



BSR Non-Newtonian Club Meeting 2007
University of Oxford, UK
19th June 2007

A non-Newtonian club meeting was held at the University of Oxford on 19th June 2007, hosted by **Dr. Peter Martin** from the Department of Engineering Science. Following coffee and cakes mid-morning, the first speaker, PhD student **Janice Giudice** from Oxford, gave an excellent talk on 'Non-Newtonian Fluids and Finite Elements'. This was presented very clearly, particularly considering the degree of derivations given and equations for finite element algorithms examining the flow of shear thinning fluids. **Dr. Bogdan Dobrasczyk** from the University of Reading then presented on 'Rheological And Polymer Molecular Structure-Function Relationships In Gluten In Relation To Breadmaking Quality'. He highlighted the origin of the viscoelastic properties of dough and discussed how these affect entrainment and retention of gas bubbles in dough. He linked these properties, and the quality of dough, to the confirmation and entanglements of gluten proteins. The next speakers were two undergraduate students from Oxford, **Alasdair Walker** and **David MacTaggart**, who presented work they have performed on 'Wall slip in paste flows' and 'Models of shear induced particle migration'. Both of these talks prompt lively discussion from the audience.

Following a filling lunch, **Chris Holland**, a PhD student from Oxford's Zoology department, then gave an interesting talk on spiders and the silk that they produce. He highlighted the unique mechanical properties of silk, and the difficulties in reproducing this by artificial means. **Dr Samjid Mannan** from Kings College London then discussed the use of electrical methods to detect and measure jamming in solder pastes. This was followed in similar vein by a talk from **Georgina Davies**, a young scientist from Unilever Corporate Research. She highlighted the use of parallel plate rheometry to measure the viscous and elastic properties of non-Newtonian fluids at gaps as low as 10 microns. This enabled shear rates up to 10^5 s^{-1} to be accessed and the detection of normal stresses for weakly elastic fluids. She also discussed jamming and slip/depletion of microstructured fluids and suspensions in thin films.

Following the tea break, the theme of jamming continued with **Dr. Mark Haw** from the University of Nottingham presenting on jamming transitions and dilation of complex fluids, particularly suspensions. He discussed this in context of a range of systems, from understanding earthquakes to engineering 'self-organization' in granulars and soils. This was followed by our host of the day, **Dr Peter Martin**, who presented the complex rheology of commercial and model ice creams. He discussed the difficulty in measuring the rheology of such systems, and highlighted the use of the multi-pass rheometer where wall slip must be taken into account. The day finished with an engrossing presentation on flow during geotechnical processes by **Dr. Chris Martin** from Civil Engineering at Oxford.

The wide variety of talks generated numerous questions and fruitful discussion from the audience of around 30. An award was also given to the overall best presentation by a 'young' rheologist, selected by a few senior scientists in the audience. This was difficult since all the 'young' scientists gave excellent talks, including the 2 undergraduate students. Despite impressive talks by both Georgina Davies and Chris Holland, the award went to **Janice Guidance** from the University of Oxford with comments made on the clarity of her presentation on such a difficult topic. The award consisted of copies of 'Rheology Reviews' from the last 3 years.



On behalf of the BSR and non-Newtonian club, I would like to thank the speakers and participants/audience, as well as **Peter Martin** for hosting such a successful event and **Steve Goodyear** from Anton Paar for organising sponsorship for the catering.

Jason Stokes.