Dynamics of Complex Fluids: Proceedings of the 2nd Royal Society-Unilever Indo-UK Forum in Materials Science and Engineering. M.J. Adams, R.A. Mashelkar, J.R.A. Pearson and A.R. Rennie, Imperial College Press, 1998, 485 pp., £60.00, ISBN 1-86094-086-2.

This is the second set of proceedings to emerge from the very successful 6-month program entitled 'Dynamics of Complex Fluids', held at the Isaac Newton Institute for Mathematical Sciences in Cambridge. This is a remarkable venue, designed to encourage informal collaboration and discussion, and the breadth of these proceedings and the nature of the discussions reflect this atmosphere. While the first proceedings presented a tutorial focus, often from a physics-informed viewpoint, this second collection aims at a slightly more advanced level and has a somewhat broader spectrum of contributors.

In the introduction, the editors define complex as 'structural and rheological complexity' and fluids as 'coherent materials that can be deformed continuously'. These are broad definitions, and are applied as such in the book. The collection of contributed and invited manuscripts is divided by the editors into four categories.

- Viscoelasticity, incorporating traditional rheology and constitutive modelling (much of it computational) of polymer melts and solutions.
- Polymer and self-assembled fluids, featuring slightly more molecularly-informed treatments of dynamics of polymeric, liquid crystalline, and surfactant systems.
- Particulate suspensions, such as model spherical and rod-like suspensions, including blood, under sedimentation and flow.
- Viscoplasticity, including pastes, sand and soil, geotechnical materials, and other yield-stress 'fluids'.

Each section comprises 8–9 'chapters', each chapter being a single contribution.

Complex fluids has 'traditionally' (in its short tenure of a few decades) been the domain of physicists, chemical engineers, and physical chemists. However, many of the newer materials have significant overlap with mechanical and civil engineering (granular materials, sand and soil) and with geophysical (plate tectonics, layered media) disciplines. Applied mathematicians have also long contributed to the understanding of the unavoidable non-linearities inherent in the rheology of complex fluids. This is one of the few volumes which contains contributions spanning this wide range of disciplines. In addition to the diversity of researchers, approaches to modelling complex fluids vary from molecular to continuum, and these extremes often operate in exclusion from each other. The editors have consciously organised this book to recognise this dichotomy in an attempt to illustrate the complementary understanding that can emerge from considering both approaches. Hence, the book broadly swings from a continuum approach to molecular ideas and theories, and back to continuum modelling.

The papers are largely theoretical or computational, with 7 of the 33 presenting experimental results. They are split between presentations of particular results (for example, the contributions of Marrucci and Ianniruberto on convective constraint release, of Goddard on migrational instabilities, and of Harden and Cates on flow in adsorbed polymer layers) and more general reviews (for example, McKinley's discussion of instabilities in extensional rheology and Ottinger's review of Brownian dynamics simulations). There are contributions on instabilities in polymer melt and solution rheology, and on singularities in constitutive modelling. Several papers address the interface between continuum and meso-scale modelling (Brownian and micro–macro approaches). In addition to FENE-type dumbbells, there are molecular discussions of polymer melts, solutions, brushes, and associating networks. The studies of suspensions include both continuum (Langevin) and molecular approaches; while the discussion on yield stress and plastic materials is largely constitutive.

The editors have done an admirable job in sensibly ordering the material (choosing from many possibilities), and ensuring common and clear typesetting in all manuscripts (hodgepodge typesetting makes so many proceedings uncomfortable to read). They have also provided a useful introduction and index. The best feature is the paragraph or so of objective and accurate summary which precede each paper. A final useful feature is the inclusion, as in the well-known Faraday discussions series, of questions and answers at the end of the invited lectures. The exchanges are never boring, are often humorous, and are always successful in providing useful reference points and a framework for critical reading. In some cases, much can be gained by skimming the manuscript, reading the discussion in detail, and then backtracking with the comments in mind.

It is not the place of proceedings to present comprehensive treatments, but rather to provide a subjective snapshot of the current state of the art in a particular field. This collection succeeds in this goal; the material and approaches are contemporary and, while some detailed discussion is presented, most contributions give enough highlights to illustrate the main results, coupled with a reflective overview and valuable pointers to the current literature.

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PII: S1385-8947(99)00068-6

Guidelines for Pressure Relief and Effluent Handling Systems. Centre for Chemical Process Safety (CCPS), American Institute Of Chemical Engineers, 1998, 538 pp., £121 plus £3.33 VAT on the CD-ROM included with the book, ISBN 0-8169-0476-6.