

Title: Biodegradable Electronics in the Semiconductor Era

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Presenter: Prof. Shweta Agarwala, School of Engineering and Applied Science,
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Abstract:

The semiconductor era has transformed modern life, yet, as electronic technologies become increasingly pervasive, their environmental footprint, short product lifecycles, and growing contribution to global e-waste present a critical challenge. In this context, biodegradable electronics is emerging as a complementary paradigm for specific classes of future devices where transient operation, material sustainability, and responsible end-of-life are essential.

This talk will examine how biodegradable electronics can be positioned within the broader semiconductor ecosystem through innovations in functional materials, low-temperature processing, flexible device platforms, and sustainable integration strategies. Particular emphasis will be placed on biodegradable and bio-derived substrates, piezoelectric and conductive material systems, as well as their relevance to packaging, sensor platforms, and distributed electronic applications. The discussion will highlight how principles from semiconductor science and engineering can be extended beyond the chip toward greener system-level design, including interface materials, encapsulation, and degradation-aware architectures.

Biography:

Shweta Agarwala is a full Professor and Associate Dean at the School of Engineering and Applied Science at Ahmedabad University, India, where she leads the pioneering Green Materials and Devices Laboratory. Her interdisciplinary work focuses on the development of sustainable electronic materials and devices, with a vision to drive environmental responsibility in electronics through the creation of fully biodegradable and flexible devices. She earned her PhD from the National University of Singapore and was a tenured professor at Aarhus University, Denmark. An IGSTC WISER grant recipient, co-founder of successful startups in Singapore and Denmark, and author of over 80 peer-reviewed Q1 journals, she is also an active contributor to the scientific community. She is a senior IEEE member, a Distinguished Lecturer in the IEEE Sensors Council, and is dedicated to advancing gender diversity in engineering.