College of Science: Doctoral scholarship

Location:	**Auckland, New Zealand**
Duration:	3 years
Scholarship:	$25 000 per year (fees also covered)
Application due:	1 April 2018
Requirements:	>= 7.5 GPA
Additional information:	Dr Emilia Nowak (e.nowak@massey.ac.nz)

PhD scholarship in MIFST: Moving the boundaries – interfacial dynamics simulation

PROJECT DETAILS

There are numerous practical applications involving multiphase systems that are challenging to model with current computational capabilities. Moving boundaries, or free surface flows, often play a key role in such systems: that is, the simulation of interfaces between phases which requires the tracking of a curve or surface on the computational grid. The simulation of evolving topologically complex interfaces and accurately representing surface tension is very challenging. The latter requires estimation of the normal forces at the interface and the curvature and this challenges the existing Volume-of-Fluid or Level-Set methodologies for moving boundary problems.

This project aims to develop methodologies for the accurate representation of interface-tracking in multiphase systems. Development will be integrated with existing state of the art fluid modelling software (likely Code BLUE but others will be considered). An important goal will be to reconstruct experimental observations of the topological changes that occur at the point of contact in two and three-phase systems. Both immiscible and miscible phase systems will be considered.

REQUIREMENTS

The successful candidate will have an Honours or Masters degree in a relevant discipline with a GPA >= 7.5. Relevant disciplines include Mathematics, Chemical or Computational Engineering, Computing, Chemistry and Physics.

The successful candidate will receive a stipend of $25 000 NZD per year for a three year period (starting latest April 2018). Annual tuition fees will also be met under the scholarship. The successful candidate will spend the first months on intensive training in numerical simulation techniques in the group of Prof. Omar Matar (Group profile) at Imperial College London, UK. The remaining PhD studies will be completed at Massey University in Auckland, New Zealand under the supervision of Dr Emilia Nowak, Dr Richard Love from Massey University and Prof Omar Matar from ICL. Massey University's College of Sciences' world-leading scientists are internationally-acclaimed and ranked. You will gain expert guidance from our internationally-recognised researchers. Consistent processes across the university help build a culture of empowerment and ownership. The Massey University Institute of Food Science and Technology (MIFST), brings together the activities of the School of Food and Nutrition, FoodPilot and Riddet Innovation.

Website: http://www.massey.ac.nz/massey/research/higher-research-degrees/funding-scholarships/doctoral-project-funding.cfm