Stanford

John Louis Sarrao

Director of the SLAC National Accelerator Laboratory, Professor of Photon Science, Senior Fellow at the Precourt Institute for Energy and Professor, by courtesy, of Materials Science and Engineering

Photon Science Directorate

Bio

BIO

John Sarrao became SLAC National Accelerator Laboratory's sixth director in October 2023. The lab's ~2,000 staff advance the frontiers of science by exploring how the universe works at the biggest, smallest, and fastest scales and invent powerful tools used by scientists around the globe. SLAC's research helps solve real-world problems and advances the interests of the nation. SLAC is operated by Stanford University for the U.S. Department of Energy's Office of Science. It is home to three Office of Science national user facilities: the Linac Coherent Light Source (LCLS), the world's most powerful X-ray laser; the Stanford Synchrotron Radiation Lightsource (SSRL); and the Facility for Advanced Accelerator Experimental Tests, (FACET-II). SLAC hosts thousands of users each year and manages an annual budget of ~$700M. In addition to his role as lab director, John is a professor of photon science, and by courtesy, of materials science and engineering at Stanford University, a senior fellow at Stanford's Precourt Institute, and dean of SLAC faculty.

John came to SLAC from Los Alamos National Laboratory (LANL) in New Mexico, where he served as the deputy director for science, technology, and engineering. In that role, he led multiple directorates, including chemistry, earth and life sciences, global security, physical sciences, and simulation and computation. He also stewarded technology transitions and served as LANL's chief research officer in support of its national security mission. Before becoming deputy director, he served as associate director for theory, simulation, and computation and division leader for materials physics and applications at LANL.

John's scientific research focus is superconductivity in materials. He studies the synthesis and characterization of correlated electron systems, especially actinide materials. He won the 2013 Department of Energy's E.O. Lawrence Award and is a fellow of the American Association for the Advancement of Science, the American Physical Society, and LANL. John received his PhD and master's degree in physics from the University of California, Los Angeles, and a bachelor's degree in physics from Stanford University.

ACADEMIC APPOINTMENTS

- Professor, Photon Science Directorate
- Senior Fellow, Precourt Institute for Energy
- Professor (By courtesy), Materials Science and Engineering

HONORS AND AWARDS

- Department of Energy Secretary's Achievement Award - The Science and Technology Risk Matrix Team, U.S. Department of Energy (2020)
- Department of Energy Secretary's Appreciation Award - Technology Convergence Working Group, U.S. Department of Energy (2017)

- E.O. Lawrence Award, U.S. Department of Energy (2013)
- Fellow, Los Alamos National Laboratory (2010)
- Fellow, American Association for the Advancement of Science (AAAS) (2009)
- Fellow, American Physical Society (2005)
- Fellows Prize for Outstanding Research, Los Alamos National Laboratory (2004)
- Director's Development Program, Los Alamos National Laboratory (2003)

PROFESSIONAL EDUCATION

- Ph.D., University of California Los Angeles , Physics (1993)
- M.S., University of California, Los Angeles , Physics (1991)
- B.S., Stanford University , Physics (1989)

Publications

PUBLICATIONS

- **Global perspectives of the bulk electronic structure of URu₂Si₂ from angle-resolved photoemission** *ELECTRONIC STRUCTURE*
  Denlinger, J. D., Kang, J., Dudy, L., Allen, J. W., Kim, K., Shim, J., Haule, K., Sarrao, J. L., Butch, N. P., Maple, M. B.
  2022; 4 (1)

- **Localized-to-itinerant transition preceding antiferromagnetic quantum critical point and gapless superconductivity in CeRh_{0.5}Ir_{0.5}In₅** *COMMUNICATIONS PHYSICS*
  Kawasaki, S., Oka, T., Sorime, A., Kogame, Y., Uemoto, K., Matano, K., Guo, J., Cai, S., Sun, L., Sarrao, J. L., Thompson, J. D., Zheng, G.
  2020; 3 (1)

- **National Competitiveness** *FRONTIERS OF MATERIALS RESEARCH: A DECADAL SURVEY (2019)*
  Greene, L. H., Lubensky, T., Tirrell, M. V., Chaikin, P. M., Ding, H., Faber, K. T., Hammond, P. T., Heckle, C. E., Hemker, K. J., Heremans, J. P., Jones, B. A., Mason, N., Mason, et al
  2019: 220–47

- **Brief Survey of Developments over the Decade** *FRONTIERS OF MATERIALS RESEARCH: A DECADAL SURVEY (2019)*
  Greene, L. H., Lubensky, T., Tirrell, M. V., Chaikin, P. M., Ding, H., Faber, K. T., Hammond, P. T., Heckle, C. E., Hemker, K. J., Heremans, J. P., Jones, B. A., Mason, N., Mason, et al
  2019: 14–25

- **Research Tools, Methods, Infrastructure, and Facilities** *FRONTIERS OF MATERIALS RESEARCH: A DECADAL SURVEY (2019)*
  Greene, L. H., Lubensky, T., Tirrell, M. V., Chaikin, P. M., Ding, H., Faber, K. T., Hammond, P. T., Heckle, C. E., Hemker, K. J., Heremans, J. P., Jones, B. A., Mason, N., Mason, et al
  2019: 162–219

- **Frontiers of Materials Research A Decadal Survey Preface** *FRONTIERS OF MATERIALS RESEARCH: A DECADAL SURVEY (2019)*
  Greene, L. H., Lubensky, T., Tirrell, M. V., Chaikin, P. M., Ding, H., Faber, K. T., Hammond, P. T., Heckle, C. E., Hemker, K. J., Heremans, J. P., Jones, B. A., Mason, N., Mason, et al
  2019: IX-+

- **Materials Research Opportunities** *FRONTIERS OF MATERIALS RESEARCH: A DECADAL SURVEY (2019)*
  Greene, L. H., Lubensky, T., Tirrell, M. V., Chaikin, P. M., Ding, H., Faber, K. T., Hammond, P. T., Heckle, C. E., Hemker, K. J., Heremans, J. P., Jones, B. A., Mason, N., Mason, et al
  2019: 104–61

- **Progress and Achievements in Materials Research over the Past Decade** *FRONTIERS OF MATERIALS RESEARCH: A DECADAL SURVEY (2019)*
  Greene, L. H., Lubensky, T., Tirrell, M. V., Chaikin, P. M., Ding, H., Faber, K. T., Hammond, P. T., Heckle, C. E., Hemker, K. J., Heremans, J. P., Jones, B. A., Mason, N., Mason, et al
  2019: 26–103

- **Kondo lattice excitation observed using resonant inelastic x-ray scattering at the YbM₅ edge** *PHYSICAL REVIEW B*
  Hancock, J. N., Dzero, M., Sarrao, J., Schmitt, T., Strocov, Guarise, M., Grioni, M.
  2018; 98 (7)
- **Magnetic properties of Ce_xY_{1-x}Pt compared to Ce_xLa_{1-x}Pt ones** *JOURNAL OF MAGNETISM AND MAGNETIC MATERIALS*
  Ocko, M., Zadro, K., Drobac, D., Aviani, I., Salamon, K., Mixon, D., Bauer, E. D., Sarrao, J. L.
  2018; 451: 727-733
- **Evolution of ground-state wave function in CeCoIn₅ upon Cd or Sn doping** *PHYSICAL REVIEW B*
  Chen, K., Strigari, F., Sundermann, M., Hu, Z., Fisk, Z., Bauer, E. D., Rosa, P. S., Sarrao, J. L., Thompson, J. D., Herrero-Martin, J., Pellegrin, E., Betto, D., Kummer, et al
  2018; 97 (4)
- **Application of an atomic force microscope piezocantilever for dilatometry under extreme conditions** *MEASUREMENT SCIENCE AND TECHNOLOGY*
  Wang, L., Schmiedeshoff, G. M., Graf, D. E., Park, J., Murphy, T. P., Tozer, S. W., Palm, E., Sarrao, J. L., Cooley, J. C.
  2017; 28 (6)
- **Progress in mesoscale science** *MRS BULLETIN*
  Sarrao, J. L., Crabtree, G. W.
  2015; 40 (11): 919-922
- **Multiconfigurational nature of 5f orbitals in uranium and plutonium and some of their intermetallic compounds**
  Booth, C. H., Jiang, Y., Wang, D. L., Mitchell, J. N., Tobash, P. H., Bauer, E. D., Wall, M. A., Allen, P. G., Sokaras, D., Nordlund, D., Weng, T., Nordlund, D., Torrez, et al
  AMER CHEMICAL SOC.2013
- **Viewpoint: Materials prediction scores a hit** *Physics*
  Ronning, F., Sarrao, J.
  2013: 109
- **Opportunities for mesoscale science** *MRS BULLETIN*
  Crabtree, G. W., Sarrao, J. L.
  2012; 37 (11): 1079-1088
- **Controlling the Functionality of Materials for Sustainable Energy** *ANNUAL REVIEW OF CONDENSED MATTER PHYSICS, VOL 2*
  Crabtree, G., Sarrao, J.
  edited by Langer, J. S.
  2011; 2: 287-301
- **New surprises "down below": Recent successes in the synthesis of actinide materials** *MRS BULLETIN*
  Sarrao, J. L., Haga, Y., Ward, R. C.
  2010; 35 (11): 877-882
- **The road of sustainability** *Physics World*
  Crabtree, G., Sarrao, J.
  2009; 22: 24
- **Hidden magnetism and quantum criticality in the heavy fermion superconductor CeRhIn5.** *Nature*
  Park, T., Ronning, F., Yuan, H. Q., Salamon, M. B., Movshovich, R., Sarrao, J. L., Thompson, J. D.
  2006; 440 (7080): 65-8
- **Unconventional superconductivity in PuCoGa5.** *Nature*
  Curro, N. J., Caldwell, T., Bauer, E. D., Morales, L. A., Graf, M. J., Bang, Y., Balatsky, A. V., Thompson, J. D., Sarrao, J. L.
  2005; 434 (7033): 622-5
- **Plutonium based superconductivity above 18K** *Nature*
  Sarrao , J. L., Morales, L. A., Thompson, J. D., Scott, B. L., Stewart, G. R., Wastin, F., Rebizant, J., Boulet, P., Colineau, E., Lander, G. H.
  2002: 297-299

- **Heavy fermion superconductivity in CeCoIn** *Journal of Physics: Condensed Matter*
  Petrovic, C., Pagliuso, P. G., Hundley, M. F., Movshovich, R., Sarrao, J. L., Thompson, J. D., Fisk, Z., Monthoux, P.
  2001; 13
- **A new heavy fermion superconducting prototype CeIrIn5: A relative of the cuprates** *Europhysics Letters*
  Petrovic, C., Movshovich, R., Jaime, M., Pagliuso, P. G., Hundley, M. F., Sarrao, J. L., Fisk, Z., Thompson, J. D.
  2001; 53 (3)
- **Pressure-induced superconductivity in quasi-2D CeRhIn5.** *Physical review letters*
  Hegger, H., Petrovic, C., Moshopoulou, E. G., Hundley, M. F., Sarrao, J. L., Fisk, Z., Thompson, J. D.
  2000; 84 (21): 4986-9
- **Resonant Ultrasound Spectroscopy**
  Migliori, A., Sarrao, J. L.
  Wiley.1997