

# **Institute Lecture**

## **Polymer and Printable Transistors: Recent Advances**

**Prof. Ananth Dodabalapur, Ashley H Priddy Centennial Professor,  
The University of Texas at Austin**

**Thursday, 14<sup>th</sup> March 2013, Time: 6.00 PM, Venue: L-16, Lecture Hall  
Complex**

### **Abstract**

This talk will describe the important device characteristics of a variety of printable thin-film transistors including state-of-the-art polymer thin-film transistors (TFTs), single-walled carbon nanotube (SWCNT) and amorphous oxide TFTs. New device geometries will be discussed that improve performance. Charge transport in organic and polymer field effect transistors can be described by multiple-trap-and-release (MTR) type transport superposed with both molecular and dielectric polaron effects, the latter typically originating from the gate insulator and other polarizing media. In amorphous oxide TFTs, MTR type transport is observed at low carrier concentrations and in low mobility materials whereas in high mobility systems at high carrier densities, a mobility edge is clearly observed along with signatures of extended state (band) transport. We have observed gate-field modulated metal-insulator transitions in an amorphous semiconductor for the first time. The final part of the talk will discuss practical applications of polymer TFTs and describe how RFID tag circuits can be constructed with such polymer TFTs.

### **About the speaker**

Dr. Ananth Dodabalapur received his bachelors degree from the Indian Institute of Technology, Madras (Chennai) in 1985, and M.S. and Ph.D. degrees in Electrical Engineering from The University of Texas at Austin in 1987 and 1990 respectively. Between 1990 and 2001 he was with Bell Laboratories, NJ. Since 1992 he has investigated various aspects of the physics and technology of organic and polymer semiconductor devices.

He has published more than 150 articles in refereed journals which have been cited more than 13,000 times and has 27 US patents. He is a co-recipient of the 2002 National award for team innovation of the American Chemical Society, and a co-recipient of an R&D 100 award for 2001. Since September 2001, he is with The University of Texas at Austin and is the Ashley H Priddy Centennial Professorship in Engineering, and also holds the June and Gene Gillis Endowed Faculty Fellowship. His present research includes organic and inorganic thin-film transistors, chemical sensors, photovoltaics and thin-film circuits. In 2003, he co-founded OrganicID, a company that is investigating using printable polymer electronics to fabricate low-cost RFID tags for the 13.56 MHz frequency. He is a visiting professor at the Institute of Materials Research and Engineering, Singapore.

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**Tea at 5.45 PM**

**All interested are welcome.**

Ajit Kumar Chaturvedi  
Dean of Research and Development  
IIT Kanpur