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Professor Gu is Distinguished Professor and Associate Deputy Vice-Chancellor at RMIT University and was a Laureate Fellow of the Australian Research Council. He is an author of four standard reference books and over 480 publications. He is an elected Fellow of the Australian Academy of Science and the Australian Academy of Technological Sciences and Engineering as well as a Foreign Fellow of the Chinese Academy of Engineering. He is also an elected fellow of the AIP, the OSA, the SPIE, the InstP, and the IEEE. He was President of the International Society of Optics within Life Sciences, Vice President of the Board of the International Commission for Optics and a Director of the Board of the Optical Society of America. He was awarded the W. H. (Beattie) Steel Medal, the Ian Wark Medal, the Boas Medal and the Victoria Prize for Science and Innovation.

ABSTRACT

Magnetic optical nanoscopy with nanodiamonds

Nanodiamonds (NDs) have emerged as a new platform for biomedical microscopy imaging at nanoscales. Negatively charged nitrogen-vacancy (NV^-) centers in NDs have laid a new ground for super resolution imaging and magnetic sensing. Here, we demonstrate magnetic optical nanoscopy of magnetically-labeled MCF10A cells tagged with blinking NDs. NDs are imaged under an external magnetic source of 7 mT to acquire the blinking fluorescence for nanoscale reconstruction of cells. We demonstrate a resolution down to 19 nm. The magnetic field pattern is reconstructed via optically detected magnetic resonance (ODMR) of NV^- centers in the ND-labeled cells. We demonstrate a magnetic sensitivity down to $1 \text{ nT}/\sqrt{\text{Hz}}$.