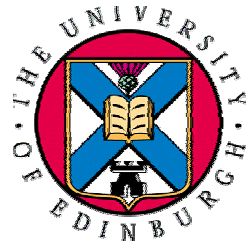


## 4. SOFT MATTER: SCIENCE VISION



- Beyond equilibrium self assembly:  
using controlled forcing (shear, quench) to steer through a landscape
- Arrested end-states sometimes more robust than equilibrium:  
memory effects can ride out changes in the here and now
- To control end-state “products” we must understand free energy landscapes:  
not just the free energy minima that define equilibrium
- Huge challenges ahead for simulation:  
this applies at direct (dynamical) and also landscape (MC) level
- “Combinatorial physics”:  
glasses, plus phase separation, plus shear, plus fields, plus....

HOW DO WE AVOID GETTING LOST IN THIS IMMENSE SPACE?

Image: microtexture of nematic/colloid composites viewed by confocal microscopy, as function of colloid volume fraction and cooling rate. Arrested colloid-rich domains show bright. All these samples are solid gels retaining full optical activity of the nematic phase (dark).

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image created by J Cleaver

