



FLEXE

National Centre for Flexible Electronics

SCDT – FlexE Centre Webinar Series

The webinars aim to bring together researchers in Flexible Electronics and allied areas from across India (and other countries) on a single platform to promote professional interaction.

Webinar by



Dr. Nazek El-Atab

Electrical and Computer Engineering at King Abdullah University of Science and Technology (KAUST), Saudi Arabia on

“Ultra-flexible, Ultra-stretchable, Lightweight and High efficiency Silicon Solar Cells for Wide Ranging Deployment”

Date: 12th September, 2023

Time: 7:30 PM to 8:30 PM

Visit www.iitk.ac.in/scdt/webinars.html to access the zoom link to join the webinar.

The event will be chaired by

Dr. Sushmee Badhulika

Indian Institute of Technology Hyderabad

Abstract of the Webinar

The demand on flexible and stretchable energy harvesting devices is rapidly increasing, driven by the substantial market growth of a wide range of applications including wearables and humane robotics. In this talk, I will discuss the development of ultra-flexible and ultra-stretchable lightweight silicon solar cells with high-efficiency which can fully conform to curved and foldable surfaces of devices, systems and buildings. The flexible and stretchable solar cells are developed using a corrugation technique where high-efficiency (19%) rigid monocrystalline silicon solar cells with interdigitated-back-contacts (IBC) are transformed into ultra-flexible cells with no degradation in their original efficiency. As a result, silicon islands with different shapes are obtained which are interconnected by the IBC grid. Moreover, the corrugation technique results in silicon solar cells with a higher surface area-to-volume ratio which enhances their heat dissipation characteristic by natural convection. Eco-friendly and transparent polymers (polydimethylsiloxane/Ecoflex) are used to encapsulate the cells which improves their mechanical robustness as confirmed by a drone-assisted drop test and relieves the thermal mismatch challenge between the silicon and the polymeric encapsulant.

Information about the speaker

Nazek El-Atab is an Assistant Professor of Electrical and Computer Engineering at King Abdullah University of Science and Technology (KAUST), Saudi Arabia. Prof. Nazek El-Atab received her Ph.D. degree in Interdisciplinary Engineering from the Masdar Institute of Science and Technology, Abu Dhabi, UAE, in 2017, under a cooperative program with the MIT and funded by the US Office of Naval Research. Prof. El-Atab’s research interest focuses on the design and fabrication of smart memory and electronic devices and their applications, including in-memory computing and in-memory sensing. Prof. El-Atab has received several awards for her research, including the 2015 For Women in Science Middle East Fellowship and the the 2017 International Rising Talents Award by L’Oreal-UNESCO, and was portrayed in the 2019 “Remarkable Women in Technology” by UNESCO. Prof. El-Atab was also selected to participate in the 70th Lindau Nobel Laureate Meeting in Germany, was selected among the 2020 UC Berkeley EECS Rising Stars, among the 10 Innovators under 35 by MIT Technology Review Arabia in 2020, and as a “NEOM Changemaker” in 2021. She is an IEEE Electron Devices Society Distinguished Lecturer.