



ME Special Seminar

Electro-Thermal Transport in Electronics Materials and Their Devices



Dr. Satish Kumar

Associate Professor

*George W. Woodruff School of Mechanical Engineering
at Georgia Tech*

Wednesday, October 17, 2018

10:30 – 11:30 am

2000A Phoenix Memorial Lab

Abstract:

This talk will give an overview of the research work pursued by Micro Nano Devices and Systems Lab (MiNDS) led by Dr. Satish Kumar at Georgia Tech, USA. His research group addresses electro-thermal transport in wide band-gap devices using multi-scale modeling and ultra-fast thermal imaging techniques; phonon transport in 2D materials (graphene, boron-nitride, MoSe₂, etc.) and their interfaces using atomistic modeling techniques and time-domain thermo-reflectance method; and carbon nanotube network devices for sensing and flexible electronics. Electro-thermal transport and hot-spot generation mechanism in GaN based electronic devices will be discussed. Next, phonon transport analysis in 2D materials and their hetero-structures using density functional theory and atomistic Green's function method will be presented. This study has investigated phonon properties of 2D materials considering the effect of doping and defects, and the thermal conductance/transport at the interfaces of 2D materials. Finally, carbon nanotube network devices and fabrication/analysis of these devices for sensing and flexible electronics will be discussed.

Bio:

Dr. Satish Kumar is currently Associate Professor in George W. Woodruff School of Mechanical Engineering at Georgia Tech. Prior to joining Georgia Tech in 2009 as an Assistant Professor, he worked at IBM Corporation where he was responsible for the thermal management of electronic devices. Kumar received his Ph.D. in Mechanical Engineering and M.S. degree in Electrical and Computer Engineering from Purdue University, West Lafayette in 2007; and B.Tech. degree in Mechanical Engineering from the Indian Institute of Technology, Guwahati in 2001. His research interests are in electro-thermal transport study in nano-structures and electronic devices, wide band-gap devices, and flexible-electronics. He is author or co-author of over 100 journal or conference publications. Dr. Kumar is recipient of 2005 Purdue Research Foundation Fellowship, 1969 Teaching Fellow from Center for the Enhancement of Teaching and Learning Center at Georgia Tech, 2012 Summer Faculty Fellow from Air Force Research Lab, 2014 Sigma Xi Young Faculty Award, 2014 DARPA Young Faculty Award, and 2017 Woodruff Faculty Fellow.