

# **CANBERRA HOSPITAL PRIVATE PRACTICE FUND VACATION SCHOLARSHIPS 2010/2011 PROJECT SUMMARY**

**Title:** Estimating geometrical distortion in Neurosurgical MRI

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## **Outline of the project:**

In order to account for brain deformation during neurosurgery, it is beneficial to obtain images of the brain during the procedure<sup>1</sup>. An intra-operative neurosurgical Magnetic Resonance Imaging (MRI) suite has recently been commissioned at The Canberra Hospital. The MR scanner is moveable, and brought into the operating room (OR) when updated anatomical information is required. The installation poses many challenges with regards to image quality. In MRI, filters are normally applied to correct for geometrical distortions caused by inhomogeneous electromagnetic fields. However, distortions still remain which might effect the accuracy and precision of neuro navigation. The aim of this project is to develop a phantom to be used for investigating of image distortion, and consequently uncertainties in neuro navigation. Within the scope of this scholarship a high resolution phantom will be designed, developed and tested.

**Preferred study discipline being undertaken by the student:** Science student with strength in Physics, Mathematics or Engineering.

## **Potential benefits to the student and to the department:**

The student will get experience in theoretical as well as experimental aspects of a research project. The project is ideally suited for someone with an interest in Medical Physics, i.e. the application of physics to medicine and surgery. For the Department this will enable the initiation of a long term research project aimed at investigating uncertainties and improving the accuracy of intra-operative Neurosurgical MRI.

## **Department within Canberra Hospital where the student will be based:**

Department of Medical Physics, The Canberra Hospital.

## References

<sup>1</sup>Mislow et al, Neurosurg Clin N Am 2009, pp 137.