OPTICS & PHOTONICS
UNIVERSITY OF NOTTINGHAM

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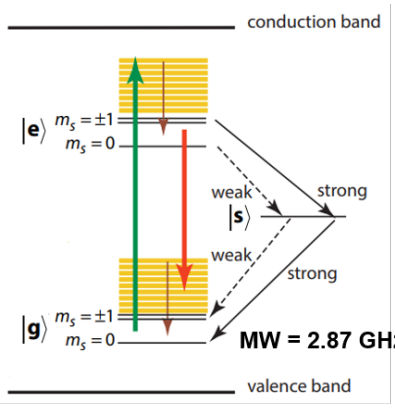
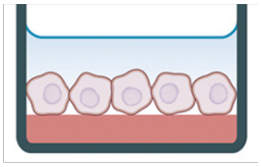
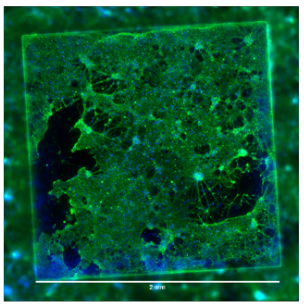
Optics and Photonics Group
Lunchtime Seminar

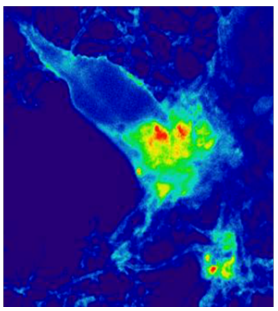
"Quantum sensing in biology using nitrogen vacancy defects in diamond"

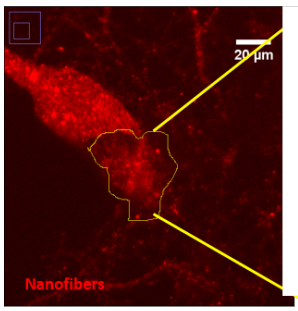
Melissa Mather

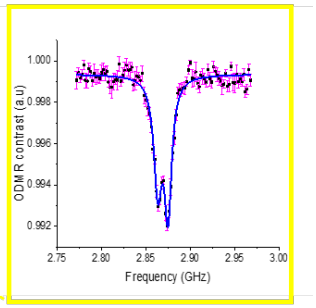












Abstract

1:00pm Wednesday 27th March 2019
203 Tower building
All Welcome

http://optics.nottingham.ac.uk/wiki/Talks_2019

“Quantum sensing in biology using nitrogen vacancy defects in diamond”

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The Nitrogen-Vacancy (NV) colour centre in diamond has emerged as a high performance quantum sensor with application areas including photonics, quantum information science and the life sciences. Quantum physicists have primarily led the development of NV based quantum sensing in the pursuit of quantum computing. As such, there is a paucity of studies addressing biologically important questions using NV based optical sensing. Moreover, optical sensing protocols reported to date rely on complicated experimental protocols and equipment not readily available in a life sciences laboratory. This presentation will provide an overview of current work in our laboratory demonstrating accessible strategies with application in the life sciences and medicine. In particular, exemplar studies will be presented demonstrating sensing in highly viable populations of differentiated neural stem cells functioning as a connected neural network using NV nanodiamonds, planar diamond chips and electrospun polymer nanofibers embedded with NV nanodiamonds, which recapitulates the nanoscale architecture and topography of the cell niche. Protocols for real time sensing of paramagnetic species in solution will also be reported along with ongoing and future research.