

# SEVENTH RESEARCH SCHOLARS' DAY 2021

24th & 25th April



## KHOJ

The event revolves around the theme "KHOJ", the Hindi word for search, representing the quest for discovery in a researcher's life.



## Information Brochure

**24<sup>th</sup> APRIL  
SATURDAY**

# **DAY ONE SCHEDULE**

**RESEARCH  
SCHOLARS'  
DAY 2021**

## **INAUGURAL SESSION**

Welcome by PhD Representative

10:00 - 10:05

Welcome Message from Prof. B S Murty, Director, IITH

10:05 - 10:12

Introduction of the Chief Guest

10:12 - 10:15

Inaugural Address by the Chief Guest - Prof. Sandeep Verma, Secretary, SERB

10:15 - 10:45

Interaction session with the Honourable Chief Guest

10:45 - 10:55

Vote of Thanks

10:55 - 11:00

## **SESSION TWO**

Best presentations from Departmental RSD - Slot 1

11:00 - 12:30

Lunch break

## **SESSION THREE**

Panel discussion - Research experiences of students across universities in the Covid-19 time

14:30 - 15:00

Colloquium by Prof. P. Rajalakshmi, IITH

15:00 - 15:30

Colloquium by Prof. Saptarshi Majumdar, IITH

15:30 - 16:00

Workshop on the art of Scientific Writing by Dr. Tiju Thomas, IIT Madras

16:00 - 17:30

**25<sup>th</sup> APRIL  
SUNDAY**

## **DAY TWO SCHEDULE**

**RESEARCH  
SCHOLARS'  
DAY 2021**

### **SESSION FOUR**

Workshop on the Preparation of CV & SOP by Prof. G. Phanikumar, IIT Madras

10:00 - 11:15

5G: Significance and Implications - a talk by Prof. Kiran Kuchi, IITH

11:15 - 12:00

Best presentations from Departmental RSD - Slot 2

12:00 - 13:00

Lunch break

### **SESSION FIVE**

How to ideate and incubate a start-up: the model of space-tech company Agnikul

15:00 - 15:40

Best presentations from Departmental RSD - Slot 3

15:40 - 16:30

Solving the protein folding problem through AI and its implications by Prof. John Moulton, University of Maryland, USA

16:30 - 17:10

Announcement of winners from departmental RSDs

17:00 - 17:20

Cultural program

17:20 Onwards



भारतीय प्रौद्योगिकी संरसान हैदराबाद  
Indian Institute of Technology Hyderabad

# SEVENTH RESEARCH SCHOLARS' DAY 2021

DETAILS OF THE SPEAKERS

**IN DEPTH  
TALKS**



### CHIEF GUEST

#### Prof. Sandeep Verma

Secretary, Science and Engineering  
Research Board  
Professor, Department of Chemistry,  
Indian Institute of Technology, Kanpur



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Prof. Sandeep Verma took charge as Secretary of Science and Engineering Research Board (SERB) on 8th April 2019. Prof. Verma holds doctoral degree from the University of Illinois Medical Center, Chicago (1994), followed by two postdoctoral stints at the Department of Biochemistry and Molecular Biology, Johns Hopkins Bloomberg School of Public Health, Johns Hopkins Medical Institutions, Baltimore, USA, and at Max-Planck-Institute for Experimentelle Medizin, Goettingen, Germany. He joined the Department of Chemistry, Indian Institute of Technology, Kanpur, in 1997, where he is a Professor of Chemistry. He is also an affiliated faculty in the Department of Biological Sciences and Bioengineering, Center for Nanoscience, and Center for Environmental Science and Engineering at IIT, Kanpur.

His work has been recognized by the Goyal Prize (2019), J C Bose Fellowship (2015), Shanti Swarup Bhatnagar Prize (2010), DAE-SRC Outstanding Investigator Award (2010), Swarnajayanti Fellowship (2005), B M Birla Science Prize (2004), to name a few. He recently received the Distinguished Alumnus Award (2020) of Banaras Hindu University, Varanasi. He is an elected fellow of Indian National Science Academy, Indian Academy of Sciences and National Academy of Sciences, India. He is an Associate Editor of Chemical Communications (Royal Society of Chemistry, UK) and serves on the Editorial Advisory Boards of Cell Chemical Biology, ChemBioChem, and Journal of Peptide Science. His research interests include programmable soft matter for neuronal regeneration, bioinspired nanomaterials, novel antimicrobials, and small molecule-stem cell modulation.

### Prof. B S Murty

Director, IIT Hyderabad



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Prof. B.S. Murty has taken over as Director of IIT Hyderabad from August 26, 2019. Prof. Murty started his academic journey with a Diploma in Metallurgy in 1983 from Govt. Polytechnic, Vijayawada, followed by BE from VRCE Nagpur in 1986 and ME from IISc Bangalore in 1988. He obtained his PhD (1992) also from IISc, Bangalore.

He has made significant contributions to the fields such as non-equilibrium processing through mechanical alloying, nanocrystalline materials, bulk metallic glasses, high entropy alloys, grain refinement of Al alloys and Al based composites.

He is a recipient of a number of awards including Shanti Swarup Bhatnagar Award (2007), JC Bose Fellowship award (2018-2023), INAE Outstanding Teacher award (2019), Honorary Doctorate from Deakin University, Australia (2017), Life time Achievement Award of IIT Madras (2016), GD Birla Gold Medal (2015), Eminent Materials Engineer Award (2011), Distinguished Alumnus Award of VNIT (2010), Metallurgist of the Year Award (2004), MRSI Medal (2004), INAE Young Engineer Award (1997), INS Young Scientist Award (1995), Young Metallurgist Award (1994), and ISCA Young Scientists Award (1992).

## Panel Discussion

### Research experiences of students across universities in the covid19 time.



**Moderator**  
**Ms. Tejaswini Appidi**

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PhD student, Department of Biomedical Engineering, IIT Hyderabad

#### Panel Members



**Ms. Sushma  
Indrakumar**

PhD Scholar,  
Department of  
Materials Engineering,  
IISc, Bangalore



**Dr. Sai Gaurang  
Patnaik**

Post doctoral fellow  
Humboldt university of  
Berlin



**Mr. Thejus Kartha**

Phd Scholar,  
Department of  
Chemistry,  
IIT Hyderabad

### Prof. Rajalakshmi Pachamuthu

Department of Electrical Engineering  
IIT Hyderabad

Colloquium Scheduled at:  
03:00-03:30 PM, 24th April



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Prof. Rajalakshmi is a professor in the department of electrical engineering at IIT Hyderabad and currently the Dean (students) at IITH. Her research interests include Wireless communications, Wireless sensor networks, UAV-based sensing, Embedded systems, Cyber Physical Systems/Internet of Things (CPS/IoT), Converged network modelling, Energy efficiency, Green communications.

Her achievements include 'Young Faculty Research Fellowship' under Visvesvaraya PhD scheme for Electronics and IT of DeitY from January 2016 for a period of 5 years, "Digital Trail Blazer Award 2016" by India Today in December 2016 at National Level, Bronze Medal in Seoul International Invention Fair 2016 for "Ultra Compact IoT Enabled Power Monitor Device", Silver Medal in International Innovation Fair (IIA) 2017 held at Vizag, "Digital Trail Blazer Award" for Telangana State by India Today in June 2016, "Silver Medal" in "Non-invasive power monitoring technology" in International Innovation Fair (IIA) 2017 held at Vizag. She was also awarded as an "INDIA's most inspiring Women Engineer/Scientist" For the Year 2014 by Engineering Watch.

Some of the products developed by her research group are: IOT Enabled Soil Moisture probe, Ultra-compact IoT Enabled Power Monitoring Module, IITH-Micromote, IITH-MOTE, IITH-MOTE-Air pollution, IoT Enabled Ultrasound Scanning System, Smart Phone based Node placement advisor for Wireless Sensor Networks, Smart Phone Based Smart Room Monitoring and Actuation, and Solar Powered Weather Proof Air Pollution Monitoring System

## **Prof. Saptarshi Majumdar**

Department of Chemical Engineering,  
IIT Hyderabad

Colloquium Scheduled at:  
03:30-04:00 PM, 24th April



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Prof. Saptarshi Majumdar is a professor in the department of Chemical engineering at IIT Hyderabad and currently the Dean (academics) at IITH.

Prof. Majumdar did his PhD from IIT Kharagpur. His research interest is in the area of multi-scale modeling, bio materials design and industrial process analysis.

The research team led by Prof. Saptarshi Majumdar and Dr. Chandra Shekhar Sharma, associate professor, Creative and Advanced Research Based on Nanomaterials (CARBON) Laboratory, Department of Chemical Engineering, developed a method to produce controlled-release oral tablets for treating fungal infections and leishmaniasis (kala-azar or black fever), which are prevalent in the country

### Dr. Tiju Thomas

Department of Materials Science & Metallurgical Engineering at Indian Institute of Technology, Madras

Workshop : Art of scientific writing.  
At 04:00-05:30 PM, 24th April



Dr. Tiju Thomas is an Associate Professor and head of the "Applied Nanostructure Engineering and Nanochemistry" lab at the Department of Metallurgical and Materials Engineering (Indian Institute of Technology Madras, IITM) in Chennai, India. Before coming to IITM, he was working as a Faculty Fellow at the Materials Research Center in the Indian Institute of Science, Bangalore. Prior to that he was on an industry-academia joint project involving University of Toronto (Chemistry, Optical Science), Memorial University of Newfoundland (Physics), and Lumentra Inc. (a start up company, specializing in light emitting devices). He has graduate degrees (MS, PhD; Electrophysics) from the School of Engineering in Cornell University. He also holds a masters degree (M.S (Engg.)) from the Theoretical Sciences Unit in Jawaharlal Nehru Centre for Advanced Scientific Research. His undergraduate degree is in electrical engineering.

Dr. Thomas' research group (Applied Nanostructures Engineering and Nanochemistry/ANeN) focuses on developing compositionally complex oxides, oxynitrides and nitrides, and nanometals for energy and environmental engineering related applications. Among the classes of materials identified here, (i) nano-morphology transformations and control, and (ii) high pressure synthesis and processing are being currently pursued.

He has won the Fast Track Young Scientist award, DST, May 2016 and the INSPIRE Faculty award, DST, Feb 2012. Dr. Tiju Thomas' lectures and videos are available on youtube and they are very interesting and engaging.

### Prof. Gandham Phanikumar

Department of Materials Science & Metallurgical Engineering at Indian Institute of Technology, Madras

Workshop : How to prepare a CV and write an SOP for applying in an industry or academia.

At 10:00-11:00 AM, 25th April



Prof. Gandham Phanikumar is a professor in the Department of Materials Science & Metallurgical Engineering at Indian Institute of Technology, Madras. He has completed his PhD in Experimental and computational studies on laser processing of dissimilar metals from Indian Institute of Science, Bangalore in the year of 2002, and B.Tech in Metallurgical Engineering from IIT Madras in 1996.

His research expertise includes experimental and computational studies on laser welding and laser surface alloying of dissimilar metals. He has done solidification studies and direct measurements of growth rate using Electromagnetic levitation and Directional solidification from the Institute of Materials Physics in Space, German Aerospace Center(DLR), Cologne, Germany.

He has received the Young Metallurgist of the Year award from the Ministry of Steel and Mines conferred during the National Metallurgists Day of the Indian Institute of Metals on November 14, 2005, French Embassy Special Prize 2007 (SAFRAN) conferred on October 23, 2007 at the French Embassy, New Delhi, and the Metallurgist of the Year award from the Ministry of Steel and Mines conferred during the National Metallurgists Day of the Indian Institute of Metals on November 14, 2019.

Prof. Gandham Phanikumar's videos on research in general on YouTube are indeed insightful and informative.

### Prof. Kiran Kumar Kuchi

Department of Electrical Engineering,  
IIT Hyderabad

Talk : 5G:Significance and implications.  
At 11:15-11:45 PM, 25th April



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Prof. Kiran Kumar Kuchi is a professor at the department of electrical engineering at IIT Hyderabad. He completed his Ph.D. in 2006 and MS in 1997 in Electrical Engineering from the University of Texas. He completed his B.Tech in 1995 in Electronics and Communication Engineering from Sri Venkateswara University College of Engineering, Tirupati.

He has been associated with the wireless industry since 1997. He started his career with Motorola Labs, Fort Worth, Texas right after completion of my MS in EE from the University of Texas at Arlington (UTA) in Dec, 1997. He worked with Motorola Labs for 2-years where he was involved in the design and development of CDMA-2000 standard. Later, he joined Nokia research located in Irving, Texas in Jan 2000, where he spent 8-years developing baseband modem algorithms for GSM/EDGE, WiMAX, and LTE systems. He relocated back to India in 2008 to join Centre of Excellence in Wireless Technology (CEWiT), IIT-Madras Research Park.

His present research interests include signal processing algorithms for communications, wireless networks, network MIMO systems, cross-layer optimization, and development of experimental test-beds for network MIMO systems and next generation cloud radios.

### Srinath Ravichandran

Co-founder, Agnikul

Talk on the topic: How to ideate and incubate a start-up: the model of space-tech company Agnikul  
At 03:00-03:30 PM, 25th April



AgniKul Cosmos Private Limited (Agni Kul: lit. 'Fire Clan') is an Indian aerospace manufacturer based in National Center for Combustion R&D (NCRD) of IIT Madras, Chennai. The startup aims to develop and launch its own small-lift launch vehicle namely Agnibaan, capable of placing 100 kg (220 lb) payload into a 700 km (430 mi) orbit. First commercial launch is expected in 2022. The company was founded by Srinath Ravichandran and Moin SPM within IIT Madras aiming to develop and launch its first rocket in 2021 and subsequently develop ability to provide launch service for satellites weighing up to 500 kg. A Non-Disclosure Agreement (NDA) was signed with Department of Space, Indian Space Research Organisation to obtain government's technological assistance in development of launch vehicles. In February 2021, Agnikul test fired its semi-cryogenic rocket engine Agnilet which will power second stage of its rocket Agnibaan for the first time. The engine has been developed in single-piece through 3D printing with no assembled parts.

Agnibaan (lit. 'Arrow of fire') is envisaged to be a mobile launch system capable of placing a 100 kg (220 lb) into a 700 km (430 mi) orbit. The rocket will be 18 meters long with a diameter of 1.3 meters and a lift-off mass of 14,000 kg (31,000 lb). It will use clustered engines on first stage in various configurations depending upon the payload and will only use LOX or Kerosene based engines. The rocket is supposed to be manufactured by 3D printing at whole.

### Prof. John Moult

Department of Cell Biology and Molecular Genetics, Institute for Bioscience and Biotechnology Research, University of Maryland

Talk : Solving the protein folding problem through AI.  
At 04:30-05:00 PM, 25th April



Prof. John Moult is a Professor at the Department of Cell Biology and Molecular Genetics, Institute for Bioscience and Biotechnology Research, University of Maryland. He completed his PhD in Molecular Biophysics at University of Oxford in the year of 1970, and BSc in Physics at University of London in 1965.

Research in Dr. John Moult's laboratory is focused on computational modeling of biological systems, including Investigating the effects of missense single nucleotide variants on protein structure and function to elucidate their role in human disease; Integrating knowledge of the biological mechanisms underlying the relationship between human genetic variation and disease, particularly complex trait diseases such as Alzheimer's, diabetes, and Crohn's disease; Using novel neural network architectures derived from deep biological knowledge to probe aspects of disease mechanism, including the evaluation of potential drug targets and the best choice of drug for any patient, given their genome sequence; Conducting large-scale community experiments to assess and advance the state of the art in areas of computational biology, particularly genome interpretation and protein structure modeling.



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