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Nanoscale Organisation  
and Dynamics Group

## **Nanodiamond-enhanced MRI**

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### **Abstract**

Nontoxic nanodiamonds (NDs) have proven useful as a vector for therapeutic drug delivery to cancers and as optical bioprobes of subcellular processes. Despite their potential clinical relevance, an effective means of noninvasively imaging NDs *in vivo* is still lacking. Recent developments in hyperpolarized MRI leverage an over 10 000 times increase in the nuclear polarization of biomolecules. In this talk I will show how we have used intrinsic paramagnetic defects to enable imaging of nanodiamonds via hyperpolarized MRI. Further, I will explain how developments we have made in ultra-low field MRI (< 10 mT) enable new molecular imaging applications of nanodiamond and other contrast agents.

### **Profile**

Dr David Waddington is a Postdoctoral Research Fellow working on the Australian MRI-Linac project. David graduated with a PhD in Physics from the University of Sydney in 2018. Through his PhD research he developed new modalities for tracking therapeutic drug delivery via hyperpolarized magnetic resonance imaging (MRI) of nontoxic nanoparticles, such as nanodiamond. Awarded a 2013-14 Fulbright scholarship, he has also worked on new MRI modalities with leading biomedical imaging groups at Harvard University and the Massachusetts General Hospital. David's current work aims to improve the accuracy of radiation delivery in cancer treatment by integrating radiotherapy with real time MR imaging of tumours.

**Staff and students at all levels are welcome to attend.**

### **Venue and Time:**

This talk will be held on Friday March 29 at 14:00 at the Campbelltown Campus in Building 21, Lecture Theatre 5 (CA. 21.G.03). Or via Zoom <https://uws.zoom.us/j/153401352> .

### **Enquiries:**

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