IWNMNNF 2007 Program

Day 1: Wednesday Afternoon, June 6, 2007

18:00-18:30 *Registration*
18:30-18:40 Welcome remarks – Motivation – Organizational details
   <u>Evan Mitsoulis</u>, National Technical University of Athens, Greece

Plenary Lecture
Chair: E. Mitsoulis

18:40-19:20 The changing face of computational rheology
   <u>Roger Tanner</u>, University of Sydney, Sydney, NSW, Australia

Session 1: Viscoelastic Suspensions
Chair: B. Khomami

19:25-19:45 (A24) Rigid rods in non-homogeneous shear flow
   <u>M.J. Green</u>, R.C. Armstrong, MIT, Cambridge, MA, USA
   R.A. Brown, Boston University, Boston, MA, USA

19:50-20:10 (A30) Numerical simulations of concentrated viscoelastic suspensions in an elongational flow
   G. D′Avino, P.L. Maffetone, University of Napoli, Italy
   <u>M.A. Hulsen</u>, G.W.M. Peters, Eindhoven University of Technology, The Netherlands

20:15-20:35 (A23) Numerical simulation of polymer melts containing short and long fibers
   <u>P. Wapperom</u>, D.G. Baird, G. Velez, A.P.R. Eberle, Virginia Tech, Blacksburg, VA, USA

20:40-21:00 (A70) Numerical simulation of suspensions of rigid and deformable particles in polymer melts
   <u>Ahamadi Malidi</u>, O.G. Harlen, University of Leeds, UK

21:05-22:30 *Welcome buffet – Registration (cont.)*

Day 2: Thursday Morning, June 7, 2007

Session 2: Multiscale Modeling and Molecular Simulations
Chair: V.G. Mavrantzas

8:00-8:20   (A45) Realizing rheological dreams: efficient solution of highly dimensional Fokker-Planck equations
A. Ammar, Laboratoire de Rheologie, Grenoble, France
F. Chinesta, ENSAM, Paris, France
R. Keunings, Université Catholique de Louvain, Louvain-la-Neuve, Belgium

8:25-8:45   (A20) Optimal choices of correlation operators in Brownian simulation methods
Raz Kupferman, Yossi Shamai, The Hebrew University, Jerusalem, Israel

8:50-9:10   (A9) A log transformation applied to the method of Brownian configuration fields
Claude Mangoubi, Raz Kupferman, The Hebrew University, Jerusalem, Israel
Martien A. Hulsen, Eindhoven University of Technology, The Netherlands

9:15-9:35   (A11) A P3M method for computation of many-body hydrodynamic interactions in a confined geometry: application to migration and apparent slip in nondilute polymer solutions
J.P. Hernandez-Ortiz, S. Anekal, M.D. Graham, University of Wisconsin-Madison, USA

9:40-10:00   (A78) Frictional drag properties of polymeric solution in complex kinematics flows: a multi-scale simulation approach
A.P. Koppol, R. Sureshkumar, Washington University, St. Louis, MO, USA
B. Khomami, University of Tennessee, Knoxville, TN, USA

10:05-10:20   *Coffee break*

Session 3: Multiscale Modeling and Molecular Simulations (Cont'd)
Chair: R. Keunings

10:20-10:40   (A34) DPD as a tool for rheological characterization
T.F. Clarke, R.C. Armstrong, MIT, Cambridge, MA, USA

10:45-11:05   (A73) Atomistic Monte-Carlo simulation of a polymer melt under a flow field by employing generalized ensembles
Chunggi Baig, V.G. Mavrantzas, University of Patras, Greece; FORTH-ICE/HT, Patras, Greece

11:10-11:30 (A6) Rheological and Entanglement Characteristics of Linear Chain Polyethylene Liquids in Planar Couette and Planar Elongational Flows
J.M. Kim, D.J. Keffer, B.J. Edwards, University of Tennessee, USA
M. Kröger, ETH, Zurich, Switzerland

11:35-12:00 (A42) Transient 3D Flow of Polymer Solutions
N.F. Morrison, J.M. Rallison, University of Cambridge, UK

12:05-14:00 *Lunch*

Day 2: Thursday Afternoon, June 7, 2007

Session 4: Viscoplastic Fluids – Modeling and Simulations
Chair: A.N. Beris

14:00-14:20 (A49) Steady bubble rise and deformation in Bingham fluids and conditions for their entrapment
J. Tsamopoulos, Y. Dimakopoulos, N. Chatzidai, G. Karapetsas, M. Pavlidis, University of Patras, Greece

14:25-14:45 (A76) Weakly compressible Poiseuille flows of a Bingham fluid
E. Taliadorou, G. Georgiou, A. Alexandrou, University of Cyprus, Nicosia, Cyprus

14:50-15:10 (A79) Numerical simulation of calendering of viscoplastic materials
E. Mitsoulis, S. Sofou, National Technical University of Athens, Greece

15:15-15:35 (A59) Wave evolution in two-layer pressure driven flow – Newtonian upper layer over a non-Newtonian bottom layer
P. Valluri, P.D.M. Spelt, O.K. Matar, C.J. Lawrence, Imperial College London, UK

15:40-15:55 *Coffee break*

15:55-16:15 (A85) Squeeze flow of carbopol gels
E. Mitsoulis, I. Argyropaidas, National Technical University of Athens, Greece

16:20-16:40 (A63) Blood hemodynamics in carotid bifurcation: influence of rheological models
P. Ternik, Z. Zunic, J. Marn, University of Maribor, Slovenia

16:45-17:00 Discussion

Free Evening

Day 3: Friday Morning, June 8, 2007

Session 5: Viscoelastic Flow Instabilities
Chair: P.J. Oliveira

8:00-8:20   (A8) Using Newton-GMRES for viscoelastic flow time-steppers
<u>Z. Anwar,</u> R.C. Armstrong, MIT, Cambridge, MA, USA

8:25-8:45   (A46) On a new elastic instability: bifurcation in a cross-slot
<u>R.J. Poole</u>, University of Liverpool, UK
M.A. Alves, University of Porto, Portugal
P.J. Oliveira, University of Beira Interior, Covilha, Portugal

8:50-9:10   (A72) Bifurcation analysis of flow instabilities in polymer melts during extrusion
M.E. Kavousanakis, C.I. Siettos, A.G. Boudouvis, National Technical University of Athens, Greece
L. Russo, University of Naples, Italy
<u>G. Georgiou</u>, University of Cyprus, Nicosia, Cyprus

9:15-9:35   (A31) Modeling of axisymmetric instabilities observed during the electrospinning of highly conducting, non-Newtonian jets
<u>C.P. Carroll</u>, Y.L. Joo, Cornell University, Ithaca, NY, USA

9:40-10:00 (A53) Cavity filling process modeling by rheological characterization and large scale computation
<u>K. Christodoulou</u>, R. Mehrabi, A. Mehrabi, E. Rozenbaum, Avery Research Center, Pasadena, CA, USA

10:05-10:20 *Coffee break*

Session 6: Viscoelastic Flow Instabilities (Cont'd)
Chair: G.C. Georgiou

10:20-10:40 (A52) A parallel adaptive unstructured finite volume method for linear stability (normal mode) analysis of viscoelastic fluid flows
M. Sahin, <u>H.J. Wilson</u>, University College London, UK

10:45-11:05 (A9) A new stability mechanism associated with the Oldroyd-B model in creeping flow regime
<u>Raz Kupferman</u>, The Hebrew University, Jerusalem, Israel

11:10-11:30 (A54) Coil-stretch transition and the break down of continuum models
M. Bajaj, <u>J. Ravi Prakash</u>, Monash University, Melbourne, Australia
M. Pasquali, Rice University, Houston, TX, USA

11:35-11:55 (A15) On kinetic models for dilute suspensions of rigid rods
F. Otto, University of Bonn, Germany

A. Tzavaras, University of Maryland, MD, USA

12:00-14:00 *Lunch*

Day 3: Friday Afternoon, June 8, 2007

Session 7: Poster Session

14:00-15:40 **P1**. (A74) A generalized single-conformation tensor viscoelastic model based on principles of non-equilibrium thermodynamics
<u>P. Stephanou</u>, Chunggi Baig, V.G. Mavrantzas, University of Patras, Greece

P2. (A58) Numerical simulation of complex fluid flows with non-Newtonian differential models
<u>O. Wünsch,</u> M. Krebs, University of Kassel, Germany

P3. (A57) Numerical simulations of flow in a variable speed co-rotating twin screw extruder
<u>C. Tzoganakis,</u> S. Zhu, University of Waterloo, Canada
T. Shigeishi, K. Tikara, Japan Steel Works, Hiroshima, Japan

P4. (A48) Correlating the rheology of PVC pastes with particle characteristics
M.G. Rasteiro, <u>L.M. Ferreira</u>, A. Tomàs, S. Figueiredo, University of Coimbra, Portugal

P5. (A80) Rheological characterization of foodstuff used in rolling experiments and modeling via integral constitutive equations
E. Muliawan, S.G. Hatzikiriakos, University of British Columbia, Vancouver, Canada
<u>S. Sofou,</u> E. Mitsoulis, National Technical University of Athens, Greece

P6. (A81) Predicting the behaviour of nylon-6 through industrial spin packs
<u>A. Gustin,</u> A. Zupancic, University of Ljubljana, Slovenia
E. Mitsoulis, National Technical University of Athens, Greece

P7. (A71) Numerical simulation of the extrusion of strongly compressible liquid foams
<u>E. Taliadorou,</u> G. Georgiou, University of Cyprus, Nicosia, Cyprus
E. Mitsoulis, National Technical University of Athens, Greece

P8. (A77) Annular Poiseuille flow of a Newtonian liquid with non-monotonic slip along the walls
M. Chatzimina, <u>G. Georgiou</u>, University of Cyprus, Nicosia, Cyprus
K. Housiadas, University of the Aegean, Samos, Greece
S.G. Hatzikiriakos, University of British Columbia, Vancouver, Canada

P9. (A41a) Comparative study of multi-mode constitutive equations for film blowing process
S. Sarafrazi, <u>F. Sharif</u>, Amirkabir University of Technology, Tehran, Iran

P10. (A82) The temperature dependence of the Rouse mode relaxation spectrum and zero shear rate viscosity in cis-1,4-polybutadiene: results from long atomistic molecular dynamics simulations down to the glass transition temperature T_g
<u>G. Tsolou</u>, V.G. Mavrantzas, University of Patras, Greece

15:40-15:55 *Coffee break*

16:00-20:30 *Excursion to Ancient Lindos*

Day 4: Saturday Morning, June 9, 2007

Session 8: Viscoelastic Fluids - Modeling and Simulations
Chair: J. Tsamopoulos

8:00-8:20   (A47) On the gas penetration in periodically constricted circular tubes filled with viscoelastic liquids
Y. Dimakopoulos, J. Tsamopoulos, University of Patras, Greece

8:25-8:45   (A27) The log-conformation tensor approach in the FVM framework: benchmark solutions and stability analysis
A. Afonso, M.A. Alves, University of Porto, Portugal
F.T. Pinho, University of Minho, Braga, Portugal
P.J. Oliveira, University of Beira Interior, Covilha, Portugal

8:50-9:10   (A13) Oscillating channel flows of UCM and Oldroyd-B fluids: numerical and analytical solutions
A.S.R. Duarte, A.I.P. Miranda, P.J. Oliveira, University of Beira Interior, Covilha, Portugal

9:15-9:35   (A39) Numerical simulation of the flow of a PTT fluid past a cylinder
H. Kamal, L. Thais, G. Mompean, H. Naji, Polytech'Lille, France

9:40-10:00   (A84) On the numerical treatment of integral models for elasticity in a compressible fluid
P.C Bollada, T.N. Phillips, Cardiff University, UK

10:05-10:20   *Coffee break*

Session 9: Viscoelastic Fluids - Modeling and Simulations (cont'd)
Chair: E. Mitsoulis

10:20-10:40 (A51) Viscoelastic analysis of complex flows: from the constitutive model through the numerical simulations and their experimental validation
I. Sirakov, University of St-Etienne, France
E. Mitsoulis, National Technical University of Athens, Greece

10:45-11:05 (A50) Numerical simulation of viscoelastic flows in cross-slot flow devices
M.F. Webster, F. Belblidia, B. Puangkird, University of Wales, Swansea, UK

11:10-11:30 (A19) Prediction of die swell in polymer melt extrusion using an Arbitrary Lagrangian Eulerian (ALE) based finite element method
V. Ganvir, A. Lele, Pune, India
R. Thaokar, IIT, Bombay, India
B.P. Gautham, NCL, Pune, India

11:35-11:55 (A41b) Non-isothermal simulation of the film-blowing process using the multi-mode extended pom-pom model
S. Sarafrazi, <u>F. Sharif</u>, Amirkabir University of Technology, Tehran, Iran

12:00-14:00 *Lunch*

Day 4: Saturday Afternoon, June 9, 2007

Session 9: Complex Materials: Experiments and Modeling
Chair: M.F. Webster

14:00-14:20 (A22a) Computing with power-law viscoelastic materials
<u>Roger Tanner</u>, F. Qi, S.-C. Dai, University of Sydney, NSW, Australia

14:25-14:45 (A68) Characterization of the compressive behaviour of brain tissue and constitutive modeling
<u>G.W.M. Peters</u>, M. Hrapko, J.A.W. van Dommelen, J.S.H.M. Wismans, Eindhoven University of Technology, The Netherlands

14:50-15:10 (A43) Experimental and numerical evaluation of drop deformation and break-up in complex flow fields
<u>R.D. Egholm</u>, P. Szabo, Technical University of Denmark, Lyngby, Denmark
P. Fischer, ETH, Zurich, Switzerland
K. Feigl, Michigan Technological University, Houghton, MI, USA

15:15-15:35 (A67) Experimental and numerical study of cavitation in journal bearings
<u>P.C. Bollada</u>, T.N. Phillips, Cardiff University, UK
P.R. Williams, R.L. Williams, University of Wales, Swansea, UK

15:40-15:55 *Coffee break*

Session 10: Complex Materials: Experiments and Modeling (Cont'd)
Chair: G.W.M. Peters

15:55-16:15 (A26) Modeling of non-isothermal electrospinning of polymer melts with and without crystallization
<u>E. Zhmayev</u>, Y.L. Joo, Cornell University, Ithaca, NY, USA

16:20-16:40 (A37) Structure-property relationships for the Newtonian and the non-Newtonian flow of polymer solutions
F. Meyer, H. Storz, J. Storz, A. Bingoel, <u>W.-M. Kulicke</u>, University of Hamburg, Germany

16:45-20:30 *Free time*

20:30-22:30 *Conference dinner*

Day 5: Sunday Morning, June 10, 2007

Session 11: Turbulence in Complex Fluids
Chair: G. Mompean

9:00-9:20   (A56) Dynamic K-L analysis of coherent structures based on DNS of turbulent Newtonian and viscoelastic flows
G. Samanta, <u>A.N. Beris</u>, University of Delaware, Newark, DE, USA
G. Oxberry, MIT, MA, USA
R. Handler, Naval Research Laboratory, Washington, DC, USA
K. Housiadas, University of the Aegean, Samos, Greece

9:25-9:45   (A55) A log-exponential mapping for the preservation of positive definiteness in the numerical integration of viscoelastic constitutive equations
<u>K. Housiadas</u>, University of the Aegean, Samos, Greece
L. Wang, A.N. Beris, University of Delaware, Newark, DE, USA

9:50-10:10   (A38) Direct and large eddy numerical simulations of FENE-P drag reduction flows
<u>L. Thais</u>, G. Mompean, Polytech'Lille, France
A.E. Tejada-Martinez, University of South Florida, FL, USA
T.B. Gatski, University of Poitiers, ENSMA, France

10:15-10:35   (A29) A turbulence closure for viscoelastic fluids based on the FENE-P model
<u>F.T. Pinho</u>, University of Minho, Braga, Portugal
P.R. Resende, University of Porto, Portugal
C.F. Li, R. Sureshkumar, Washington University, St. Louis, MO, USA
B.A. Younis, University of California, Davis, CA, USA

10:35-11:00   *Coffee break*

11:00-11:20   (A21) DNS experiments of surfactant drag reducing fluid flows
<u>S. Guillou</u>, R. Makhloufi, F. Hadri, A. Besq, University of Cherbourg, France

11:25-11:55   Discussion – Closing remarks

12:00-14:00   *Lunch*

END OF WORKSHOP