

An Indian-Australian research partnership

Project Title: **Graphene-based composite for remediation of emerging contaminants/pollutants from water and wastewater**

Project Number **IMURA0900**

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Metallurgical Engineering & Materials Science

Research Clusters:

Research Themes:

Highlight which of the Academy's CLUSTERS this project will address? <i>(Please nominate JUST <u>one</u>. For more information, see www.iitbmonash.org)</i>		Highlight which of the Academy's Theme(s) this project will address? <i>(Feel free to nominate more than one. For more information, see www.iitbmonash.org)</i>	
1	Material Science/Engineering (including Nano, Metallurgy)	1	Advanced computational engineering, simulation and manufacture
2	Energy, Green Chem, Chemistry, Catalysis, Reaction Eng	2	Infrastructure Engineering
3	Math, CFD, Modelling, Manufacturing	3	Clean Energy
4	CSE, IT, Optimisation, Data, Sensors, Systems, Signal Processing, Control	4	Water
5	Earth Sciences and Civil Engineering (Geo, Water, Climate)	5	Nanotechnology
6	Bio, Stem Cells, Bio Chem, Pharma, Food	6	Biotechnology and Stem Cell Research
7	Semi-Conductors, Optics, Photonics, Networks, Telecomm, Power Eng	7	Humanities and social sciences
8	HSS, Design, Management	8	Design

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The research problem

Emerging contaminants or pollutants (ECs/EPs) are typically synthetic or naturally occurring chemicals or even any microorganisms that are not commonly monitored in the environment but have the potential to enter the environment and cause adverse ecological and/or human health effects. ECs/EPs include antibiotics, antidiabetics, pharmaceuticals, pesticides, industrial chemicals, surfactants, endocrine-disrupting compounds and personal care products available in groundwater, surface water, municipal wastewater, drinking water, etc. therefore, there is an urgent need to monitor ECs/EPs in water system and develop high-efficient approach to remediate these ECs/Eps. This project will fabricate graphene-based composite for the adsorption and subsequent removal of ECs/EPs from water and wastewater.

Project aims

This research aims to develop state-of-art graphene-based composite for the remediation of ECs or EPs from aqueous solutions including water and wastewater.

Expected outcomes

By this project, we expect to find an efficient and cost effective way to fabricate graphene-based composite to remediate concerning water issue.

How will the project address the Goals of the above Themes?

Project directly falls into the theme of "water" and "nanotechnology" as it deals with detection of water impurities using nanotechnology based technique.

Capabilities and Degrees Required

BTech, MTech, MSc in EE, Physics, Chemistry, Material Science, Green Energy, Laser, Optics, ME, CE, ESE or any other relevant field. Experience in surface patterning/preparation, optics or dispersion science would be preferred.

Potential Collaborators

Please visit the IITB website www.iitb.ac.in OR Monash Website www.monash.edu to highlight some potential collaborators that would be best suited for the area of research you are intending to float.

Select up to **(4)** keywords from the Academy's approved keyword list (**available at <http://www.iitbmonash.org/becoming-a-research-supervisor/>**) relating to this project to make it easier for the students to apply.

Water, Nanoscience, Smart manufacturing,