MONASH
ENGINEERING

MONASH University

Faculty of Engineering

Summer Research Program 2022-2023

Project Title: Determining Atomic Structures in Light Alloys using Atomistic Simulations

Supervisor(s): A/Prof. Nikhil Medhekar, A/Prof. Laure Bourgeois

Department: Materials Science and Engineering

Email: Nikhil.medhekar@monash.edu

Website profile of project supervisor:
https://www.monash.edu/engineering/nikhilmedhekar

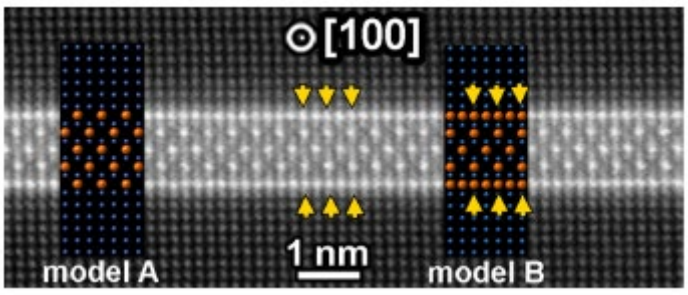
Objective

This project will investigate atomic structures in aluminium-copper light alloys. For this computational project, you will employ modern computing tools on massively parallel computing systems and learn highly employable skills such as advanced computing, modelling and data analysis.

Project Details

Alloys of aluminium containing small amounts of copper are a classic example of materials used for lightweight structural applications such as in bodies of aircraft. The strength of these alloys is governed by small precipitates, and yet, the structure of the precipitates and how they form remains unknown. In this computational project, we will focus on investigating the atomic structure of precipitates commonly found in aluminium-copper alloys using high performance computing, large-scale first principles simulations and deep-learning potentials.

This is a collaborative project between academics from Materials Science and Engineering and the Monash Centre of Electron Microscopy, providing you a very unique experience of an interdisciplinary engineering project.



Prerequisites

An avid interest in computer simulations