Stanford



Aaron Lindenberg

Professor of Materials Science and Engineering and of Photon Science

CONTACT INFORMATION

- **Administrator**

  Benita Givens - Administrative Associate

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Bio

BIO

Lindenberg's research is focused on visualizing the ultrafast dynamics and atomic-scale structure of materials on femtosecond and picosecond time-scales. X-ray and electron scattering and spectroscopic techniques are combined with ultrafast optical techniques to provide a new way of taking snapshots of materials in motion. Current research is focused on the dynamics of phase transitions, ultrafast properties of nanoscale materials, and charge transport, with a focus on materials for information storage technologies, energy-related materials, and nanoscale optoelectronic devices.

ACADEMIC APPOINTMENTS

- Professor, Materials Science and Engineering
- Professor, Photon Science Directorate
- Member, Bio-X
- Affiliate, Precourt Institute for Energy
- Principal Investigator, Stanford Institute for Materials and Energy Sciences
- Principal Investigator, Stanford PULSE Institute

HONORS AND AWARDS

- Chambers Fellow, Stanford University (2015-2018)
- Young Faculty Award, DARPA (2010)
- DOE Outstanding Mentor Award, Department of Energy (2009)
- Terman Fellow, Stanford University (2007-2009)
- Faculty Fellow Post-doctoral Fellowship, University of California, Berkeley (2001-2003)
- Alfred Moritz Michaelis Prize in Physics, Columbia University (1996)
- I.I. Rabi Scholar, Columbia University (1992-1996)

PROFESSIONAL EDUCATION

- BA, Columbia University (1996)

- PhD, UC Berkeley (2001)

PATENTS

- Jun Xiao, Aaron Lindenberg. "United States Patent 11,355,697 Nanometer scale nonvolatile memory device and method for storing binary and quantum memory states", Leland Stanford Junior University, Jun 7, 2022
- Edbert Sie, Clara Nyby, Das Pemmaraju Xijie Wang, Aaron Lindenberg. "United States Patent 10861995 Fast topological switch using strained weyl semimetals", Leland Stanford Junior University, Dec 8, 2020

LINKS

- Group Site: https://lindenberg.sites.stanford.edu/

Teaching

COURSES

2026-27

- X-Ray Science and Techniques: MATSCI 326 (Win)

2025-26

- Quantum Mechanics of Nanoscale Materials: MATSCI 142 (Aut)

2024-25

- Quantum Mechanics of Nanoscale Materials: MATSCI 142 (Spr)

2023-24

- Quantum Mechanics of Nanoscale Materials: MATSCI 142 (Spr)

STANFORD ADVISEES

Doctoral Dissertation Reader (AC)

Tri Nguyen, Kelly Xiao

Postdoctoral Faculty Sponsor

Huaiyu Wang

Doctoral Dissertation Advisor (AC)

Autumn Lee, Pranav Mahaadev, Yuejun Shen

Doctoral Dissertation Co-Advisor (AC)

Xin Chen, Samuel Lai

Postdoctoral Research Mentor

Sheikh Rubaiat Ul Haque

Publications

PUBLICATIONS

- **Interfacial Control of Hot-Carrier Extraction and Photostability in Two-Dimensional Materials.** *ACS nano*
  Gollner, C., Taghinejad, M., Xia, C., Zhang, Z., Liu, F., Laudani, F., Foelske, A., Brongersma, M. L., Mannix, A. J., Heinz, T. F., Lindenberg, A. M. 2026; 20 (38): 26205-26214
- **Interfacial Control of Hot-Carrier Extraction and Photostability in Two-Dimensional Materials** *ACS NANO*
  Gollner, C., Taghinejad, M., Xia, C., Zhang, Z., Liu, F., Laudani, F., Foelske, A., Brongersma, M. L., Mannix, A. J., Heinz, T. F., Lindenberg, A. M. 2026

- **Tracking Thermal Transport in Colloidal Quantum Dot Films Using in Situ Time-Resolved X-ray Diffraction.** *Nano letters*
  Wieman, E., Nagelj, N., Curling, E., Chen, L., Yu, J., Alivisatos, A. P., Lindenberg, A. M., Diroll, B. T., Olshansky, J. H., Ma, J., Guzelturk, B., Cotts, B. L.
  2026; 26 (32): 10725-10733
- **Quantifying and Minimizing Dissipation in a Nonequilibrium Phase Transition** *PHYSICAL REVIEW LETTERS*
  Shen, Y., Jiang, Z., Huang, Y., Cleary, B. M., Jiang, Y., Rotskoff, G. M., Lindenberg, A. M.
  2026; 137 (7)
- **Tracking ThermalTransport in Colloidal Quantum DotFilms Using in Situ Time-Resolved X-ray Diffraction** *NANO LETTERS*
  Wieman, E., Nagelj, N., Curling, E., Chen, L., Yu, J., Alivisatos, A., Lindenberg, A. M., Diroll, B. T., Olshansky, J. H., Ma, J., Guzelturk, B., Cotts, B. L.
  2026
- **Decoding THz-Driven Dynamic Fingerprints of Ferroelectric Nanotwin Networks.** *Advanced materials (Deerfield Beach, Fla.)*
  Li, X., Ross, A., Stoica, V. A., Das, S., Hazra, S., Wang, H. H., Padma, H., Hoffmann, M. C., Kramer, P., Song, S., Nelson, S., Sato, T., Zhu, et al
  2026: e73118
- **Time-domain terahertz emission spectroscopy on van der Waals materials** *MRS COMMUNICATIONS*
  Gollner, C., Lindenberg, A., Heinz, T. F.
  2026
- **Time-domain terahertz emission spectroscopy on van der Waals materials.** *MRS communications*
  Gollner, C., Lindenberg, A., Heinz, T. F.
  2026; 16 (3): 659-671
- **Solid-phase heteroepitaxy of oriented Sb₂Se₃ on GaAs for birefringent thin films** *JOURNAL OF VACUUM SCIENCE & TECHNOLOGY A*
  Xiao, K., Shen, Y., Vailionis, A., Skipper, A. M., Preidl, A., Lindenberg, A. M., Mukherjee, K.
  2026; 44 (2)
- **Non-equilibrium entropy production and information dissipation in a non-Markovian quantum dot** *NATURE PHYSICS*
  Shen, Y., Chen, C., Ma, H., Saunders, A. P., Heide, C., Liu, F., Rotskoff, G. M., Shi, J., Lindenberg, A. M.
  2026
- **Direct probing of ultrafast hot-carrier injection and photo-induced degradation at Au/WS₂ interfaces using time-domain THz emission spectroscopy**
  Gollner, C., Xia, C., Taghinejad, M., Zhang, Z., Liu, F., Brongersma, M. L., Mannix, A. J., Heinz, T., Lindenberg, A.
  edited by Majumdar, A., Torres, C. M., Deng, H.
  SPIE-INT SOC OPTICAL ENGINEERING.2026
- **Photoinduced twist and untwist of moiré superlattices.** *Nature*
  Duncan, C. J., Johnson, A. C., Maity, I., Rubio, A., Gordon, M., Bartnik, A. C., Kaemingk, M., Li, W. H., Andorf, M. B., Pennington, C. A., Bazarov, I. V., Tate, M. W., Muller, et al
  2025
- **Terahertz-field activation of polar skyrons.** *Nature communications*
  Wang, H. H., Stoica, V. A., Dai, C., Paściak, M., Das, S., Yang, T., Gonçalves, M. A., Kulda, J., McCarter, M. R., Mangu, A., Cao, Y., Padma, H., Saha, et al
  2025; 16 (1): 8994
- **Nonresonant Raman Control of Ferroelectric Polarization.** *Advanced materials (Deerfield Beach, Fla.)*
  Shi, J., Heide, C., Xu, H., Shen, Y., Henstridge, M., Sedwick, I., Mangu, A., Peng, X., Zhang, S., Trigo, M., Heinz, T. F., Li, J., Nelson, et al
  2025: e10524
- **Phase segregation dynamics in mixed-halide perovskites revealed by plunge-freeze cryo-electron microscopy** *CELL REPORTS PHYSICAL SCIENCE*
  Fan, Q., Cui, Y., Li, Y., Vigil, J. A., Jiang, Z., Nandi, P., Colby, R., Zhang, C., Cui, Y., Karunadasa, H. I., Lindenberg, A. M.
  2025; 6 (6)
- **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)

- **Analysis methodology of coherent oscillations in time- and angle-resolved photoemission spectroscopy.** *The Review of scientific instruments*

  Gauthier, N., Soifer, H., Sobota, J. A., Pfau, H., Sie, E. J., Lindenberg, A. M., Shen, Z. X., Kirchmann, P. S.

  2025; 96 (2)

- **Hidden domain boundary dynamics toward crystalline perfection.** *Proceedings of the National Academy of Sciences of the United States of America*

  Mangu, A., Stoica, V. A., Zheng, H., Yang, T., Zhang, M., Wang, H. H., Zu, R., Nguyen, Q. L., Song, S., Das, S., Meisenheimer, P., Donoway, E., Chollet, et al

  2025; 122 (2): e2407772122

- **Probing Hot Carrier Acceleration in Evanescent Plasmon Fields**

  Hemmatyar, O., Taghinejad, M., Gollner, C., Lindenberg, A. M., Brongersma, M. L., IEEE

  IEEE.2025

- **THz-Driven Symmetry Modulation in MnPS₃**

  Cross, M. J., Ul Haque, S. R., Lindenberg, A. M., Hoffmann, M. C., IEEE

  IEEE.2025

- **Terahertz Emission of Hot Carrier Plasmonics**

  Taghinejad, M., Gollner, C., Lindenberg, A. M., Brongersma, M. L., IEEE

  IEEE.2025

- **Electrochemical Control of the Ultrafast Lattice Response of a Layered Semimetal.** *Advanced science (Weinheim, Baden-Wurttemberg, Germany)*

  de Quesada, F. A., Muscher, P. K., Krakovsky, E. S., Sood, A., Poletayev, A. D., Sie, E. J., Nyby, C. M., Irvine, S. J., Zajac, M. E., Luo, D., Shen, X., Hoffmann, M. C., Kramer, et al

  2024: e2411344

- **3D Heisenberg universality in the van der Waals antiferromagnet NiPS₃** *NPJ QUANTUM MATERIALS*

  Plumley, R., Mardanya, S., Peng, C., Nokelainen, J., Assefa, T., Shen, L., Burdet, N., Porter, Z., Petsch, A., Israelski, A., Chen, H., Lee, J., Morley, et al

  2024; 9 (1)

- **Ultrafast Symmetry Control in Photoexcited Quantum Dots.** *Advanced materials (Deerfield Beach, Fla.)*

  Guzelturk, B., Portner, J., Ondry, J., Ghanbarzadeh, S., Tarantola, M., Jeong, A., Field, T., Chandler, A. M., Wieman, E., Hopper, T. R., Watkins, N. E., Yu, J., Cheng, et al

  2024: e2414196

- **Colossal Strain Tuning of Ferroelectric Transitions in KNbO3 Thin Films.** *Advanced materials (Deerfield Beach, Fla.)*

  Hazra, S., Schwaigert, T., Ross, A., Lu, H., Saha, U., Trinquet, V., Akkopru-Akgun, B., Gregory, B. Z., Mangu, A., Sarker, S., Kuznetsova, T., Sarker, S., Li, et al

  2024: e2408664

- **Coupling to octahedral tilts in halide perovskite nanocrystals induces phonon-mediated attractive interactions between excitons.** *Nature physics*

  Yazdani, N., Bodnarchuk, M. I., Bertolotti, F., Masciocchi, N., Fureraj, I., Guzelturk, B., Cotts, B. L., Zajac, M., Rainò, G., Jansen, M., Boehme, S. C., Yarema, M., Lin, et al

  2024; 20 (1): 47-53

- **Non-equilibrium pathways to emergent polar supertextures.** *Nature materials*

  Stoica, V. A., Yang, T., Das, S., Cao, Y., Wang, H. H., Kubota, Y., Dai, C., Padma, H., Sato, Y., Mangu, A., Nguyen, Q. L., Zhang, Z., Talreja, et al

  2024

- **Roadmap on low-power electronics** *APL MATERIALS*

  Ramesh, R., Salahuddin, S., Datta, S., Diaz, C. H., Nikonov, D. E., Young, I. A., Ham, D., Chang, M., Khwa, W., Lele, A., Binek, C., Huang, Y., Sun, et al

2024; 12 (9)

- **Giant Terahertz Birefringence in an Ultrathin Anisotropic Semimetal.** *Nano letters*
  Sie, E. J., Othman, M. A., Nyby, C. M., Pemmaraju, D., Garcia, C. A., Wang, Y., Guzelturk, B., Xia, C., Xiao, J., Poletayev, A., Ofori-Okai, B. K., Hoffmann, M. C., Park, et al
  2024
- **Solution-phase sample-averaged single-particle spectroscopy of quantum emitters with femtosecond resolution.** *Nature materials*
  Shi, J., Shen, Y., Pan, F., Sun, W., Mangu, A., Shi, C., McKeown-Green, A., Moradifar, P., Bawendi, M. G., Moerner, W. E., Dionne, J. A., Liu, F., Lindenberg, et al
  2024
- **Publisher Correction: The persistence of memory in ionic conduction probed by nonlinear optics.** *Nature*
  Poletayev, A. D., Hoffmann, M. C., Dawson, J. A., Teitelbaum, S. W., Trigo, M., Islam, M. S., Lindenberg, A. M.
  2024
- **Hidden phonon highways promote photoinduced interlayer energy transfer in twisted transition metal dichalcogenide heterostructures.** *Science advances*
  Johnson, A. C., Georgaras, J. D., Shen, X., Yao, H., Saunders, A. P., Zeng, H. J., Kim, H., Sood, A., Heinz, T. F., Lindenberg, A. M., Luo, D., da Jornada, F. H., Liu, et al
  2024; 10 (4): eadj8819
- **The persistence of memory in ionic conduction probed by nonlinear optics.** *Nature*
  Poletayev, A. D., Hoffmann, M. C., Dawson, J. A., Teitelbaum, S. W., Trigo, M., Islam, M. S., Lindenberg, A. M.
  2024; 625 (7996): 691-696
- **Terahertz Radiation of Plasmonic Hot Carriers**
  Taghinejad, M., Xia, C., Hrton, M., Lee, K., Kim, A. S., Li, Q., Guzelturk, B., Kalousek, R., Xu, F., Cai, W., Lindenberg, A. M., Brongersma, M. L.
  edited by Lin, S. Y., Adibi, A., Scherer, A.
  SPIE-INT SOC OPTICAL ENGINEERING.2024
- **Accelerating Quantum Materials Development with Advances in Transmission Electron Microscopy.** *Chemical reviews*
  Moradifar, P., Liu, Y., Shi, J., Siukola Thurston, M. L., Utzat, H., van Driel, T. B., Lindenberg, A. M., Dionne, J. A.
  2023
- **Coupling to octahedral tilts in halide perovskite nanocrystals induces phonon-mediated attractive interactions between excitons** *NATURE PHYSICS*
  Yazdani, N., Bodnarchuk, M. I., Bertolotti, F., Masciocchi, N., Fureraj, I., Guzelturk, B., Cotts, B. L., Zajac, M., Raino, G., Jansen, M., Boehme, S. C., Yarema, M., Lin, et al
  2023
- **Determining hot-carrier transport dynamics from terahertz emission.** *Science (New York, N.Y.)*
  Taghinejad, M., Xia, C., Hrton, M., Lee, K. T., Kim, A. S., Li, Q., Guzelturk, B., Kalousek, R., Xu, F., Cai, W., Lindenberg, A. M., Brongersma, M. L.
  2023; 382 (6668): 299-305
- **Nonthermal Bonding Origin of a Novel Photoexcited Lattice Instability in SnSe.** *Physical review letters*
  Huang, Y., Teitelbaum, S., Yang, S., De la Peña, G., Sato, T., Chollet, M., Zhu, D., Niedziela, J. L., Bansal, D., May, A. F., Lindenberg, A. M., Delaire, O., Trigo, et al
  2023; 131 (15): 156902
- **Subnanosecond Reconfiguration of Ferroelectric Domains in Bismuth Ferrite.** *Advanced materials (Deerfield Beach, Fla.)*
  Guzelturk, B., Yang, T., Liu, Y. C., Wei, C. C., Orenstein, G., Trigo, M., Zhou, T., Diroll, B. T., Holt, M. V., Wen, H., Chen, L. Q., Yang, J. C., Lindenberg, et al
  2023: e2306029
- **Giant room-temperature nonlinearities in a monolayer Janus topological semiconductor.** *Nature communications*
  Shi, J., Xu, H., Heide, C., HuangFu, C., Xia, C., de Quesada, F., Shen, H., Zhang, T., Yu, L., Johnson, A., Liu, F., Shi, E., Jiao, et al
  2023; 14 (1): 4953
- **Ultrafast Wavefront Shaping via Space-Time Refraction** *ACS PHOTONICS*
  Fan, Q., Shaltout, A. M., van de Groep, J., Brongersma, M. L., Lindenberg, A. M.

2023

- **Pulsed laser ejection of single-crystalline III-V solar cells from GaAs substrates** *CELL REPORTS PHYSICAL SCIENCE*
  Reeves, B. A., Steiner, M. A., Carver, T. E., Zhang, Z., Lindenberg, A. M., Clemens, B. M.
  2023; 4 (6)

- **Understanding and Controlling Photothermal Responses in MXenes.** *Nano letters*
  Guzelturk, B., Kamysbayev, V., Wang, D., Hu, H., Li, R., King, S. B., Reid, A. H., Lin, M., Wang, X., Walko, D. A., Zhang, X., Lindenberg, A., Talapin, et al
  2023

- **Ultrafast Optomechanical Strain in Layered GeS.** *Nano letters*
  Luo, D., Zhang, B., Sie, E. J., Nyby, C. M., Fan, Q., Shen, X., Reid, A. H., Hoffmann, M. C., Weathersby, S., Wen, J., Qian, X., Wang, X., Lindenberg, et al
  2023

- **Bidirectional phonon emission in two-dimensional heterostructures triggered by ultrafast charge transfer.** *Nature nanotechnology*
  Sood, A., Haber, J. B., Carlström, J., Peterson, E. A., Barre, E., Georgaras, J. D., Reid, A. H., Shen, X., Zajac, M. E., Regan, E. C., Yang, J., Taniguchi, T., Watanabe, et al
  2022

- **Light-Driven Ultrafast Polarization Manipulation in a Relaxor Ferroelectric.** *Nano letters*
  Park, S., Wang, B., Yang, T., Kim, J., Saremi, S., Zhao, W., Guzelturk, B., Sood, A., Nyby, C., Zajac, M., Shen, X., Kozina, M., Reid, et al
  2022

- **A room-temperature polarization-sensitive CMOS terahertz camera based on quantum-dot-enhanced terahertz-to-visible photon upconversion.** *Nature nanotechnology*
  Shi, J., Yoo, D., Vidal-Codina, F., Baik, C. W., Cho, K. S., Nguyen, N. C., Utzat, H., Han, J., Lindenberg, A. M., Bulović, V., Bawendi, M. G., Peraire, J., Oh, et al
  2022

- **Thickness- and Twist-Angle-Dependent Interlayer Excitons in Metal Monochalcogenide Heterostructures.** *ACS nano*
  Zheng, W., Xiang, L., de Quesada, F. A., Augustin, M., Lu, Z., Wilson, M., Sood, A., Wu, F., Shcherbakov, D., Memaran, S., Baumbach, R. E., McCandless, G. T., Chan, et al
  2022

- **Large Exchange Coupling Between Localized Spins and Topological Bands in Magnetic Topological Insulator MnBi2 Te4.** *Advanced materials (Deerfield Beach, Fla.)*
  Padmanabhan, H., Stoica, V. A., Kim, P. K., Poore, M., Yang, T., Shen, X., Reid, A. H., Lin, M., Park, S., Yang, J., Hugo Wang, H., Koocher, N. Z., Puggioni, et al
  2022: e2202841

- **Non-Equilibrium Lattice Dynamics in Photo-Excited Two-Dimensional Perovskites.** *Advanced materials (Deerfield Beach, Fla.)*
  Cuthriell, S. A., Panuganti, S., Laing, C. C., Quintero, M. A., Guzelturk, B., Yazdani, N., Traore, B., Brumberg, A., Malliakas, C. D., Lindenberg, A. M., Wood, V., Katan, C., Even, et al
  2022: e2202709

- **Defect-driven anomalous transport in fast-ion conducting solid electrolytes.** *Nature materials*
  Poletayev, A. D., Dawson, J. A., Islam, M. S., Lindenberg, A. M.
  2022

- **Interlayer magnetophononic coupling in MnBi2Te4.** *Nature communications*
  Padmanabhan, H., Poore, M., Kim, P. K., Koocher, N. Z., Stoica, V. A., Puggioni, D., Hugo Wang, H., Shen, X., Reid, A. H., Gu, M., Wetherington, M., Lee, S. H., Schaller, et al
  2022; 13 (1): 1929

- **Laser-induced patterning for a diffraction grating using the phase change material of Ge2Sb2Te5 (GST) as a spatial light modulator in X-ray optics: a proof of concept** *OPTICAL MATERIALS EXPRESS*
  Park, J., Zalden, P., Ng, E., Johnston, S., Fong, S. W., Chang, C., Tassone, C. J., Van Campen, D., Mok, W., Mabuchi, H., Wong, H., Shen, Z., Lindenberg, et al
  2022; 12 (4): 1408-1416

- **Observation of a Novel Lattice Instability in Ultrafast Photoexcited SnSe** *PHYSICAL REVIEW X*
  Huang, Y., Yang, S., Teitelbaum, S., De la Pena, G., Sato, T., Chollet, M., Zhu, D., Niedziela, J. L., Bansal, D., May, A. F., Lindenberg, A. M., Delaire, O., Reis, et al
  2022; 12 (1)

- **Testing the data framework for an AI algorithm in preparation for high data rate X-ray facilities**
  Chen, H., Chitturi, S. R., Plumley, R., Shen, L., Drucker, N. C., Burdet, N., Peng, C., Mardanya, S., Ratner, D., Mishra, A., Yoon, C., Song, S., Chollet, et al
  IEEE.2022: 1-9

- **Dynamically Tunable Terahertz Emission Enabled by Anomalous Optical Phonon Responses in Lead Telluride** *ACS PHOTONICS*
  Guzelturk, B., Trigo, M., Delaire, O., Reis, D. A., Lindenberg, A. M.
  2021; 8 (12): 3633-3640

- **Inq, a Modern GPU-Accelerated Computational Framework for (Time-Dependent) Density Functional Theory.** *Journal of chemical theory and computation*
  Andrade, X., Pemmaraju, C. D., Kartsev, A., Xiao, J., Lindenberg, A., Rajpurohit, S., Tan, L. Z., Ogitsu, T., Correa, A. A.
  2021

- **Twist-Angle-Dependent Ultrafast Charge Transfer in MoS2-Graphene van der Waals Heterostructures.** *Nano letters*
  Luo, D., Tang, J., Shen, X., Ji, F., Yang, J., Weathersby, S., Kozina, M. E., Chen, Z., Xiao, J., Ye, Y., Cao, T., Zhang, G., Wang, et al
  2021

- **Dynamic structural views in solar energy materials by femtosecond electron diffraction** *MRS BULLETIN*
  Guzelturk, B., Lindenberg, A.
  2021

- **Direct observation of ultrafast hydrogen bond strengthening in liquid water.** *Nature*
  Yang, J., Dettori, R., Nunes, J. P., List, N. H., Biasin, E., Centurion, M., Chen, Z., Cordones, A. A., Deponte, D. P., Heinz, T. F., Kozina, M. E., Ledbetter, K., Lin, et al
  2021; 596 (7873): 531-535

- **Highly Efficient Uniaxial In-Plane Stretching of a 2D Material via Ion Insertion.** *Advanced materials (Deerfield Beach, Fla.)*
  Muscher, P. K., Rehn, D. A., Sood, A., Lim, K., Luo, D., Shen, X., Zajac, M., Lu, F., Mehta, A., Li, Y., Wang, X., Reed, E. J., Chueh, et al
  2021: e2101875

- **Universal phase dynamics in VO2 switches revealed by ultrafast operando diffraction** *SCIENCE*
  Sood, A., Shen, X., Shi, Y., Kumar, S., Park, S., Zajac, M., Sun, Y., Chen, L., Ramanathan, S., Wang, X., Chueh, W. C., Lindenberg, A. M.
  2021; 373 (6552): 352-+

- **Universal phase dynamics in VO2 switches revealed by ultrafast operando diffraction.** *Science (New York, N.Y.)*
  Sood, A., Shen, X., Shi, Y., Kumar, S., Park, S. J., Zajac, M., Sun, Y., Chen, L. Q., Ramanathan, S., Wang, X., Chueh, W. C., Lindenberg, A. M.
  2021; 373 (6552): 352-355

- **Electrochemical ion insertion from the atomic to the device scale** *NATURE REVIEWS MATERIALS*
  Sood, A., Poletayev, A. D., Cogswell, D. A., Csernica, P. M., Mefford, J., Fraggedakis, D., Toney, M. F., Lindenberg, A. M., Bazant, M. Z., Chueh, W. C.
  2021

- **Nanoscale Disorder Generates Subdiffusive Heat Transport in Self-Assembled Nanocrystal Films.** *Nano letters*
  Utterback, J. K., Sood, A., Coropceanu, I., Guzelturk, B., Talapin, D. V., Lindenberg, A. M., Ginsberg, N. S.
  2021

- **Subterahertz collective dynamics of polar vortices.** *Nature*
  Li, Q., Stoica, V. A., Pasciak, M., Zhu, Y., Yuan, Y., Yang, T., McCarter, M. R., Das, S., Yadav, A. K., Park, S., Dai, C., Lee, H. J., Ahn, et al
  2021; 592 (7854): 376–80

- **Dynamic lattice distortions driven by surface trapping in semiconductor nanocrystals.** *Nature communications*
  Guzelturk, B., Cotts, B. L., Jasrasaria, D., Philbin, J. P., Hanifi, D. A., Koscher, B. A., Balan, A. D., Curling, E., Zajac, M., Park, S., Yazdani, N., Nyby, C., Kamysbayev, et al

2021; 12 (1): 1860

- **Visualization of dynamic polaronic strain fields in hybrid lead halide perovskites.** *Nature materials*
  Guzelturk, B., Winkler, T., Van de Goor, T. W., Smith, M. D., Bourelle, S. A., Feldmann, S., Trigo, M., Teitelbaum, S. W., Steinruck, H., de la Pena, G. A., Alonso-Mori, R., Zhu, D., Sato, et al
  2021
- **Carrier-specific dynamics in 2H-MoTe2 observed by femtosecond soft x-ray absorption spectroscopy using an x-ray free-electron laser.** *Structural dynamics (Melville, N.Y.)*
  Britz, A., Attar, A. R., Zhang, X., Chang, H., Nyby, C., Krishnamoorthy, A., Park, S. H., Kwon, S., Kim, M., Nordlund, D., Sainio, S., Heinz, T. F., Leone, et al
  2021; 8 (1): 014501
- **Steam-created grain boundaries for methane C-H activation in palladium catalysts.** *Science (New York, N.Y.)*
  Huang, W., Johnston-Peck, A. C., Wolter, T., Yang, W. D., Xu, L., Oh, J., Reeves, B. A., Zhou, C., Holtz, M. E., Herzing, A. A., Lindenberg, A. M., Mavrikakis, M., Cargnello, et al
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