

## Introduction

Complex fluids, like conventional solids and liquids, are made up of atoms and molecules. However, here atoms and molecules are organised to form larger structures in length scales (of nano and micro meters) much larger compared to the molecular sizes. The observed behaviour of these materials cannot be explained from the chemical constituents alone, without taking into account these intermediate scales of organisation. These fluids for which the deformation and flow behaviour do not fall under the realm of Newtonian fluid behaviour have a complex rheological response and hence these fluids are commonly referred as “complex fluids.” Incidentally, many industrial fluids encountered in chemical, food and allied processing industries such as suspensions, colloidal dispersions, emulsions, powders, foams, polymeric liquids, etc., exhibit complex behaviour. A clear understanding of the flow and rheological behaviour of such fluids is crucial while carrying out the processing operations, designing process equipment which handle/transport these fluids, and in their end-use applications.

The Science and Engineering Research Council (SERC) of the Department of Science and Technology (DST) sponsors conducting of state-of-the-art courses in engineering and science for the benefit of faculty of engineering colleges in the country. These courses may be run in parallel as a Continuing Education Program (CEP) modules for the industry, and offer an opportunity for increasing industry academia interaction. This SERC school (Feb 18–20, 2008) is the third in series for Rheology of Complex Fluids; the earlier ones were held at IISc Bangalore (2004) and IIT Kanpur (2006). The school will be followed by a two day national symposium (Feb 21–22, 2008) on complex fluids, with invited speakers who will present the latest developments in this broad area.

## Aims and scope

The aim of this combined School and Symposium on Rheology of Complex fluids is to bring together young researchers and teachers from educational and R&D institutions, and expose them to the basic concepts and research techniques used in the study of rheological behaviour of complex fluids. The lectures will be delivered by well-recognised experts from around the country who have several years of experience in the teaching, research, and industrial R&D of various aspects of complex fluids. This course should be useful for the participants in their teaching and should also help them in undertaking research in challenging fundamental as well as industrial problems involving complex fluids. The two day symposium will complement the course by providing invited lectures on specific aspects of current research in complex fluids.

Three important benefits of this workshop may be envisioned. First, it is hoped that the participants will be encouraged to initiate teaching and research in the general area of complex fluids in their respective institutions. Secondly, discussion with the experts could assist in resolving difficulties in an ongoing project. Finally, there will be opportunities to nucleate new research collaborations between the participants and the experts.

## Course contents

The course will be conducted in modules each of 1.5 hours of lecture. Some topics will be covered in more than one module. For each topic the participants will be provided with detailed notes and references. The topics that have been planned are:

- Introduction to Fluid mechanics
- Stability analysis of fluid flows
- Rheology of polymers
- Granular rheology
- Rheology of suspensions
- Interfacial rheology

- Rheology of surfactant solutions
- Gels, Thixotropy and Yielding
- Glassy systems

## Faculty

The following faculty from across the country have been invited to deliver the course lectures.

- Prof. KS Gandhi, IISc Bangalore
- Dr. Ashish Lele, NCL Pune
- Dr. V. Shankar, IIT Kanpur
- Prof. K. Kesava Rao, IISc Bangalore
- Dr. S. Ganesh, JNCASR Bangalore
- Prof. V. A. Juvekar, IIT Bombay
- Dr. Ranjani Bandyopadhyay, RRI Bangalore
- Prof. Abhijeet Deshpande, IIT Madras
- Prof. Chandan Dasgupta, IISc Bangalore

## Participation and Funding

Twenty five participants from academic institutions will be sponsored by DST to participate in the school and symposium. Though the sponsorship is mainly for college teachers, a limited number (about five) research scholars could be considered for the funding on a case-to-case basis. The selections will be on an all-India basis. Selected candidates will be paid AC-III tier (sleeper class for students) railway/bus round trip fares by the shortest route from/to their place of work. Boarding and lodging (twin-sharing in the IITB Guest House) expenses of these participants at IIT Bombay will be borne by DST. One set of course notes will be provided. The registration form, available from website, duly forwarded by the head of the institution, should reach the organisers on or before January 10, 2008. For self-financed participants from academia (TEQIP), consult the website for costs.

**Self-financed participants** For participants from R&D organisations and industry, the costs for the CEP course (school) and symposium are separate. The school fee is Rs. 12,000, which covers the cost of course notes and lunch. The symposium registration fee, including a banquet dinner, is Rs. 5,000. Travel and lodging arrangements is to be taken care of by the participants. A crossed demand draft for the desired participation amount, drawn in favour of "Registrar, IIT Bombay (CEP A/c)" and payable at Bombay (State Bank of India and Canara Bank have branches in IIT Bombay), and the registration form (available from the website), duly filled and forwarded, should reach the course coordinator on or before February 1, 2008.

#### Important dates

Last date for Application	10 Jan 2008
Confirmation from organisers	15 Jan 2008
Self-financed Application by	01 Feb 2008
School dates	18–20 Feb 2008
Symposium dates	21–22 Feb 2008

Selected candidates will be informed by e-mail/fax. All queries should be emailed to: [comflu@che.iitb.ac.in](mailto:comflu@che.iitb.ac.in)

#### Organisers and Contact Information

The school and symposium is organised by Prof. Devang Khakhar, with assistance from Drs. Sameer Jadhav, P Sunthar, Rochish Thaokar, and Mahesh Tirumkudulu, of the Department of Chemical Engineering, IIT Bombay.

Email	<a href="mailto:comflu@che.iitb.ac.in">comflu@che.iitb.ac.in</a>
URL	<a href="http://www.che.iitb.ac.in/comflu">http://www.che.iitb.ac.in/comflu</a>
Phone	+91 (22) 2576 4237
Fax	+91 (22) 2572 6895
Address	Dept. of Chemical Engineering, IIT Bombay, Mumbai 400076

#### Registration form

The registration form is available for download at <http://www.che.iitb.ac.in/comflu>. If you have difficulty in obtaining it from the web, please fill out the following information in a plain paper and mail it to the organisers.

SERC School (CEP Course) and Symposium on  
Rheology of Complex Fluids  
18–22 Feb 2008

Name: \_\_\_\_\_  
 Date of Birth: \_\_\_\_\_  
 Designation: \_\_\_\_\_  
 Organisation: \_\_\_\_\_  
 Experience (yrs): \_\_\_\_\_  
 Email: \_\_\_\_\_  
 Phone (O) : \_\_\_\_\_  
 Phone (M) : \_\_\_\_\_  
 Fax: \_\_\_\_\_  
 Address : \_\_\_\_\_  
 Highest Degree \_\_\_\_\_ Year \_\_\_\_\_ University \_\_\_\_\_

Research Interests \_\_\_\_\_

#### Payment Details

Amount \_\_\_\_\_ Date \_\_\_\_\_  
 DD No. \_\_\_\_\_ Bank \_\_\_\_\_  
 DD should be drawn in favour of *Registrar, IIT Bombay (CEP A/c)*

#### Sponsor Details

Name \_\_\_\_\_  
 Designation \_\_\_\_\_  
 Organisation \_\_\_\_\_

(Applicants Signature)

Recommended  
Signature (Head of Institution with Seal)

SERC School/CEP Course and  
Symposium on

## Rheology of Complex Fluids

18–22 February 2008

Sponsored by  
*Science and Engineering Research Council  
Department of Science and Technology, New Delhi*



Organised at  
*Department of Chemical Engineering  
Indian Institute of Technology, Bombay  
Mumbai 400076, India*