Four exciting new research opportunities to join the C3 team in 2016

The Climate Change Cluster (C3) at UTS is a world class integrated research institute delivering research excellence in the area of food and energy security, sustainability, ecological resilience, and global health. We have identified a number of key new roles that require PhD candidates with a range of specialist backgrounds including engineering, chemistry, bioinformatics, oceanography and photobiology.

Overseas applications are welcomed (with current IELTS assessments), but Australian and New Zealand permanent residents will be preferred and successful applicant must commence their studies no later than 25 August 2016 (visa pending).

Funding: Successful applicants will receive an annually indexed postgraduate stipend of AUD $26,288 p.a. for three years.

Expressions of interest should be sent to individual project leaders by COB 8th July 2016.

1) PhD opportunity in algal molecular biology

Glyco- engineering of therapeutic proteins from microalgae

Project Description: The use of non-mammalian cells for the expression of therapeutic proteins is emerging as a novel branch in biopharmaceutical industry. However, their successful implementation for human therapy depends on the extent of their post-translational modifications (PTMs). This project is aimed at exploring the PTMs of recombinant therapeutic proteins and their subsequent engineering to increasing their immunogenic potential and longevity. Such advancements of algal based therapeutic proteins will greatly enhance their application in the global biopharmaceutical market.

Expected skills: In addition to meeting the general PhD entry requirements of UTS, the ideal candidate should have a first class Honours or Master’s degree with a strong background in proteomics/biochemistry. Knowledge about mass spectroscopy based analytical techniques is highly desirable.

Contact: For further information please contact Dr Manoj Kumar (Manoj.Kumar@uts.edu.au) or Professor Peter Ralph. Applicants should submit their CV, a complete set of academic transcripts and a project outline by 8th July 2016.
2) PhD opportunity in Sustainable Chemistry research

**Chemical processes to deliver bio-based high value products from microalgae.**

**Project Description:** The replacement of petrochemical products with new bio-based materials from renewable resources, and the high yielding and efficient chemical transformations to prepare such materials, are receiving growing attention. Many opportunities exist to devise improved methods and products by the use of sustainable chemistry practices. Microalgae can be grown economically on industrial scale and provide a real opportunity for chemical processing to lead to the production of value-added small molecules. This project will lead to new insights into the influence of various catalysts on product profiles. These insights will enable to development of selective chemical transformations and to processes that are scalable to pilot and industrial scale. It is anticipated that the project will lead to proof of concept demonstrations at small or medium pilot plant scale.

**Expected skills:** In addition to meeting the general PhD entry requirements of UTS, the ideal candidate will have a strong background in chemistry, will be a self-starter and will have well-developed interpersonal skills. To be considered, applicants must have completed a Master's degree in Chemistry or bachelor's degree with first or second class honours (division 1), or an equivalent or higher qualification.

**Contact:** For further information please contact Professor Williams (bradley.williams@uts.edu.au) or Dr Unnikrishnan Kuzhiumparambil (Unnikrishnan.Kuzhiumparambil@uts.edu.au). Applicants should submit their CV, a complete of academic transcripts and a project outline by 8th July 2016.

3) PhD opportunity in systems biology approach to diatom photobiology

**Novel data-driven investigation of the complex photosynthetic process in diatoms.**

**Project Description:** Diatoms sequester carbon, produce immense amounts of the world’s fresh oxygen, and support the world’s most highly productive fisheries. This depends on a highly evolved and complex photosynthetic system within the cell. A wealth of recently integrated omics (transcriptomes, metabolomes) data provides valuable new opportunities to understand how this system works in diatoms, how it adjusts to changing conditions, and how it is regulated. This will be accomplished through hypothesis-driven experiments based on computational analysis and performed using cutting edge technology such as computer-controlled photobioreactors and advanced optical sensors (e.g. fluorescence emission spectrometry).
**Expected skills:** In addition to meeting the general PhD entry requirements of UTS, the ideal candidates who have experience, aptitude and/or motivated interest in mastery of the following goals and skills are particularly encouraged to apply: computational biology & data analysis, bioinformatics, molecular biology, systems biology, photobiology, cellular (algal) biology and culturing

**Contact:** For further information please contact Dr Justin Ashworth (ashwortj@uw.edu) or Professor Peter Ralph (peter.ralph@uts.edu.au). Applicants should submit their CV, a complete set of academic transcripts and a project outline by 8\textsuperscript{th} July 2016.

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**4) PhD opportunity in biological oceanography**

**Strategies of resource allocation by phytoplankton under dynamic ocean environments**

**Project Description:** This project will investigate how water column mixing regulates ocean phytoplankton growth, and identify inherent trade-offs required to maximise photosynthetic and metabolic efficiency. Working with model isolates of key ocean phytoplankton (e.g. diatoms, coccolithophores, cyanobacteria) the student will optimise photobioreactors to mimic underwater environmental scenarios, e.g. light climates and/or nutrient profiles. Analytical work will integrate cutting edge physiological techniques (active fluorometry, membrane inlet mass spectrometry, imaging) and metabolic screening (metabolomics) to track how photosynthetically derived energy is incorporated into cellular maintenance versus growth.

**Expected skills:** In addition to meeting the general PhD entry requirements of UTS we are looking for a candidate with experience in culturing microalgae and plant physiology. Additional skills in operation of photobioreactors and mass spectrometry would be advantageous.

**Contact:** For further information please contact Associate Professor David Suggett (David.Suggett@uts.edu.au). Applicants should submit their CV, a complete set of academic transcripts and a project outline by 8\textsuperscript{th} July 2016.