Stanford



Chi-Chang Kao

Professor of Photon Science and Senior Fellow at the Precourt Institute for Energy

Photon Science Directorate

Bio

BIO

Chi-Chang Kao works on the development of experimental methods exploiting the unique properties of high-brightness storage rings and X-ray Free Electron Lasers (XFEL), and their applications to materials science. Currently, he is working on using X-ray scattering in combination with high magnetic fields to study high-temperature superconductors, inelastic X-ray scattering study of materials using XFEL, and X-ray study of materials for energy applications.

Kao served as the fifth director of the SLAC National Accelerator Laboratory from November 2012 to February 2023. Prior to that, he served at Brookhaven National Laboratory for nearly 25 years in a variety of positions, including five years as chairperson of the National Synchrotron Light Source (NSLS). He was elected a fellow of the American Physical Society in 2006 and was named a fellow of the American Association for the Advancement of Science in 2010 for his many contributions to resonant elastic and inelastic X-ray scattering techniques and their application to materials physics, as well as for his leadership at the NSLS.

ACADEMIC APPOINTMENTS

- Professor, Photon Science Directorate
- Senior Fellow, Precourt Institute for Energy

PROFESSIONAL EDUCATION

- Ph.D., Cornell , Chemical Engineering (1988)

Teaching

STANFORD ADVISEES

Postdoctoral Faculty Sponsor

Tzu Yun Huang

Publications

PUBLICATIONS

- **Characterization of photoinduced normal state through charge density wave in superconducting YBa2Cu3O6.67.** *Science advances* Jang, H., Song, S., Kihara, T., Liu, Y., Lee, S., Park, S., Kim, M., Kim, H., Coslovich, G., Nakata, S., Kubota, Y., Inoue, I., Tamasaku, et al 2022; 8 (6): eabk0832

- **Detection of the Chiral Spin Structure in Ferromagnetic SrRuO3 Thin Film** *ACS APPLIED MATERIALS & INTERFACES*

Huang, H., Lee, S., Kim, B., Sohn, B., Kim, C., Kao, C., Lee, J.
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- **Femtosecond electronic structure response to high intensity XFEL pulses probed by iron X-ray emission spectroscopy.** *Scientific reports*
  Alonso-Mori, R. n., Sokaras, D. n., Cammarata, M. n., Ding, Y. n., Feng, Y. n., Fritz, D. n., Gaffney, K. J., Hastings, J. n., Kao, C. C., Lemke, H. T., Maxwell, T. n., Robert, A. n., Schropp, et al
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- **A role for subducted super-hydrated kaolinite in Earth's deep water cycle** *NATURE GEOSCIENCE*
  Hwang, H., Seoung, D., Lee, Y., Liu, Z., Liermann, H., Cynn, H., Vogt, T., Kao, C., Mao, H.
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- **Pressure-Dependent Structural and Chemical Changes in a Metal-Organic Framework with One-Dimensional Pore Structure** *CHEMISTRY OF MATERIALS*
  Im, J., Seoung, D., Hwang, G. C., Jun, J. W., Jhung, S. H., Kao, C., Vogt, T., Lee, Y.
  2016; 28 (15): 5336-5341
- **Two-Step Pressure-Induced Superhydration in Small Pore Natrolite with Divalent Extra-Framework Cations** *CHEMISTRY OF MATERIALS*
  Seoung, D., Lee, Y., Kao, C., Vogt, T., Lee, Y.
  2015; 27 (11): 3874-3880
- **Pressure-Induced Metathesis Reaction To Sequester Cs** *ENVIRONMENTAL SCIENCE & TECHNOLOGY*
  Im, J., Seoung, D., Lee, S. Y., Blom, D. A., Vogt, T., Kao, C., Lee, Y.
  2015; 49 (1): 513-519
- **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
- **Irreversible xenon insertion into a small-pore zeolite at moderate pressures and temperatures** *NATURE CHEMISTRY*
  Seoung, D., Lee, Y., Cynn, H., Park, C., Choi, K., Blom, D. A., Evans, W. J., Kao, C., Vogt, T., Lee, Y.
  2014; 6 (9): 835-839
- **Super-Hydrated Zeolites: Pressure-Induced Hydration in Natrolites** *CHEMISTRY-A EUROPEAN JOURNAL*
  Seoung, D., Lee, Y., Kao, C., Vogt, T., Lee, Y.
  2013; 19 (33): 10876-10883
- **Role of Cation-Water Disorder during Cation Exchange in Small-Pore Zeolite Sodium Natrolite** *JOURNAL OF PHYSICAL CHEMISTRY C*
  Lee, Y., Lee, J., Kao, C., Yoon, J., Vogt, T., Lee, Y.
  2013; 117 (31): 16119-16126
- **Resolving Material-Specific Structures within Fe3O4 vertical bar gamma-Mn2O3 Core vertical bar Shell Nanoparticles Using Anomalous Small-Angle X-ray Scattering** *ACS NANO*
  Krycka, K. L., Borchers, J. A., Salazar-Alvarez, G., Lopez-Ortega, A., Estrader, M., Estrade, S., Winkler, E., Daniel Zysler, R., Sort, J., Peiro, F., Dolors Baro, M., Kao, C., Nogues, et al
  2013; 7 (2): 921-931
- **Thermal Expansion of the Superhydrated Small-Pore Zeolite Natrolite** *JOURNAL OF PHYSICAL CHEMISTRY C*
  Lee, Y., Kao, C., Vogt, T.
  2012; 116 (5): 3286-3291
- **Immobilization of Large, Aliovalent Cations in the Small-Pore Zeolite K-Natrolite by Means of Pressure** *ANGEWANDTE CHEMIE-INTERNATIONAL EDITION*
  Lee, Y., Lee, Y., Seoung, D., Im, J., Hwang, H., Kim, T., Liu, D., Liu, Z., Lee, S. Y., Kao, C., Vogt, T.
  2012; 51 (20): 4848-4851
- **Pressure- and Heat-Induced Insertion of CO2 into an Auxetic Small-Pore Zeolite** *JOURNAL OF THE AMERICAN CHEMICAL SOCIETY*
  Lee, Y., Liu, D., Seoung, D., Liu, Z., Kao, C., Vogt, T.
  2011; 133 (6): 1674-1677
- **In-situ dehydration studies of fully K-,Rb-, and Cs-exchanged natrolites** *AMERICAN MINERALOGIST*

Lee, Y., Seoung, D., Liu, D., Park, M. B., Hong, S. B., Chen, H., Bai, J., Kao, C., Vogt, T., Lee, Y.
2011; 96 (2-3): 393-401

- **Electronic Structure of Crystalline He-4 at High Pressures** *PHYSICAL REVIEW LETTERS*
  Mao, H. K., Shirley, E. L., Ding, Y., Eng, P., Cai, Y. Q., Chow, P., Xiao, Y., Shu, J., Hemley, R. J., Kao, C., Mao, W. L.
  2010; 105 (18)

- **High-pressure evolution of Fe2O3 electronic structure revealed by x-ray absorption** *PHYSICAL REVIEW B*
  Wang, S., Mao, W. L., Sorini, A. P., Chen, C., Devereaux, T. P., Ding, Y., Xiao, Y., Chow, P., Hiraoka, N., Ishii, H., Cai, Y. Q., Kao, C.
  2010; 82 (14)

- **Atomic-scale visualization of inertial dynamics** *SCIENCE*
  Lindenberg, A. M., Larsson, J., Sokolowski-Tinten, K., Gaffney, K. J., Blome, C., Synnergren, O., Sheppard, J., Caleman, C., MacPhee, A. G., Weinstein, D., Lowney, D. P., Allison, T. K., Matthews, et al
  2005; 308 (5720): 392-395

- **Clocking femtosecond x rays** *PHYSICAL REVIEW LETTERS*
  Cavalieri, A. L., Fritz, D. M., Lee, S. H., Bucksbaum, P. H., Reis, D. A., Rudati, J., Mills, D. M., Fuoss, P. H., Stephenson, G. B., Kao, C. C., Siddons, D. P., Lowney, D. P., MacPhee, et al
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