Light Storage in Diamond via Stimulated Brillouin Absorption

Optical signals can carry quantum information for secure communications, quantum enhanced sensing, and quantum computation. Quantum photonics offers high bandwidth operation without noise, in ambient conditions. But scaling up has not so far been possible because the non-deterministic operations of linear optics cannot be efficiently combined without a storage device. What is required is a quantum memory, capable of holding optical signals coherently, and then releasing them on demand.

Many groups around the world are working to develop this enabling technology, but to date no system has yet demonstrated the desired combination of efficient, broadband operation at room temperature, preferably in the telecomms C- band (1550 nm), in the solid state, without noise and with on-demand readout. In this project we will establish the feasibility of a new approach to realising all these desiderata in a single quantum memory device, based on cavity-enhanced Brillouin scattering in diamond.

For further details please contact Dr Joshua Nunn:

joshua.nunn@physics.ox.ac.uk