

HERSONISOS, CRETE, GREECE

APRIL 26–29, 2006

Hellenic Society of Rheology (HSR) Newsletter to Applied Rheology

The 3rd Annual European Rheology Conference (AERC 2006) was held in Hersonisos, Crete, Greece, jointly organized by HSR, FORTH, the University of Crete and the University of Cyprus, with Prof. D. Vlassopoulos being the Chair and Prof. G. Georgiou the Co-chair. The meeting started with registration on Wednesday afternoon, 26 April 2006, at the Hotel Creta Maris, in beautiful Hersonisos bay near Heraklion.

With 440 participants from 36 countries, it was a truly international meeting. The program consisted of 5 parallel sessions with 6 plenary and 6 keynote presentations, 210 oral communications and 171 poster contributions. Following the tradition of large rheology meetings, an exhibition of rheological instrumentation was available in the conference area.

The plenary lectures were given by: (a) J.F. Brady on “Micro vs Macro Rheology”, (b) P.J. Oliveira on “Progress in Computational Rheology with the Finite Volume Method”, (c) T.C.B. McLeish on “Molecular and Flow-Scale Modelling and Experiments of Controlled-Architecture Polymer Melts”, (d) F. McKintosh on “Viscoelasticity of Cytoskeletal Biopolymer Solutions and Networks: Polymer Physics and the Cell”, (e) R.H. Colby on “Polyelectrolyte Solution Rheology”, and (f) J.K.G. Dhont on “Shear Banding Transitions of Suspensions of Rods”. The keynote lectures were given by: (a) R. Everaers on “Microscopic topology and macroscopic rheology of entangled polymer melts and networks”, (b) S.J.

Lee on “Recent progress in computational rheology: high-resolution solutions”, (c) J. Vermant on “Structure and rheology of weakly aggregated 2D and 3D suspensions”, (d) F. Greco on “Non-standard statistical thermodynamics for entangled polymeric liquids”, (e) M. Gottlieb on “Rheology and morphology in thermal gelation”, and (f) F. Lequeux on “Jamming and glassy behavior of concentrated suspensions”. The 10 major themes on rheology were:

- Blends, copolymers and nanocomposites
- Rheometry and beyond: advanced experimental methods
- Interfacial phenomena, surfactants and foams
- Suspensions and colloids
- Viscoplasticity, granular flows and jamming
- Biopolymers, biorheology and food rheology
- Liquid crystals, polyelectrolytes, and associating fluids
- Entanglements, viscoelasticity and microstructural modelling
- Non-Newtonian fluid mechanics, turbulence and processing
- Flow-induced phase transitions and instabilities

Authors were further given the opportunity to submit papers for consideration for publication in special issues of *Rheologica Acta* and of the *Journal of Non-Newtonian Fluid Mechanics*.

Figure 1:
A rare view of the Hersonisos Harbor in cloudy weather during AERC-2006 Conference.

Figure 2:
Delegates (including Professors and their students) discussing the finer points of food rheology before embarking on tasting experiments during the welcoming reception at Creta Maris Hotel for the AERC-2006 Conference. The Editor of *Rheologica Acta*, Prof. Henning Winter, is 2nd from right at the front row.



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A combination of sunny and cloudy weather permitted the participants to enjoy both the Conference sessions and the superb spring sun and sea of Crete. On Friday, April 28, the 7th ESR Committee Meeting took place. Later on the same day, D. Vlassopoulos (on behalf of the AERC-2006 Organizing committee and the Hellenic Society of Rheology) invited the ICR and ESR delegates and the ESR executive council to a joint dinner. But the highlight of AERC-2006 was the banquet, which took place at the end of the Conference on Saturday night, 29 April 2006, in a beautiful Greek taverna by the sea. The attendees enjoyed the much acclaimed Cretan food and a host of short speeches by the ESR president M.H. Wagner, D. Vlassopoulos and R. Keunings.

AERC-2006 was preceded by two rheology short courses on “Multi-scale modeling methodologies” and “Interfacial rheology and applications”. The short course on multi-scale modelling methodologies was taught by D.N. Theodorou, K. Kremer, H.-Ch. Öttinger and M. Laso and covered the following topics: Atomistic modelling, determination of entanglement molecular weight from different techniques, coarse-graining, self-consistent mean field theories and models, development of simulation methods guided by the reptation idea, and techniques for linking mesoscopic simulations with the macro-scale. The short course on interfacial rheology and applications was taught by G. Fuller, J. Vermant, and A. Kraynik, and focused on systems (such as foams, emulsions and blends) where the rheology and structure are dominated by the presence of high degrees of fluid interface. Topics covered in the short course included the fol-

lowing: capillarity and wetting, molecular structure of surfactants, stability of colloidal particles that are attached to interfaces, rheology of foams and its dependence on microstructure, rheology of emulsions and blends and its dependence on the interfaces that divide the dispersed and continuous liquid phases, and the role of interfacial agents on morphological processes. Emphasis was further given to systems from biology where the behavior of phospholipid monolayers and bilayers control the mechanical response of lung surfactants, cells, and vesicles. The two courses were attended by approximately 40 students all together.

Jointly organized by HSR, FORTH-ICE/HT and the University of Patras, with V.G. Mavrantzas being the chair, is also the “4th International Workshop on Non-Equilibrium Thermodynamics and Complex Fluids (IWNET2006)” that is scheduled to take place in Rhodes, September 3 – 7, 2006. The workshop will highlight the most recent developments in the field of non- and beyond-equilibrium thermodynamics. More than fifty papers will be presented in the Workshop from scientists from all over the world on seven different sessions, such as: non-equilibrium thermodynamics and statistical mechanics, multiscale modeling and molecular simulations, algorithms for non-equilibrium molecular dynamics simulations, complex fluid deformation and rheology, non-equilibrium thermodynamics formalisms and applications to complex materials (e.g., glasses, micelles, colloids, blends, and interfaces), and mathematical aspects of mesoscale dynamics. The three (3) invited talks in the Workshop will be given by A. Angell, G. Nicolis, and A. Onuki. Selected contributions from the papers presented in the Workshop will be compiled and published in a special issue of the Journal of Non-Newtonian Fluid Mechanics.

Greece has also been selected to host the 15th International Workshop on Numerical Methods for Non-Newtonian Fluid Flows (IWNMNF-2007). The Workshop will take place in Rhodes, June 14 – 17, 2007, with E. Mitsoulis being the Chair and V.G. Mavrantzas the Vice-Chair. More information about the Workshop will be given in the next HSR Newsletter as well as via email in due time.

The Hellenic Society of Rheology



Figure 3: Delegates enjoy a sunny lunch break during the AERC-2006 in Creta Maris Hotel by the sea. Left to right: Profs. George Georgiou, Co-Chair of AERC-2006, Savvas Hatzikiriakos, Andreas Alexandrou, Dr. Yavvis Dimakopoulos, Evan Mitsoulis, Jean-Michel Piau, Dr. Martin Sentmanat.