

An Indian-Australian research partnership

**Project Title:** **Permeability and strength of methane-hydrate bearing reservoir rocks**

**Project Number** IMURA0717

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## 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](http://www.iitbmonash.org))*

1. Clean Energy
2. Advanced computational engineering, simulation and manufacture

## The research problem

The enormous volumes of gas present within the hydrate bearing reservoir systems is the motivation behind exploring these reservoirs across the globe. The most recent phase of National Gas Hydrate Program Expedition in India has further emphasized the need to develop these reservoir systems to meet the growing energy needs of the country. These programs have yielded evidences of gas hydrates from the downhole logs as well as the core data from various sites in Indian offshore. A phase wise development may be planned once detailed characterization and understanding of these systems is achieved. This project aims to characterize the hydrate bearing sediments in their reservoir insitu conditions.

## **Project aims**

The project aims are as follows:

1. Determination of physical and reservoir rock properties of samples
2. Determination of pore characterisation of rock and sediment samples
3. Correlation among the porosity and permeability for the reservoir
4. Establishing effective correlation between absolute/relative permeability and hydrate gas saturation
5. Develop gas capacity estimations from laboratory and field data

## **Expected outcomes**

1. Absolute permeability estimates for the unconsolidated sediments in natural gas gas-hydrate bearing systems
2. Reservoir geomechanical response due to fluid flow over given periods of time
3. Verify the role of gas saturation on permeability in these reservoir systems.
4. Preliminary block scale reservoir models for Indian offshores

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

This project addresses the themes like clean energy, and advanced computational engineering, simulation and manufacture.

## **Capabilities and Degrees Required**

Capability in laboratory experiments and numerical modelling with a background in engineering geology, civil or mining engineering is desired.

## **Potential Collaborators**

Please provide a few key words relating to this project to make it easier for the students to apply.

THMC experiments, numerical modelling, geomechanics, geothermal systems