

# Stanford

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## Chi-Chang Kao

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

Photon Science Directorate

### CONTACT INFORMATION

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### Bio

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#### BIO

SLAC Director Chi-Chang Kao, a noted X-ray scientist, came to SLAC in 2010 to serve as associate laboratory director for the Stanford Synchrotron Radiation Lightsource. He became SLAC's fifth director in November 2012.

Previously, Kao served for five years as chairperson of the National Synchrotron Light Source at Brookhaven National Laboratory in New York. He undertook major upgrades to the light source's scientific programs and experimental facilities while developing potential science programs for NSLS-II, one of the newest and most advanced synchrotron facilities in the world. His research focuses on X-ray physics, superconductivity, magnetic materials and the properties of materials under high pressure.

Kao earned a bachelor's degree in chemical engineering in 1980 from National Taiwan University and a doctorate in chemical engineering from Cornell University in 1988. He joined Brookhaven shortly afterward, working his way from NSLS postdoctoral research assistant to chair. Kao also served as an adjunct professor in the Department of Physics and Astronomy at Stony Brook University.

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)

### Publications

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#### PUBLICATIONS

- **Detection of the Chiral Spin Structure in Ferromagnetic SrRuO<sub>3</sub> Thin Film** *ACS APPLIED MATERIALS & INTERFACES*

- Huang, H., Lee, S., Kim, B., Sohn, B., Kim, C., Kao, C., Lee, J.  
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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.  
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  - **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 TiO<sub>2</sub>/LaAlO<sub>3</sub> 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 Fe<sub>3</sub>O<sub>4</sub> vertical bar gamma-Mn<sub>2</sub>O<sub>3</sub> 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., Noguees, 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 CO<sub>2</sub> into an Auxetic Small-Pore Zeolite** *JOURNAL OF THE AMERICAN CHEMICAL SOCIETY*  
Lee, Y., Liu, D., Seoung, D., Liu, Z., Kao, C., Vogt, T.  
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  - **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 Fe<sub>2</sub>O<sub>3</sub> 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., Synnnergren, 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

2005; 94 (11)