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Kaustav Banerjee

Professor of Electrical and Computer Engineering
Director of the Nanoelectronics Research Laboratory
University of California, Santa Barbara

Kaustav Banerjee is Professor of Electrical and Computer Engineering and Director of the Nanoelectronics Research Laboratory at the University of California, Santa Barbara. His research has helped establish atomically thin two-dimensional (2D) materials as a leading platform for energy-efficient nanoelectronics. Through predictive, device-physics-driven frameworks, his group has revealed fundamental scaling and performance limits of silicon–copper technologies and developed physically realistic, manufacturable pathways beyond them.

His contributions include pioneering the understanding and engineering of metal–2D-semiconductor interfaces; advancing intercalation-doped multilayer graphene for energy-efficient, beyond-copper interconnects; inventing the graphene kinetic inductor for highly miniaturized radio-frequency electronics; and developing CMOS-compatible, transfer-free graphene synthesis. His graphene-interconnect technologies have been independently validated by leading semiconductor manufacturers and incorporated into advanced semiconductor technology roadmaps. Collectively, his work has influenced semiconductor pathfinding worldwide, helping define future directions in advanced logic, memory, heterogeneous integration, and energy-efficient AI computing. To accelerate translation into semiconductor manufacturing, he co-founded Destination 2D in 2021, which is developing 300-mm graphene platforms for interconnects, thermal management, and advanced packaging.

Professor Banerjee is a Fellow of IEEE, APS, AAAS, JSPS, and AIIA, and a Clarivate Highly Cited Researcher. His honors include the IEEE Kiyo Tomiyasu Award, one of IEEE’s highest technical distinctions; the prestigious Friedrich Wilhelm Bessel Research Award from Germany’s Alexander von Humboldt Foundation; and the JSAP Fellow International, a major international distinction of the Japan Society of Applied Physics.