

IITB Sensors Workshop (Virtual): Sensing the World 5 - 6 March, 2021

About the workshop

Sensors are ubiquitous in our lives. They have improved all aspects of our lives including health, smart homes, automotives, industries, agriculture etc.

The purpose of this workshop is to bring together experts who work in varied aspects of sensors and systems starting from sensor's design, materials, theories, fabrication and developing real time applications using sensor interfacing, software, algorithm, data analysis, etc.

The workshop would not only provide a platform to showcase the activities going on in the institute in the sensors domain, but would also bring in experts from industries and other academic institutions to gauge the current developments and opportunities in this domain.

Through the panel discussions, the workshop would try to understand the challenges, needs of specific technologies and leverage on the existing expertise to bring out the solutions that potentially would enhance socio-economic growth.

Keynote Addresses:

- [Shri Nilesh Desai \(Director, ISRO-SAC\)](#)
- [Prof. Ramgopal Rao \(Director, IIT Delhi\)](#)
- [Prof. Navakanta Bhat \(Dean, IISc\)](#)

Sensor Theory, Materials, Design, Fabrication:

- Prof. C. Subramaniam (IIT Bombay) - Nanomaterials for Sensor Applications
- Prof. Anil Kumar (IIT Bombay) - Nanomaterials for Sensor Applications
- Prof. Kasturi Saha (IIT Bombay) - Quantum Sensors
- [Prof. Hsiao-Wen Zan \(NCTU Taiwan\): Ultrasensitive gas sensors and their applications in breath detection](#)
- Prof. Amit Agrawal (IIT Bombay) - Microfluidic Devices
- Prof. Prasanna Gandhi (IIT Bombay) - Multi-scale manufacturing

Sensor Interfaces, Signal Processing, Packaging:

- Prof. Pradeep Dixit (IIT Bombay) - Sensor Packaging
- Prof. Pramod Murali (IIT Bombay) - CMOS Magnetic Flow Cytometry
- Prof. Swaroop Ganguly (IIT Bombay) - Vibration-based Electronic Nose Sensing
- Prof. Ravindra Gudi (IIT Bombay) - Sensor Network Design
- Prof. Ajit Rajwade (IIT Bombay) - Compressed Sensing: Measuring Data Smartly in the Big Data Era
- [Prof. Mrinal Kumar \(Ohio State University\) - Sensor data processing](#)

Panel Discussion (Translating research in India):

- [Dr. Suraj Rengarajan \(Applied Materials\)](#)
- [Prof. Vasant Kumar \(Cambridge University\)](#)
- [Mr. Shashank Kumar \(Multi Nano Sense Technologies\)](#)
- [Ms. Poyni Bhatt \(SINE\)](#)
- [Mr. Runal Dahiwade \(Peppermint\)](#)
- Prof. Ravi Gudi (IIT Bombay)

Sensor Applications for Industry 4.0:

- Prof. Siddharth Tallur (IIT Bombay) - Structural Health Monitoring Sensors
- Dr. Ajay Agarwal (CSIR-CEERI) - Miniaturized Sensors for Industrial Applications
- Dr. Nitin Kale (Nanosniff) - Explosive detection
- Dr. T.N. Satish (DRDO-GTRE) - Measurements in Propulsion Systems

Panel Discussion (Future of Sensing):

- Dr. Ajay Agarwal (CSIR-CEERI)
- Dr. Chandrasekhar Nair (Bigtec)
- Dr. Beena Rai (TCS)
- Dr. Alpana Dubey (Accenture)
- Prof. Amit Agrawal (IIT Bombay)

Sensor Applications for Society:

- Prof. Maryam Shojaei (IIT Bombay) - Sensors for Precision Agriculture
- Prof. Rajesh Zele (IIT Bombay) - Wireless Sensor Network Design for Air Quality Monitoring
- Prof. Soumyo Mukherji (IIT Bombay) - Water Quality Sensors
- Prof. Dipti Gupta (IIT Bombay) - Wearable Sensors
- Prof. Rohit Srivastava (IIT Bombay) - Sensors for Healthcare Monitoring
- Prof. Debjani Paul (IIT Bombay) - Sensors for Healthcare Monitoring
- Prof. Suparna Mukherji (IIT Bombay) - Sensors for Environmental Monitoring
- Prof. Rinti Banerjee (IIT Bombay) - Sensors for Diagnostics

IITB Sensors Workshop: Tentative Schedule (Changes will be made in the same document)

Session	Time	Title	Speaker
Day 1: Friday, March 5th, 2021			
9:10 AM – 9:20 AM	Opening Remarks Prof. Subhasis Chaudhuri, Director, IIT Bombay		
9:20 AM – 9:30 AM	Welcome Address Prof. Milind D. Atrey, Dean R&D, IIT Bombay		
<p><u>Session 1</u></p> <p>Sensor Theory, Materials, Design, Fabrication</p> <p>Chair : Prof. Pradeep Dixit</p>	9:30 AM – 9:50 AM	Nanostructured materials for point-of-care chemical and electrochemical sensors	Prof. C. Subramaniam (IIT Bombay)
	9:50 AM – 10:10 AM	Development of state-of-the-art bio-microdevices	Prof. Amit Agrawal (IIT Bombay)
	10:10 AM – 10:30 AM	Diamond quantum sensor for neuronal imaging	Prof. Kasturi Saha (IIT Bombay)
	10:30 AM- 10:40 AM	Tea Break	
	10:40 AM – 11:00 AM	Ultrasensitive gas sensors and their applications in breath detection	Prof. Hsiao-Wen Zan (NCTU, Taiwan)
	11:00 AM – 11:20 AM	AI-based approach for generic and versatile chemical and biological sensors based on fluorescent transducers	Prof. Anil Kumar (IIT Bombay)
	11:20 AM – 11:40 AM	Novel lithography-less multi-scale fabrication methods via shaping of nanoparticle slurries	Prof. Prasanna Gandhi (IIT Bombay)
Keynote Address	11:40 AM – 12:25 PM	Prof. Navakanta Bhat, IISc Bangalore Bio-Chemical Sensor Systems	
Lunch (12:25 PM – 1:30 PM)			

Session	Time	Title	Speaker
<p>Session 2</p> <p>Sensor Interfaces, Signal Processing, Packaging</p> <p>Chair: Prof. Kasturi Saha</p>	1:30 PM – 1:50 PM	Development of through-glass vias interconnects by electrochemical discharge machining	Prof. Pradeep Dixit (IIT Bombay)
	1:50 PM – 2:10 PM	Miniature sensor interface circuits	Prof. Pramod Murali (IIT Bombay)
	2:10 PM – 2:30 PM	Vibration-based Electronic Nose Sensing - circuits and ML perspectives	Prof. Swaroop Ganguly (IIT Bombay)
	2:30 PM – 2:50 PM	Sensor network design: Critical design factors	Prof. Ravi Gudi (IIT Bombay)
	2:50 PM – 3:10 PM	Compressed Sensing: Measuring Data Smartly in the Big Data Era	Prof. Ajit Rajwade (IIT Bombay)
	3:10 PM- 3:40 AM	Tea Break	
	3:40 PM – 4:00 PM	Separating uncertainty from ignorance for sensors operating in an adverse environment	Prof. Mrinal Kumar (Ohio State University)
<p>Panel Discussion</p> <p>Moderator: Prof. Swaroop Ganguly</p>	4:00 PM – 5:30 PM	<p>Translating sensor research into products in India</p> <p>Ms. Poyini Bhatt (SINE) Mr. Runal Dahiwade (Peppermint) Dr. Suraj Rengarajan (Applied Materials) Prof. Vasant Kumar (Cambridge University) Mr. Shashank Kumar (Multi Nano Sense Technologies) Prof. Ravi Gudi (IITB Research Park)</p>	

End of Day 1

Session	Time	Title	Speaker
Day 2: Saturday, March 6th, 2021			
<u>Session 3</u> Sensor Applications for Industry 4.0 Chair: Prof. Soumyo Mukherji	9:00 AM – 9:20 AM	Sensor systems for structural health monitoring	Prof. Siddharth Tallur (IIT Bombay)
	9:20 AM – 9:40 AM	Miniaturized Sensors for Industrial Applications	Dr. Ajay Agarwal (CSIR-CEERI)
	9:40 AM – 10:00 AM	Nanosniffer: An Explosives Trace Detector	Dr. Nitin S. Kale (Nanosniff)
	10:00 AM – 10:30 AM	Challenges in Measurements related to Propulsion Systems	Dr. T. N. Satish (DRDO-GTRE)
Keynote Address	10:30 AM – 11:15 AM	Prof. V. Ramgopal Rao, IIT Delhi Sensor Platforms for Affordable IoT Solutions in the Developing World	
11:15 AM - 11:30 AM		Tea Break	
Keynote Address	11:30 AM – 12:15 PM	Shri Nilesh Desai, ISRO-SAC Space based Remote Sensors and Associated Technologies	
Panel Discussion Moderator: Prof. Dipti Gupta	12:15 PM – 1:45 PM	Sensing the future of ubiquitous sensing Dr. Ajay Agarwal (CSIR-CEERI) Dr. Chandrasekhar B. Nair (Bigtec Labs) Dr. Beena Rai (TCS) Dr. Alpana Dubey (Accenture) Prof. Amit Agrawal (IIT Bombay)	
Lunch (1:45 PM – 2:15 PM)			

Session	Time	Title	Speaker
Session 4 Sensor Applications for Society Chair: Prof. C. Subramaniam	2:15 PM – 2:35 PM	Wireless sensor network design for air quality monitoring	Prof. Rajesh Zele (IIT Bombay)
	2:35 PM – 2:55 PM	The need for sensors in water quality monitoring and inherent challenges	Prof. Suparna Mukherji (IIT Bombay)
	2:55 PM – 3:15 PM	Nanostructure decorated optical fiber sensors	Prof. Soumyo Mukherji (IIT Bombay)
	3:15 PM – 3:30 PM	Tea Break	
	3:30 PM – 3:50 PM	Sensors and systems for productive agriculture	Prof. Maryam Shojaei (IIT Bombay)
	3:50 PM – 4:10 PM	Affordable healthcare technologies	Prof. Rohit Srivastava (IIT Bombay)
	4:10 PM – 4:30	Detection of sickle cell anemia at point of care	Prof. Debjani Paul (IIT Bombay)
	4:30 PM – 4:50 PM	Smart nanomaterial based point-of-care sensors for diagnostics	Prof. Rinti Banerjee (IIT Bombay)
	4:50 PM – 5:10 PM	Wearable sensors and applications	Prof. Dipti Gupta (IIT Bombay)
5:10 PM – 5:20 PM		Valedictory Address Prof. A. M. Pradeep, Associate Dean R&D, IIT Bombay	

End of Day 2