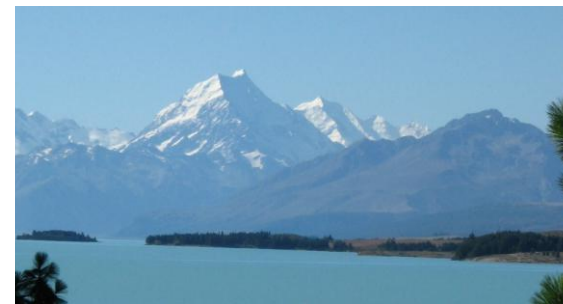




## PhD scholarship: Designer Nanocrystals for Enhanced Catalytic Functionality.



The PhD student will be enrolled at the University of Canterbury, which is recognised as one of the top Universities in New Zealand for research excellence. A PhD degree from Canterbury, supported by the MacDiarmid Institute for Advanced Materials and Nanotechnology as well as the Industrial Research Ltd., will give you internationally recognised skills and knowledge to help advance your career, whether you want to be an academic or a leader within industry.

**We are looking for an excellent (1 or 2.1 class honours, strong MSc or equivalent), motivated student with a background in Inorganic/(Nano)Materials Chemistry and Catalysis.**

This project is aimed at examining synthesis methods to influence metal oxide nanocrystal growth. It is part of a larger objective aiming to investigate the utility and functionality of different  $\text{TiO}_2$ ,  $\text{WO}_3$  and  $\text{Fe}_2\text{O}_3$  catalysts composed of different ratios of defined crystal facets, to the photo reduction of  $\text{CO}_2$  into  $\text{CO}$ ,  $\text{CH}_3\text{OH}$ ,  $\text{CH}_4$ ,  $\text{H}_2$  *etc.* The studies will involve the hydrothermal synthesis of the nanocrystals from hydrolysable precursors with focus on detailed investigation of the effects of the presence of surfactant templates and surface adsorbates, such as fluoride ions, long chain carboxylate molecules, alcohols *etc.*, in a range of reaction conditions. Photocatalytic activities will be examined initially through studying photocatalytic oxidation of pollutants, such as industrial dyes and volatile organic compounds. However the focus of the work will develop into studying the reformation of  $\text{CO}_2$  into fuels and chemical intermediates, where more selective activity has a high value.

Scholarship funds (stipend + fees) provided by the MacDiarmid Institute are available from 2011 for 3 years. All enquiries and applications, including a CV, a copy of transcript (in English) and names of two referees, should be directed to Dr. Tim Kemmitt ([T.Kemmitt@irl.cri.nz](mailto:T.Kemmitt@irl.cri.nz)) and Dr. Vladimir Golovko ([vladimir.golovko@canterbury.ac.nz](mailto:vladimir.golovko@canterbury.ac.nz)). Prospective student is expected to carry out most of research activities at the Industrial Research Ltd (<http://www.irl.cri.nz>), Lower Hutt site, under direct supervision of Dr. Tim Kemmitt.



**The MacDiarmid Institute**  
*for Advanced Materials and Nanotechnology*

