72nd Annual Meeting of the Society of Rheology

Hilton Head/South Carolina, USA
February, 11th - 15th, 2001

The Society of Rheology held its 72nd Annual Meeting from February 11-15, 2001[1]. The meeting was attended by 292 registered delegates of whom 77 were students. The meeting was held at the luxury Westin Resort on Hilton Head Island just off the coast of South Carolina. Local organizer Prof. Don Baird together with his wife Treesha did a fantastic job of ensuring that the registration process, social events and technical sessions ran smoothly. They even ensured that the weather remained rather foggy and overcast for the first 2.5 days so that participants attended sessions before heading out to explore the splendid local beach and unspoiled dunes. The technical program organizers (Profs. S. Khan and G. McKinley) arranged for a program of 192 talks over 3.5 days that were divided into 13 mini-symposia spanning both the traditional rheological fare (e.g. 'Polymer Melts and Solutions', 'Liquid Crystalline Systems', and 'Non-Newtonian Fluid Dynamics & Flow Stability') to newer emerging areas such as 'Microscopic Rheology & Single Chain Dynamics' and 'Rheology in Confined Geometries'. The growing industrial relevance of such problems and the large attendance at these latter sessions (even on the final Thursday morning when numbers typically drop off) suggests that such areas will remain 'hot topics' for rheologists in the near future.

One of the most heavily attended sessions was the 'Rheology & Topology' symposium organized by Prof. Tom McLeish and Prof. Jay Janzen. Twenty-two papers were presented over two consecutive days of the conference and covered the spectrum from model branched materials to the complexities of real polyolefins. Continual reference to the 'pom-pom' model framework of McLeish & Larson in almost every talk became a running joke of the symposium. Lively discussions followed each presentation in this symposium and over 20 people gathered for continued discussions on the Monday evening following the Society reception. Large numbers of papers and high attendances could also be noted at the symposia on 'Associating Polymers and Surfactant Systems', 'Food and Biopolymers' and 'Suspensions and Colloidal Systems' which seems indicative of current industrial interest in furthering rheological understanding and commercial applications of such materials. Additional sessions focused on both specific kinematics and geometries (e.g. 'Extensional Flows and Extensional Rheometry', 'Rheology in Processing Flows') and on specific types of materials (e.g. 'Blends and Copolymers', 'Elastomers, Adhesives and Soft Solids'). The organizers attempted to ensure that chairs for each symposia were selected equally from academia and industry or government laboratories. A complete archive of symposia and abstracts from the talks is available online at

www.rheology.org/soro12/default.asp.

Travel grants by both the Society of Rheology and the British Society of Rheology enabled a number of young researchers to attend the meeting. The Society also held its first Student Poster Competition in conjunction with its regular poster session. The (anonymous) panel of judges split the first place prize of $200 between two students. The winners were Allen Kaiser of Texas Tech University for his poster with Professor Alan L. Graham titled "Rheological and Transport Properties of Suspensions" and Kevin D. Dorfman of Massachusetts Institute of Technology for his poster with Professor Howard Brenner titled "Vector Chromatography: Modeling Micropatterned Separation Devices". The contest was deemed a great success by participants, judges and organizers alike and plans are already underway for the next Student Poster Competition at the annual meeting in Bethesda, Maryland/USA. Entry details are posted on the Society's website

(http://www.rheology.org/SoR/annual_meeting/2001Oct/poster_competition.htm)

Plenary lectures were presented by Prof. Ludwig Leibler who described recent studies on the rheological aging of soft solids using both conventional techniques and particle microrheometry, and by Prof. Robert Prud'homme who discussed at length the plethora of morphologies and dynamical responses that can be obtained in surfactant mesophases. On the Tuesday morning Professor L. Gary Leal presented the 2000 Bingham Medal lecture on the 'Microhydrodynamics of Drop Breakup and Coalescence in Flow'. In addition to describing the significant experimental and theoretical advances made both in his lab and elsewhere over the past 15 years, Prof. Leal also highlighted a number of areas (for example the role of surfactants and compatibilizers and the dynamics of the topological transition at coalescence) in which our understanding is still limited. Many of these

[1] As is traditional following the quadrennial International Congress (see conf. report in previous issue) the usual Fall meeting of the Society is shifted to the subsequent Spring.

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issues were echoed in a subsequent presentation by Yuriko Renardy (Talk No. FD6) which featured (to quote the abstract) 'an exciting program of videos' with musical accompaniment!

Since there were four parallel sessions it was impossible to attend all the talks; however, a personal list capturing some additional highlights of the meeting includes Paul Callaghan's RheoNMR study of shear-banding in worm-like micellar systems (AS12), the study of high-speed cavitation events on both the nano- and macro-scale by Rhodri Williams and co-workers (CG13) and the use of microparticle tracking by J.-F.Berret et al. (AS7) to probe viscoelastic fracture in associating polymers under large step strain events. In each case the use of a novel imaging techniques added additional insight into the dynamical behavior of a rheologically complex fluid. The session on flow stability featured a closely inter-related trio of consecutive talks by J. Rothstein (FD1), J. White (FD2) and R. Sureshkumar (FD3) on the role of viscous heating on purely elastic flow instabilities – which turns out to be very significant due to the poor thermal conductivity of polymeric fluids. R. Liang et al. (SC28) demonstrated a very dramatic viscosity enhancement that can be achieved using aramid 'fibrids' or platelets. The change in viscosity with concentration and appearance of a yield stress is enhanced by the rapid development of a percolated space filling network structure at very low vol. fractions. The rate of change of viscosity with concentration in concentrated & entangled polymer solutions was also convincingly shown by McLeish and coworkers (RT13) to be a powerful tool in characterizing the degree of long chain branching in both model and commercial materials. Finally in a well-attended session before lunch on Tuesday, participants were treated to a 'sneak preview' of the second edition of the film and multi-media extravaganza "Non-Newtonian Fluids" from the Univ. of Wales Institute of Non-Newtonian Fluid Dynamics. To quote a well-known American film critic, this reviewer gave the movie 'two enthusiastic thumbs up'!

The range of topics presented and diversity of attendees and symposia suggest that the subject of rheology is as vital and as relevant as ever. The Society convenes again for its 73rd Annual Meeting from Oct 21-25, 2001 in Bethesda, Maryland in an event that coincides with the centennial of the US National Institute of Standards and Technology (NIST).

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View of the conference hotel (Westin Resort, Hilton Head Island). Note the large expanse of Newtonian fluid in the fore-ground. Few rheologists seemed interested in exploring its properties at close range! Perhaps if some polyethylene oxide had been added ...

By the third day, participants were treated to bright sunshine which provided a welcome respite from winter for many conference participants and encouraged extended discussion over lunch on the sundeck.

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