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Soft Matter Research Group
Nottingham Trent University
United Kingdom

David Fairhurst

Team Presentation – Annual Workshop, COST Action MP1106
Dublin, September, 2012

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Team's general info

Research Team Name: Soft Matter Physics

7 related academic staff members

- David Fairhurst
- Carl Brown
- Mike Newton
- Martin Bencsik
- Haida Liang
- Fouzia Ouali
- Rob Morris

4 post doctoral researchers

6 PhD students

2 technicians

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Relevance to MP1106

Research interests related to MP1106:

- Dielectrowetting of liquid drops
- Capillary flow on smooth and rough channels
- Drag reduction on super-hydrophobic interfaces
- Evaporation and deposits from complex fluid drops
- Non-invasive MRI imaging of pressure with micro-bubble solutions
- OCT imaging of flows within films and drops
- Foam stability using green molecules

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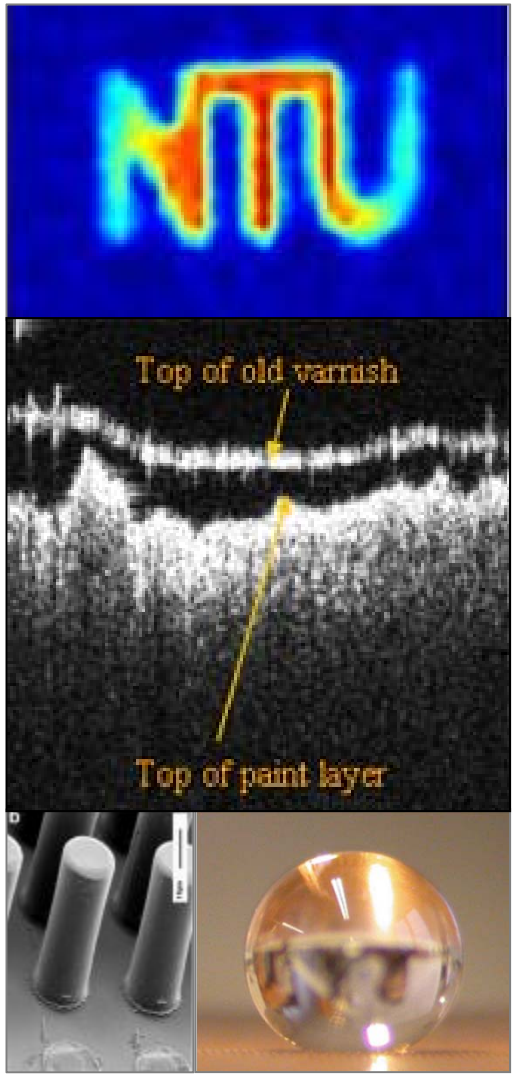
Lab description

Basic facilities, equipment, devices etc

- 3 MRI scanners for bulk, drops and films, including a 2.3T superconducting small animal scanner.
- Laser Doppler apparatus for flow near interfaces
- Light, confocal and electron microscopes
- Optical coherence tomography for non-invasive imaging of turbid samples, such as foams
- Synthetic chemistry labs for functionalization of green molecules
- Micro-fabrication facility for structured interfaces
- Drop shape analysis and environmental chamber



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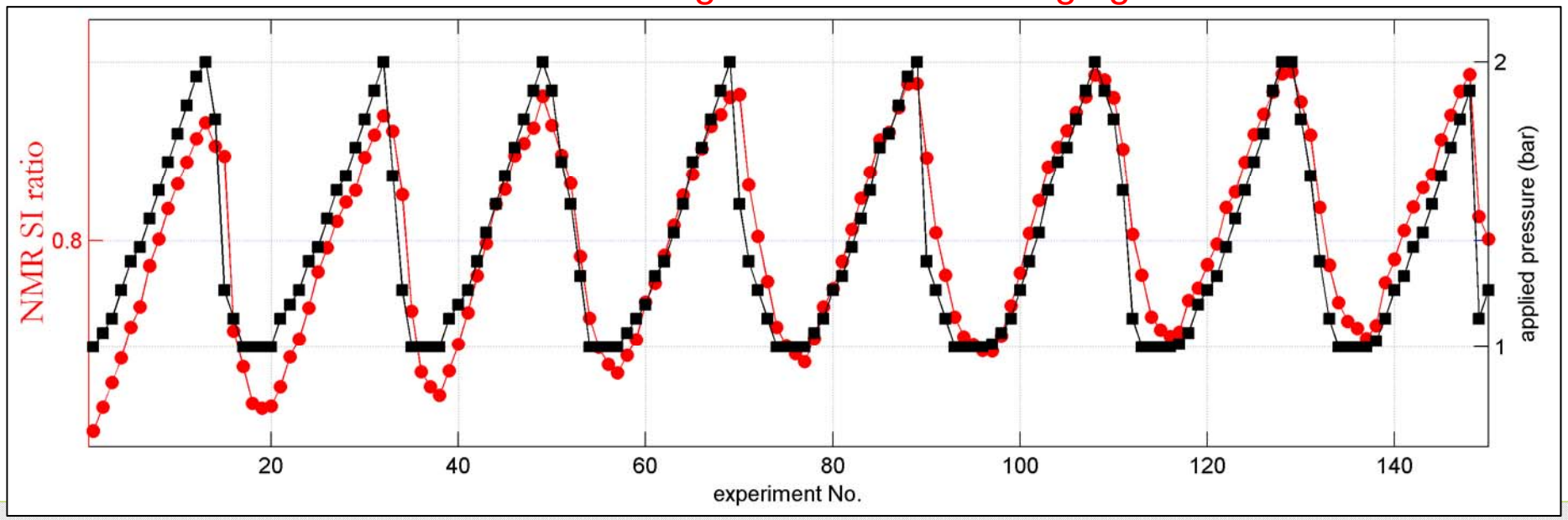
Projects

#1 project :

Title: Micro-bubbles as MRI pressure contrast agents
Duration: 3 years
Funding organization: Saudi Arabian government
People involved and their function: 1PhD student + Martin Bencsik (supervisor) + Stephen Evans (Leeds, microbubbles expert)
Facilities/equipment: micro-bubble fabrication
Future work: enhanced contrast agents for *in-vivo* imaging



Projects

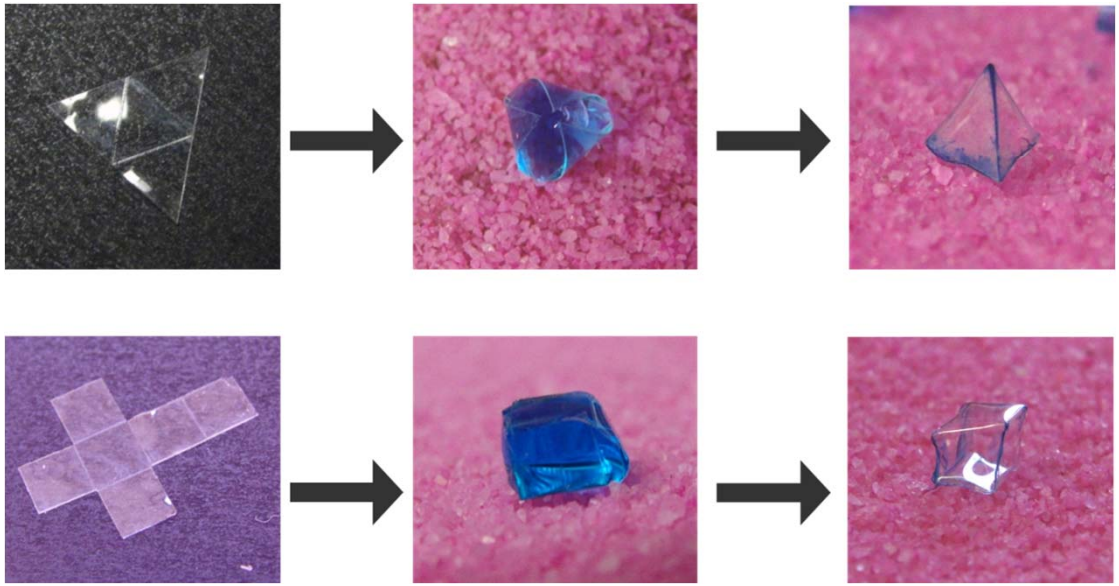
#2 project :

Title: Green molecules for foam stabilization
Duration: 2 years
Funding organization: Industrial
People involved and their function: Post-doc + David Fairhurst (supervisor)
Facilities/equipment: Imaging, chemical synthesis, foam stability measurements
Most interesting results: not yet started!

Projects

#3 project :

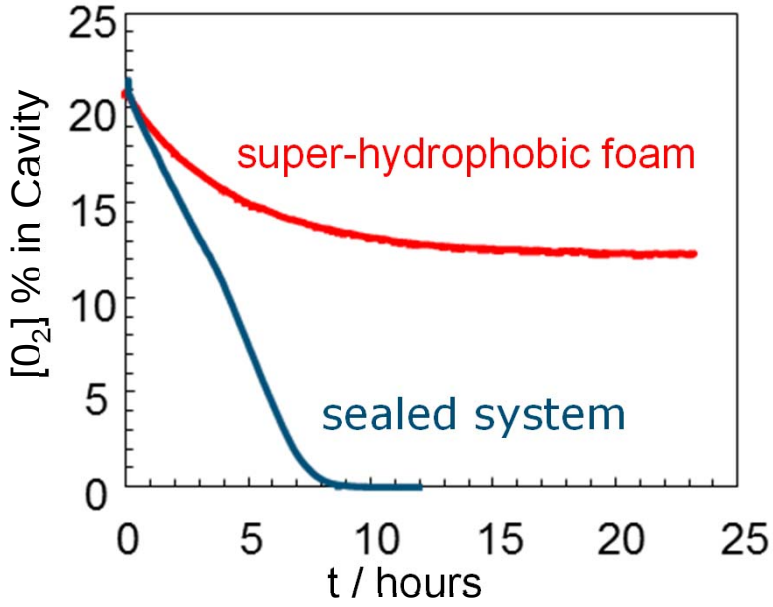
Title: Liquid origami
Duration: 3 years
Funding organization: Nottingham Trent University
People involved and their function: PhD students + Mike Newton (supervisor)
Facilities/equipment: surface fabrication
Most interesting results: Smart flexible surfaces wrap around liquid droplets



Projects

#4 project :

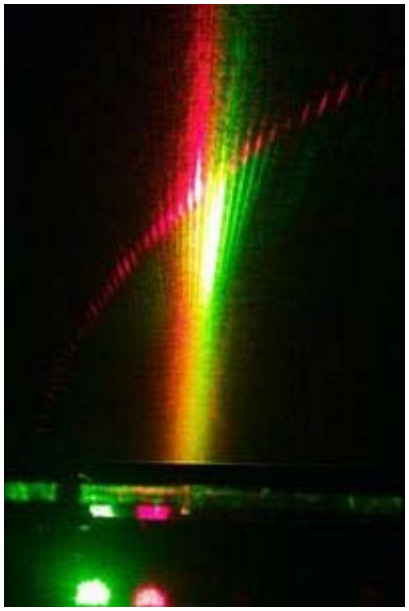
Title: Plastron properties of a super-hydrophobic interfaces
Duration: Ongoing
Funding organization: Nottingham Trent University
People involved and their function: BSc student, post-doc, Mike Newton (supervisor)
Facilities/equipment:
Most interesting results: Oxygen extracted from water through smart interface

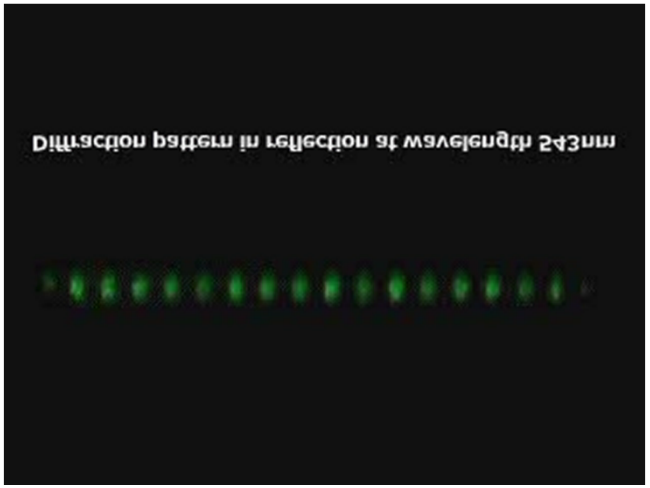


Projects

#5 project :

Title: Voltage-programmable liquid optical interface
Duration: ongoing
Funding organization: EPSRC, Industrial and NTU
People involved and their function: various, Carl Brown (supervisor)
Facilities/equipment :fabrication of smart patterned surfaces + electrodes
Most interesting results: see below





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Topics for Research Proposal

#1 Topic

Title: Dynamic droplets on functional surfaces

Promotion images & text:
Controlling droplets by using complex fluids and smart interfaces.

Duration: ____

Expertise required: ____

Facilities/equipment required: _____

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Topics for Research Proposal

#2 Topic

Title: Stability and dynamics of micro-bubbles and foams

Promotion images & text:
Extension of existing projects looking at foams and bubbles

Duration: 1-2 years

Expertise/facilities/equipment required:

creating green/bio-compatible foams and bubbles;
measuring foam stability;
measuring dynamic surface tension

Thank you for your attention