# Dr Mike Smith

Dr Mike Smith is a Royal Society University Research Fellow based in the School of Physics, University of Nottingham. His group conduct research into fluids containing additives. These additives consist of a variety of small particles, polymers ~ 10 nm to 2μm. Although the work focusses on idealised systems these types of fluids are analogous to paints, inks, personal care products, liquid sprays (e.g for agricultural applications).

Typical applications can be broken down into a number of areas:

## 1) Dispensing and deposition of fluids

High speed imaging techniques enable us to follow processes such as jetting of fluids from a nozzle, or impact of a droplet with a surface. The role of the surface chemistry and fluid additives in influencing dynamic wetting is central to many applications.

## 2) Flow of fluids

Particularly for fluids with high particle loading (e.g a paste or slurry) the flow of fluids can lead to jamming. Fluids may also become unstable in response to changing temperature or pH, resulting in irreversible gels of protein or particle based networks.

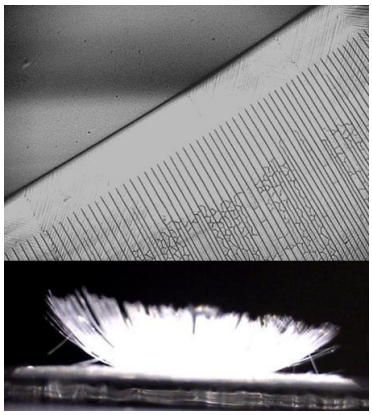
*Jamming in a colloidal Fluid*

## 3) Film formation and instabilities

When a fluid's liquid evaporates the additives form a film. However strong forces due to drying may lead to instabilities such as cracking, film pealing etc. We aim to understand these processes, measuring and manipulating the forces at work.

Further details of the research being conducted in the group can be found on the website:

www.nottingham.ac.uk/~ppzmis



*Cracking and pealing film*