



Supratik Guha

Professor

Director of Nanoscience and Technology, Argonne National Laboratory

Areas of Research Expertise

Materials and devices for new computing architectures, cyberphysical sensing systems, energy conversion technologies; materials science of semiconductors and oxides

Research Overview: Guha Group

The Guha group is focused on transitioning materials from their initial discovery and fundamental study phase into useful electronic and optical devices. Current research in the Guha group is focused in two directions. The first is in new materials and devices for future computing architectures, including the study and discovery of new oxide and oxy-chalcogenide heterostructures. The second is in the development of low power sensing networks and sensing materials/sensors for water, soil and agriculture.

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Research

Supratik Guha is a materials scientist with interests in new semiconductors and oxide materials and devices for non-Boolean computing architectures, cyberphysical sensing systems, and energy conversion technologies.

His work focuses on the discovery of thin film materials and novel devices that can be used for ultra-low power non-Boolean computing and sensing. In addition, Guha has been conducting sensor-based studies for geo-spatial applications such as high-resolution agriculture, and the tracking of pollutants in rivers.

Guha has made many contributions to semiconductor materials science, including pioneering the development of high dielectric constant metal gate transistors, one of the most significant developments in silicon chip technology in decades. Today, the processor chips in over fifty percent of smart phones and tablets use Guha's nanoscale dielectrics and processes.

Bio

Guha earned his PhD in materials science from the University of Southern California and began his career as a post-doc in the Esaki-Chang group at the IBM T.J. Watson Research Center in 1991. After a brief stint at 3M Corporate Research Labs from 1992 to 1995, Guha returned to IBM in 1995, where he became director of physical sciences in 2010, and ran IBM's worldwide research strategy in the physical sciences between 2010 and 2015. He joined the faculty at IME in 2015, with a joint appointment as Director of the Nanoscience and Technology Division at Argonne National Laboratory.

Guha is a fellow of the Materials Research Society and the American Physical Society, and he was elected to the National Academy of Engineering in 2014.

Guha won the 2013 IBM Corporate Award for his work on this technology, and in 2015, he was awarded the Prize for Industrial Applications of Physics from the American Physical Society.