

Chemical Applications of Nanophotonic: Probing the Structure of Soft Matter with Chiral Nanostructures

Chirality, the property of an object to lack mirror symmetry and thus be able to exist in two non-superimposable mirror image forms, is a ubiquitous property in nature. Indeed, the building blocks of life, amino acids and sugars are chiral, and this sense of handedness propagates in to the complex structures of life. In this talk I will discuss how near fields with chiral asymmetries, generated by light scattering from chiral nanostructures, can uniquely characterise higher order biological structure which is invisible to conventional spectroscopy. I will demonstrate how the interaction of chiral nanostructures and biomaterials can be understood using concepts from physical chemistry and atomic and molecular physics; orbital hybridisation and quantum interference phenomenon such as electromagnetic induced transparency (EIT).