



## 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. V. Ramgopal Rao

Department of Electrical Engineering,  
Indian Institute of Technology Delhi

on  
“IoT Platforms for Developing Countries:  
Materials to Commercial Systems”

Date: 12<sup>th</sup> July, 2022

Time: 7:30 PM to 8:30 PM

Visit [www.iitk.ac.in/scdt/webinars.html](http://www.iitk.ac.in/scdt/webinars.html)  
to access the zoom link to join the  
webinar.

The event will be chaired by

**Dr. Ruma Ghosh**

Indian Institute of Technology Dharwad

### Abstract of the Webinar

IoT based sensor networks are expected to see a massive growth the world over in the next few years. However, the poor infrastructural facilities available in many of the developing countries and meeting of the low-cost requirements in these markets can pose two major challenges for a massive deployment of IoT sensors in the developing world. Sensor networks for security, healthcare, environment and agriculture are some of the areas where IoT can significantly impact the world populations.

While silicon has been the most widely used material for Nanoelectronics and Micro/Nano-Electro-Mechanical-Sensor systems, polymers enable fabrication of MEMS/NEMS devices with superior electro-mechanical characteristics as compared to the traditional silicon-based materials. Polymers are also ideally suited for low cost disposable sensor applications, as well as for applications that require high surface stress sensitivity. The applications for polymer MEMS/NEMS range from healthcare to homeland security. There are however multiple issues that need to be addressed in order to make the polymer MEMS a mainstream technology. One of the issues is related to the electro-mechanical transduction sensitivity, which requires integration of novel materials and process techniques. The other issue concerns the stability of polymer materials in atmosphere, when used as sensors. CMOS compatibility of these materials processing is another issue. In this talk, we will look at some of the approaches for addressing these concerns using a variety of processes & materials. This talk discusses the current status of research with polymer MEMS/NEMS devices and use of organics for enhancing the performance of silicon devices.

### Information about the speaker

Prof. V. Ramgopal Rao is currently the Pillay Chair Professor in EE and the immediate Past Director of IIT Delhi. Before joining IIT Delhi as the Director in April 2016, Dr. Rao served as a P. K. Kelkar Chair Professor for Nanotechnology in the Department of Electrical Engineering and as the Chief Investigator for the Centre of Excellence in Nanoelectronics project at IIT Bombay. Dr. Rao has over 480 research publications in the area of nano-scale devices & Nanoelectronics and is an inventor on 49 patents and patent applications, which include 18 issued US patents. Thirteen of his patents have been licensed to industries for commercialization. Prof. Rao is a co-founder of two deep technology startups at IIT Bombay ([www.nanosniff.com](http://www.nanosniff.com) & [www.soilsens.com](http://www.soilsens.com)) which have successfully launched products in the market. Dr. Rao is a Fellow of IEEE, a Fellow of the Indian National Academy of Engineering, the Indian Academy of Sciences, the National Academy of Sciences, and the Indian National Science Academy.

Prof. Rao's research and leadership contributions have been recognized with over 35 awards and honors in the country and abroad. He is a recipient of three honorary doctorates. The recognitions Prof. Rao received include the Shanti Swarup Bhatnagar Prize in Engineering Sciences, Infosys Prize, IEEE EDS Education Award, Swarnajayanti Fellowship award from the Department of Science & Technology, J.C.Bose National Fellowship among many others.

Prof. Rao was an Editor for the IEEE Transactions on Electron Devices during 2003-2012 for the CMOS Devices and Technology area and currently serves on the Editorial Advisory Board of ACS Nano Letters, a leading international journal in the area of Nanotechnology. He also serves as an Editor for the IEEE Journal on Flexible Electronics.