



IIT Kanpur-La Trobe University Research Academy Workshop

27-28 November 2023

TLC Building Level 2
La Trobe University, Bundoora

Welcome to this inaugural two-day workshop.

Background: the Indian Institute of Technology (IIT) Kanpur in India and La Trobe University in Australia joined hands in 2020 to form a Research Academy to contribute towards research, planning, implementation, and evaluation of complex Smart City development projects involving all stakeholders including industries, government organisations and universities. The IIT Kanpur-La Trobe University Research Academy brings the research capabilities of the two organisations together to build a critical mass of resources, researchers, and research efforts to create a globally recognised centre of excellence, with a strong focus on industry engagement. The Academy fosters long-term collaboration that reflects a common research purpose leading to collaborative research, joint training and scholarship support for doctoral students jointly enrolled at both the institutions. Details about the academy can be found at <https://ra-latrobe.iitk.ac.in/>.

Workshop chairs:

Sandeep Verma

Professor of Chemistry
Professor-in-Charge, Gangwal School of
Medical Sciences and Technology,
Indian Institute of Technology Kanpur

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Adam Mechler

Professor of Chemistry
Health and Wellbeing Theme Lead, Asian Smart
Cities Research Innovation Network and IITK-LTU
Research Academy, La Trobe University

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The workshop aims to provide a platform for Research Academy researchers to have face-to-face interaction to discuss research ideas, joint supervision and a way forward aligned with the objectives of the Academy. The workshop has paper presentations pertaining, but not limited to, the existing thematic tracks of the Academy:

- Infrastructure & Technology
- Economic Development
- Mobility & Transport
- Health & Well-Being
- Urban Planning
- Energy, Water & Waste
- Food Security & Agriculture
- Emerging areas

These sessions are bringing colleagues already engaged in mutual discussions, along with other researchers looking to create new thought partnerships for future Joint Degree Program (JDP) and research calls for proposals. Students already working in the JDP are presenting their work in the form of posters, which will be displayed for the duration of the workshop and students will informally present their posters to interested participants during the lunch breaks.

Once again, welcome, and we hope you enjoy the workshop.

DAY 1
Monday 27 November 2023

9.00am – 9.30am Arrival and registration – coffee and pastries will be available

9.30am – 10.00am **Official opening and welcome – MC – Professor Aniruddha Desai**, Co-director of IIT Kanpur- La Trobe University Research Academy, La Trobe University

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- Professor John Dewar AO, Vice Chancellor, La-Trobe University
- Professor Subramaniam Ganesh, Officiating Director, IIT Kanpur
- Professor Suresh Chandra Srivastava, Director of IIT Kanpur-La Trobe University Research Academy, IIT Kanpur

10.00am – 11.00am **Plenary – MC – Professor Aniruddha Desai**

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- **An overview of La Trobe Institute of Sustainable Agriculture and Food (LISAF)** – Professor Tony Bacic, La Trobe
- **Research Collaborations in Sustainability Challenges** – Professor Raju Kumar Gupta, IIT K
- **Multidisciplinary Research at LIMS: The La Trobe Institute for Molecular Science** – Professor Patrick Humbert, La Trobe
- **Evolution of an Engineering-Driven Medical School at IIT Kanpur** – Professor Sandeep Verma, IIT K

11.00am – 11.30am Networking with morning tea

Track 1
TLC - 213

Track 2
TLC 215

Chair: Professor Kantesh Balani, IIT K

Chair: Professor Adam Mechler, La Trobe

11.30am – 11.45am **Digital Twin of Microgrid**
Professor Ankush Sharma, IIT K

Development of fluorescent probes for cell biology
Associate Professor Yuning Hong

11.45am – 12.00pm **Scalable blockchain for large-scale Internet of Things networks**
Professor Naveen Chilamkurti, La Trobe

Visible-light-driven Photocatalytic Systems for Environmental Remediation Applications
Professor Raju Kumar Gupta, IIT K

12.00pm – 12.15pm **AI in healthcare**
Professor Tushar Sandhan, IIT K

Frequency enhanced electrochemical pressure solution and its applications in nanofabrication
Associate Professor Wren Greene, La Trobe

12.15pm – 12.30pm **Field Robotics, Sensing and Escape Rooms for Learning**
Associate Professor Robert Ross, La Trobe

Thin Films of Molecular Functional Materials: Possible Materials for Future Electronics
Professor Thiruvancheril G Gopakumar, IIT K

12.30pm – 1.30pm Student Poster Session, networking with lunch

Track 1 continues

TLC - 213

Track 2 continues

TLC 215

Chair: Professor Suresh Srivastava, IIT K

Chair: Professor Adam Mechler, La Trobe

1.30pm – 1.45pm

Seasonal changes, water balance, and soil suction: Holistic approach to the analysis of geostructures

Professor Rajesh Sathiyamoorthy, IIT K

Biosensors

Professor Conor Hogan, La Trobe

1.45pm – 2.00pm

How Dams Climb Mountains: China, India and the race to extract hydropower from the Himalaya

Dr Ruth Gamble, La Trobe

Detection of adulterants in milk using handheld FT-IR sensor with AI/ML-based decision system

Professor Shantanu Bhattacharya, IIT K

2.00pm – 2.15pm

Outage Resilient Peer-to-Peer Energy Trading in Smart Grids using Transactive Energy and Blockchain Technology

Professor Gururaj Mirle Vishwanath, IIT K

Extracellular vesicles in drug delivery and cancer therapy

Professor Suresh Mathivanan, La Trobe

2.15pm – 2.30pm

Artificial Intelligence and Affective Computing in Healthcare

Professor Damminda Alahakoon, La Trobe

Molecular Characterization of Prostate Cancer: prospects of precision medicine in India

Professor Bushra Ateeq, IIT K

2.30pm – 3.00pm

Networking with afternoon tea – team from La Trobe's Graduate Research School in attendance

Track 1 continues

TLC - 213

Track 2 continues

TLC 215

Chair: Professor Bushra Ateeq, IIT K

Chair: Professor Aniruddha Desai, La Trobe

3.00pm – 3.15pm

Audio Tokenization for Efficient Audio Search

Professor Vipul Arora, IIT K

Disruptive technologies for social inclusion: A product design approach

Professor Janakarajan Ramkumar, IIT K

3.15pm – 3.30pm

Advanced Polymer and Composite Materials Group – Our Areas of Focus

Associate Professor Ing Kong, La Trobe

Development of High-Efficiency 3D Printed Pulsating Heat Pipes for Solar Water Desalination

Professor James Maxwell, La Trobe

Professor Sameer Khandekar, IIT K

3.30pm – 3.45pm	<i>Multifunctional 58S Bioglass-Ag-CeO₂ Biocomposites with Effective Antibacterial, Cytocompatible and Mechanical Properties</i>	Dynamic loading response in flawed rock samples: An experimental and numerical analysis
	Professor Kantesh Balani, IIT K	Professor Arghya Das

3.45pm – 4.00pm Brief rest period

4.00pm – 4.30pm Walk to AgriBio

4.30pm – 5.30pm Tour of AgriBio

5.30pm – 8.30pm Workshop dinner and networking

Atrium, AgriBio

NOTES:

Day 2 – Tuesday 28 November 2023

9.00am – 9.30am Arrival and registration – coffee and pastries will be available

Track 1 continues

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Track 2 continues

TLC 215

Chair: Mr Ajay Kumar Saxena, TERI

Chair: Professor Adam Mechler, La Trobe

9.30am – 9.45am ***The 4R Paradigm: Research@IITK.LaTrobe
(Rewind Review Recalibrate & Rejuvenate)***

Professor B.V. Phani, IIT K

IoT System on Chip (SoC) Design for ultra-low power applications

Professor Aniruddha Desai, La Trobe

9.45am – 10.00am ***Cocreating people friendly powerful knowledgebase regarding clean Ganges water***

Dr Prem Kurup, La Trobe

Neuromorphic Computing: Mapping Neural Networks to Hardware

Professor Shubham Sahay, IIT K

10.00am – 10.15am ***The Importance of Digital Convergence for Realising Superior Digital Health Solutions***

Professor Nilmini Wickramasinghe, La Trobe

Medicinal Inorganic Chemistry and Organometallic Chemical Sensors

Associate Professor Peter Barnard, La Trobe

10.15am – 10.30am ***Global Agricultural Supply Chains under Tariff Rate Quotas***

Associate Professor Sean Arisian, La Trobe

Systems: New Synthetic Strategies

Professor Anand Singh, IIT K

10.30am – 10.45am ***Towards Sustainable and Decentralized Water Solutions: Thermal Purification and Atmospheric Harvesting***

Professor Sameer Khandekar, IIT K

Talk and Gesture in Tibetan Languages of Nepal

Dr Lauren Gawne, La Trobe

10.45am – 11.00am ***Nature inspired surfaces for controlling bacterial attachment***

Dr Avinash Baji, La Trobe

Documenting Tawang Monpa: A step towards preservation of the cultural heritage of Tawang Monpas

Professor Chaitra Puttaswamy, IIT K

11.00am – 11.30am Networking with morning tea

Parallel Breakout sessions to explore funding opportunities, new collaborations

Chair: Professor Suresh Srivastava, IIT K

Chair: Professor Aniruddha Desai, La Trobe

11.30am – 12.30pm

Engineering and Technology focus

Health and Agri-tech focus

12.30pm – 1.30pm Networking with lunch

1.30pm – 2.00pm **Virtual Student Poster Session**

Chair: TBA

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Neha Sharma, Akanksha Singh and Ashish Shukla confirmed

Industry Session

Chairs: Professor Sandeep Verma, IIT K and Professor Adam Mechler, La Trobe

2.00pm – 4.00pm

Peak Industry body representatives

Tully Smith, CEO, Australia India Chamber of Commerce (AICC)

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Mr Ajay Kumar Saxena, TERI

Industry representatives

Seb Marcuccio, Advanced Molecular Technologies Pty Ltd

Michael Foley, Founder- AdAlta

Chris Maylea, Care Economy Research Institute

Mr Ashok Mysore, Infosys

Incubators

Professor Ankush Sharma, IIT K

Ms Cerasela Tanasescu, Director Innovation and Entrepreneurship, La Trobe

4.00pm – 4.30pm

Workshop wrap up and closing remarks to be provided by Workshop Chairs:

Professor Sandeep Verma, IIT K and Professor Adam Mechler, La Trobe

Wednesday 29 November 2023

Potential on this day for informal collaborations and further visits to La Trobe by international guests

Workshop Contact:

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For any questions or issues, please contact Diana via WhatsApp or SMS or email who will respond as quickly as possible to assist.