

Speaker. Jason Greenwood.

Room. SA106.

Date. 2nd April 2020.

Time. 1pm.

Title.

Using chiral light pulses to probe molecular structure and dynamics

Abstract.

The property of chirality, where an object does not possess an internal plane of reflection symmetry, is a key scientific property. In particular as Life is homochiral most biological processes depend critically on the handedness of molecular interactions, such as the pharmacology of drugs, but it also provides a template to study fundamental concepts such as parity violation. However, it is not possible to easily identify the handedness of chiral molecules using circularly polarised “chiral” light, due to small asymmetries which are not directly manifested through electric dipole interactions. However, the discovery of new chiro-optical phenomena, such as photoelectron circular dichroism, have opened up the possibility of sensitively probing chiral changes. This talk will present some recent experiments of this phenomenon and how laser pulses with circular (or more exotic) polarisation states could be used to observe and even control molecular properties on ultrafast timescales.

Bio.

Jason Greenwood obtained his PhD at Queen’s University Belfast on, “Elastic and Inelastic Scattering of Electrons from Ions” in 1995. Following a short postdoc at Queen’s, he became an NAS National Research Associate at the Jet Propulsion Lab in Pasadena, California where he led various “laboratory astrophysics” experiments which simulated the interaction of solar wind ions with comets and other phenomena. In 1999 he returned at Queen’s as a lecturer, where he has studied the interaction of ultrashort laser pulses with molecules and probed molecular processes on femtosecond and attosecond timescales. He is now a reader and currently his research is focussed on using chiral asymmetries as a sensitive observable of molecular dynamics.