

# Stanford

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## Harold Hwang

Director, Stanford Institute for Materials and Energy Sciences (SIMES), Professor of Applied Physics, of Photon Science and Senior Fellow at the Precourt Institute for Energy

### Bio

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#### ACADEMIC APPOINTMENTS

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

### Teaching

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#### COURSES

##### 2021-22

- Solid State Physics II: APPPHYS 273 (Aut)

##### 2020-21

- Solid State Physics II: APPPHYS 273 (Aut)

##### 2019-20

- Condensed Matter Seminar: APPPHYS 470 (Aut, Win)
- Solid State Physics: APPPHYS 272, PHYSICS 172 (Spr)
- Solid State Physics II: APPPHYS 273 (Aut)

##### 2018-19

- Solid State Physics: APPPHYS 272, PHYSICS 172 (Spr)
- Solid State Physics II: APPPHYS 273 (Aut)

#### STANFORD ADVISEES

##### Doctoral Dissertation Reader (AC)

Lauren Riddiford, Ruby Shi, Matthew Sorensen, Yue YU, Caleb Zerger, Xinyang Zhang, Charles Zheng

##### Postdoctoral Faculty Sponsor

Jennifer Fowlie, Shannon Harvey, Woojin Kim, Kyuho Lee, Ruijuan Xu, Yijun Yu

##### Doctoral Dissertation Advisor (AC)

Kyuho Lee, Bai Yang Wang

##### Doctoral Dissertation Co-Advisor (AC)

Sam Abernethy

## Doctoral (Program)

Fatih Dinc, Tudor Giurgica-Tiron, Sophia Han, Omer Hazon, YoungJu Jo, Kuan-Yu Li, Megan Nantel, Ryotatsu Yanagimoto

## Postdoctoral Research Mentor

Shannon Harvey, Woojin Kim, Ruijuan Xu

## Publications

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### PUBLICATIONS

- **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 Nd<sub>1-x</sub>Sr<sub>x</sub>NiO<sub>2</sub>** *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)NiO<sub>2</sub>.** *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 SrTiO<sub>3</sub> 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 SrIrO<sub>3</sub> 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 Sr<sub>3</sub>Al<sub>2</sub>O<sub>6</sub> 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 Fe<sub>2</sub>TiO<sub>5</sub> 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 SrTiO<sub>3</sub> 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 Nd<sub>0.775</sub>Sr<sub>0.225</sub>NiO<sub>2</sub>** *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 Pr<sub>1-x</sub>Sr<sub>x</sub>NiO<sub>2</sub> 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<sub>1-x</sub>Sr<sub>x</sub>NiO<sub>2</sub> 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 Nd<sub>1-x</sub>Sr<sub>x</sub>NiO<sub>2</sub> 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 dx<sub>2</sub>-y<sub>2</sub>-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 La<sub>0.7</sub>Ca<sub>0.3</sub>MnO<sub>3</sub> membranes.** *Science (New York, N.Y.)*  
Hong, S. S., Gu, M. n., Verma, M. n., Harbola, V. n., Wang, B. Y., Lu, D. n., Vaillonis, 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 SrTiO<sub>3</sub> 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 SrTiO<sub>3</sub>** *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 SrTiO<sub>3</sub> (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 BaSnO<sub>3</sub> 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 YBa<sub>2</sub>Cu<sub>3</sub>O<sub>7-x</sub> 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 SrTiO<sub>3</sub> 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 IrO<sub>x</sub>/SrIrO<sub>3</sub> 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<sub>x</sub>/SrIrO<sub>3</sub> 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 MoS<sub>2</sub> 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. 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 elasto-resistivity at finite frequency by amplitude demodulation** *REVIEW OF SCIENTIFIC INSTRUMENTS*  
Hristov, A. T., Palmstrom, J. C., Straquadine, J. W., Merz, T. A., Hwang, H. Y., Fisher, I. R.  
2018; 89 (10)
- **Measurement of elasto-resistivity 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., Wissler, 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. 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-SnSe<sub>2</sub>** *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 SrTiO<sub>3</sub> domain walls** *NATURE MATERIALS*  
Frenkel, Y., Haham, N., Shperber, Y., Bell, C., Xie, Y., Chen, Z., Hikita, Y., Hwang, H. Y., Salje, E. 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 MoS<sub>2</sub>** *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 Sr<sub>3</sub>Al<sub>2</sub>O<sub>6</sub> 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 Bi<sub>2</sub>O<sub>2</sub>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–+
- **Ubiquitous strong electron-phonon coupling at the interface of FeSe/SrTiO<sub>3</sub>** *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 SrTiO<sub>3</sub> 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 SrTiO<sub>3</sub>** *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 IrO<sub>x</sub>/SrIrO<sub>3</sub> 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  
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