Who's New

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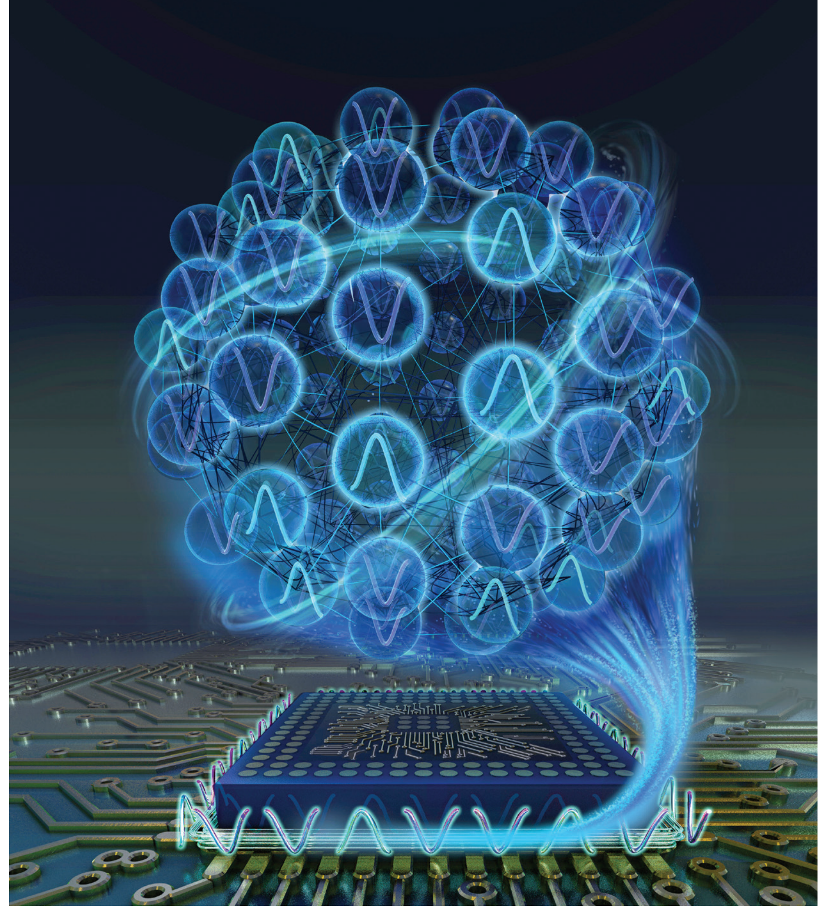


Artistic illustration of an Ising machine—a special-purpose computer for optimization problems that uses short pulses of light

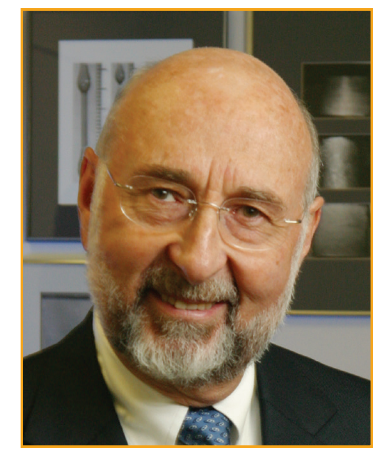
Alireza Marandi

Assistant Professor of Electrical Engineering

Alireza Marandi's research is focused on fundamental technological developments in nonlinear photonics. These technologies enable innovative, practical, and scalable solutions for challenges related to capturing information and its processing. His work explores the frontiers of ultrafast optics, optical frequency combs, quantum optics, optical information processing, mid-infrared photonics, and laser spectroscopy. His group uses state-of-the-art laser systems, micro- and nanofabrication techniques, numerical and theoretical techniques, and unconventional materials. Their main goal is experimental realization of novel nonlinear photonic systems, techniques, and technologies. In addition, they are working to advance the theoretical understanding of these systems and their applications, which range from sensing to unconventional computing and information processing.

Marandi received his BS from the University of Tehran, Iran, his MS from the University of Victoria, Canada, and his PhD from Stanford University, all in electrical engineering. Before joining Caltech as a faculty member, he was a postdoctoral scholar and research engineer at Stanford. He has also been a visiting scientist at the National Institute of Informatics in Japan and a senior engineer in the Advanced Technology Group of Dolby Laboratories, developing photonic technologies for high-dynamic-range display applications.

The Moore Distinguished Scholar program was established by Gordon and Betty Moore to invite researchers of exceptional quality who are distinguished at both the national and international levels to visit the California Institute of Technology for three to six months. There are no teaching or other obligations during the appointment, allowing Moore Scholars to focus on research. Visit eas.caltech.edu/people/moorescholars.

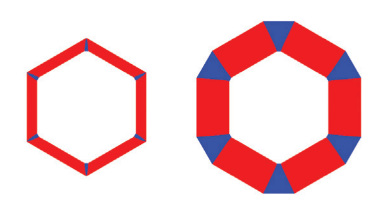


Stephen H. Davis

Professor of Applied Mathematics, Northwestern University

Stephen Davis is McCormick Institute Professor and Walter P. Murphy Professor of Applied Mathematics at Northwestern University. One of his research interests is fluid mechanics, with a specialization in interfacial dynamics, moving contact lines, thin films, and stability theory. Another research focus is in materials science: he explores solidification/fluid-flow interactions, rapid solidification, nanowire growth, cladding of nanowires, and island formation.

Davis received his BEE, MS, and PhD from Rensselaer Polytechnic Institute. Among his previous roles are research mathematician at the RAND Corporation, lecturer in applied mathematics at Imperial College London, and professor of mechanics at Johns Hopkins University. He is a member of the National Academy of Sciences, the National Academy of Engineering, the American Academy of Arts and Sciences, and the Academia Europaea. Davis has been awarded the G. I. Taylor Medal by the Society of Engineering Science, the Fluid Dynamics Prize by the American Physical Society, and the Humboldt Research Award for senior research scientists.



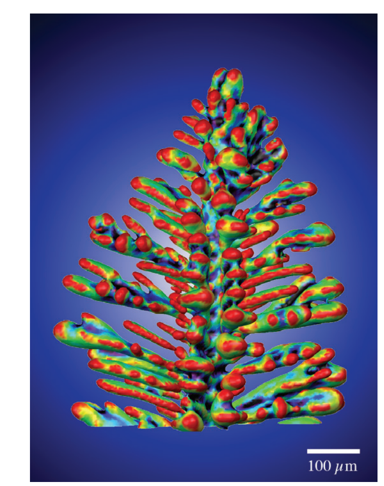
Cross section of the six-fold core-shell nanowire

Peter Voorhees

Frank C. Engelhart Professor of Materials Science and Engineering, Northwestern University

Peter Voorhees is the Frank C. Engelhart Professor of Materials Science and Engineering at Northwestern University. He is also the co-director of the Northwestern-Argonne Institute of Science and Engineering and co-director of the Center for Hierarchical Materials Design.

Voorhees's research focuses on the thermodynamics and kinetics of phase transformations in materials. He has a long-standing interest in coarsening processes that can occur in two-phase mixtures and has provided both theories for coarsening phenomena and experiments that test these theories. Voorhees's group also developed the first machine that automatically produces serial sections of a material, and they have created the computational tools needed to both reconstruct the three-dimensional structure and interpret the large data sets that are produced by such machines. Voorhees received his PhD in materials engineering from Rensselaer Polytechnic Institute. He has received numerous awards, including the ASM J. Willard Gibbs Phase Equilibria Award and is a fellow of several societies, including the American Academy of Arts and Sciences.



Three-dimensional reconstruction of an aluminum dendrite that was growing from an aluminum-copper liquid. In the image, the mean interfacial curvature is displayed on the interface of the dendrite, where positive mean curvature is red and negative mean curvature is blue. The challenge is to predict this morphologically complex dendrite and connect its morphology to the properties of an alloy.