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. Subho Dasgupta
Department of Materials Engineering,
Indian Institute of Science, Bangalore

on

"Fully printed, ultra-flexible and low temperature processed oxide electronics"

Date: 12th April, 2022
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. Soumya Dutta
Indian Institute of Technology Madras

Abstract of the Webinar

Research on printed logic electronics was initiated in the last century with the invention of easy-to-print organic semiconductors with appreciable carrier mobility. It is only about the last one decade that printed oxide semiconductors and devices have come up as a possible competitor to the matured polymer electronics activity. Here, the oxygen deficient n-type oxides can demonstrate carrier mobility close to polycrystalline silicon, and maintain their band transport even when amorphous in nature. In fact, today the dc performance of these solution-processed oxide thin film transistors (TFTs) is no way inferior to their physical vapor deposited counterparts. However, the limited printing resolution has always posed a major hindrance to achieve high operation frequency. In addition, oxides are often criticized for their high process temperatures (which may make them incompatible to inexpensive polymer substrates), and lack of mechanical flexibility/bendability. Unsurprisingly, the ceramic oxides are inherently brittle and demonstrate very little (typically <1%) strain tolerance. In contrast, here in this presentation a couple of novel material and (device) design strategies will be proposed and discussed that may help to achieve significantly large (up to 5%) strain tolerance under dynamic mechanical test conditions. At the same time, high frequency operation from several tens of kHz to hundreds of kHz will be demonstrated with fully-printed, benchmark circuit elements. Alongside demonstrated stability and reliability, the achieved frequency response can be sufficient to cover many of the application domains that have originally been envisioned for printed electronics to cater.

Information about the speaker

Prof. Subho Dasgupta was the recipient of Director's gold medal from IIT Kharagpur in 2005. He received PhD in material science from TU Darmstadt, Germany in 2009. Next, he worked as a group leader at Karlsruhe Institute of Technology (KIT) from 2012-2016. He has also served as a Visiting Scientist at Lawrence Livermore National Laboratory. Presently he is working at Indian Institute of Science (IISc), Bangalore. He has about 45 journal publications and 14 patents (submitted/accepted) to his credit. His primary research interest includes Printed electronics, Oxide electronics, 2D materials, Electrolytic field-effect, Printed supercapacitors and Sensors.