IITB-Monash Research Academy

Indian Institute of Technology Bombay | MONASH University

An Indian-Australian research partnership

**Project Title:** The structure and evolution of the lithosphere in the northeast Indian Ocean

**Project Number** IMURA0215


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| Monash Supervisor(s) | Dr Alan Aitken | *Full names and titles* |
| Monash Primary Contact: | alan.aitken@monash.edu | *Email, phone* |
| IITB Supervisor(s) | Prof. M. Radhakrishna | *Full names and titles* |
| IITB Primary Contact: | mradhakrishna@iitb.ac.in, 91-22-25767261 | *Email, phone* |


## Research Academy Themes:

**Highlight which of the Academy's Theme(s) this project will address?**

*(Feel free to nominate more than one. For more information, see www.iitbmonash.org)*

1. **Advanced computational engineering, simulation and manufacture**
2. **Infrastructure Engineering**
3. Clean Energy
4. Water
5. Nanotechnology
6. Biotechnology and Stem Cell Research

## The Research Problem

The northeast Indian Ocean lithosphere contains the region covered by the deep sea Bengal and Nicobar fans and part of the intense deformation zone of the Indo-Australian diffuse plate boundary. Two N-S trending aseismic ridges with distinctly different gravity fields divide the fans into major sub basins. A better knowledge of the structuring and evolution of these ridges and the adjacent regions will provide crucial constraint on the past evolution of this region, and also its likely future.

## Project Aims

This project aims to understand the structure and evolution of this region as follows

1 - Use a variety of geophysical data, including satellite and terrestrial potential field data, seismic reflection/refraction data and seismological data to generate 3D models of lithospheric thickness, density, strength and 3D structuring of the Ninetyeast and 85°E ridges

2 - Understand the mode of emplacement of these anomalous features.

3 - Assess the thermo-mechanical properties of the lithosphere in the eastern Indian Ocean and their implications for the regional plate-wide stresses in the vicinity of Andaman-Sumatra subduction system

4 - Develop testable hypotheses as to how the nature of the 90E ridge lithosphere will affect 1- the behaviour of the subduction system and 2 - the fate of the 90E ridge as it is drawn into the Andaman-Sumatran subduction system.

## Expected Outcomes

This project will generate a better understanding of the structure and lithosphere evolution and provide tectonic hypotheses that may help explain the emplacement of ridges, intraplate tectonic stress and state of isostasy in the northeast Indian Ocean.