Rajendra Singh

D. Houser Banks Professor of Electrical and Computer Engineering

B.S. Physics, Agra University, India, 1965

M.S. Physics/Electronics, Meerut University, India, 1968

Ph.D. Physics, McMaster University, Canada, 1979

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Academics and Experience

Before joining Clemson University, Rajendra Singh was a visiting assistant professor at both the University of Waterloo, Canada, and at Colorado State University, Fort Collins. In 1980, he joined Energy Conversion Devices Inc. as senior research scientist and worked on amorphous silicon solar cells and thermoelectric devices. Part of the work done there resulted in one U.S. and four foreign patents. He served as a professor and the director of the Microelectronics Laboratory at the University of Oklahoma's School of Electrical Engineering and Computer Science for 10 years. In 1992, he joined Clemson University as the first D. Houser Banks Professor in the Holcombe Department of Electrical and Computer Engineering. From 1996 to 1999, he served as the director of the materials science and engineering program at Clemson. In 1997, he became the director of the Center for Silicon Nanoelectronics at Clemson.

Singh has published more than 300 papers in various journals and conference proceedings. He is editor or co-editor of more than 10 conference proceedings and has presented more than 50 keynote addresses and invited talks in various national and international conferences. In 2008, he delivered a keynote talk to a conference in Europe on "Global Green Energy Conversion Revolution in the 21st Century through Solid State Devices."

Research

Singh's research contributions have been primarily in the field of rapid thermal processing, ultra-thin gate dielectrics, low and high-k dielectrics, superconductivity, manufacturing of silicon-integrated circuits, solar cells, thermoelectric devices and nanotechnology. He was the first to report the fundamental differences between furnace processing and rapid thermal processing. His work on rapid thermal processing has led to various new applications, such as novel chemical vapor deposition techniques for high- and low-dielectric-constant materials and the manufacture of solar cells. His fundamental work has served as an initial incubator to rapid thermal processing (RTP) technology. His discovery of concepts used in commercial RTP tools has been credited with the related semiconductor equipment manufacturing industry now being valued at over $1 billion per year. The use of RTP in solar cells manufacturing is also mainly due to Singh's contributions. His work on solar cells is included in many recent textbooks on solar cells and has been cited by researchers throughout the world. His early work on ultra-thin gate oxide led to the passivation techniques used on the surface of commercial silicon solar cells. Similarly, his work on conducting oxide semiconductors led to the use of these materials in all kinds of commercial thin-film solar cells. In 2011, he was named as one of 10 global "Champions of Photovoltaic Technology" by *Photovoltaics World* magazine for his lifelong work on the science of solar cells.

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