**Liquid crystals for energy applications.**

Prof Helen Gleeson

Dr Johan Mattsson

Liquid crystals have some remarkable properties that are relevant to a variety of applications in the 'energy' sector. This project will explore two specific directions:
The first is to examine the properties of liquid crystals and liquid crystal polymers as novel electrolytes in lithium ion batteries. The dramatic behaviour of some mobile phones shows the need for new, safe, electrolyte systems in such batteries.
The second part of the project will investigate the ferroelectric, piezoelectric and flexoelectric properties of liquid crystals for charge generation - by compressing or flexing liquid crystalline materials as occurs in piezoelectric polymer systems. The approach is quite new and has the potential to generate sufficient energy to power small electronic devices.
We will combine several soft matter system types; liquid crystals, polymers and colloidal dispersions to explore a wide range of possibilities.