



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. Santhosh Babu Sukumaran

Organic Chemistry Division
National Chemical Laboratory (CSIR-NCL)

on
“Design and Development of Functional
Materials: Case Studies on Solvent-Free
Organic Liquids and Nonplanar
Nanographenes”

Date: 14th April 2026

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. Venkata Suresh Mothika

Indian Institute of Technology Kanpur

Abstract of the Webinar

The rational design of functional materials with tunable (chiro)optoelectronic properties is central to advancing next-generation technologies in optoelectronics, energy storage, and soft electronics. Solvent-free organic liquids (SOLs), composed entirely of functional molecular units, offer unique advantages, including enhanced processability, intrinsic fluidity, and the elimination of volatile solvents, making them attractive for sustainable and flexible material applications. Through molecular engineering of intermolecular interactions and steric architecture, we demonstrate how viscosity, thermal stability, and optoelectronic properties can be precisely controlled. Interestingly, a polymerizable SOL enabled the development of large-area, flexible, foldable, and stretchable luminescent thin films.

In parallel, nanographenes provide a versatile platform for tailoring electronic structure through edge topology, π -conjugation, and heteroatom incorporation. By modulating molecular geometry and electronic coupling, we explore structure–property relationships governing excited-state behavior, charge transport, and photophysical responses. The innovative strategies for the design and development of functional materials, focusing on two emerging classes: solvent-free organic liquids and nonplanar nanographenes, will be discussed.

Information about the speaker

Dr. Santhosh Babu Sukumaran is currently a Senior Principal Scientist at CSIR-National Chemical Laboratory (NCL) and a Professor at the Academy of Scientific and Innovative Research (AcSIR). He obtained his Ph. D. in 2009 from National Institute for Interdisciplinary Science and Technology (CSIR-NIIST), Trivandrum, India. He carried out postdoctoral studies at Max Planck Institute of Colloids and Interfaces, Germany, National Institute for Materials Science (NIMS), Japan, and the University of Namur, Belgium till 2014. His research interests include self-assembly of organic materials, metal-free organic phosphors, and 2D-polymers for catalytic and energy applications. He has won many prestigious awards including Raman Research Fellowship 2026 and CRSI Bronze Metal 2026.