

Stanford

Harold Hwang

Professor of Applied Physics and of Photon Science

Bio

ACADEMIC APPOINTMENTS

- Professor, Applied Physics
- Professor, Photon Science Directorate

Teaching

COURSES

2019-20

- Condensed Matter Seminar: APPPHYS 470 (Aut, Win, Spr)
- 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)

2017-18

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

2016-17

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

STANFORD ADVISEES

Alfred Cheung

Doctoral Dissertation Reader (AC)

Tao Jia, Ilkyu Lee, Sam Mumford, Joshua Straquadine, Chao Wang, Patrick Worasaran

Postdoctoral Faculty Sponsor

Shannon Harvey, Seung Sae Hong, Woojin Kim, Denver Li, Ruijuan Xu

Doctoral Dissertation Advisor (AC)

Varun Harbola, Kyuho Lee, Motoki Osada, Prastuti Singh, Bai Yang Wang, Hyeok Yoon

Doctoral (Program)

Tudor Giurgica-Tiron, Omer Hazon, YoungJu Jo, Kuan-Yu Li, Megan Nantel, John Roberts, Wen Wang, Ryotatsu Yanagimoto

Postdoctoral Research Mentor

Shannon Harvey, Woojin Kim, Denver Li, Ruijuan Xu

Publications

PUBLICATIONS

- **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
- **Freestanding crystalline YBa₂Cu₃O_{7-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 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., Du, K., Ren, T., Tian, H., Zhang, Z., Hwang, H. Y., Xie, Y.
2019; 10 (1): 4026
- **Freestanding Oxide Ferroelectric Tunnel Junction Memories Transferred onto Silicon.** *Nano letters*
Lu, D., Crossley, S., Xu, R., Hikita, Y., 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
- **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 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., 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-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. H., Kalisky, B.
2017; 16 (12): 1203–+
- **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–+
- **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
- **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
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- **.** *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., Marshall, A. F., Hikita, Y., Cui, Y., 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., Vaillonis, 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., Vaillonis, 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)
- **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-?
- **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-?
- **Tuning Band Alignment Using Interface Dipoles at the Pt/Anatase TiO_n Interface.** *Advanced materials (Deerfield Beach, Fla.)*
Tachikawa, T., Minohara, M., Hikita, Y., Bell, C., Hwang, H. Y.
2015; 27 (45): 7458-61
- **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
- **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*
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