Stanford



Robert Sinclair

Charles M. Pigott Professor in the School of Engineering

Materials Science and Engineering

CONTACT INFORMATION

- **Administrator**

  Elizabeth Barbosa - Administrative Associate

  Email ebarbosa@stanford.edu

  Tel (650) 302-0571

Bio

BIO

Using high-resolution transmission electron microscopy, Sinclair studies microelectronic, magnetic thin film microstructure and nanomaterials.

ACADEMIC APPOINTMENTS

- Professor, Materials Science and Engineering
- Member, Bio-X
- Member, Stanford Cancer Institute

HONORS AND AWARDS

- Robert Lansing Hardy Gold Medal, The Metallurgical Society of AIME (1976)
- Eli Franklin Burton Award, Electron Microscopy Society of America (1977)
- Fellowship, Alfred P. Sloan Foundation (1979)
- Marcus E. Grossman Award, American Society for Metals (1982)
- Excellence in Undergraduate Teaching, Stanford University Society for Black Scientists and Engineers (1984)
- Excellence in Undergraduate Teaching, Stanford University Society of Chicano/Latino Engineers and Scientists (1993)
- Fellow (inaugural class), Microscopy Society of America (2009)
- Distinguished Scientist, Physical Sciences, Microscopy Society of America (2009)
- David Turnbull Lectureship, Materials Research Society (2012)
- Festschrift in honor of Robert Sinclair and Nestor J. Zaluzec, Ultramicroscopy, volume 176 (2017)

PROFESSIONAL EDUCATION

- BA, Cambridge University , Materials Science (1968)
- MA, Cambridge University , Materials Science (1972)
- PhD, Cambridge University , Materials Science (1972)

Teaching

COURSES

2026-27

- Introduction to Materials Science, Nanotechnology Emphasis: ENGR 50, MATSCI 50 (Spr)
- Japanese Companies and Japanese Society: ENGR 159Q, MATSCI 159Q (Spr)
- Transmission Electron Microscopy: MATSCI 321 (Win)

2025-26

- Introduction to Materials Science, Nanotechnology Emphasis: ENGR 50, MATSCI 50 (Spr)
- Japanese Companies and Japanese Society: ENGR 159Q, MATSCI 159Q (Spr)
- Nanocharacterization of Materials: MATSCI 320 (Win)

2024-25

- Introduction to Materials Science, Nanotechnology Emphasis: ENGR 50, MATSCI 50 (Spr)
- Japanese Companies and Japanese Society: ENGR 159Q, MATSCI 159Q (Spr)
- Transmission Electron Microscopy: MATSCI 321 (Win)

2023-24

- Introduction to Materials Science, Nanotechnology Emphasis: ENGR 50 (Spr)
- Japanese Companies and Japanese Society: ENGR 159Q, MATSCI 159Q (Spr)
- Nanocharacterization of Materials: MATSCI 320 (Win)

STANFORD ADVISEES

Doctoral Dissertation Advisor (AC)

Darshan Mali

Master's Program Advisor

Darshan Mali

Doctoral Dissertation Co-Advisor (AC)

Prasanna Sarkar, Chad Serrao

Publications

PUBLICATIONS

- **In Situ Gas-Cell Electron Microscopy Reveals Pressure-Selected Restructuring Pathways in AuRu Ammonia Catalysts.** *Journal of the American Chemical Society*
  McKeown-Green, A. S., Moradifar, P., Zhang, Z., Lim, C., Barnum, A., Yuan, L., Sinclair, R., Abild-Pedersen, F., Ophus, C., Dionne, J. A.
  2026; 148 (37): 39609-39622
- **In SituGas-Cell Electron Microscopy Reveals Pressure-Selected Restructuring Pathways in AuRu Ammonia Catalysts** *JOURNAL OF THE AMERICAN CHEMICAL SOCIETY*
  McKeown-Green, A. S., Moradifar, P., Zhang, Z., Lim, C., Barnum, A., Yuan, L., Sinclair, R., Abild-Pedersen, F., Ophus, C., Dionne, J. A.
  2026
- **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

- **Heterogeneous doping via nanoscale coating impacts the mechanics of Li intrusion in brittle solid electrolytes.** *Nature materials*
  Xu, X., Cui, T., McConohy, G., Jagad, H. D., Lee, S. S., Wang, S., Melamed, C., Yang, Y., Barks, E., Kaeli, E., Narun, L., Cui, Y., Zhang, et al
  2026
- **Cryogenic electron microscopy and tomography for beam-sensitive materials** *NATURE REVIEWS PHYSICS*
  Cui, Y., Zhang, Z., Sinclair, R., Chiu, W.
  2025
- **High-Durability Nitinol for Medical Devices: A 100 Million-Cycle Bending Fatigue Characterization Study (JUL, 10.1007/s40830-025-00554-9, 2025)** *SHAPE MEMORY AND SUPERELASTICITY*
  Launey, M. E., Pelton, S. M., Gill, H., Saffari, P., Keck, A., Ulmer, J., Czaja, P., Barnum, A., Sinclair, R., Pelton, A. R.
  2025
- **Reducing the degradation rate and surface segregation of (La0.5Sr0.5)FeO3_δ electrodes in ambient air through multilayering** *SOLID STATE IONICS*
  Machala, M. L., Zhang, D., Chen, D., Su, H., Guan, Z., Li, H., Liu, Y., Park, J., Sinclair, R., Crumlin, E., Bluhm, H., Chueh, W. C.
  2025; 428
- **Strain-Engineered Monolithic Multi-Band LEDs for Simultaneous Short-Wavelength and Mid-Wavelength Infrared Emission.** *Advanced materials (Deerfield Beach, Fla.)*
  Jung, H. J., Kim, D., Nguyen, P. D., Kang, S., Jeon, J., Bui, T. T., Yoon, J., Kim, M., Lee, C., Sinclair, R., Lee, I. H., Chun, B. S., Lee, et al
  2025: e08332
- **High-Durability Nitinol for Medical Devices: A 100 Million-Cycle Bending Fatigue Characterization Study** *SHAPE MEMORY AND SUPERELASTICITY*
  Launey, M. E., Pelton, S. M., Gill, H., Saffari, P., Keck, A., Ulmer, J., Czaja, P., Barnum, A., Sinclair, R., Pelton, A. R.
  2025
- **Advancing Cross-Sectional Scanning Electron Microscopy of Perovskite Solar Cells.** *Microscopy and microanalysis : the official journal of Microscopy Society of America, Microbeam Analysis Society, Microscopical Society of Canada*
  Carbone, A., Sinclair, R., Dauskardt, R. H.
  2025; 31 (4)
- **Scanning transmission election microscopy observations of twisted epitaxial gold nanodiscs in twisted molybdenum disulfide bilayers.** *Micron (Oxford, England : 1993)*
  Cui, Y., Czaja, P., Cui, Y., Sinclair, R.
  2024; 190: 103776
- **Electrified Operando-Freezing of Electrocatalytic CO2 Reduction Cells for Cryogenic Electron Microscopy.** *Nano letters*
  Li, Y., Liu, Y., Zhang, Z., Zhou, W., Xu, J., Ye, Y., Peng, Y., Xiao, X., Chiu, W., Sinclair, R., Li, Y., Cui, Y.
  2024
- **Unraveling sources of emission heterogeneity in Silicon Vacancy color centers with cryo-cathodoluminescence microscopy.** *Proceedings of the National Academy of Sciences of the United States of America*
  Angell, D. K., Li, S., Utzat, H., Thurston, M. L., Liu, Y., Dahl, J., Carlson, R., Shen, Z. X., Melosh, N., Sinclair, R., Dionne, J. A.
  2024; 121 (14): e2308247121
- **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
- **Twisted Epitaxial Growth of Gold Nanodiscs Confined in Twisted Bilayer Molybdenum Disulfide.** *Microscopy and microanalysis : the official journal of Microscopy Society of America, Microbeam Analysis Society, Microscopical Society of Canada*
  Cui, Y., Sinclair, R., Cui, Y.
  2023; 29 (Supplement_1): 1657-1658
- **Resolving Current-Dependent Regimes of Electroplating Mechanisms for Fast Charging Lithium Metal Anodes.** *Nano letters*
  Boyle, D. T., Li, Y., Pei, A., Vila, R. A., Zhang, Z., Sayavong, P., Kim, M. S., Huang, W., Wang, H., Liu, Y., Xu, R., Sinclair, R., Qin, et al
  2022

- **Remotely controlled near-infrared-triggered photothermal treatment of brain tumours in freely behaving mice using gold nanostars.** *Nature nanotechnology*
  Arami, H., Kananian, S., Khalifehzadeh, L., Patel, C. B., Chang, E., Tanabe, Y., Zeng, Y., Madsen, S. J., Mandella, M. J., Natarajan, A., Peterson, E. E., Sinclair, R., Poon, et al
  2022

- **Strategies for Modulating the Catalytic Activity and Selectivity of Manganese Antimonates for the Oxygen Reduction Reaction** *ACS CATALYSIS*
  Kreider, M. E., Gunasooriya, G., Liu, Y., Zeledon, J., Valle, E., Zhou, C., Montoya, J. H., Gallo, A., Sinclair, R., Norskov, J. K., Stevens, M., Jaramillo, T. F.
  2022

- **First-Row Transition Metal Antimonates for the Oxygen Reduction Reaction.** *ACS nano*
  Gunasooriya, G. T., Kreider, M. E., Liu, Y., Zamora Zeledon, J. A., Wang, Z., Valle, E., Yang, A., Gallo, A., Sinclair, R., Stevens, M. B., Jaramillo, T. F., Norskov, J. K.
  2022

- **Characterization of a Dynamic Y2Ir2O7 Catalyst during the Oxygen Evolution Reaction in Acid** *JOURNAL OF PHYSICAL CHEMISTRY C*
  Hubert, M. A., Gallo, A., Liu, Y., Valle, E., Sanchez, J., Sokaras, D., Sinclair, R., King, L. A., Jaramillo, T. F.
  2022

- **An approach for optimizing gold nanoparticles for possible medical applications, using correlative electron energy loss and Raman spectroscopies on electron beam lithographically fabricated arrays** *JOURNAL OF MATERIALS RESEARCH*
  Sinclair, R., Zeng, Y., Madsen, S. J., Gambhir, S. S.
  2021

- **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

- **Persistent and partially mobile oxygen vacancies in Li-rich layered oxides** *NATURE ENERGY*
  Csernica, P. M., Kalirai, S. S., Gent, W. E., Lim, K., Yu, Y., Liu, Y., Ahn, S., Kaeli, E., Xu, X., Stone, K. H., Marshall, A. F., Sinclair, R., Shapiro, et al
  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

- **Isolating the Electrocatalytic Activity of a Confined NiFe Motif within Zirconium Phosphate** *ADVANCED ENERGY MATERIALS*
  Sanchez, J., Stevens, M., Young, A. R., Gallo, A., Zhao, M., Liu, Y., Ramos-Garces, M. V., Ben-Naim, M., Colon, J. L., Sinclair, R., King, L. A., Bajdich, M., Jaramillo, et al
  2021

- **Exploring valence states of abnormal mineral deposits in biological tissues using correlative microscopy and spectroscopy techniques: A case study on ferritin and iron deposits from Alzheimer's disease patients.** *Ultramicroscopy*
  Zeng, Y., DiGiacomo, P. S., Madsen, S. J., Zeineh, M. M., Sinclair, R.
  2021: 113254

- **Mitochondria-Rich Extracellular Vesicles Rescue Patient-Specific Cardiomyocytes From Doxorubicin Injury: Insights Into the SENECA Trial.** *JACC. CardioOncology*
  O'Brien, C. G., Ozen, M. O., Ikeda, G., Vaskova, E., Jung, J. H., Bayardo, N., Santoso, M. R., Shi, L., Wahlquist, C., Jiang, Z., Jung, Y., Zeng, Y., Egan, et al
  2021; 3 (3): 428-440

- **Identifying and Tuning the In Situ Oxygen-Rich Surface of Molybdenum Nitride Electrocatalysts for Oxygen Reduction** *ACS APPLIED ENERGY MATERIALS*
  Stevens, M., Kreider, M. E., Patel, A. M., Wang, Z., Liu, Y., Gibbons, B. M., Statt, M. J., Ievlev, A., Sinclair, R., Mehta, A., Davis, R. C., Norskov, J. K., Gallo, et al
  2020; 3 (12): 12433–46

- **Correlative Microscopy to Localize and Characterize Iron Deposition in Alzheimer's Disease.** *Journal of Alzheimer's disease reports*
  Madsen, S. J., DiGiacomo, P. S., Zeng, Y., Goubran, M., Chen, Y., Rutt, B. K., Born, D., Vogel, H., Sinclair, R., Zeineh, M. M.
  2020; 4 (1): 525–36

- **COMBINING THE GLIOBLASTOMA CELL MEMBRANE-PERMEABILIZING EFFECT OF TUMOR TREATING FIELDS (TTFIELDS) WITH WITHAFERIN A (AND OTHER) CHEMOTHERAPY**
  Chang, E., Patel, C., Young, C., Flores, T., Zeng, Y., Joubert, L., Arami, H., Natarajan, A., Sinclair, R., Gambhir, S.
  OXFORD UNIV PRESS INC.2020: 30

- **Acidic Oxygen Evolution Reaction Activity-Stability Relationships in Ru-Based Pyrochlores** *ACS CATALYSIS*
  Hubert, M. A., Patel, A. M., Gallo, A., Liu, Y., Valle, E., Ben-Naim, M., Sanchez, J., Sokaras, D., Sinclair, R., Norskov, J. K., King, L. A., Bajdich, M., Jaramillo, et al
  2020; 10 (20): 12182–96

- **Atomic Resolution Observation of the Oxidation of Niobium Oxide Nanowires: Implications for Renewable Energy Applications** *ACS APPLIED NANO MATERIALS*
  Betzler, S. B., Koh, A., Lotsch, B., Sinclair, R., Scheu, C.
  2020; 3 (9): 9285–92

- **Enhancing the nanoplasmonic signal by a nanoparticle sandwiching strategy to detect viruses** *APPLIED MATERIALS TODAY*
  Inci, F., Karaaslan, M., Mataji-Kojouri, A., Shah, P., Saylan, Y., Zeng, Y., Avadhani, A., Sinclair, R., Lau, D., Demirci, U.
  2020; 20

- **Nanosized Zirconium Porphyrinic Metal-Organic Frameworks that Catalyze the Oxygen Reduction Reaction in Acid** *SMALL METHODS*
  Chen, G., Stevens, M., Liu, Y., King, L. A., Park, J., Kim, T., Sinclair, R., Jaramillo, T. F., Bao, Z.
  2020

- **Effect of Adventitious Carbon on Pit Formation of Monolayer MoS2.** *Advanced materials (Deerfield Beach, Fla.)*
  Park, S., Siahrostami, S., Park, J., Mostaghimi, A. H., Kim, T. R., Vallez, L., Gill, T. M., Park, W., Goodson, K. E., Sinclair, R., Zheng, X.
  2020: e2003020

- **Combining the glioblastoma cell membrane-permeabilizing effect of tumor treating fields with chemotherapy**
  Chang, E., Patel, C., Young, C. J., Flores, T., Joubert, L., Zeng, Y., Sinclair, R., Gambhir, S.
  AMER ASSOC CANCER RESEARCH.2020

- **Nitride or Oxynitride? Elucidating the Composition-Activity Relationships in Molybdenum Nitride Electrocatalysts for the Oxygen Reduction Reaction** *CHEMISTRY OF MATERIALS*
  Kreider, M. E., Stevens, M., Liu, Y., Patel, A. M., Statt, M. J., Gibbons, B. M., Gallo, A., Ben-Naim, M., Mehta, A., Davis, R. C., Ievlev, A., Norskov, J. K., Sinclair, et al
  2020; 32 (7): 2946–60

- **Pro-efferocytic nanoparticles are specifically taken up by lesional macrophages and prevent atherosclerosis.** *Nature nanotechnology*
  Flores, A. M., Hosseini-Nassab, N. n., Jarr, K. U., Ye, J. n., Zhu, X. n., Wirka, R. n., Koh, A. L., Tsantilas, P. n., Wang, Y. n., Nanda, V. n., Kojima, Y. n., Zeng, Y. n., Lotfi, et al
  2020

- **Comparative electron and photon excitation of localized surface plasmon resonance in lithographic gold arrays for enhanced Raman scattering.** *Nanoscale*
  Zeng, Y. n., Madsen, S. J., Yankovich, A. B., Olsson, E. n., Sinclair, R. n.
  2020

- **TUMOR TREATING FIELDS LEADS TO CHANGES IN MEMBRANE PERMEABILITY AND INCREASED PENETRATION BY ANTI-GLIOMA DRUGS**
  Chang, E., Patel, C., Beinat, C., Young, C., Flores, T., Zeng, Y., Joubert, L., Arami, H., Natarajan, A., Sinclair, R., Gambhir, S.
  OXFORD UNIV PRESS INC.2019: 93

- **Editorial for the Special Issue "Characterization of Nanomaterials: Selected Papers from 6th Dresden Nanoanalysis Symposium".** *Nanomaterials (Basel, Switzerland)*
  Zschech, E., Sinclair, R., Martins, R., Sebastiani, M., Sartori, S.
  2019; 9 (11)

- **Cryo-EM Structures of Atomic Surfaces and Host-Guest Chemistry in Metal-Organic Frameworks** *MATTER*
  Li, Y., Wang, K., Zhou, W., Li, Y., Vila, R., Huang, W., Wang, H., Chen, G., Wu, G., Tsao, Y., Wang, H., Sinclair, R., Chiu, et al
  2019; 1 (2): 428–38
- **Cryo-EM structures of atomic surfaces and host-guest chemistry in metal-organic frameworks.** *Matter*
  Li, Y., Wang, K., Zhou, W., Li, Y., Vila, R., Huang, W., Wang, H., Chen, G., Wu, G. H., Tsao, Y., Wang, H., Sinclair, R., Chiu, et al
  2019; 1 (2): 428-438
- **Magnetization switching using topological surface states.** *Science advances*
  Li, P., Kally, J., Zhang, S. S., Pillsbury, T., Ding, J., Csaba, G., Ding, J., Jiang, J. S., Liu, Y., Sinclair, R., Bi, C., DeMann, A., Rimal, et al
  2019; 5 (8): eaaw3415
- **Precious Metal-Free Nickel Nitride Catalyst for the Oxygen Reduction Reaction.** *ACS applied materials & interfaces*
  Kreider, M. E., Gallo, A., Back, S., Liu, Y., Siahrostami, S., Nordlund, D., Sinclair, R., Norskov, J. K., King, L. A., Jaramillo, T. F.
  2019
- **Intranasal delivery of targeted polyfunctional gold-iron oxide nanoparticles loaded with therapeutic microRNAs for combined theranostic multimodality imaging and presensitization of glioblastoma to temozolomide.** *Biomaterials*
  Sukumar, U. K., Bose, R. J., Malhotra, M., Babikir, H. A., Afjei, R., Robinson, E., Zeng, Y., Chang, E., Habte, F., Sinclair, R., Gambhir, S. S., Massoud, T. F., Paulmurugan, et al
  2019; 218: 119342
- **Tumor treating fields increases membrane permeability in glioblastoma cells**
  Chang, E., Patel, C., Pohling, C., Young, C., Song, J., Flores, T. A., Zeng, Y., Joubert, L., Arami, H., Natarajan, A., Sinclair, R., Gambhir, S. S.
  AMER ASSOC CANCER RESEARCH.2019
- **Nanomedicine for Spontaneous Brain Tumors: A Companion Clinical Trial.** *ACS nano*
  Arami, H., Patel, C. B., Madsen, S. J., Dickinson, P. J., Davis, R. M., Zeng, Y., Sturges, B. K., Woolard, K. D., Habte, F. G., Akin, D., Sinclair, R., Gambhir, S. S.
  2019
- **Optimizing Nanostructure Size to Yield High Raman Signal Enhancement by Electron Energy Loss Spectroscopy.** *Microscopy and microanalysis : the official journal of Microscopy Society of America, Microbeam Analysis Society, Microscopical Society of Canada*
  Zeng, Y. n., Madsen, S. n., Yankovich, A. n., Olsson, E. n., Sinclair, R. n.
  2019; 25 (Suppl 2): 610–11
- **Visualizing Facet-Dependent Hydrogenation Dynamics in Individual Palladium Nanoparticles.** *Nano letters*
  Sytwu, K., Hayee, F., Narayan, T. C., Koh, A. L., Sinclair, R., Dionne, J. A.
  2018
- **Synthesis, characterization and light-induced spatial charge separation in Janus graphene oxide**
  Holm, A., Park, J., Goodman, E., Zhang, J., Sinclair, R., Cargnello, M., Frank, C.
  AMER CHEMICAL SOC.2018
- **In-situ observation of plasmon-driven hydrogenation reactions within Au@Pd coreshell nanoparticles**
  Sytwu, K., Vadai, M., Hayee, F., Koh, A., Sinclair, R., Dionne, J.
  AMER CHEMICAL SOC.2018
- **Rapid flame doping of Co to WS2 for efficient hydrogen evolution** *ENERGY & ENVIRONMENTAL SCIENCE*
  Shi, X., Fields, M., Park, J., McEnaney, J. M., Yan, H., Zhang, Y., Tsai, C., Jaramillo, T. F., Sinclair, R., Norskov, J. K., Zheng, X.
  2018; 11 (8): 2270–77
- **Contributions to High Resolution and In Situ Electron Microscopy.** *Microscopy and microanalysis : the official journal of Microscopy Society of America, Microbeam Analysis Society, Microscopical Society of Canada*
  Sinclair, R., Liu, Y., Lee, S., Koh, A. L.
  2018; 24 (Suppl 1): 10–11
- **Designing Boron Nitride Islands in Carbon Materials for Efficient Electrochemical Synthesis of Hydrogen Peroxide.** *Journal of the American Chemical Society*
  Chen, S., Chen, Z., Siahrostami, S., Higgins, D., Nordlund, D., Sokaras, D., Kim, T. R., Liu, Y., Yan, X., Nilsson, E., Sinclair, R., Norskov, J. K., Jaramillo, et al

2018; 140 (25): 7851–59

- **Atomic and Molecular Layer Deposition of Hybrid Mo-Thiolate Thin Films with Enhanced Catalytic Activity** *ADVANCED FUNCTIONAL MATERIALS*
  MacIsaac, C., Schneider, J. R., Closser, R. G., Hellstern, T. R., Bergsman, D. S., Park, J., Liu, Y., Sinclair, R., Bent, S. F.
  2018; 28 (26)

- **Synthesis, Characterization, and Light-Induced Spatial Charge Separation in Janus Graphene Oxide** *CHEMISTRY OF MATERIALS*
  Holm, A., Park, J., Goodman, E. D., Zhang, J., Sinclair, R., Cargnello, M., Frank, C. W.
  2018; 30 (6): 2084–92

- **Deformable Organic Nanowire Field-Effect Transistors** *ADVANCED MATERIALS*
  Lee, Y., Oh, J., Kim, T., Gu, X., Kim, Y., Wang, G., Wu, H., Pfattner, R., To, J. W. F., Katsumata, T., Son, D., Kang, J., Matthews, et al
  2018; 30 (7)

- **Deformable Organic Nanowire Field-Effect Transistors.** *Advanced materials (Deerfield Beach, Fla.)*
  Lee, Y., Oh, J. Y., Kim, T. R., Gu, X., Kim, Y., Wang, G. N., Wu, H. C., Pfattner, R., To, J. W., Katsumata, T., Son, D., Kang, J., Matthews, et al
  2018; 30 (7)

- **Anti-Hermitian photodetector facilitating efficient subwavelength photon sorting** *NATURE COMMUNICATIONS*
  Kim, S., Kang, J., Mutlu, M., Park, J., Park, W., Goodson, K. E., Sinclair, R., Fan, S., Kik, P. G., Brongersma, M. L.
  2018; 9: 316

- **In-situ visualization of solute-driven phase coexistence within individual nanorods.** *Nature communications*
  Hayee, F. n., Narayan, T. C., Nadkarni, N. n., Baldi, A. n., Koh, A. L., Bazant, M. Z., Sinclair, R. n., Dionne, J. A.
  2018; 9 (1): 1775

- **Tumor treating fields increases membrane permeability in glioblastoma cells.** *Cell death discovery*
  Chang, E. n., Patel, C. B., Pohling, C. n., Young, C. n., Song, J. n., Flores, T. A., Zeng, Y. n., Joubert, L. M., Arami, H. n., Natarajan, A. n., Sinclair, R. n., Gambhir, S. S.
  2018; 4: 113

- **Tumor Treating Fields Increases Membrane Permeability in Glioblastoma Cells** *Cell Death Discovery*
  Chang, E., Patel, C. B., Pohling, C., Young, C., Song, J., Flores, T., Zeng, Y., Joubert, L. M., Arami, H., Natarajan, A., Sinclair, R., Gambhir, S. S.
  2018; 4

- **Tumor Cell-Derived Extracellular Vesicle-Coated Nanocarriers: An Efficient Theranostic Platform for the Cancer-Specific Delivery of Anti-miR-21 and Imaging Agents.** *ACS nano*
  Jc Bose, R. n., Uday Kumar, S. n., Zeng, Y. n., Afjei, R. n., Robinson, E. n., Lau, K. n., Bermudez, A. n., Habte, F. n., Pitteri, S. J., Sinclair, R. n., Willmann, J. K., Massoud, T. F., Gambhir, et al
  2018

- **Defective Carbon-Based Materials for the Electrochemical Synthesis of Hydrogen Peroxide** *ACS SUSTAINABLE CHEMISTRY & ENGINEERING*
  Chen, S., Chen, Z., Siahrostami, S., Kim, T., Nordlund, D., Sokaras, D., Nowak, S., To, J. W. F., Higgins, D., Sinclair, R., Norskov, J. K., Jaramillo, T. F., Bao, et al
  2018; 6 (1): 311–17

- **Correlative Magnetic Imaging of Heat-Assisted Magnetic Recording Media in Cross Section Using Lorentz TEM and MFM** *IEEE TRANSACTIONS ON MAGNETICS*
  Kim, T., Phatak, C., Petford-Long, A. K., Liu, Y., Taylor, C., Zhang, B., Myers, S., Greene, A., Seki, T., Alex, M., Bertero, G. A., Sinclair, R.
  2018; 54 (1)

- **Synthesis and characterization of graphite-encapsulated iron nanoparticles from ball milling-assisted low-pressure chemical vapor deposition** *CARBON*
  Agaogullari, D., Madsen, S. J., Ogut, B., Koh, A., Sinclair, R.
  2017; 124: 170–79

- **Highly Stable Molybdenum Disulfide Protected Silicon Photocathodes for Photoelectrochemical Water Splitting** *ACS APPLIED MATERIALS & INTERFACES*
  King, L. A., Hellstern, T. R., Park, J., Sinclair, R., Jaramillo, T. F.

2017; 9 (42): 36792–98

- **Intrinsic Chirality Origination in Carbon Nanotubes.** *ACS nano*
  Pierce, N., Chen, G., P Rajukumar, L., Chou, N. H., Koh, A. L., Sinclair, R., Maruyama, S., Terrones, M., Harutyunyan, A. R.
  2017; 11 (10): 9941-9949
- **In Situ Field Emission of Carbon Nanotubes in Oxygen Using Environmental TEM and the Influence of the Imaging Electron Beam.** *Microscopy and microanalysis : the official journal of Microscopy Society of America, Microbeam Analysis Society, Microscopical Society of Canada*
  Koh, A. L., Gidcumb, E., Zhou, O., Sinclair, R.
  2017; 23 (Suppl 1): 910-911
- **depends non-monotonically on large biaxial strain.** *Nature communications*
  Balaji Gopal, C., García-Melchor, M., Lee, S. C., Shi, Y., Shavorskiy, A., Monti, M., Guan, Z., Sinclair, R., Bluhm, H., Vojvodic, A., Chueh, W. C.
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