



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



Prof. K.S. Narayan

Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), Bangalore

On
“Organic Semiconductors for Bio-Electronics”

Date: 16th March, 2021

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 Prof. Parikshit Sahatiya, BITS Pilani, Hyderabad

Abstract of the Webinar

The possibility of seamlessly integrating human sense organs with device components and circuits consisting of soft electronic materials on biocompatible substrates offers useful options to monitor-enhance-augment natural response to various stimuli. It has been observed generally that polymer surfaces with appropriate mechanical attributes such as adhesive strength, microtexture and nanotopography, surface wettability and stiffness are conducive for anchoring neuronal cells.

The electronic characteristics of certain semiconducting and conducting polymers have also been used for sensing and stimulating neuronal activity. The optoelectronic properties of these tailored-materials have recently been utilized in our laboratory as active triggers for neuronal stimulation. We have pioneered the use of these novel optoelectronic features of organic semiconductors as an interface to evoke neuronal signals (from retinal ganglion cells) in a blind retina of a developing chick-embryo. This possibility of triggering neuronal signals in a blind retina has opened up a route for utilizing these (intelligent) structures as a prosthetic element. These promising initial results requires systematic deeper understanding to enable promising route for vision restoration targeted in retinitis pigmentosa and macular degeneration.

Information about the speaker

Prof. K.S. Narayan is an academic researcher and a Professor at JNCASR. He has been active in the general field of molecular/organic/polymer/bio electronics at JNCASR. Narayan’s research interests are in applied physics and materials-physics with a focus on electronic and optoelectronic processes of extended macromolecular systems and utilizing it for device development. After contributing to the initial discoveries in the field of molecular magnetism during his PhD, he branched out to different research themes. His sustained, original and rigorous efforts over the last two decades at JNCASR, where he established a unique laboratory for this pursuit led to the early reports on plastic optical-field effect transistors, polymer solar cells and polymer light emitting diodes. He has also contributed to research area of these soft-electronic polymers in biomedical arena where these materials have exhibited utility in tissue engineering and for vision prosthetic elements. His present laboratory theme focusses on exploring advanced materials for integrating seamlessly the connected world with human sensory systems for variety of biomedical applications and understand it from a device physics perspective. His other current pursuits include developing noise measurement and scanning techniques to predict the full life cycle of photovoltaic modules. His work has received international coverage (Physics World, Laser Focus World, Printed Electronics World, Materials Research Society Bulletin, Nature India). He has been regularly invited to speak at APS and MRS meetings.