Project Title	Advanced Microscopy for Everyone
Supervisor	Dr Christopher Rowlands
Theme(s)	Biomedical Sensing Diagnostics and Imaging Molecular and Cellular Bioengineering
Project Type	Lab based
Project Description	One of the workhorse instruments in a microscopy suite is the confocal microscope. Unlike a normal microscope, it can image objects in three dimensions, which helps explain why modern laboratories use theirs so extensively, in fields as diverse as histopathology, neuroscience and cell biology. Nevertheless, confocal microscopes are very expensive, costing hundreds of thousands of pounds in many cases, despite containing no particularly expensive parts. This enormous price puts the instrument out of reach of researchers in the developing world, and even several laboratories in developed countries as well. This project will seek to redress this balance, by developing a confocal microscope using modern low-cost rapid prototyping facilities, off-the-shelf microcontrollers and careful design, broadening access to this core technology throughout the world. The student on this project will be responsible for building this instrument, based on a modern design known as a 'rescanned confocal'. This will require some work with a CAD package (like SolidWorks), some 3D printing or CNC machining (possibly outsourced) and a bit of programming experience. Students should not be put off taking this project if they don't feel they possess these skills though, as they can be taught. Motivation and a willingness to learn is much more important.