



## Sadasivan (Sadas) Shankar

Research Technical Manager, SLAC National Accelerator Laboratory

 NIH Biosketch available Online

### Bio

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#### BIO

Sadasivan (Sadas) Shankar is Research Technology Manager at SLAC National Laboratory and Adjunct Professor in Stanford Materials Science and Engineering. He was the first Margaret and Will Hearst Visiting Lecturer in Harvard University and the first Distinguished Scientist in Residence at the Harvard Institute of Applied Computational Sciences. He has co-instructed classes related to materials, computing, and sustainability and was awarded Harvard University Teaching Excellence Award. He is involved in research in materials, chemistry, and specialized AI methods for complex problems in physical and natural sciences, new frameworks for studying computing, and a new course on Translation: From Invention to Innovation. He is a co-founder and the Chief Scientist in Material Alchemy, a “last mile” translational and independent venture for sustainable design of materials.

Dr. Shankar was an invited speaker at the Vin Future “Science for Life” Symposium in Vietnam on Semiconductors Unleashed (2023), Clean-IT Conference in Germany on Revolutionize Digital Systems and AI (2023), Telluride Quantum Inspired Neuromorphic Computing Workshop (2023) on Limiting Energy Estimates for Classical and Quantum Information Processing, Argonne National Laboratory Director’s Special Colloquium on the Future of Computing (2022), panelist on Carnegie Science series on Brain and Computing (2020), lecturer in the Winter Course on Computational Brain Research in IIT-M-India (2020), invited participant in the Kavli Institute of Theoretical Physics program on Cellular Energetics in UCSB (2019), invited speaker to the Camille and Henry Dreyfus Foundation meeting on Machine Learning for problems in Chemistry and Materials Science (2019), a Senior Fellow in UCLA Institute of Pure and Applied Mathematics during the program on Machine Learning and Many-body Physics (2016), invited to the White House event for starting of the Materials Genome Initiative (2012), Invited speaker in Erwin Schrödinger International Institute for Mathematical Physics-Vienna (2007), Intel’s first Distinguished Lecturer in Caltech (1998) and MIT (1999). He has also given several colloquia and lectures in universities all over the world and his research was also featured in the publications Science (2012), TED (2013), IEEE Computer (2024), Nature Machine Intelligence (2022), Nature Physics (2022), Nature Communications (2024, 2025), Proceedings of the National Academy of Sciences (2021, 2025).

#### CURRENT ROLE AT STANFORD

Research Technology Manager, Microelectronics

SLAC National Accelerator Laboratory

2575 Sand Hill Road

Menlo Park, CA 94025

sshankar@slac.stanford.edu

Adjunct Professor, Materials Science and Engineering

William F. Durand Building

496 Lomita Mall, Suite 102

Stanford University

Stanford, CA 94305

sadasivan.shankar@stanford.edu; sadas.shankar@stanford.edu

## Publications

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### PUBLICATIONS

- **Oxidative stress is a shared characteristic of ME/CFS and Long COVID.** *Proceedings of the National Academy of Sciences of the United States of America*  
Shankar, V., Wilhelmy, J., Curtis, E. J., Michael, B., Cervantes, L., Mallajosyula, V., Davis, R. W., Snyder, M., Younis, S., Robinson, W. H., Shankar, S., Mischel, P. S., Bonilla, et al  
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2025; 16 (1): 3086
- **Challenging Trends in Energy of Computing for Data Centers** *COMPUTER*  
Shankar, S.  
2024; 57 (12): 134-142
- **<i>In-Silico</i> Analysis of High Refractive Index Materials Through Principles of Materials Design** *IEEE NANOTECHNOLOGY MAGAZINE*  
Shankar, S., Sumpter, B. G., Shankar, V., Goddard, W., Naserifar, S.  
2024
- **Neuromorphic intermediate representation: A unified instruction set for interoperable brain-inspired computing.** *Nature communications*  
Pedersen, J. E., Abreu, S., Jobst, M., Lenz, G., Fra, V., Bauer, F. C., Muir, D. R., Zhou, P., Vogginger, B., Heckel, K., Urgese, G., Shankar, S., Stewart, et al  
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- **Oxidative stress is a shared characteristic of ME/CFS and Long COVID**  
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AMER ASSOC IMMUNOLOGISTS.2024
- **Neuromorphic Intermediate Representation: A Unified Instruction Set for Interoperable Brain-Inspired Computing** *arXiv*  
Pedersen, J., Abreu, S.  
2024
- **Energy Estimates Across Layers of Computing: <i>From Devices to Large-Scale Applications in Machine Learning for Natural Language Processing</i>, <i>Scientific Computing</i>, <i>and Cryptocurrency Mining</i>**  
Shankar, S., IEEE  
IEEE.2023
- **The perils of machine learning in designing new chemicals and materials** *Nature Machine Intelligence*  
Shankar, S., Zare, R.  
2022; 4: 314–315
- **Trends in Energy Estimates for Computing in AI/Machine Learning Accelerators, Supercomputers, and Compute-Intensive Applications** *High Performance Extreme Computing Conference (HPEC)*  
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2022: 1-8

- **Now Is the Time to Build a National Data Ecosystem for Materials Science and Chemistry Research Data** *ACS Omega*  
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2022: 1-5
- **Physical bioenergetics: Energy fluxes, budgets, and constraints in cells.** *Proceedings of the National Academy of Sciences of the United States of America*  
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- **Characterization of Phases and Orientations of Micro-structured Materials Using Computational Crystallography** *Computational Materials, Chemistry, and Biochemistry: From Bold Initiatives to the Last Mile*  
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- **Can machine learning be used to learn laws of natural science? Illustration for Planck's blackbody radiation**  
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2022

- **Generalized Sheath Criterion for Multi-species Weakly Ionized Plasmas** *APS Spring Meeting*  
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- **Can Artificial Intelligence "formulate" Quantum Mechanics? An Illustration for Planck's Blackbody Radiation** *APS Spring Meeting*  
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