Project Title	Watching Sound - creating a new technique for stand-off ultrasound imaging
Supervisor	Dr Christopher Rowlands
Theme(s)	Biomedical Sensing Diagnostics and Imaging Medical Devices
Project Type	Lab based
Project Description	Ultrasound is one of the safest, cheapest and most powerful ways to image deep within the body. Compared to MRI it is fast, easy to use and significantly less onerous on the patient. Nevertheless, there are limitations which we are working to overcome. All current forms of ultrasound imaging require the user to place an ultrasound probe in contact with the skin. This in turn requires a skilled ultrasound technician to apply ultrasound gel and move the probe to image the organ of interest. A more elegant solution would be to use optical imaging to see the acoustic signal (as well as exciting it), thus removing the need for the technician, gel or even for the patient to lie on a bed. The acoustic signal could be simply recorded by imaging the patient's body with a very fast camera. The Rowlands lab is working on developing optical ultrasound detectors based on evanescent wave sensors; these are extremely sensitive to minute changes in the position of an array of nanoparticles, and thus to a passing acoustic wave. The student working on this project will help develop this new type of ultrasound detector, building the nanoparticle suspension, excitation optics and imaging / readout. The ideal student would have a background in the physical sciences or engineering, with a willingness to try new things and learn. The Rowlands lab is highly multidisciplinary, with lots of different researchers studying lots of different things, so new perspectives and approaches are encouraged. The student can be taught most (if not all) of the skills and techniques they will need to know.