Examples of *Discovery* Projects commencing in 2014

**New South Wales**

New South Wales universities will receive more than $82.2 million through the Australian Research Council *Discovery Projects* scheme for 224 new research projects commencing in 2014.

Some examples of the NSW projects are provided below.

To view the summaries of all successful projects, visit the [ARC announcements page](#).

**The University of Sydney**

*Lead Chief Investigator:* Associate Professor Rachel Codd (DP140100092)

*Summary:* Positron emission tomography (PET) using a zirconium-89-ligand complex bound to a prostate-specific membrane antigen is used to detect and monitor prostate cancer. The hydroxamic acid-based ligand bound to zirconium has a high affinity towards iron, which can cause metal exchange in vivo and loss of radiotracer. The project will prepare new ligands with a higher specificity towards zirconium over iron, and measure immuno-PET imaging activity. A second series of macrocyclic zirconium-specific ligands will be prepared to establish the relationship between variable water-lipid solubility and pharmacokinetic properties. The results will increase the capability of immuno-PET for prostate cancer detection and improve survival outcomes.

**ARC funding:** $370,000 over three years

**The University of New South Wales**

*Lead Chief Investigator:* Associate Professor Nicole Kessissoglou (DP140104043)

*Summary:* Underwater noise radiated from marine vessels is a significant problem for research, fishing and military vessels, and is a major source of pollution in the marine environment. The major source contributing to underwater noise is due to the propeller. This work will develop numerical models with experimental validation that can accurately predict the sources of noise generated by marine propellers and acoustic signatures of marine vessels due to propeller motion. This work has great significance for Australia’s construction and military maritime industries. The technologies developed in this project are also applicable to rotors in other industries such as in aircraft, helicopters and wind turbines.

**ARC funding:** $415,000 over three years

**University of Wollongong**

*Lead Chief Investigator:* Professor Sharon Robinson (DP140101488)

*Summary:* Assessment of plant health and productivity is vital to ensure future food security of the global population under a changing climate. Chlorophyll fluorescence (CF), a signal emitted by green plants, can reveal this information. Although CF has revolutionised photosynthetic research, current measurements are limited to individual plants. Remote sensing of canopy CF is required for efficient management of agricultural crops, forests, and natural ecosystems and is crucial for accurate estimation of plant carbon assimilation and production. This project will deliver remote sensing technology to bridge the gap between leaf and canopy productivity and pave the way for understanding both artificial and solar induced canopy CF measured from space.

**ARC funding:** $520,000 over three years