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In Search for the Next Magic Stone

Materials demarcate periods of human civilization. The current period can be argued as defined by silicon, the magic stone that transformed the way we live. From the vantage point of McCullough building on Stanford campus, I will discuss how the simplest implementation of the quantum theory of solid contributed to the rise of silicon, integrated circuit, Silicon Valley and the information age. I will then discuss the challenges and opportunities in materials where silicon class theory fails. The focus will be on modern spectroscopy tools in aiding the development of quantum many-body theory, by testing ideas, discovering surprises and benchmarking theories, aiming at new classes of quantum matter, in search for the next magic stone.

Dr. Shen is the Paul Pigott professor of Physical Sciences, Stanford University, and a Professor of Physics and Applied Physics of Stanford University. He is a member of the US National Academy of Science. His primary interest is the novel quantum phenomena in materials. His contributions have been recognized by the US Department of Energy E.O. Lawrence Award, the American Physical Society Oliver E. Buckley Prize, the International H. Kamerlingh Onnes Prize, and the Einstein Professorship Award of Chinese Academy of Sciences. He served as the Chief Scientist of SLAC National Accelerator Laboratory, the Director of the Stanford Institute for Material and Energy Sciences and the Director of Geballe Laboratory for Advanced Materials of Stanford University. He is the Tage Erlander visiting Professor at KTH, the Royal Institute of Technology, Sweden.

