Beaufort Undergraduate Internship Programme 2010

PROJECT NO. 2

Supervisors: Dr. Kim Lau

Co-supervisors: Prof. Dermot Diamond

Project Title: Environmental pollution monitoring: Optical technique for measuring pollutants in marine waters

Duration of Project **From:** 7 June 2010 **To:** 10 September 2010

Project Description:

The environmental impact of human activities has significantly worsened through decades of industrial and agricultural developments to satisfy the modern day demands and lifestyles. One of the worse affected areas is the coastal waters. Marine water pollution is a combined results of industrial discharges, agricultural discharges and direct civil discharge of untreated sewage waste from populated area. Constant monitoring of the marine environment is important to safeguard its vital functions as food producer and recreational resource.

This project is part of a bigger development that envisaged a simple, low-cost platform for monitoring marine water quality in real time. Basic water qualities such as turbidity, colour, conductivity, salinity, bacterial content, pH, dissolved gaseous concentration are among the targets. The goal is to have a field-deployable integrated monitoring system that measures, logs and transmits these parameters at high frequency in order to track the change in water quality.

This project focuses on developing simple optical methods for measuring colour and turbidity and/or other chemical species in marine waters using in-house fabricated optical sensor. The student is required to help to optimise the fabricated optical sensor through calibrations in both laboratory and also in field environment. Through this short-term research programme, the student will acquire good general knowledge in environmental research, especially in the area of water analysis. Bench top instrumentation such as UV-VIS spectrometer, conductometer and turbidity meter will be used as the reference techniques.