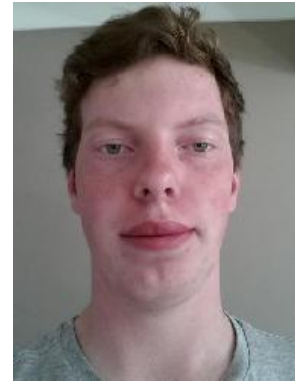# Niall Mulkerns
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Niall studied for his Undergraduate and Masters (MSci) course in Physics at the University of Bristol before joining the BCFN. Broadly, his interest lies in the overlap between physics and biology, especially in the application of physics to medical problems and the computational aspects. His Masters thesis focused on the dynamics of micro-/nano-scale bubbles and droplets using total internal reflectance microscopy under the supervision of Dr Massimo Antognozzi and Dr Natasa Vasiljevic.

"Sensitivity and Stability Enhancements for Refractive Index Sensing via Backscattering Interferometry"

Backscattering interferometry (BSI) is a technique operating on the principle of self-interference of light perpendicular to a circular channel to allow observation refractive index (RI) changes. Typically, BSI is used for determining binding kinetics, but with optical modifications, it can be used to monitor miniscule quantities of contaminants in solutions. In this talk, current improvements to the phase sensitivity and stability of BSI will be discussed in the context of both these uses, and possible error sources elucidated based on empirical evidence as well as simulations. This will inform future work and allow us to distinguish smaller RI changes combined with a lower limit of detection.