

An Indian-Australian research partnership

Project title: Determining, understanding and controlling electrochemical phenomena at the nano-scale.

Project number: IMURA0063

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Research Academy theme/s

List only the research academy theme/s that is relevant to the project

1. Advanced computational engineering, simulation and manufacture
2. Nanotechnology

The research problem

Most of the advanced engineering materials are required to perform complicated functions which invoke more than one physical property of the material. Hence in order to meet such requirements, materials are developed which have several constituents at the nanometer and sub-nanometer length scales. These designs however have deficiencies such as deterioration under certain conditions starting at nanoscale heterogeneities in the microstructure.

Project aims

This project aims to measure the local electrochemical / electronic properties of engineering alloys on the nanoscale using advanced scanning probe microscopy techniques.

Expected outcomes

The ability to probe activity (or inactivity) of nanoscale features is the first step in the development of materials on a fitness-for-purpose basis.

Which of the above Theme does this project address?

5. Nanotechnology

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

Modern advances in technology place particular emphasis on both understanding and controlling phenomena on the nanoscale. This project deals with understanding the materials behaviour at the sub-200nm length scale.