Xu, R., Liu, W., Vailionis, A., Hwang, H. Y., Moler, et al
  2016; 94 (17)
- **Dual-Gate Modulation of Carrier Density and Disorder in an Oxide Two-Dimensional Electron System** *NANO LETTERS*
  Chen, Z., Yuan, H., Xie, Y., Lu, D., Inoue, H., Hikita, Y., Bell, C., Hwang, H. Y.
  2016; 16 (10): 6130-6136
- **Synthesis of freestanding single-crystal perovskite films and heterostructures by etching of sacrificial water-soluble layers.** *Nature materials*
  Lu, D., Baek, D. J., Hong, S. S., Kourkoutis, L. F., Hikita, Y., Hwang, H. Y.
  2016
- **A highly active and stable IrOx/SrIrO3 catalyst for the oxygen evolution reaction** *SCIENCE*
  Seitz, L. C., Dickens, C. F., Nishio, K., Hikita, Y., Montoya, J., Doyle, A., Kirk, C., Vojvodic, A., Hwang, H. Y., Norskov, J. K., Jaramillo, T. F.
  2016; 353 (6303): 1011-1014
- **Defect Control of Conventional and Anomalous Electron Transport at Complex Oxide Interfaces** *PHYSICAL REVIEW X*
  Gunkel, F., Bell, C., Inoue, H., Kim, B., Swartz, A. G., Merz, T. A., Hikita, Y., Harashima, S., Sato, H. K., Minohara, M., Hoffmann-Eifert, S., Dittmann, R., Hwang, et al
  2016; 6 (3)
- **Evolution of the Valley Position in Bulk Transition-Metal Chalcogenides and Their Monolayer Limit.** *Nano letters*
  Yuan, H., Liu, Z., Xu, G., Zhou, B., Wu, S., Dumcenco, D., Yan, K., Zhang, Y., Mo, S., Dudin, P., Kandyba, V., Yablonskikh, M., Barinov, et al
  2016; 16 (8): 4738-4745
- **Photoinduced Demagnetization and Insulator-to-Metal Transition in Ferromagnetic Insulating BaFeO3 Thin Films** *PHYSICAL REVIEW LETTERS*
  Tsuyama, T., Chakraverty, S., Macke, S., Pontius, N., Schuessler-Langeheine, C., Hwang, H. Y., Tokura, Y., Wadati, H.
  2016; 116 (25)
- **Anisotropic Transport at the LaAlO3/SrTiO3 Interface Explained by Microscopic Imaging of Channel-Flow over SrTiO3 Domains** *ACS APPLIED MATERIALS & INTERFACES*
  Frenkel, Y., Haham, N., Shperber, Y., Bell, C., Xie, Y., Chen, Z., Hikita, Y., Hwang, H. Y., Kalisky, B.
  2016; 8 (19): 12514-12519
- **Depth resolved domain mapping in tetragonal SrTiO3 by micro-Laue diffraction** *APPLIED PHYSICS LETTERS*
  Merz, T. A., Noad, H., Xu, R., Inoue, H., Liu, W., Hikita, Y., Vailionis, A., Moler, K. A., Hwang, H. Y.
  2016; 108 (18)
- **Magnetic anisotropy, damping, and interfacial spin transport in Pt/LSMO bilayers** *AIP ADVANCES*

Lee, H. K., Barsukov, I., Swartz, A. G., Kim, B., Yang, L., Hwang, H. Y., Krivorotov, I. N.
2016; 6 (5)

- **Band Edge Engineering of Oxide Photoanodes for Photoelectrochemical Water Splitting: Integration of Subsurface Dipoles with Atomic-Scale Control** *ADVANCED ENERGY MATERIALS*
  Hikita, Y., Nishio, K., Seitz, L. C., Chakthranont, P., Tachikawa, T., Jaramillo, T. F., Hwang, H. Y.
  2016; 6 (7)
- **High Responsivity Phototransistors Based on Few-Layer ReS2 for Weak Signal Detection** *ADVANCED FUNCTIONAL MATERIALS*
  Liu, E., Long, M., Zeng, J., Luo, W., Wang, Y., Pan, Y., Zhou, W., Wang, B., Hu, W., Ni, Z., You, Y., Zhang, X., Qin, et al
  2016; 26 (12): 1938-1944
- **Thermodynamic guiding principles in selective synthesis of strontium iridate Ruddlesden-Popper epitaxial films** *APL MATERIALS*
  Nishio, K., Hwang, H. Y., Hikita, Y.
  2016; 4 (3)
- **Electric polarization control of magnetoresistance in complex oxide hetero junctions**
  Swartz, A. G., Inoue, H., Hwang, H. Y.
  edited by Drouhin, H. J., Wegrowe, J. E., Razeghi, M.
  SPIE-INT SOC OPTICAL ENGINEERING.2016
- **Tuning Band Alignment Using Interface Dipoles at the Pt/Anatase TiO2 Interface** *ADVANCED MATERIALS*
  Tachikawa, T., Minohara, M., Hikita, Y., Bell, C., Hwang, H. Y.
  2015; 27 (45): 7458-?
- **Tuning Band Alignment Using Interface Dipoles at the Pt/Anatase TiO# Interface.** *Advanced materials (Deerfield Beach, Fla.)*
  Tachikawa, T., Minohara, M., Hikita, Y., Bell, C., Hwang, H. Y.
  2015; 27 (45): 7458-61
- **Origin of the Magnetoresistance in Oxide Tunnel Junctions Determined through Electric Polarization Control of the Interface** *PHYSICAL REVIEW X*
  Inoue, H., Swartz, A. G., Harmon, N. J., Tachikawa, T., Hikita, Y., Flatte, M. E., Hwang, H. Y.
  2015; 5 (4)
- **Inelastic x-ray scattering in heterostructures: electronic excitations in LaAlO3/SrTiO3** *JOURNAL OF PHYSICS-CONDENSED MATTER*
  Ruotsalainen, K. O., Sahle, C. J., Ritschel, T., Geck, J., Hosoda, M., Bell, C., Hikita, Y., Hwang, H. Y., Fister, T. T., Gordon, R. A., Hamalainen, K., Hakala, M., Huotari, et al
  2015; 27 (33)
- **Polarization-sensitive broadband photodetector using a black phosphorus vertical p-n junction** *NATURE NANOTECHNOLOGY*
  Yuan, H., Liu, X., Afshinmanesh, F., Li, W., Xu, G., Sun, J., Lian, B., Curto, A. G., Ye, G., Hikita, Y., Shen, Z., Zhang, S., Chen, et al
  2015; 10 (8): 707-713
- **Direct Imaging of Nanoscale Conductance Evolution in Ion-Gel-Gated Oxide Transistors.** *Nano letters*
  Ren, Y., Yuan, H., Wu, X., Chen, Z., Iwasa, Y., Cui, Y., Hwang, H. Y., Lai, K.
  2015; 15 (7): 4730-4736
- **Electrically tunable coherent optical absorption in graphene with ion gel.** *Nano letters*
  Thareja, V., Kang, J., Yuan, H., Milaninia, K. M., Hwang, H. Y., Cui, Y., Kik, P. G., Brongersma, M. L.
  2015; 15 (3): 1570-1576
- **Room temperature optical anisotropy of a LaMnO3 thin-film induced by ultra-short pulse laser** *APPLIED PHYSICS LETTERS*
  Munkhbaatar, P., Marton, Z., Tsermaa, B., Choi, W. S., Seo, S. S., Kim, J. S., Nakagawa, N., Hwang, H. Y., Lee, H. N., Myung-Whun, K.
  2015; 106 (9)
- **X-ray spectroscopic study of BaFeO3 thin films: An Fe4+ ferromagnetic insulator** *PHYSICAL REVIEW B*
  Tsuyama, T., Matsuda, T., Chakraverty, S., Okamoto, J., Ikenaga, E., Tanaka, A., Mizokawa, T., Hwang, H. Y., Tokura, Y., Wadati, H.
  2015; 91 (11)
- **Enhanced Electrical Transparency by Ultrathin LaAlO3 Insertion at Oxide Metal/Semiconductor Heterointerfaces** *NANO LETTERS*
  Yajima, T., Minohara, M., Bell, C., Kumigashira, H., Oshima, M., Hwang, H. Y., Hikita, Y.

2015; 15 (3): 1622-1626

- **Optical Study of Tetragonal Domains in LaAlO3/SrTiO3** *JOURNAL OF SUPERCONDUCTIVITY AND NOVEL MAGNETISM*
  Erlich, Z., Frenkel, Y., DRORI, J., Shperber, Y., Bell, C., Sato, H. K., Hosoda, M., Xie, Y., Hikita, Y., Hwang, H. Y., Kalisky, B.
  2015; 28 (3): 1017-1020
- **Controlling band alignments by artificial interface dipoles at perovskite heterointerfaces.** *Nature communications*
  Yajima, T., Hikita, Y., Minohara, M., Bell, C., Mundy, J. A., Kourkoutis, L. F., Muller, D. A., Kumigashira, H., Oshima, M., Hwang, H. Y.
  2015; 6: 6759-?
- **Integrated digital inverters based on two-dimensional anisotropic ReS2 field-effect transistors.** *Nature communications*
  Liu, E., Fu, Y., Wang, Y., Feng, Y., Liu, H., Wan, X., Zhou, W., Wang, B., Shao, L., Ho, C., Huang, Y., Cao, Z., Wang, et al
  2015; 6: 6991-?
- **Pressure induced metallization with absence of structural transition in layered molybdenum diselenide.** *Nature communications*
  Zhao, Z., Zhang, H., Yuan, H., Wang, S., Lin, Y., Zeng, Q., Xu, G., Liu, Z., Solanki, G. K., Patel, K. D., Cui, Y., Hwang, H. Y., Mao, et al
  2015; 6: 7312-?
- **Integrated digital inverters based on two-dimensional anisotropic ReS2 field-effect transistors.** *Nature communications*
  Liu, E., Fu, Y., Wang, Y., Feng, Y., Liu, H., Wan, X., Zhou, W., Wang, B., Shao, L., Ho, C., Huang, Y., Cao, Z., Wang, et al
  2015; 6: 6991-?
- **Pressure induced metallization with absence of structural transition in layered molybdenum diselenide.** *Nature communications*
  Zhao, Z., Zhang, H., Yuan, H., Wang, S., Lin, Y., Zeng, Q., Xu, G., Liu, Z., Solanki, G. K., Patel, K. D., Cui, Y., Hwang, H. Y., Mao, et al
  2015; 6: 7312-?
- **Large-Scale Production of Graphene Nanoribbons from Electrospun Polymers** *JOURNAL OF THE AMERICAN CHEMICAL SOCIETY*
  Liu, N., Kim, K., Hsu, P., Sokolov, A. N., Yap, F. L., Yuan, H., Xie, Y., Yan, H., Cui, Y., Hwang, H. Y., Bao, Z.
  2014; 136 (49): 17284-17291
- **Quantification and impact of nonparabolicity of the conduction band of indium tin oxide on its plasmonic properties** *APPLIED PHYSICS LETTERS*
  Liu, X., Park, J., Kang, J., Yuan, H., Cui, Y., Hwang, H. Y., Brongersma, M. L.
  2014; 105 (18)
- **Quantum longitudinal and Hall transport at the LaAlO3/SrTiO3 interface at low electron densities** *SOLID STATE COMMUNICATIONS*
  Xie, Y., Bell, C., Kim, M., Inoue, H., Hikita, Y., Hwang, H. Y.
  2014; 197: 25-29
- **Visible-light-enhanced gating effect at the LaAlO3/SrTiO3 interface** *NATURE COMMUNICATIONS*
  Lei, Y., Li, Y., CHEN, Y. Z., Xie, Y. W., Chen, Y. S., Wang, S. H., Wang, J., Shen, B. G., Pryds, N., Hwang, H. Y., Sun, J. R.
  2014; 5
- **Atomically Engineered Metal Insulator Transition at the TiO2/LaAlO3 Heterointerface** *NANO LETTERS*
  Minohara, M., Tachikawa, T., Nakanishi, Y., Hikita, Y., Kourkoutis, L. F., Lee, J., Kao, C., Yoshita, M., Akiyama, H., Bell, C., Hwang, H. Y.
  2014; 14 (11): 6743-6746
- **Generation and electric control of spin-valley-coupled circular photogalvanic current in WSe2** *NATURE NANOTECHNOLOGY*
  Yuan, H., Wang, X., Lian, B., Zhang, H., Fang, X., Shen, B., Xu, G., Xu, Y., Zhang, S., Hwang, H. Y., Cui, Y.
  2014; 9 (10): 851-857
- **Generation and electric control of spin-valley-coupled circular photogalvanic current in WSe2.** *Nature nanotechnology*
  Yuan, H., Wang, X., Lian, B., Zhang, H., Fang, X., Shen, B., Xu, G., Xu, Y., Zhang, S., Hwang, H. Y., Cui, Y.
  2014; 9 (10): 851-857
- **Spin-dependent transport across Co/LaAlO3/SrTiO3 heterojunctions** *APPLIED PHYSICS LETTERS*
  Swartz, A. G., Harashima, S., Xie, Y., Lu, D., Kim, B., Bell, C., Hikita, Y., Hwang, H. Y.
  2014; 105 (3)
- **Spatial density profile of electrons near the LaAlO3/SrTiO3 heterointerface revealed by time-resolved photoluminescence spectroscopy** *APPLIED PHYSICS LETTERS*

Yamada, Y., Sato, H. K., Hikita, Y., Hwang, H. Y., Kanemitsu, Y.
2014; 104 (15)

- **In-plane terahertz response of thin film Sr2RuO4** *PHYSICAL REVIEW B*
  Takahashi, Y., Chakraverty, S., Kawasaki, M., Hwang, H. Y., Tokura, Y.
  2014; 89 (16)
- **Visualizing the interfacial evolution from charge compensation to metallic screening across the manganite metal-insulator transition.** *Nature communications*
  Mundy, J. A., Hikita, Y., Hidaka, T., Yajima, T., Higuchi, T., Hwang, H. Y., Muller, D. A., Kourkoutis, L. F.
  2014; 5: 3464-?
- **Detection of Berry's Phase in a Bulk Rashba Semiconductor** *SCIENCE*
  Murakawa, H., Bahramy, M. S., Tokunaga, M., Kohama, Y., Bell, C., Kaneko, Y., Nagaosa, N., Hwang, H. Y., Tokura, Y.
  2013; 342 (6165): 1490-1493
- **Tunable coupling of two-dimensional superconductors in bilayer SrTiO3 heterostructures** *PHYSICAL REVIEW B*
  Inoue, H., Kim, M., Bell, C., Hikita, Y., Raghu, S., Hwang, H. Y.
  2013; 88 (24)
- **Multiple helimagnetic phases and topological Hall effect in epitaxial thin films of pristine and Co-doped SrFeO3** *PHYSICAL REVIEW B*
  Chakraverty, S., Matsuda, T., Wadati, H., Okamoto, J., Yamasaki, Y., Nakao, H., Murakami, Y., Ishiwata, S., Kawasaki, M., Taguchi, Y., Tokura, Y., Hwang, H. Y.
  2013; 88 (22)
- **Locally enhanced conductivity due to the tetragonal domain structure in LaAlO3/SrTiO3 heterointerfaces.** *Nature materials*
  Kalisky, B., Spanton, E. M., Noad, H., Kirtley, J. R., Nowack, K. C., Bell, C., Sato, H. K., Hosoda, M., Xie, Y., Hikita, Y., Woltmann, C., Pfanzelt, G., Jany, et al
  2013; 12 (12): 1091-1095
- **Tuning the electrons at the LaAlO3/SrTiO3 interface: From growth to beyond growth** *CHINESE PHYSICS B*
  Xie Yan-Wu, Harold, H. Y.
  2013; 22 (12)
- **Landau Level Spectroscopy of Dirac Electrons in a Polar Semiconductor with Giant Rashba Spin Splitting** *PHYSICAL REVIEW LETTERS*
  Bordacs, S., Checkelsky, J. G., Murakawa, H., Hwang, H. Y., Tokura, Y.
  2013; 111 (16)
- **Controlled Growth of High-Quality Monolayer WS2 Layers on Sapphire and Imaging Its Grain Boundary** *ACS NANO*
  Zhang, Y., Zhang, Y., Ji, Q., Ju, J., Yuan, H., Shi, J., Gao, T., Ma, D., Liu, M., Chen, Y., Song, X., Hwang, H. Y., Cui, et al
  2013; 7 (10): 8963-8971
- **BaFeO3 cubic single crystalline thin film: A ferromagnetic insulator** *APPLIED PHYSICS LETTERS*
  Chakraverty, S., Matsuda, T., Ogawa, N., Wadati, H., Ikenaga, E., Kawasaki, M., Tokura, Y., Hwang, H. Y.
  2013; 103 (14)
- **Enhancing Electron Mobility at the LaAlO3 /SrTiO3 Interface by Surface Control.** *Advanced materials*
  Xie, Y., Bell, C., Hikita, Y., Harashima, S., Hwang, H. Y.
  2013; 25 (34): 4735-4738
- **Transistor operation and mobility enhancement in top-gated LaAlO3/SrTiO3 heterostructures** *APPLIED PHYSICS LETTERS*
  Hosoda, M., Hikita, Y., Hwang, H. Y., Bell, C.
  2013; 103 (10)
- **Coexistence of two-dimensional and three-dimensional Shubnikov-de Haas oscillations in Ar+-irradiated KTaO3** *PHYSICAL REVIEW B*
  Harashima, S., Bell, C., Kim, M., Yajima, T., Hikita, Y., Hwang, H. Y.
  2013; 88 (8)
- **Titanium d(xy) ferromagnetism at the LaAlO3/SrTiO3 interface** *NATURE MATERIALS*
  Lee, J., Xie, Y. W., Sato, H. K., Bell, C., Hikita, Y., Hwang, H. Y., Kao, C.
  2013; 12 (8): 703-706

- **Measurement of the Femtosecond Optical Absorption of LaAlO3/SrTiO3 Heterostructures: Evidence for an Extremely Slow Electron Relaxation at the Interface** *PHYSICAL REVIEW LETTERS*
  Yamada, Y., Sato, H. K., Hikita, Y., Hwang, H. Y., Kanemitsu, Y.
  2013; 111 (4)
- **Stoichiometry control of the electronic properties of the LaAlO3/SrTiO3 heterointerface** *APPLIED PHYSICS LETTERS*
  Sato, H. K., Bell, C., Hikita, Y., Hwang, H. Y.
  2013; 102 (25)
- **Spontaneous B-site order and metallic ferrimagnetism in LaSrVMoO6 grown by pulsed laser deposition** *APPLIED PHYSICS LETTERS*
  Chakraverty, S., Yu, X. Z., Kawasaki, M., Tokura, Y., Hwang, H. Y.
  2013; 102 (22)
- **Strongly Spin-Orbit Coupled Two-Dimensional Electron Gas Emerging near the Surface of Polar Semiconductors** *PHYSICAL REVIEW LETTERS*
  Sakano, M., Bahramy, M. S., Katayama, A., Shimojima, T., Murakawa, H., Kaneko, Y., Malaeb, W., Shin, S., Ono, K., Kumigashira, H., Arita, R., Nagaosa, N., Hwang, et al
  2013; 110 (10)
- **Compositional and gate tuning of the interfacial conductivity in LaAlO3/LaTiO3/SrTiO3 heterostructures** *APPLIED PHYSICS LETTERS*
  Hosoda, M., Bell, C., Hikita, Y., Hwang, H. Y.
  2013; 102 (9)
- **Shubnikov-de Haas oscillations in the bulk Rashba semiconductor BiTeI** *PHYSICAL REVIEW B*
  Bell, C., Bahramy, M. S., Murakawa, H., Checkelsky, J. G., Arita, R., Kaneko, Y., Onose, Y., Tokunaga, M., Kohama, Y., Nagaosa, N., Tokura, Y., Hwang, H. Y.
  2013; 87 (8)
- **Hot electron transport in a strongly correlated transition-metal oxide** *SCIENTIFIC REPORTS*
  Rana, K. G., Yajima, T., Parui, S., Kemper, A. F., Devereaux, T. P., Hikita, Y., Hwang, H. Y., Banerjee, T.
  2013; 3
- **Intrinsic spin-orbit coupling in superconducting delta-doped SrTiO3 heterostructures** *PHYSICAL REVIEW B*
  Kim, M., Kozuka, Y., Bell, C., Hikita, Y., Hwang, H. Y.
  2012; 86 (8)
- **Gate-tuned superfluid density at the superconducting LaAlO3/SrTiO3 interface** *PHYSICAL REVIEW B*
  Bert, J. A., Nowack, K. C., Kalisky, B., Noad, H., Kirtley, J. R., Bell, C., Sato, H. K., Hosoda, M., Hikita, Y., Hwang, H. Y., Moler, K. A.
  2012; 86 (6)
- **Scanning Probe Manipulation of Magnetism at the LaAlO3/SrTiO3 Heterointerface** *NANO LETTERS*
  Kalisky, B., Bert, J. A., Bell, C., Xie, Y., Sato, H. K., Hosoda, M., Hikita, Y., Hwang, H. Y., Moler, K. A.
  2012; 12 (8): 4055-4059
- **Effect of anisotropic strain on the charge dynamics of Nd0.5Sr0.5MnO3 thin films** *SOLID STATE COMMUNICATIONS*
  Munkhbaatar, P., Nakagawa, N., Hwang, H. Y., Kim, J. S., Myung-Whun, K.
  2012; 152 (16): 1541-1544
- **Metal-to-insulator transition in anatase TiO2 thin films induced by growth rate modulation** *APPLIED PHYSICS LETTERS*
  Tachikawa, T., Minohara, M., Nakanishi, Y., Hikita, Y., Yoshita, M., Akiyama, H., Bell, C., Hwang, H. Y.
  2012; 101 (2)
- **Scanning SQUID susceptometry of a paramagnetic superconductor** *PHYSICAL REVIEW B*
  Kirtley, J. R., Kalisky, B., Bert, J. A., Bell, C., Kim, M., Hikita, Y., Hwang, H. Y., Ngai, J. H., Segal, Y., Walker, F. J., Ahn, C. H., Moler, K. A.
  2012; 85 (22)
- **Critical thickness for ferromagnetism in LaAlO3/SrTiO3 heterostructures** *NATURE COMMUNICATIONS*
  Kalisky, B., Bert, J. A., Klopfer, B. B., Bell, C., Sato, H. K., Hosoda, M., Hikita, Y., Hwang, H. Y., Moler, K. A.
  2012; 3

- **Subband Structure of a Two-Dimensional Electron Gas Formed at the Polar Surface of the Strong Spin-Orbit Perovskite KTaO3** *PHYSICAL REVIEW LETTERS*
  King, P. D., He, R. H., Eknapakul, T., Buaphet, P., Mo, S., Kaneko, Y., Harashima, S., Hikita, Y., Bahramy, M. S., Bell, C., Hussain, Z., Tokura, Y., Shen, et al
  2012; 108 (11)
- **Single-valley quantum Hall ferromagnet in a dilute MgxZn1-xO/ZnO strongly correlated two-dimensional electron system** *PHYSICAL REVIEW B*
  Kozuka, Y., Tsukazaki, A., Maryenko, D., Falson, J., Bell, C., Kim, M., Hikita, Y., Hwang, H. Y., Kawasaki, M.
  2012; 85 (7)
- **Emergent phenomena at oxide interfaces** *NATURE MATERIALS*
  Hwang, H. Y., Iwasa, Y., Kawasaki, M., Keimer, B., Nagaosa, N., Tokura, Y.
  2012; 11 (2): 103-113
- **General considerations of the electrostatic boundary conditions in oxide heterostructures** *MULTIFUNCTIONAL OXIDE HETEROSTRUCTURES*
  Higuchi, T., Hwang, H. Y.
  edited by Tsymbal, E. Y., Dagotto, E. R., Eom, C. B., Ramesh, R.
  2012: 183-213
- **Electronic charges and electric potential at LaAlO3/SrTiO3 interfaces studied by core-level photoemission spectroscopy** *PHYSICAL REVIEW B*
  Takizawa, M., Tsuda, S., Susaki, T., Hwang, H. Y., Fujimori, A.
  2011; 84 (24)
- **Control of electronic conduction at an oxide heterointerface using surface polar adsorbates** *NATURE COMMUNICATIONS*
  Xie, Y., Hikita, Y., Bell, C., Hwang, H. Y.
  2011; 2
- **Direct imaging of the coexistence of ferromagnetism and superconductivity at the LaAlO3/SrTiO3 interface** *NATURE PHYSICS*
  Bert, J. A., Kalisky, B., Bell, C., Kim, M., Hikita, Y., Hwang, H. Y., Moler, K. A.
  2011; 7 (10): 767-771
- **Fermi Surface and Superconductivity in Low-Density High-Mobility delta-Doped SrTiO3** *PHYSICAL REVIEW LETTERS*
  Kim, M., Bell, C., Kozuka, Y., Kurita, M., Hikita, Y., Hwang, H. Y.
  2011; 107 (10)
- **Reentrant insulating state in ultrathin manganite films** *APPLIED PHYSICS LETTERS*
  Kim, B., Kwon, D., Yajima, T., Bell, C., Hikita, Y., Kim, B. G., Hwang, H. Y.
  2011; 99 (9)
- **Common Origin of the Circular-Dichroism Pattern in Angle-Resolved Photoemission Spectroscopy of SrTiO3 and CuxBi2Se3** *PHYSICAL REVIEW LETTERS*
  Ishida, Y., Kanto, H., Kikkawa, A., Taguchi, Y., Ito, Y., Ota, Y., Okazaki, K., Malaeb, W., Mulazzi, M., Okawa, M., Watanabe, S., Chen, C., Kim, et al
  2011; 107 (7)
- **Structural Comparison of n-Type and p-Type LaAlO3/SrTiO3 Interfaces** *PHYSICAL REVIEW LETTERS*
  Yamamoto, R., Bell, C., Hikita, Y., Hwang, H. Y., Nakamura, H., Kimura, T., Wakabayashi, Y.
  2011; 107 (3)
- **Electric field penetration in Au/Nb: SrTiO3 Schottky junctions probed by bias-dependent internal photoemission** *APPLIED PHYSICS LETTERS*
  Hikita, Y., Kawamura, M., Bell, C., Hwang, H. Y.
  2011; 98 (19)
- **Nanometer-scale epitaxial strain release in perovskite heterostructures using "SrAlOx" sliding buffer layers** *APPLIED PHYSICS LETTERS*
  Sato, H. K., Mundy, J. A., Higuchi, T., Hikita, Y., Bell, C., Muller, D. A., Hwang, H. Y.
  2011; 98 (17)

- **Tuning the Electron Gas at an Oxide Heterointerface via Free Surface Charges** *ADVANCED MATERIALS*
  Xie, Y., Bell, C., Hikita, Y., Hwang, H. Y.
  2011; 23 (15): 1744-?
- **A heteroepitaxial perovskite metal-base transistor** *NATURE MATERIALS*
  Yajima, T., Hikita, Y., Hwang, H. Y.
  2011; 10 (3): 198-201
- **LaVO4:Eu Phosphor films with enhanced Eu solubility** *APPLIED PHYSICS LETTERS*
  Higuchi, T., Hotta, Y., Hikita, Y., Maruyama, S., Hayamizu, Y., Akiyama, H., Wadati, H., Hawthorn, D. G., Regier, T. Z., Blyth, R. I., Sawatzky, G. A., Hwang, H. Y.
  2011; 98 (7)
- **Built-in and induced polarization across LaAlO3/SrTiO3 heterojunctions** *NATURE PHYSICS*
  Singh-Bhalla, G., Bell, C., Ravichandran, J., Siemons, W., Hikita, Y., Salahuddin, S., Hebard, A. F., Hwang, H. Y., Ramesh, R.
  2011; 7 (1): 80-86
- **Enhancing the electron mobility via delta-doping in SrTiO3** *APPLIED PHYSICS LETTERS*
  Kozuka, Y., Kim, M., Ohta, H., Hikita, Y., Bell, C., Hwang, H. Y.
  2010; 97 (22)
- **Microscopic origins for stabilizing room-temperature ferromagnetism in ultrathin manganite layers** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Kourkoutis, L. F., Song, J. H., Hwang, H. Y., Muller, D. A.
  2010; 107 (26): 11682-11685
- **Atomic-resolution spectroscopic imaging of oxide interfaces** *PHILOSOPHICAL MAGAZINE*
  Kourkoutis, L. F., Xin, H. L., Higuchi, T., Hotta, Y., Lee, J. H., Hikita, Y., Schlom, D. G., Hwang, H. Y., Muller, D. A.
  2010; 90 (35-36): 4731-4749
- **Two-dimensional normal-state quantum oscillations in a superconducting heterostructure** *NATURE*
  Kozuka, Y., Kim, M., Bell, C., Kim, B. G., Hikita, Y., Hwang, H. Y.
  2009; 462 (7272): 487-490
- **Magnetodielectric coupling in nonmagnetic Au/GaAs:Si Schottky barriers** *PHYSICAL REVIEW B*
  Tongay, S., Hebard, A. F., Hikita, Y., Hwang, H. Y.
  2009; 80 (20)
- **Resonant soft x-ray scattering studies of interface reconstructions in SrTiO3/LaAlO3 superlattices** *JOURNAL OF APPLIED PHYSICS*
  Wadati, H., Hawthorn, D. G., Geck, J., Higuchi, T., Hikita, Y., Hwang, H. Y., Kourkoutis, L. F., Muller, D. A., Huang, S., Huang, D. J., Lin, H., Schuessler-Langeheine, C., Wu, et al
  2009; 106 (8)
- **Multiple conducting carriers generated in LaAlO3/SrTiO3 heterostructures** *APPLIED PHYSICS LETTERS*
  Seo, S. S., Marton, Z., Choi, W. S., Hassink, G. W., Blank, D. H., Hwang, H. Y., Noh, T. W., Egami, T., Lee, H. N.
  2009; 95 (8)
- **Enhanced lattice polarization in SrTiO3/LaAlO3 superlattices measured using optical second-harmonic generation** *PHYSICAL REVIEW B*
  Ogawa, N., Miyano, K., Hosoda, M., Higuchi, T., Bell, C., Hikita, Y., Hwang, H. Y.
  2009; 80 (8)
- **Mn3O4 precipitates in laser-ablated manganite films** *APPLIED PHYSICS LETTERS*
  Higuchi, T., Yajima, T., Kourkoutis, L. F., Hikita, Y., Nakagawa, N., Muller, D. A., Hwang, H. Y.
  2009; 95 (4)
- **Interface reconstruction in V-oxide heterostructures determined by x-ray absorption spectroscopy** *APPLIED PHYSICS LETTERS*
  Wadati, H., Hawthorn, D. G., Geck, J., Regier, T. Z., Blyth, R. I., Higuchi, T., Hotta, Y., Hikita, Y., Hwang, H. Y., Sawatzky, G. A.
  2009; 95 (2)
- **Thickness dependence of the mobility at the LaAlO3/SrTiO3 interface** *APPLIED PHYSICS LETTERS*

Bell, C., Harashima, S., Hikita, Y., Hwang, H. Y.
2009; 94 (22)

- **Enhanced thermodynamic stability of epitaxial oxide thin films** *ADVANCED MATERIALS*
  Song, J. H., Susaki, T., Hwang, H. Y.
  2008; 20 (13): 2528-?
- **Negative differential resistance induced by Mn substitution at SrRuO3/Nb : SrTiO3 Schottky interfaces** *PHYSICAL REVIEW B*
  Hikita, Y., Kourkoutis, L. F., Susaki, T., Muller, D. A., Takagi, H., Hwang, H. Y.
  2008; 77 (20)
- **Atomic-scale chemical imaging of composition and bonding by aberration-corrected microscopy** *SCIENCE*
  Muller, D. A., Kourkoutis, L. F., Murfitt, M., Song, J. H., Hwang, H. Y., Silcox, J., Dellby, N., Krivanek, O. L.
  2008; 319 (5866): 1073-1076
- **Polar discontinuity doping of the LaVO3/SrTiO3 interface** *PHYSICAL REVIEW LETTERS*
  Hotta, Y., Susaki, T., Hwang, H. Y.
  2007; 99 (23)
- **Growth mode control of the free carrier density in SrTiO3-delta films** *JOURNAL OF APPLIED PHYSICS*
  Ohtomo, A., Hwang, H. Y.
  2007; 102 (8)
- **Asymmetric interface profiles in LaVO3/SrTiO3 heterostructures grown by pulsed laser deposition** *APPLIED PHYSICS LETTERS*
  Kourkoutis, L. F., Muller, D. A., Hotta, Y., Hwang, H. Y.
  2007; 91 (16)
- **Characterization of the Schottky barrier in SrRuO3/Nb : SrTiO3 junctions** *APPLIED PHYSICS LETTERS*
  Hikita, Y., Kozuka, Y., Susaki, T., Takagi, H., Hwang, H. Y.
  2007; 90 (14)
- **Electronic structure of the Mott insulator LaVO3 in a quantum well geometry** *APPLIED PHYSICS LETTERS*
  Hotta, Y., Wadati, H., Fujimori, A., Susaki, T., Hwang, H. Y.
  2006; 89 (25)
- **Growth and epitaxial structure of LaVOx films** *APPLIED PHYSICS LETTERS*
  Hotta, Y., Mukunoki, Y., Susaki, T., Hwang, H. Y., Fitting, L., Muller, D. A.
  2006; 89 (3)
- **Why some interfaces cannot be sharp** *NATURE MATERIALS*
  Nakagawa, N., Hwang, H. Y., Muller, D. A.
  2006; 5 (3): 204-209
- **Atomically flat (110) SrTiO3 and heteroepitaxy** *APPLIED PHYSICS LETTERS*
  Mukunoki, Y., Nakagawa, N., Susaki, T., Hwang, H. Y.
  2005; 86 (17)
- **Magnetocapacitance and exponential magnetoresistance in manganite-titanate heterojunctions** *APPLIED PHYSICS LETTERS*
  Nakagawa, N., Asai, M., Mukunoki, Y., Susaki, T., Hwang, H. Y.
  2005; 86 (8)
- **Atomic-scale imaging of nanoengineered oxygen vacancy profiles in SrTiO3** *NATURE*
  Muller, D. A., Nakagawa, N., Ohtomo, A., Grazul, J. L., Hwang, H. Y.
  2004; 430 (7000): 657-661
- **Active mode locking of broadband quantum cascade lasers** *IEEE JOURNAL OF QUANTUM ELECTRONICS*
  Soibel, A., Capasso, F., Gmachl, C., Peabody, M. L., Sergent, A. M., Paiella, R., Hwang, H. Y., Sivco, D. L., Cho, A. Y., Liu, H. C., Jirauschek, C., Kartner, F. X.
  2004; 40 (7): 844-851

- **High-mobility electrons in SrTiO3 heterostructures** *PHYSICA E-LOW-DIMENSIONAL SYSTEMS & NANOSTRUCTURES*
  Hwang, H. Y., Ohtomo, A., Nakagawa, N., Muller, D. A., Grazul, J. L.
  2004; 22 (1-3): 712-716
- **Surface depletion in doped SrTiO3 thin films** *APPLIED PHYSICS LETTERS*
  Ohtomo, A., Hwang, H. Y.
  2004; 84 (10): 1716-1718
- **A high-mobility electron gas at the LaAlO3/SrTiO3 heterointerface** *NATURE*
  Ohtomo, A., Hwang, H. Y.
  2004; 427 (6973): 423-426
- **Free-space mid-infrared optical links using quantum cascade lasers** *Conference on Free-Space Laser Communication Technologies XV*
  Martini, R., Bethea, C., Capasso, F., Gmachl, C., Paiella, R., Whittaker, E. A., Hwang, H. Y., Sivco, D. L., Baillargeon, J. N., Cho, A. Y.
  SPIE-INT SOC OPTICAL ENGINEERING.2003: 20–24
- **Artificial charge-modulation in atomic-scale perovskite titanate superlattices** *NATURE*
  Ohtomo, A., Muller, D. A., Grazul, J. L., Hwang, H. Y.
  2002; 419 (6905): 378-380
- **Epitaxial growth and electronic structure of LaTiOx films** *APPLIED PHYSICS LETTERS*
  Ohtomo, A., Muller, D. A., Grazul, J. L., Hwang, H. Y.
  2002; 80 (21): 3922-3924
- **Quantum cascade lasers with double metal-semiconductor waveguide resonators** *APPLIED PHYSICS LETTERS*
  Unterrainer, K., Colombelli, R., Gmachl, C., Capasso, F., Hwang, H. Y., Sergent, A. M., Sivco, D. L., Cho, A. Y.
  2002; 80 (17): 3060-3062
- **Recent results in quantum cascade lasers and intersubband transitions in GaN/AlGaN multiple quantum wells** *PHYSICA E-LOW-DIMENSIONAL SYSTEMS & NANOSTRUCTURES*
  Gmachl, C., Ng, H. M., Paiella, R., Martini, R., Hwang, H. Y., Sivco, D. L., Capasso, F., Cho, A. Y., Frolov, S. V., Chu, S. N., Liu, H. C.
  2002; 13 (2-4): 823-828
- **High-frequency modulation without the relaxation oscillation resonance in quantum cascade lasers** *APPLIED PHYSICS LETTERS*
  Paiella, R., Martini, R., Capasso, F., Gmachl, C., Hwang, H. Y., Sivco, D. L., Baillargeon, J. N., Cho, A. Y., Whittaker, E. A., Liu, H. C.
  2001; 79 (16): 2526-2528
- **Quantum cascade lasers with low-loss chalcogenide lateral waveguides** *IEEE PHOTONICS TECHNOLOGY LETTERS*
  Gmachl, C., Hwang, H. Y., Paiella, R., Sivco, D. L., Baillargeon, J. N., Capasso, F., Cho, A. Y.
  2001; 13 (3): 182-184
- **Monolithic active mode locking of quantum cascade lasers** *APPLIED PHYSICS LETTERS*
  Paiella, R., Capasso, F., Gmachl, C., Hwang, H. Y., Sivco, D. L., Hutchinson, A. L., Cho, A. Y., Liu, H. C.
  2000; 77 (2): 169-171
- **Magnetic anisotropy of doped manganite thin films and crystals** *7th Joint Magnetism and Magnetic Materials / International Magnetics Conference*
  Suzuki, Y., Hwang, H. Y., Cheong, S. W., Siegrist, T., van Dover, R. B., Asamitsu, A., Tokura, Y.
  AMER INST PHYSICS.1998: 7064–66
- **Magnetic anisotropy and lattice distortions in the doped perovskite manganites** *Symposium on Metallic Magnetic Oxides at the Materials-Research-Society Fall Meeting*
  Suzuki, Y., Hwang, H. Y., Cheong, S. W., van Dover, R. B., Asamitsu, A., Tokura, Y.
  MATERIALS RESEARCH SOCIETY.1998: 41–51
- **Ln(3)Cu(4)P(4)O(2): A new lanthanide transition metal Pnictide oxide structure type** *Symposium on Solid-State Chemistry of Inorganic Materials*
  Cava, R. J., Zandbergen, H. W., Krajewski, J. J., Siegrist, T., Hwang, H. Y., Ramirez, A. P., Batlogg, B.
  MATERIALS RESEARCH SOCIETY.1997: 305–310

- **The effects of strain on the magnetic anisotropy of doped manganite thin films** *Symposium on Epitaxial Oxide Thin Films III, at the 1997 MRS Spring Meeting*
  Suzuki, Y., Tsai, C., Hwang, H. Y., Cheong, S. W., VANDOVER, R. B.
  MATERIALS RESEARCH SOCIETY.1997: 205–210
- **ORDERING OF CHARGE-CARRIERS IN (LA,SR)2NIO4** *International Conference on Strongly Correlated Electron Systems (SCES 93)*
  Cheong, S. W., Chen, C. H., Hwang, H. Y., Batlogg, B., RUPP, L. W., Cooper, A. S.
  ELSEVIER SCIENCE BV.1994: 659–661