



Complex Fluids – 2016

PUNE, INDIA
JANUARY 2–4, 2016

The Indian Society of Rheology organized Complex Fluids – 2016 (<http://pune2016.isr.org.in>) from 2–4 January, 2016 in Pune, India. This meeting was held back-to-back with an Indo-US Science and Technology Forum Workshop (also in Pune, from 4–6 January) and a Faraday Discussions meeting on Nanoparticle Assemblies (held in nearby Mumbai from 7–9 January).

Several participants attended more than one of these meetings. Complex Fluids – 2016 was a very successful meeting that brought together physicists, chemists, biologists and engineers to discuss advances in soft matter. About 300 researchers attended this meeting; over 100 talks and about 150 posters were presented. The meeting had three parallel sessions on topics ranging from active matter; polymers; gels; rheology; suspensions and granular materials; colloids and

nanoparticles; surfactants; wetting and adhesion; glassy matter; membranes; confined liquids and turbulent flows.

The Complex Fluids meetings have been held regularly in India since the first meeting in 2002 in Bangalore. The 2016 meeting in Pune was the largest meeting in this series and had participation from researchers from USA, UK, Germany, Israel, China, Taiwan, Japan and Australia, in addition to scientists from India. The next meeting in this series will be held in Hyderabad in December 2016.

Guruswamy Kumaraswamy
Organizer, Complex Fluids – 2016
ak.lele@ncl.res.in

7th International Conference, Physics of Liquid Matter: Modern Problems (PLMMP 2016)

KYIV, UKRAINE
MAY 27–30, 2016

This 7th International Conference, Physics of Liquid Matter: Modern Problems continued the success of the previous conferences on the topic and provided the interdisciplinary community with an opportunity to learn about the latest advantages in different fields including physics, chemistry, materials science and medicine. The PLMMP – 2016 Conference was organized by the Kyiv Taras Shevchenko National University, Ministry of Education and Science of Ukraine and National Academy of Sciences of Ukraine. All presentations were given in English. The Conference registered over 400 participants from 32 countries of over the world (Figure 1). The aim of the Conference was to bring together the Physics of Liquid Matter community and to strengthen the cooperation among the research groups. It hosted this year 11 topics:

- Water, water systems and biomedical applications
- Quantum liquids and solutions
- Ionic and ionic-electronic liquids and solutions (molten salts and metals)
- Polymer and biopolymer solutions
- Mixtures of fullerenes, nanotubes, nanoplatelets with liquids
- Colloidal systems: ferrofluids, nano-diamonds, fluids with self-organization; clay suspensions
- Liquids at interfaces, under confinement, and in porous media
- Radiative aspects of the physics of liquid state
- Phase transitions and critical phenomena in liquids and liquid systems
- Glass-forming liquids
- Small-angle neutron scattering and X-rays in liquids and liquid systems

This is an extract of the complete reprint-pdf, available at the Applied Rheology website
<http://www.appliedrheology.org>

The rheological presentations (oral and poster) were distributed over all abovementioned topics. In total more than 30 papers were presented during the Conference on rheological problems. Particular interest was focused on the rheological properties of different colloidal systems. H.-J. Mögel presented a lecture on shear induced structural changes and normal forces in concentrated clay suspensions (Figure 2). A micro-rheological model of shear induced structure changes in concentrated kaolin suspension was discussed. N.O. Mchedlov-Petrosyan reviewed the colloidal stability of nanodiamond in water and discussed correlations between viscosity and size of aggregates in colloidal systems. Olga Ya. Khliyeva presented data on the density and viscosity of a nanofluid (water/ethanol/ propylene glycol/ Al_2O_3 nanoparticles) in the temperature range of 248–303 K. A model for the prediction of properties at a limited number of experimental data in a wide range of concentrations was discussed. A. K. Zaripov presented results of numerical simulations concerning the concentration dependencies of the shear viscosity and shear modulus in magnetic suspensions. Aleksandr D. Alekhin presented results from a study of viscosity of solutions of isobutyric acid in water in the neighborhood of the critical solution concentration in presence of low molecular weight ions KCl and charged nanoparticles of laponite. The nature of similarity in behavior of KCl and laponite species was discussed.

Strong attention was also paid to the rheological properties of individual liquids and various mixtures. J. Vrabec presented a comprehensive study on the prediction of mutual diffusion coefficients in binary mixtures on the basis of molecular dynamics simulations and the Green-Kubo formalism with special emphasis on the shear viscosity behavior.

■ V. Rudenko with co-workers compared the kinematic viscosities of non-fluorinated and fluorinated primary alcohols as well as the activation energies of viscous flow. He also reported on the rheological behavior of polyvinyl alcohol in dimethyl sulfoxide and water.

■ I. Bilous delivered a report on the study of the dynamic viscosity and speed of sound in the aqueous solutions of 1,2-propyl alcohol and discussed the nature of the observed non-monotonic dependences of this characteristics along the isotherms.

■ M. Alekseev with co-workers compared complex modes of temperature dependencies of dielectric permittivity, viscosity and dynamic light scattering of hydroxypropyl cellulose aqueous solutions.

■ Sergey S. Lugovskiy with coworkers discussed the effects of atom clustering and pressure on the shear-viscosity and estimated the radii of atomic clusters in different liquids.

■ Pavlo V. Makhlaichuk presented a discussion on the nature of the kinematic shear viscosity of different low-molecular liquids (argon, nitrogen, benzene and nitro-



Figure 1: Group photo (PLMMP 2016).

This is an extract of the complete reprint-pdf, available at the Applied Rheology website <http://www.appliedrheology.org>

benzene) and demonstrated that the similarity in the behavior of the shear viscosities can be explained by identical structure of their averaged inter-particle potentials.

- A.V. Shylin represented data on testing of various empirical and semi-empirical relations for the concentration dependence of viscosity in binary liquid mixtures of carbon tetrachloride, chloroform, and dichloroform with alcohol.
- V. Saienko discussed viscous flow thermodynamic characteristics of aqueous solutions of different polyols in dependence of concentration of solute.
- A. Dorosh reported data on the thixotropic behavior various paint systems measured using the cone-plate geometry and on the basis of X-ray data and results of rheological studies along the equilibrium curve of the liquid-vapor. He discussed a model of diffusion-averaged structure of water.
- V. Sklyarchuk with co-workers presented their study on the impact of minor Co impurities on the viscosity

and electrical conductivity on metallic Sn-Ag-Cu alloys in the liquid state. Observed changes in viscosity by minor Co additions were in correspondence with thermodynamic modeling.

- A. Gritsenko et al. discussed the mechanism of the drag coefficient in liquid helium at different temperatures (0.1 to 3.5 K) and frequencies of oscillation (6.4–33 kHz).
- The rheology of glasses and glass-forming liquids was discussed in two presentations.
- G. Jug presented a report on a cellular model of glass formation and glass structure and paid attention to the Vogel-Fulcher-Tamman viscosity divergence in super-cooled liquids.
- V. Lubchenko discussed the universal thermal, rheological, and electronic behaviors of glasses, presented a quantitative theory of the structural glass transition and explained both crystallisation and the emergence of the landscape regime followed by vitrification in a unified, thermodynamics-rooted fashion.

Finally two presentations were devoted to the application of rheology in medical physics.

- Natalya N. Kizilova presented multiscale modeling results of blood flow in various arterial systems as coupled 3d, 2d and 1d newtonian and non-newtonian flow models. The models have been validated using in vivo measurements of the blood flow and pressure oscillation curves.
- In a related work Vitalii A. Cherevko presented studies of Poiseuille flow of suspensions of nanoparticles in different geometries. Expressions for the velocities, volumetric rate and the effective viscosity of the complex fluid were presented. It was shown that different combinations of the rheological parameters of the fluids, flow conditions and velocity slip constants produce both shear-thinning and shear thickening effects.

In general the attendance to the oral presentations was exceptionally high and very stimulating discussions took place. Moreover, the poster sessions during the coffee breaks were followed with very stimulated stimulating discussions. A warm atmosphere allowed many stimulating contacts between the Ukrainian and all the participants who valued the hospitality of the city of Kyiv. Beside the pure scientific work during the four days, some special events were also organized. The Conference has offered the chance to visit the most prominent historical and cultural places in beautiful Kyiv (May 27–28, 2016) and to make an excursion to the old “Red” building of the Kyiv Taras Shevchenko National University (May 30, 2016).



Figure 2: Professor Hans-Jörg Mögel (TU Bergakademie Freiberg, Germany) during his presentation “Shear induced structure changes and normal forces in concentrated clay suspensions”.

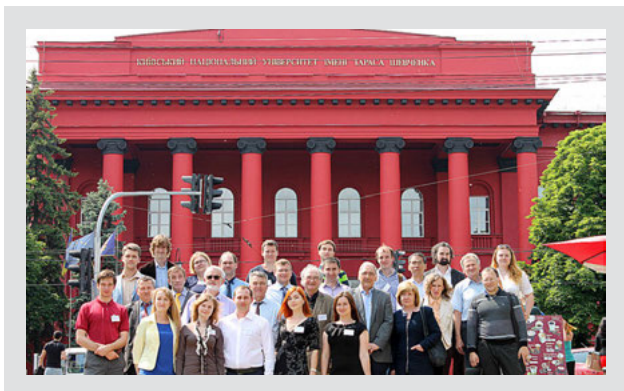


Figure 3: The old “Red” building of Kyiv Taras Shevchenko National University – venue of the PLMMP 2016 Conference. The first lectures in physics were started at Kiev University since its foundation in 1834.

Leonid Bulavin
Nikolai Lebovka
ebovka@gmail.com

This is an extract of the complete reprint-pdf, available at the Applied Rheology website
<http://www.appliedrheology.org>