Abstract

Inorganic-organic hybrids are some of the most exciting materials to have emerged over the last decade or so. In this presentation I will describe how some of approaches to the synthesis of these materials have developed, and how the solids we are preparing have had cross disciplinary impact. In particular I will describe how highly porous metal-organic frameworks can be used to safely and economically store toxic gases with the aim of using them as therapeutic agents in medicine. This takes a perceived weakness of these hybrids (their poor hydrothermal stability) and turns it into a strength. I will also discuss how the development of new synthesis techniques, designed for hybrids, can be used to prepare materials with new structures and physical properties. I will exemplify this work with examples of new quantum spin liquids with novel compositions and discuss how the structure of the materials affects the physics in these frustrated magnetic systems.