



# The Society of Rheology 83<sup>rd</sup> Annual Meeting InterContinental Cleveland, Cleveland, Ohio

## Meeting Schedule

### Monday, October 10, 2011

	AMA	AMB	FBA	FBB	R204	R207
8:30			J. J. de Pablo (PL1) - AM			
9:20			Coffee Break			
10:00	BS1	SC1	SI1	MB1	MF1	IR1
10:25	BS2	SC2	SI2	MB2	MF2	IR2
10:50	BS3	SC3	SI3	MB3	MF3	IR3
11:15	BS4	SC4	SI4	MB4	MF4	IR4
11:40	BS5	SC5	SI5	MB5	MF5	IR5
12:05		Lunch Break / Society Business Meeting				
1:30	BS6	SC6	SI6	MB6	MF6	IR6
1:55	BS7	SC7	SI7	MB7	MF7	IR7
2:20	BS8	SC8	SI8	MB8	MF8	IR8
2:45	BS9	SC9	SI9	MB9	MF9	IR9
3:10			Coffee Break			
3:35	BS10	SC10	SI10	MB10	MF10	IR10
4:00	BS11	SC11	SI11	MB11	MF11	IR11
4:25	BS12	SC12	SI12	MB12	MF12	IR12
4:50	BS13	SC13	SI13	MB13	MF13	IR13
5:15	BS14	SC14	SI14	MB14	MF14	IR14
5:40			End			
6:30			Society Reception			

### Tuesday, October 11, 2011

	AMA	AMB	FBA	FBB	R204	R207
8:30			E. S. Shaqfeh (PL2) - AM			
9:20			Coffee Break			
10:00	SG1	SC15			MF15	CR1
10:25	SG2	SC16			MF16	CR2
10:50	SG3	SC17			MF17	CR3
11:15	SG4	SC18			MF18	CR4
11:50	SG5	SC19			MF19	CR5
12:05			Lunch Break			
1:30	SG6	SC20	FS1	MB15	MF20	CR6
1:55	SG7	SC21	FS2	MB16	MF21	CR7
2:20	SG8	SC22	FS3	MB17	MF22	CR8
2:45	SG9	SC23	FS4	MB18	MF23	CR9
3:10			Coffee Break			
3:35	SG10	SC24	FS5	MB19	SA1	CR10
4:00	SG11	SC25	FS6	MB20	SA2	CR11
4:25	SG12	SC26	FS7	MB21	SA3	CR12
4:50	SG13	SC27	FS8	MB22	SA4	CR13
5:15	SG14	SC28	FS9	MB23	SA5	CR14
5:40			End			
7:00			Awards Reception			
8:00			Awards Banquet			

### Wednesday, October 12, 2011

	AMA	AMB	FBA	FBB	R204	R207
8:30			D. J. Pine (PL3) - AM			
9:20			Coffee Break			
10:00	SG15	SC29	FS10	MB24	SA6	PS1
10:25	SG16	SC30	FS11	MB25	SA7	PS2
10:50	SG17	SC31	FS12	MB26	SA8	PS3
11:15	SG18	SC32	FS13	MB27	SA9	PS4
11:40	SG19	SC33	FS14	MB28	SA10	PS5
12:05			Lunch Break			
1:30	SG20	SC34	FS15	MB29	SA11	PS6
1:55	SG21	SC35	FS16	MB30	SA12	PS7
2:20	SG22	SC36	FS17	MB31	SA13	PS8
2:45	SG23	SC37	FS18	MB32	SA14	PS9
3:10			Coffee Break			
3:35	SG24	SC38	FS19	MB33	SA15	PS10
4:00	SG25	SC39	FS20	MB34	SA16	PS11
4:25	SG26	SC40	FS21	MB35	SA17	PS12
4:50	SG27	SC41	FS22	MB36	SA18	PS13
5:15			End			
5:30			Poster Session & Reception			

### Thursday, October 13, 2011

	AMB	R207	FBA	FBB	R204
8:00			R. S. Graham (AP1) - AMB		
8:40	SG28	SC42	FS23	MB37	SA19
9:05	SG29	SC43	FS24	MB38	SA20
9:30	SG30	SC44	FS25		SA21
9:55			Coffee Break		
10:25	SG31	SC45	FS26	MB40	SA22
10:50	SG32	SC46	FS27	MB41	SA23
11:15	SG33	SC47	FS28	MB42	SA24
11:40	SG34	SC48	FS29	MB43	SA25
12:05		SC49	FS30	MB44	SA26
12:30			End		

## Session and Room Codes

AP = Award Presentations  
 BS = Rheology in Biological Systems  
 CR = Computational Rheology  
 FS = Non-Newtonian Flows and Stability  
 IR = Industrial Rheology  
 MB = Rheology of Polymer Melts and Blends  
 MF = Microfluidics, Microrheology and Confined Systems

PL = Plenary Lectures  
 PS = Polymer Solution Rheology  
 SA = Self-Assembling, Associative and Gel-like Systems  
 SC = Suspensions, Colloids and Emulsions  
 SG = Rheology of Solids, Glasses and Composites  
 SI = Surface and Interfacial Rheology

AM = Amphitheater A/B  
 AMA = Amphitheater A  
 AMB = Amphitheater B  
 FB = Founders Ballroom  
 FBA = Founders Ballroom A  
 FBB = Founders Ballroom B  
 R204 = Room 204  
 R207 = Room 207

# Monday, October 10

## Morning

8:30	PL1. Directed assembly of complex fluids, and its application to nanoscale fabrication. <i>J. J. de Pablo</i> Amphitheater A/B					
9:20	COFFEE BREAK					
	<b>Amphitheater A</b>	<b>Amphitheater B</b>	<b>Founders Ballroom A</b>	<b>Founders Ballroom B</b>	<b>Room 204</b>	<b>Room 207</b>
	<b>Rheology in Biological Systems</b>	<b>Suspensions, Colloids, Emulsions</b>	<b>Surface and Interfacial Rheology</b>	<b>Polymer Melts and Blends</b>	<b>Microfluidics, Microrheology, CS</b>	<b>Industrial Rheology</b>
10:00	<b>BS1.</b> Can we make rheology easier to swallow? Pt II – the ‘pharyngeal squeeze’. <i>A. S. Burbidge and J. Engmann</i>	<b>SC1.</b> Modification of biomass rheology: The influence of physical chemistry. <i>J. R. Samaniuk, C. T. Scott, T. W. Root and D. J. Klingenberg</i>	<b>SI1.</b> A new droplet-based method for compressible and incompressible interfacial rheology. <i>K. A. Erk, F. R. Phelan Jr., S. D. Hudson, J. T. Schwalbe and J. D. Martin</i>	<b>MB1.</b> Stress maximum and steady extensional flow of branched polymer melts. <i>Q. Huang, A. L. Skov, H. K. Rasmussen, D. M. Hoyle, T. C. McLeish, O. Harlen, D. Hassel, T. D. Lord, M. R. Mackley and O. Hassager</i>	<b>MF1.</b> Extensional flow of worm-like micellar solutions in a microfluidic cross-slot device. <i>S. J. Haward, T. J. Ober and G. H. McKinley</i>	<b>IR1.</b> The influence of particles on the rheology of monoclonal antibody solutions. <i>J. A. Pathak, R. R. Sologuren and R. Anandakumar</i>
10:25	<b>BS2.</b> A volume-expanding self-defense gel: The non-linear rheology of hagfish slime. <i>R. H. Ewoldt, T. M. Winegard, D. S. Fudge and G. H. McKinley</i>	<b>SC2.</b> Activated relaxation, elasticity and yielding in dense suspensions of nonspherical colloids. <i>R. Zhang and K. S. Schweizer</i>	<b>SI2.</b> Analysis of the flow profiles in the interfacial shear magnetic rod rheometer. <i>T. Verwijlen, P. Moldenaers, H. A. Stone and J. Vermant</i>	<b>MB2.</b> Molecular weight and rate effects in uniaxial extension of polymer melts. <i>S. Cheng and S.-Q. Wang</i>	<b>MF2.</b> A study of flow-induced structure formation in wormlike micellar solutions using local micelle density measurements. <i>N. Dubash, P. Cheung, J. J. Cardiel and A. Shen</i>	<b>IR2.</b> Effect of temperature on rheological properties of rubber materials in both the linear and the non-linear viscoelastic domains. <i>J. L. Leblanc</i>
10:50	<b>BS3.</b> Methodology for rigorous rheological characterization of biological hydrogels. <i>C. J. Rivet, J. M. Zuidema, F. A. Morrison and R. J. Gilbert</i>	<b>SC3.</b> Yield stress of biomass suspensions using magnetic resonance imaging. <i>D. M. Lavenson, E. J. Tozzi, M. J. McCarthy and R. L. Powell</i>	<b>SI3.</b> Interfacial viscoelasticity, yielding and creep ringing of globular protein-surfactant mixtures. <i>A. Jaishankar, V. Sharma and G. H. McKinley</i>	<b>MB3.</b> What and where is the strain hardening and softening. <i>S.-Q. Wang, Y. Wang, H. Sun and G. Liu</i>	<b>MF3.</b> Presentation of biomolecules for analysis: Nano-confined DNA dumbbells. <i>K. L. Kounovsky-Shafer, J. P. Hernandez-Ortiz, J. J. de Pablo and D. C. Schwartz</i>	<b>IR3.</b> RaPiD simulations of the rheology of pressure sensitive adhesives. <i>J. T. Padding, C. Bailly and W. J. Briels</i>
11:15	<b>BS4.</b> Direct observation of flexible polymer chain relaxation using ssDNA. <i>C. A. Brockman, F. B. Latinwo and C. M. Schroeder</i>	<b>SC4.</b> The rheology of nanofibrillated cellulose (NFC) suspensions. <i>F. Richmond, D. W. Bousfield and A. Co</i>	<b>SI4.</b> Microrheology of phospholipid monolayers at the air-water interface. <i>K. Kim, S. Q. Choi, J. A. Zasadzinski and T. M. Squires</i>	<b>MB4.</b> Microscopic theory of the dynamic tube confinement potential for entangled liquids of rigid macromolecules. <i>D. M. Sussman and K. S. Schweizer</i>	<b>MF4.</b> Transition to elastic turbulence in 4:1 microcontraction flow. <i>D. Lee, K. H. Ahn and S. J. Lee</i>	<b>IR4.</b> Rheology and pH study of a model crystallizing surfactant system. <i>C. B. Street, N. J. Wagner, M. S. Vethamuthu, K. D. Hermanson and K. P. Ananthapadmanabhan</i>
11:40	<b>BS5.</b> Relaxation pathway of a self-entangled DNA molecule back to a coil. <i>P. S. Doyle and J. Tang</i>	<b>SC5.</b> Intrinsic viscosity of actively swimming microalgae suspensions. <i>R. H. Ewoldt, L. M. Caretta, A. A. Chengala and J. Sheng</i>	<b>SI5.</b> Phases and phase transitions of a phosphatidylethanolamine monolayer studied by interfacial active microrheology. <i>P. Dhar and J. A. Zasadzinski</i>	<b>MB5.</b> Microscopic theory of nonlinear rheology, relaxation and yielding in entangled polymer liquids. <i>K. S. Schweizer and D. M. Sussman</i>	<b>MF5.</b> Comparing extensional viscosities of food biopolymers in aqueous solutions via capillary break-up and microchannel rheometry. <i>J. Engmann and A. S. Burbidge</i>	<b>IR5.</b> Slip and melt fracture of broad molecular weight metallocene high density polyethylenes. <i>M. Ansari, S. Hatzikiriakos, A. M. Sukhadia and P. J. Deslauriers</i>
12:05	LUNCH BREAK / SOCIETY BUSINESS MEETING Room 207, 12:15					

## Afternoon

	<b>Amphitheater A</b>	<b>Amphitheater B</b>	<b>Founders Ballroom A</b>	<b>Founders Ballroom B</b>	<b>Room 204</b>	<b>Room 207</b>
	<b>Rheology in Biological Systems</b>	<b>Suspensions, Colloids, Emulsions</b>	<b>Surface and Interfacial Rheology</b>	<b>Polymer Melts and Blends</b>	<b>Microfluidics, Microrheology, CS</b>	<b>Industrial Rheology</b>
1:30	<b>BS6.</b> Analysis of red blood cells viscoelastic properties in microfluidic devices. <i>G. Tomaiuolo and S. Guido</i>	<b>SC6.</b> The relation between shear flow and extensional flow of non-Brownian shear-thickening fluids. <i>M. Roche, H. Kellay and H. A. Stone</i>	<b>SI6.</b> Transport and interfacial rheology of polymer-grafted nanoparticles at air-water and oil-water interfaces. <i>N. J. Alvarez, T. Saigal, R. D. Tilton, S. L. Anna and L. M. Walker</i>	<b>MB6.</b> Nanoparticles in polymer melts: Size and dispersion effects. <i>J. Moll, S. Gong, S. Kumar and R. H. Colby</i>	<b>MF6.</b> Deformation and buckling of colloidal particle stabilized interfaces. <i>M. K. Mulligan and J. P. Rothstein</i>	<b>IR6.</b> Melt extensional viscosity of highly filled thermoplastic blends for automotive heavy layer material. <i>C. L. Jackson, J. D. Oelberg and J. T. Seliskar</i>

1:55	<b>BS7.</b> $\mu$ PIV blood microflow velocity profile measurements: Comparison of the use of fluorescent particles versus RBC as tracer particles. <i>K. L. Pitts, C. Pagiatakis and M. Fenech</i>	<b>SC7.</b> Shear thickening and jamming in dense suspensions of different particle shapes. <i>E. M. Brown, H. Zhang, N. A. Forman, B. W. Maynor, D. E. Betts, J. M. DeSimone and H. M. Jaeger</i>	<b>SI7.</b> Porous media model and collective behaviour of colloidal particles trapped at a fluidic interface. <i>S. Yan, E. S. Shaqfeh and G. G. Fuller</i>	<b>MB7.</b> Nanoparticles in polymer melts: Dynamics of polymers and the nanoparticle network. <i>S. Gong, J. Moll, R. H. Colby and S. Kumar</i>	<b>MF7.</b> Capillary-driven convective assembly of colloidal monolayers. <i>A. L. Weldon, T. Muangnapoh and J. F. Gilchrist</i>	<b>IR7.</b> Extensional rheometry of aqueous PZT ceramic slips. <i>S. S. Vadodaria, R. English, G. Buckles and T. Dobbie</i>
2:20	<b>BS8.</b> Flow induced segregation in suspensions of mixtures of deformable capsules in confined geometries using the boundary integral method. <i>A. Kumar and M. D. Graham</i>	<b>SC8.</b> Shear thickening of chemical mechanical polishing slurries using high shear rheology. <i>N. C. Crawford, M. W. Liberatore, D. Boldridge and S. K. Williams</i>	<b>SI8.</b> Graphene oxide sheets at planar interfaces: Interfacial rheology and structural characterization. <i>L. Imperiali d'Afflito, C. Clasen, J. Fransaer, C. W. Macosko and J. Vermant</i>	<b>MB8.</b> The effect of flow and confinement on the placement of non-spherical nanofillers in polymer melts: Simulation and experiment. <i>J. H. Park, V. Kalra and Y. L. Joo</i>	<b>MF8.</b> Viscoelasticity induced migration of particles in confined flows. <i>G. D'avino, G. Romeo, M. M. Villone, F. Greco, P. A. Netti and P. L. Maffettone</i>	<b>IR8.</b> Annular displacement flows in the cementing of oil and gas wells. <i>M. Carrasco-Teja and I. A. Frigaard</i>
2:45	<b>BS9.</b> Self-assembly of sickle cell hemoglobin: A dissipative particle dynamics simulation study. <i>X. Li, B. Caswell and G. E. Karniadakis</i>	<b>SC9.</b> Imaging the microscopic structure of shear thinning and thickening colloidal suspensions. <i>X. Cheng, J. McCoy, J. Israelachvili and I. Cohen</i>	<b>SI9.</b> Bulk and interfacial rheology of the tear film. <i>L. Rosenfeld, D. L. Leiske and G. G. Fuller</i>	<b>MB9.</b> The viscoelastic properties of layered silicate filled corn protein (zein) nanocomposite moldable resins. <i>J. Luecha and J. L. Kokini</i>	<b>MF9.</b> Microfluidic migration of soft particles in low Reynolds flow. <i>Y.-L. Chen</i>	<b>IR9.</b> Exponential shear of downhole fluids. <i>J. Maxey and R. van Zanten</i>
3:10	COFFEE BREAK					
3:35	<b>BS10.</b> The microrheology of cancer cells and their metastatic potential. <i>E. Baker, M. H. Zaman and R. T. Bonnecaze</i>	<b>SC10.</b> Rheo-physics of shear thickening fluids (STF) studied with large amplitude oscillatory shear (LAOS). <i>A. K. Gurnon and N. J. Wagner</i>	<b>SI10.</b> Interfacial shear rheological behaviors of natural silk fibroin. <i>L. Wang, H. Xie, X. Qiao, A. Goffin, T. Hodgkinson, X. Yuan, K. Sun and N. J. Wagner</i>	<b>MB10.</b> A new generation dual controlled-stress/rate extensional rheometer for polymer melts. <i>J. Maia, R. Andrade and P. Harris</i>	<b>MF10.</b> Tuning bubbly structures in microchannels. <i>S. M. Vuong and S. L. Anna</i>	<b>IR10.</b> Rheological characterization of waxy crude oils. <i>F. H. Marchesini, A. A. Alicke, P. R. de Souza Mendes and C. Zíglio</i>
4:00	<b>BS11.</b> Matrix-induced alignment and shear flow: Effects on endothelial cells. <i>E. S. Lai, N. F. Huang, C. M. Anderson and G. G. Fuller</i>	<b>SC11.</b> A comparative LAOS study of yielding and flow in soft glasses. <i>N. Virgilio, D. Vlassopoulos and M. Cloitre</i>	<b>SI11.</b> Morphological and mechanical properties of recombinant protein interfaces. <i>V. Mitropoulos, B. Struth, T. Geue, E. J. Windhab and P. Fischer</i>	<b>MB11.</b> Flow and failure of monodisperse and bidisperse polymer melts in controlled stress uniaxial extensional flow. <i>R. Andrade and J. Maia</i>	<b>MF11.</b> Microfluidics based monodisperse alginate droplet production. <i>M. J. Fiedler and A. Shen</i>	<b>IR11.</b> Viscosity evaluation of mixtures of biodiesel. <i>F. L. B. Abreu and D. M. Santo Filho</i>
4:25	<b>BS12.</b> Hydrodynamic behavior of tumor cells in a confined model microvessel. <i>Z. S. Khan, J. Hashem, R. Martinez-Zaguilan and S. A. Vanapalli</i>	<b>SC12.</b> LAOF: large amplitude oscillatory flow, a microstructural perspective. <i>J. W. Swan, R. N. Zia and J. F. Brady</i>	<b>SI12.</b> Anomalous coalescence in sheared 2D foam. <i>H. Mohammadigoushki, G. Ghigliotti, G. M. Homsy and J. J. Feng</i>	<b>MB12.</b> Non-Gaussian stretching behavior of entangled polymers. <i>Y. Wang and S.-Q. Wang</i>	<b>MF12.</b> Conducting polymer polyaniline droplet production by using microfluidic devices. <i>J. Stockham and A. Shen</i>	<b>IR12.</b> Applied rheology in decorative and protective coatings. <i>R. R. Eley</i>
4:50	<b>BS13.</b> Rheology of active-particle suspensions. <i>A. Morozov and D. Marenduzzo</i>	<b>SC13.</b> Applications of Rheo-PIV to oscillatory shear of model crude oils. <i>C. J. Dimitriou, R. Venkatesan and G. H. McKinley</i>	<b>SI13.</b> Rheology of ultrathin polymer films: Biaxial inflation vs. liquid dewetting. <i>J. Wang, P. A. O'Connell and G. B. McKenna</i>	<b>MB13.</b> In situ x-ray scattering studies of ordered block copolymer melts during uniaxial extensional flow. <i>W. R. Burghardt, R. Mao and E. McCready</i>	<b>MF13.</b> Microfluidic synthesis of PDMS beads with tunable stiffness and their application as gas sensors. <i>K. Jiang, P. Thomas, S. Forry, D. DeVoe and S. Raghavan</i>	<b>IR13.</b> High-throughput rheology using robotic systems. <i>S. S. Deshmukh, M. Bishop, J. Mecca, D. Dermody, E. Gee, J. Ziemann, B. Orvosh and T. Kuo</i>
5:15	<b>BS14.</b> Rheology of active fluids. <i>Z. Cui</i>	<b>SC14.</b> Surface driven-organization in liquid crystal nanodrops. <i>J. P. Hernandez-Ortiz, V. Tomar, S. I. Hernandez, J. A. Moreno-Razo and J. J. de Pablo</i>	<b>SI14.</b> The development of an innovative triborheometry fixture/design to study the frictional dynamics of solid-liquid systems. <i>D. I. Medina, A. Elmoumni, G. J. C. Braithwaite and G. H. McKinley</i>	<b>MB14.</b> Extensional flow induced crystallization of polypropylene. <i>E. Bischoff White and J. P. Rothstein</i>	<b>MF14.</b> Hydrodynamic feedback and self-rectification regulate the formation of Newtonian and viscoelastic droplet arrays in a microfluidic network. <i>S. S. Bithi and S. A. Vanapalli</i>	<b>IR14.</b> A new apparatus for powder flow testing: A different type of rheometry. <i>D. J. Moonay</i>
5:40	END					
6:30	SOCIETY RECEPTION Cleveland Museum of Natural History					

# Tuesday, October 11

## Morning

8:30 **PL2.** The local and non-local rheology of vesicle and capsule suspensions. *E. S. Shaqfeh* (Bingham Lecture) Amphitheater A/B

9:20 COFFEE BREAK

	<i>Amphitheater A</i>	<i>Amphitheater B</i>	<i>Founders Ballroom A</i>	<i>Founders Ballroom B</i>	<i>Room 204</i>	<i>Room 207</i>
	<b>Solids, Glasses and Composites</b>	<b>Suspensions, Colloids, Emulsions</b>			<b>Microfluidics, Microrheology, CS</b>	<b>Computational Rheology</b>
10:00	<b>SG1.</b> A simple molecular constitutive model that predicts yielding and strain hardening in extensional flow of polymer glasses. <i>S. M. Fielding, R. G. Larson and M. Cates</i>	<b>SC15.</b> Physical origin of shear-banding in jammed systems: A toy model. <i>P. Coussot and G. Ovarlez</i>			<b>MF15.</b> High-throughput rheology using a microfluidic device. <i>E. M. Furst and K. M. Schultz</i>	<b>CR1.</b> Molecular dynamics simulations of flow-mediated interactions between cylindrical micelles. <i>A. Sangwai and R. Sureshkumar</i>
10:25	<b>SG2.</b> On rheology, cure kinetics and chemorheology of gum rubbers. <i>A. Mitra and A. I. Leonov</i>	<b>SC16.</b> Microstructure measurements of shearing concentrated, near hard sphere colloidal dispersions via 1-2 plane flow-SANS. <i>N. J. Wagner, D. Kalman and L. Porcar</i>			<b>MF16.</b> Quantification of the interfacial rheology of a model oil-brine-dispersant system at microscale interfaces. <i>M. D. Reichert, N. J. Alvarez, S. L. Anna and L. M. Walker</i>	<b>CR2.</b> Dynamic arrest and creep in a simulated associative polymer gel. <i>A. R. Baljon, J. Billen, A. Coleman and R. Khare</i>
10:50	<b>SG3.</b> Predicting the rheology of long glass fiber reinforced thermoplastic melts in a simple shear flow. <i>K. C. Ortman and D. G. Baird</i>	<b>SC17.</b> Normal stress distribution in highly concentrated suspensions undergoing squeeze flow. <i>M. Nikkhoo, L. Brozovsky, K. Khodabandehlou and F. A. Gadala-Maria</i>			<b>MF17.</b> Polymer melt microfluidics: Rheology, mixing, and compatibilization and interfacial tension. <i>K. B. Migler and D. Moon</i>	<b>CR3.</b> Particle rheology simulations of viscoelastic properties. <i>M. Karim and R. Khare</i>
11:15	<b>SG4.</b> Modeling environmentally induced changes in elastomer modulus. <i>C. C. White, D. Hunston and K. T. Tan</i>	<b>SC18.</b> Percolation, structure, kinetic arrest, and mechanical response in dense mixtures of rods and nanospheres. <i>R. B. Jadrich and K. S. Schweizer</i>			<b>MF18.</b> Multiplexed microfluidic viscometer for complex fluid and blood rheology. <i>D. E. Solomon and S. A. Vanapalli</i>	<b>CR4.</b> Concentration dependent dynamics of polymer solutions: Universal behaviour from coarse-grained simulations. <i>A. Jain, P. Sunthar, B. Duenweg and J. R. Prakash</i>
11:50	<b>SG5.</b> Soft-particle suspensions near jamming: Effective diffusion. <i>C. E. Maloney, P. Trocha and K. Karimi</i>	<b>SC19.</b> Rheology and microstructure of concentrated non-Brownian suspensions. <i>F. Blanc, F. Peters and E. Lemaire</i>			<b>MF19.</b> Intracellular particle-transport as a measure for cancer-cell aggressiveness. <i>N. Gal and D. Weihs</i>	<b>CR5.</b> Magnetorheology of dilute ferrofluids: Comparison of predictions of Brownian dynamics simulations and the ferrohydrodynamics equations. <i>D. Soto-Aguino and C. Rinaldi</i>
12:05	LUNCH BREAK					

## Afternoon

	<i>Amphitheater A</i>	<i>Amphitheater B</i>	<i>Founders Ballroom A</i>	<i>Founders Ballroom B</i>	<i>Room 204</i>	<i>Room 207</i>
	<b>Solids, Glasses and Composites</b>	<b>Suspensions, Colloids, Emulsions</b>	<b>Non-Newtonian Flows, Stability</b>	<b>Polymer Melts and Blends</b>	<b>Microfluidics, Microrheology, CS</b>	<b>Computational Rheology</b>
1:30	<b>SG6.</b> Durometry of yield stress materials. <i>A. W. Mix and A. J. Giacomin</i>	<b>SC20.</b> A theoretical study of active microrheology in concentrated colloidal suspensions. <i>E. Nazockdast and J. Morris</i>	<b>FS1.</b> The Rayleigh plateau instability on a highly stretched viscoelastic filament. <i>C. Wagner</i>	<b>MB15.</b> Cocontinuous blends for producing porous membranes. <i>C. W. Macosko, A. Hedegaard and M. Trifkovic</i>	<b>MF20.</b> Study of inertial effects in microrheology. <i>T. Indei, J. D. Schieber, A. Cordoba and E. Pilyugina</i>	<b>CR6.</b> Non-monotonic stretch of isolated polymer chains in shear flow. <i>I. Saha Dalal, N. Hoda and R. G. Larson</i>

1:55	<b>SG7.</b> Nonlinear mechanics of glassy polymers. <i>G. D. Zartman, X. Li and S.-Q. Wang</i>	<b>SC21.</b> Decoupling of rotational and translational diffusion near the colloidal glass transition. <i>E. R. Weeks</i>	<b>FS2.</b> The viscoelastic bungee jumper: Constant force extensional rheometry of polymer solutions. <i>C. Clasen, G. H. McKinley and P. Szabo</i>	<b>MB16.</b> Effects of phase-separation on the rheological, morphological and conductive properties of blends containing CNTs or graphene. <i>S. Bose, C. Ozdilek, J. Vermant, C. W. Macosko and P. Moldenaers</i>	<b>MF21.</b> Multiple particle tracking (MPT) study on highly elastic fluids: Treatment of particle localization errors. <i>A. Kowalczyk and N. Willenbacher</i>	<b>CR7.</b> Diversity from uniaxial state and director incompatibility in nematic liquid crystals. <i>H. Pourmatin, A. Acharya and K. Dayal</i>
2:20	<b>SG8.</b> Physical aging of an epoxy film subjected to carbon dioxide plasticization jumps: Evidence of a new glassy state. <i>S. Subramanian, G. B. McKenna and J. Zhao</i>	<b>SC22.</b> Rheological behavior of binary mixtures of highly concentrated emulsions. <i>R. Foudazi, I. Masalova and A. Y. Malkin</i>	<b>FS3.</b> Stability of fiber spinning under filament pull-out conditions. <i>C. van der Walt, M. A. Hulsen and A. C. Bogaerds</i>	<b>MB17.</b> Effect of diblock copolymers on droplet coalescence, emulsification, and aggregation in immiscible homopolymer blends. <i>D. L. Green, J. Fowler, R. Gao, T. Saito, E. Fried and T. Long</i>	<b>MF22.</b> Simulations and analysis of passive microrheology data. <i>A. Cordoba, T. Indei and J. D. Schieber</i>	<b>CR8.</b> Computational based study of suspension flow in a vane rheometer. <i>N. S. Martys, C. F. Ferraris, W. L. George, S. G. Satterfield and M. T. Olano</i>
2:45	<b>SG9.</b> Segmental dynamics in polystyrene melts. <i>H. Watanabe, Y. Matsumiya and T. Inoue</i>	<b>SC23.</b> Dye absorption induced gelation of dilute suspensions of spherical and rod-like zinc oxide nanoparticles – a new route to gelation. <i>F. J. Stadler, C. Martini, F. Fages and C. Bailly</i>	<b>FS4.</b> Studying origins of different failure modes in uniaxial extension of entangled polymer melts. <i>H. Sun, X. Zhu and S.-Q. Wang</i>	<b>MB18.</b> A study on influence of nanosilica in determining morphology of ternary blends: With emphasize on core-shell morphology. <i>Z. Javidi and H. Nazockdast</i>	<b>MF23.</b> 2-Dimensional mapping of dielectrophoresis-free AC electroosmotic flow. <i>J. Wang and H. D. Ou-Yang</i>	<b>CR9.</b> Dynamics of high-Deborah-number flows around a confined cylinder. <i>A. M. Afonso, M. N. Oliveira, F. T. Pinho and M. A. Alves</i>
3:10	COFFEE BREAK					
3:35	<b>SG10.</b> Shape memory behavior of POSS-based thermoplastic polyurethanes. <i>X. Gu and P. T. Mather</i>	<b>SC24.</b> Yielding in dilute colloidal gels under transient flow. <i>H. K. Chan, B. Rajaram and A. Mohraz</i>	<b>FS5.</b> Linear instabilities in channel flows with constrictions: Two distinct elastic instabilities. <i>T. Reis, M. Sahin and H. J. Wilson</i>	<b>MB19.</b> Entanglement relaxation in miscible polymer blends. <i>H. Watanabe</i>	<b>Self-Assembling, Assoc. Gel-like</b>	
4:00	<b>SG11.</b> Rheology and structure of soft colloids. <i>P. Agarwal, S. Srivastava and L. A. Archer</i>	<b>SC25.</b> Induced failure in colloidal gel stabilized particles suspensions. <i>M. Caggioni, S. E. Lindberg and P. T. Spicer</i>	<b>FS6.</b> Purely elastic instabilities in serpentine channels. <i>A. Lindner, J. Zilz, R. J. Poole and M. A. Alves</i>	<b>MB20.</b> A visco-hyperelastic formulation for the rheology of immiscible blends. <i>D. Yao</i>	<b>SA1.</b> Rheology and adhesion of lightly cross-linked polymer gels. <i>A. M. Grillet, N. B. Wyatt, L. M. Gloe and R. Bernstein</i>	<b>CR10.</b> On some matrix transformations applied to computational rheology. <i>A. M. Afonso, M. A. Alves and F. T. Pinho</i>
4:25	<b>SG12.</b> Diffusion of polymer-grafted nanoparticles in polymer melts. <i>D. L. Green and M. E. McEwan</i>	<b>SC26.</b> Rheology and microstructure of a colloidal gel undergoing high strain-rate yielding. <i>L. C. Hsiao and M. J. Solomon</i>	<b>FS7.</b> Numerical simulation of electro-elastic instabilities. <i>A. M. Afonso, M. A. Alves and F. T. Pinho</i>	<b>MB21.</b> Rheological behavior of DL-lactide-block-L-lactide copolymers and blends of poly(DL-lactide) and poly(L-lactide). <i>N. Othman, C. Xu, P. Mehrkhodavandi and S. Hatzikiriakos</i>	<b>SA2.</b> Viscoelastic and mechanical behavior of hydrophobically modified physical hydrogels. <i>J. Hao and R. A. Weiss</i>	<b>CR11.</b> A parametric study of two-layer polymer coextrusion. <i>J. P. Bishop, C. H. Laufer, P. J. Brigandi, N. J. Wagner and A. N. Beris</i>
4:50	<b>SG13.</b> A simulation study on the effects of shear flow and nanotube shape on the electrical conductivity of carbon nanotube/polymer composites. <i>A. E. Eken, E. J. Tozzi, D. J. Klingenberg and W. Bauhofer</i>	<b>SC27.</b> Thermosensitive nanoemulsion “organohydrogels” with surprisingly solid-like rheology. <i>M. E. Helgeson, S. E. Moran and P. S. Doyle</i>	<b>FS8.</b> A Stokesian viscoelastic flow: Transition to oscillations and mixing. <i>B. Thomases, M. Shelley and J.-L. Thiffeault</i>	<b>MB22.</b> Rheological and morphological behavior of PP/PBT blends filled with multiwall carbon nanotubes. <i>A. Namadian Mojarad and H. Nazockdast</i>	<b>SA3.</b> Rheological properties of multifunctional cross-linked hydrogels. <i>X. Ye, J. Ogle and N. Tonmukayakul</i>	<b>CR12.</b> A numerical investigation of flow-type sensitive fluids. <i>F. Zinani and S. L. Frey</i>
5:15	<b>SG14.</b> Effect of mechanical percolation on the properties of nanocomposites. <i>M. R. Loos and I. Manas-Zloczower</i>	<b>SC28.</b> Gelling and ungelling blood. <i>M. B. Dowling and S. Raghavan</i>	<b>FS9.</b> On the critical conditions for purely-elastic instabilities. <i>R. J. Poole</i>	<b>MB23.</b> Linear and nonlinear viscoelastic behavior of particle containing immiscible polymer blends. <i>E. Moghimi, F. Goharpey and R. Foudazi</i>	<b>SA4.</b> Gelation of PHBV solutions. <i>A. Lele, P. Patil and J. Jog</i>	<b>CR13.</b> Computational modeling of high Deborah number flow and elastic instability in planar contraction geometry. <i>Y. Kwon</i>
5:40	END					
7:00	AWARDS RECEPTION			Terrace Club Pub, Progressive Field		
8:00	AWARDS BANQUET			Terrace Club, Progressive Field		

# Wednesday, October 12

## Morning

8:30	<b>PL3.</b> Reversibility, rheology, and nonequilibrium phase transitions in periodically sheared suspensions of non-Brownian spheres and rods. <u>D. J. Pine</u> Amphitheater A/B					
9:20	COFFEE BREAK					
	<b>Amphitheater A</b>	<b>Amphitheater B</b>	<b>Founders Ballroom A</b>	<b>Founders Ballroom B</b>	<b>Room 204</b>	<b>Room 207</b>
	<b>Solids, Glasses and Composites</b>	<b>Suspensions, Colloids, Emulsions</b>	<b>Non-Newtonian Flows, Stability</b>	<b>Polymer Melts and Blends</b>	<b>Self-Assembling, Assoc. Gel-like</b>	<b>Polymer Solution Rheology</b>
10:00	<b>SG15.</b> Time-temperature superposition in soft glassy materials. <u>R. Gupta, B. Baldewa and Y. M. Joshi</u>	<b>SC29.</b> Rheology of transient vorticity aligned structures in attractive colloidal suspensions. <u>C. Osuji and A. S. Negi</u>	<b>FS10.</b> Visco-plastic lubrication flows of viscoelastic fluids. <u>I. A. Frigaard, S. Hormozi and M. Martinez</u>	<b>MB24.</b> Large-amplitude oscillatory shear flow from the corotational Maxwell model. <u>A. J. Giacomin, R. B. Bird, L. M. Johnson and A. W. Mix</u>	<b>SA6.</b> Critical conditions for shear alignment of structured block copolymer systems. <u>V. A. Cheng and L. M. Walker</u>	<b>PS1.</b> First particle tracking velocimetric (PTV) study of entangled polystyrene solutions. <u>G. Liu and S.-Q. Wang</u>
10:25	<b>SG16.</b> Swelling behavior of crosslinked rubber: Explanation of the elusive peak in the dilational modulus or swelling activity parameter. <u>B. Xu, J. Wu, X. Di and G. B. McKenna</u>	<b>SC30.</b> Direct investigation of 3D suspension microstructural evolution. <u>B. Xu, M. T. Perera and J. F. Gilchrist</u>	<b>FS11.</b> Flow and displacement of viscoplastic fluids in eccentric annuli. <u>K. O. Olowolagba, K. V. V. N. Yerubandi, N. Tonmukayakul, T. Deawwanich and D. Q. Nguyen</u>	<b>MB25.</b> Linear viscoelastic rheology as a tool for the investigation of the chemical architecture of syndiotactic polypropylene. <u>N. Amhad, I. Di Rienzo and N. Grizzuti</u>	<b>SA7.</b> Deformation of multilamellar surfactant vesicles under shear flow. <u>A. Pommella, S. Caserta, V. Guida and S. Guido</u>	<b>PS2.</b> Characterization of axisymmetric sphere-wall interactions in non-Newtonian fluids with particle image velocimetry (PIV). <u>I. M. Klink, D. Eisenberg and R. J. Phillips</u>
10:50	<b>SG17.</b> Enhanced diffusion and rejuvenation in strained glassy polymers. <u>Y. G. Chung and D. J. Lacks</u>	<b>SC31.</b> Nanoparticle organic hybrid suspensions: Structure and rheology. <u>S. Srivastava and L. A. Archer</u>	<b>FS12.</b> Yielding behavior of a viscoelastic liquid driven by an initial shear stress jump. <u>Y. Renardy and K. L. Maki</u>	<b>MB26.</b> An overview of models for unentangled and entangled dynamics. <u>A. E. Likhtman</u>	<b>SA8.</b> Shear-induced structures in dilute polymer solutions. <u>R. Radhakrishnan and P. T. Underhill</u>	<b>PS3.</b> Using rheo-confocal microscopy to probe the entanglement-disentanglement transition (EDT) in DNA solutions. <u>P. E. Boukany</u>
11:15	<b>SG18.</b> The associated flow-rule and plastic deformation of transversely isotropic materials. <u>M. Hütter and T. A. Tervoort</u>	<b>SC32.</b> Structure and rheology of nanoparticle organic hybrid suspensions based on cube-shaped Fe <sub>3</sub> O <sub>4</sub> cores. <u>R. K. Mallavajula, L. A. Archer and D. L. Koch</u>	<b>FS13.</b> Yielding behavior of entangled melts in complex geometries. <u>X. Zhu and S.-Q. Wang</u>	<b>MB27.</b> Is it dilute enough? An examination of random walk polymer solutions. <u>S. Shanbhag</u>	<b>SA9.</b> The interaction of topological defects with shear flows in thermotropic smectic liquid crystals. <u>S. Chatterjee and S. L. Anna</u>	<b>PS4.</b> The shear rheology of semi-dilute DNA solutions. <u>S. Pan, D. A. Nguyen, P. Sunthar, T. Sridhar and J. R. Prakash</u>
11:40	<b>SG19.</b> Simulation of mechanical properties of non-woven fabrics. <u>G. W. Park and K. S. Cho</u>	<b>SC33.</b> Particle chaining and chain dynamics in viscoelastic liquids. <u>A. Mirsepassi, D. Dunn Rankin and A. Mohraz</u>	<b>FS14.</b> Planar oscillatory extensional flow of complex fluids. <u>C. Kalelkar and G. H. McKinley</u>	<b>MB28.</b> Analytical approach to discrete one dimensional barrier crossing for polymer nucleation. <u>M. J. Hamer, R. S. Graham and J. A. Wattis</u>	<b>SA10.</b> Shear induced gelation due to physical temporary networks in vinyl ester / carboxy terminated butadiene / styrene compounds. <u>T. Mahmoudi, G. S. Song, D. S. Lee and F. J. Stadler</u>	<b>PS5.</b> The role of coil-stretch hysteresis in the capillary breakup of dilute polymer solutions. <u>R. Prabhakar and S. Gadkari</u>
12:05	LUNCH BREAK					

## Afternoon

	<b>Amphitheater A</b>	<b>Amphitheater B</b>	<b>Founders Ballroom A</b>	<b>Founders Ballroom B</b>	<b>Room 204</b>	<b>Room 207</b>
	<b>Solids, Glasses and Composites</b>	<b>Suspensions, Colloids, Emulsions</b>	<b>Non-Newtonian Flows, Stability</b>	<b>Polymer Melts and Blends</b>	<b>Self-Assembling, Assoc. Gel-like</b>	<b>Polymer Solution Rheology</b>
1:30	<b>SG20.</b> Unique slow dynamics and aging phenomena in soft glassy suspensions of multiarm star polymers. <u>B. M. Erwin, D. Vlassopoulos, M. Gauthier and M. Cloitre</u>	<b>SC34.</b> Self-consistent particle simulation on flow and microstructure of colloidal suspensions. <u>J. S. Myung, K. H. Ahn and S. J. Lee</u>	<b>FS15.</b> Linear stability analysis of streamwise vortices in shear flows of viscoelastic fluids. <u>A. Morozov</u>	<b>MB29.</b> A thermo-rheological study on the phase transitions of soft and hard thermoplastic polyurethanes. <u>J. Silva, R. Andrade, M. Cox, D. Meltzer and J. Maia</u>	<b>SA11.</b> Bio-inspired metal-ligand crosslinks provide easy control of visco-elasticity of associative polymer networks. <u>N. Holten-Andersen, V. DiMarco, M. J. Harrington, H. Birkedal, B. P. Lee, J. H. Waite, P. B. Messersmith and K. Y. C. Lee</u>	<b>PS6.</b> Solvent effects on hysteresis in the coil-stretch transition. <u>R. Radhakrishnan and P. T. Underhill</u>

1:55	<b>SG21.</b> Yielding of hard and soft colloidal glasses under large amplitude oscillatory shear. <i>N. N. Koumakis, A. Poulos and G. Petekidis</i>	<b>SC35.</b> Dissipative particle dynamics modeling of blood suspensions flowing in small tubes. <i>B. Caswell, H. Lei and G. E. Karniadakis</i>	<b>FS16.</b> Transitional flow of a non-Newtonian fluid in a pipe. <i>A. Esamel, C. Nouar and A. Lefevre</i>	<b>MB30.</b> Understanding melt index. <i>A. M. Mertz and A. J. Giacomin</i>	<b>SA12.</b> Linear viscoelasticity and swelling of polyelectrolyte complex coacervates. <i>F. G. Hamad and R. H. Colby</i>	<b>PS7.</b> Analysis of temperature effects on drag reduction by polymer additives – rheometer experiments. <i>A. S. Pereira and E. J. Soares</i>
2:20	<b>SG22.</b> Time evolution of colloidal glasses under constant stress. <i>P. Ballesta and G. Petekidis</i>	<b>SC36.</b> Fractal model for viscosity of non-Newtonian liquid colloidal solutions. <i>V. I. Lesin</i>	<b>FS17.</b> Lifetime studies of localized turbulence in pipe flow of dilute polymer solutions. <i>D. Samanta, C. Wagner and B. Hof</i>	<b>MB31.</b> Combined synthesis, TGIC characterization, and rheological study of “H” polybutadienes, including the effects of synthetic impurities. <i>R. G. Larson, X. Chen, H. Lee, T. Chang, S. Rahman and J. Mays</i>	<b>SA13.</b> Structure-property relationships in conjugated polymer organogels. <i>D. C. Pozzo, G. Newbloom and K. Weigandt</i>	<b>PS8.</b> Influence of excluded volume interactions on the force-extension behavior of flexible macromolecules: A Brownian dynamics simulation study. <i>M. Malekzadeh Moghani and B. Khomami</i>
2:45	<b>SG23.</b> Suspension-like rheology of crystallizing high-density polyethylene and time-hardening superposition. <i>P. C. Roozmond, V. Janssens, P. van Puyvelde and P. W. Gerrit</i>	<b>SC37.</b> Inertia matters. <i>F. G. Pierce, J. B. Lechman and P. R. Schunk</i>	<b>FS18.</b> Reynolds number variation in direct numerical simulation of polymer-induced drag reduction. <i>L. Thais, T. B. Gatski and G. Mompean</i>	<b>MB32.</b> Nonlinear shear rheology of entangled polymers measured with cone-partitioned plate. <i>F. Snijkers and D. Vlassopoulos</i>	<b>SA14.</b> Linear and nonlinear viscoelastic behavior of triblock/diblock copolymer blends. <i>L. Martinetti, R. H. Ewoldt, S. Lee, M. Martello, M. A. Hillmyer, F. S. Bates and C. W. Macosko</i>	<b>PS9.</b> Relating polymer dynamics to non-equilibrium statistical mechanics using the Jarzynski equality. <i>F. B. Latinwo and C. M. Schroeder</i>
3:10	COFFEE BREAK					
3:35	<b>SG24.</b> Nonlinear viscoelasticity and extensional viscosity of polymer-layered silicate nanocomposites. <i>T. J. Pathak and K. Jayaraman</i>	<b>SC38.</b> Magnetorheological gels under magnetic field. <i>H. An</i>	<b>FS19.</b> Slow flow of Boger fluids through model fibrous porous media. <i>D. F. James, R. Yip and I. G. Currie</i>	<b>MB33.</b> Rotational rheometer with extended capabilities. <i>J. Laeuger</i>	<b>SA15.</b> Effects of gelation temperature on the rheology and microstructure of mozzarella type curd made from buffalo and cows' milk. <i>I. Hussain, A. s. Grandison and A. E. Bell</i>	<b>PS10.</b> Studies on strain-frequency superposition of large amplitude oscillatory shear: Comparison of experimental data with model calculation. <i>J.-E. Bae and K. S. Cho</i>
4:00	<b>SG25.</b> Structure and dynamics of polymer-grafted nanospheres in polymer melts. <i>D. Kim and L. A. Archer</i>	<b>SC39.</b> Experimental study on negative viscosity of a dispersion composed of spindle-like hematite particles in an applied magnetic field. <i>A. Satoh</i>	<b>FS20.</b> Three dimensional effects and stability of viscoelastic fluid flow past a confined cylinder. <i>V. M. Ribeiro, P. M. Coelho, F. T. Pinho and M. A. Alves</i>	<b>MB34.</b> Slip link simulations of entangled polymers under extensional/mixed flow: Dynamics of viscosity thickening. <i>A. Kushwaha and E. S. Shaqfeh</i>	<b>SA16.</b> Flocculation efficiencies under various mixing mechanisms. <i>F. G. Pierce, J. B. Lechman and J. C. Hewson</i>	<b>PS11.</b> Investigation of rheological transitions and gel characteristics of methylcellulose in the presence of salts. <i>N. Almeida, L. Rakesh and J. Zhao</i>
4:25	<b>SG26.</b> Rheological expressions for the dispersion of organo-clay in a polymer. <i>B. L. Momani and H. H. Winter</i>	<b>SC40.</b> Activated nanocage polymer electrorheological fluids. <i>E. C. McIntyre and P. F. Green</i>	<b>FS21.</b> Flow of thixotropic fluids past a confined cylinder. <i>C. Fonseca, S. L. Frey, M. F. Naccache and P. R. de Souza Mendes</i>	<b>MB35.</b> Stress versus orientation in the contributions to anisotropy in the thermal conductivity of polymers melts in flow. <i>J. D. Schieber, D. Venerus, D. Nieto and S. Gupta</i>	<b>SA17.</b> Correlating viscoelastic measurements of HPMC gels with the drug release from HPMC based matrix tablet. <i>Z. Xiao, A. Almaya and D. D. Matthew</i>	<b>PS12.</b> Abrupt shear thickening of associating polymer solutions. <i>A. Lele, I. Parmar, M. Badiger and P. Wadgaonkar</i>
4:50	<b>SG27.</b> Time/temperature evolution of the filler network in organoclay/polypropylene nanocomposites and application of the superposition principle. <i>R. Zouari, T. Domenech, B. Vergnes and E. Peuvrel-Disdier</i>	<b>SC41.</b> Normal and shear stress correlation in field-activated fluids. <i>C. S. Orellana and H. M. Jaeger</i>	<b>FS22.</b> Simulations of a sphere sedimenting in a viscoelastic fluid under the action of orthogonal shear. <i>S. Padhy, E. S. Shaqfeh, G. Iaccarino, J. Morris and N. Tonmukayakul</i>	<b>MB36.</b> Dielectric relaxation and rheology of bidisperse blends using the discrete slip-link model. <i>E. Pilyugina and J. D. Schieber</i>	<b>SA18.</b> Modulation of rheological properties in peptide-amphiphile based gels by tuning peptide head group interactions. <i>K. A. Megley, B. Lin and M. V. Tirrell</i>	<b>PS13.</b> Towards a redox-active viscosity switch via a copper ion-based metallosupramolecular polymer. <i>Z. Li, A. Miller, S. J. Rowan, A. M. Jamieson and K. A. Streltzky</i>
5:15	END					
5:30	POSTER SESSION & RECEPTION Founders Ballroom					

# Thursday, October 13

## Morning

8:00	<i>Amphitheater B</i> <b>Solids, Glasses and Composites</b>	<b>Room 207</b> <b>Suspensions, Colloids, Emulsions</b>	<b>Founders Ballroom A</b> <b>Non-Newtonian Flows, Stability</b>	<b>Founders Ballroom B</b> <b>Polymer Melts and Blends</b>	<b>Room 204</b> <b>Self-Assembling, Assoc. Gel-like</b>
		<b>AP1.</b> Modelling flow-induced nucleation in polymers. <i>R. S. Graham</i> (Metzner Award Presentation) Amphitheater B			
8:40	<b>SG28.</b> Thermally-activated shape memory behavior of fatty acid filled elastomeric ionomers. <i>S. Kollengodu-Subramanian, J. Dong and R. A. Weiss</i>	<b>SC42.</b> The effect of interfacial slip on the stretching, relaxation and breakup of a drop in a uniaxial extensional flow. <i>A. Ramachandran, G. Leal, K. Tsigklifis and A. Roy</i>	<b>FS23.</b> Shear banding in complex fluids. <i>S. M. Fielding</i>	<b>MB37.</b> Synthesis of PU/Expandable graphite nanocomposites with different hard segments ratio and evaluation of parameters affecting the phase separation by means of rheological techniques. <i>S. Zekri Ardehani, H. Nazockdast and G. Mir Mohamad Sadeghi</i>	<b>SA19.</b> Modeling of the fingering instability in a reactive system. <i>A. He and A. Belmonte</i>
9:05	<b>SG29.</b> Effect of nano-particle shape on the linear and non-linear rheological properties of polymer nano-composites. <i>H. Mahi and D. Rodrigue</i>	<b>SC43.</b> Experimental study of drop separation in dense granular suspensions. <i>G. E. Mårtensson</i>	<b>FS24.</b> Multiple banding of the VCM model for wormlike micelles under shear deformations. <i>L. Zhou, L. P. Cook and G. H. McKinley</i>	<b>MB38.</b> How to obey the stress-optical rule without violating thermodynamics in slip-link models with virtual springs. <i>R. J. Steenbakkers and J. D. Schieber</i>	<b>SA20.</b> Association and dissociation rates in a simulated telechelic polymer gel. <i>M. Wilson, A. R. Baljon and A. Rabinovitch</i>
9:30	<b>SG30.</b> Rheological and thermal properties of PET nanocomposites: The influence of clay chemistry and concentration. <i>A. Ghanbari, M. C. Heuzey, P. J. Carreau, M.-T. Ton-that and W. Leelapornpist</i>	<b>SC44.</b> Accelerated drop detachment in dense granular suspensions. <i>T. Bertrand, C. Bonnoit, E. Clément and A. Lindner</i>	<b>FS25.</b> A rigorous criterion for stability of viscoelastic flows. <i>M. Renardy</i>		<b>SA21.</b> Microscopic differences between shear bands obtained from simulations of associating polymers. <i>J. Billen and A. R. Baljon</i>
9:55			COFFEE BREAK		
10:25	<b>SG31.</b> Structural stability of transparent conducting films assembled from single-wall carbon nanotubes purified by electronic type. <i>J. M. Harris, G. Iyer, J. A. Fagan, S. D. Hudson, C. M. Stafford and E. K. Hobbie</i>	<b>SC45.</b> Relaxation of colloidal drop during drying via multi-speckle diffusing wave spectroscopy (MSDWS). <i>J. Y. Lee, J. W. Hwang, S. J. Lee, H. W. Jung, J. C. Hyun and S. H. Kim</i>	<b>FS26.</b> Viscoelasticity in thermoforming. <i>L. M. Johnson and A. J. Giacomin</i>	<b>MB40.</b> Assumptions of the discrete slip-link model and their effect on non-linear rheology predictions. <i>M. Andreev, J. D. Schieber and R. Khaliullin</i>	<b>SA22.</b> Microrheology and microstructure of flow induced structured phase in wormlike micellar solutions. <i>J. J. Cardiel, N. Dubash, P. Cheung and A. Shen</i>
10:50	<b>SG32.</b> "Boundary layer" in yield stress fluids : How does the butter slicer works. <i>P. Coussot and J. Boujlel</i>	<b>SC46.</b> Microstructure and rheology of bimodal PS latex/alumina-coated silica suspension. <i>J. Lee, S. J. Lee, K. H. Ahn and S. J. Lee</i>	<b>FS27.</b> Rinsing flows using non-Newtonian fluids. <i>T. W. Walker, T. T. Hsu, E. S. Shaqfeh and G. G. Fuller</i>	<b>MB41.</b> Crystallization and modelling of two different types of high-density polyethylene. <i>M. Derakhshandeh and S. Hatzikiriakos</i>	<b>SA23.</b> Switching between drag reduction and enhanced heat transfer of a reversible photo-responsive micellar solution. <i>H. Shi, H. Oh, Y. Talmon, D. J. Hart, S. M. Pattison, T. A. Russell, J. T. Huggins, S. Raghavan and J. L. Zakin</i>
11:15	<b>SG33.</b> Coupling of rheological and micromechanical techniques to determine strength and failure mechanisms of chemically modified TiO <sub>2</sub> and Al <sub>2</sub> O <sub>3</sub> extrudates. <i>S. Reynaud, N. Ku and R. Haber</i>	<b>SC47.</b> Effect of particle size on the dynamical arrest of model nanoparticle dispersions with short-range interactions. <i>J. M. Kim, J. Fang, A. P. Eberle and N. J. Wagner</i>	<b>FS28.</b> Molecular migration in inhomogeneous shear flows. <i>A. Schmalzer, S. Feng, A. L. Graham and A. Redondo</i>	<b>MB42.</b> Toward tractable forms of ultra-high molecular weight polyethylene (UHMWPE). <i>A. Ailianou, J. A. Kornfield, G. Forte, S. Ronca and S. Rastogi</i>	<b>SA24.</b> Converging/diverging flow of wormlike micellar solutions. <i>M. Cromer, L. P. Cook and G. H. McKinley</i>
11:40	<b>SG34.</b> Modeling elasto-viscoplastic thixotropic yield-stress materials and apparent-yield-stress fluids: A unified approach. <i>P. R. de Souza Mendes and R. L. Thompson</i>	<b>SC48.</b> Rheology of water coated glass beads dispersed in mineral oil as a model for hydrate slurry flow. <i>E. B. Webb, M. W. Liberatore, C. A. Koh, A. K. Sum and E. D. Sloan</i>	<b>FS29.</b> Coarse-grain tunable dissipative particle simulation method for entangled polymeric systems. <i>M. Yamanoi, O. Pozo and J. Maia</i>	<b>MB43.</b> Effective value of the dynamic dilution exponent in bidisperse linear polymers: From 1 to 4/3. <i>E. van Ruymbeke and H. Watanabe</i>	<b>SA25.</b> Structure, rheology and optical properties of plasmonic gels. <i>T. Cong, S. Wani and R. Sureshkumar</i>
12:05		<b>SC49.</b> Rheology and morphology of hydrogenated castor oil crystals in aqueous dispersions. <i>D. Yang and A. N. Hrymak</i>	<b>FS30.</b> Constitutive modeling of quasi-steady viscoelastic flow. <i>D. Yao</i>	<b>MB44.</b> The role of nanoclay on the droplet deformation of PP/PET nanocomposite during the elongational field. <i>R. Hajiraissi</i>	<b>SA26.</b> The molecular origin of stress generation in wormlike micelles, using a rheo-SANS LAOS approach. <i>S. Rogers, P. Lettinga and J. Kohlbrecher</i>
12:30			END		



## Poster Session

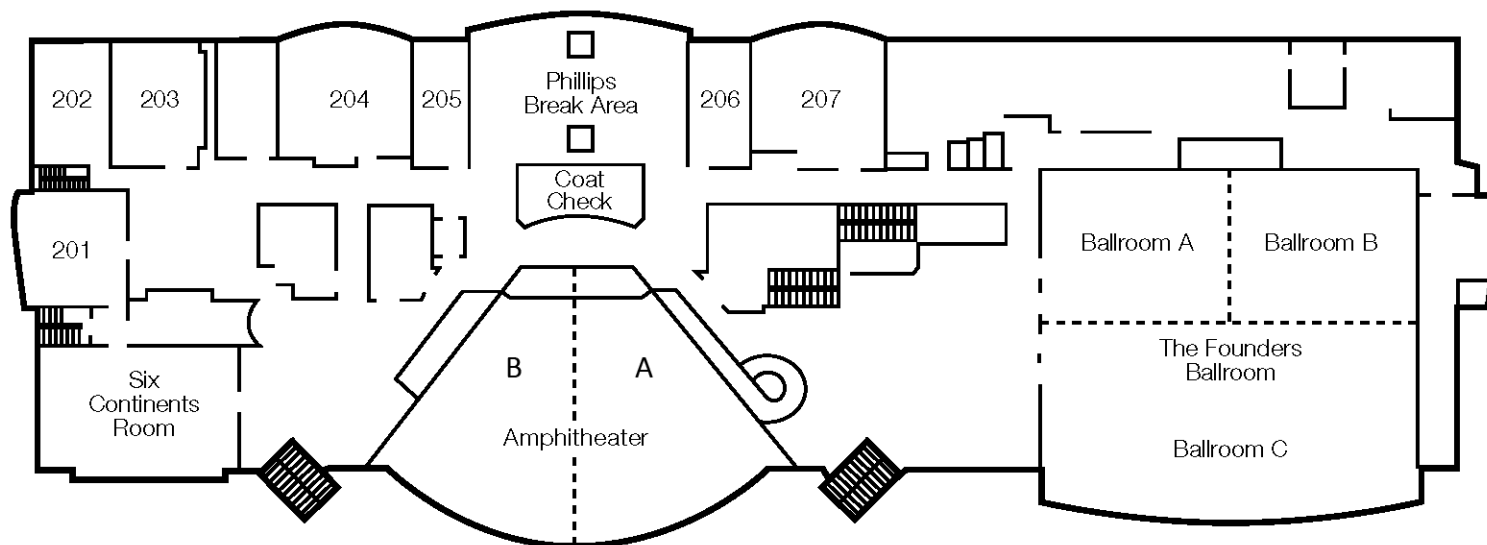
Wednesday 5:30 PM Founders Ballroom

- PO1.** *Panta rhei.* A. N. Beris and A. J. Giacomin
- PO2.** Examining the shear thickening behavior of chemical mechanical polishing slurries using high shear rheology. N. C. Crawford, M. W. Liberatore, S. K. Williams and D. Boldridge
- PO3.** Normal stresses in concentrated non-colloidal suspensions: Experiments and simulations. T. Dbouk, E. Lemaire, L. Lobry and F. Peters
- PO4.** Photogelation kinetics in Laponite-based colloidal fluids. K. A. Juggernaut, A. E. Gros and B. J. Love
- PO5.** A rapid, inexpensive technique for measuring the rheological properties of yield stress fluids. J. R. Samaniuk, C. T. Scott, T. W. Root and D. J. Klingenberg
- PO6.** Suspension rheology of polymer particles with thermosensitive deformability. Z. Shao and C. Osuji
- PO7.** Large amplitude oscillatory shear analysis of electrorheological fluids structures. A. Elmoumni and A. Franck
- PO8.** Activated nanocage-polymer electrorheological fluids. E. C. McIntyre
- PO9.** Preparation of monodisperse silicon nanocrystals through density-gradient ultracentrifugation in organic solvents. J. M. Miller, A. R. Van Sickle, G. Iyer, R. A. Anthony, U. R. Kortshagen and E. K. Hobbie
- PO10.** Clustering and gelation of attractive colloidal suspensions in confinement. M. Spannuth, R. Pandey and J. C. Conrad
- PO11.** Development of a cement-based magneto-rheological fluid. S. D. Nair and R. P. Ferron
- PO12.** Modeling fracture in polymeric fluids under step shear. O. S. Agimelen and P. D. Olmsted
- PO13.** Current and proposed rheological methods for characterizing asphalt binders. G. W. Kamykowski
- PO14.** In-situ monitoring technique for microstructural changes of cement paste via rheology. D. Han and R. P. Ferron
- PO15.** Correlations of mixture rheology with clay aggregate size and concentration for oil sands slurries. J. Smith and R. S. Sanders
- PO16.** A rheo-chemical study of vinyl ester-clay systems. J. Liu, H. Ishida and J. Maia
- PO17.** Linear algebra yielding in LAOS. S. Rogers and P. Lettinga
- PO18.** Evaluation of rheological behavior of water and oil based drilling mud in gas hydrate formation: Preliminary results. A. F. Santos, V. M. Calado and R. Lomba
- PO19.** Composite materials with viscoelastic stiffness greater than diamond due to a negative stiffness phase. L. Dong and R. Lakes
- PO20.** Heterogeneity: A solution to the mysteries of the glass transition? X. Di and G. B. McKenna
- PO21.** Shear thickening, shear thinning and obviation of yield stress in aluminum dispersions. J. R. Moffatt
- PO22.** Temporary bond-debond technology for flexible electronics: Impact of adhesive properties on performance. J. Haq and B. D. Vogt
- PO23.** Flow induced crystallization of a semiconducting polymer. M. E. Mackay, N. Nguyen and J. J. Wie
- PO24.** Experimental studies on the dynamics and stability in Anilox roll coating process. S.-K. Han
- PO25.** Experimental studies on coating dynamics of various polymeric primer paints in 3-roll coating process. J. H. Kim, I. J. Lee, S. M. Noh, J. Y. Lee, H. W. Jung and J. C. Hyun
- PO26.** Dilute solution coil dimensions of branched polymers in synthetic oils. J. M. Soulages, T. Sun, M. M. Fryd, A. H. Tsou and M. N. Webster
- PO27.** Investigation of mechanical properties of polymer membranes for alkaline exchange fuel cells. B. R. Caire, S. Lustgraaf, M. A. Vandiver, A. M. Herring and M. W. Liberatore
- PO28.** Evaluation of creaming and sedimentation for nutritional beverages via analytical centrifuge, particle size analysis and rheology. Y. Heo and M. S. Bergana
- PO29.** Rheology on large particle suspensions from saccharification processes. F. Nettesheim, M. T. Pottiger, J. C. Howe and B. W. Bennett
- PO30.** How to obtain a galactomannan standard for solution rheology? M. A. Pollard, S. Illmann, E. J. Windhab and P. Fischer
- PO31.** Dilatation rheology of protein fibers at fluid-fluid interfaces. P. Rühls, S. Jordens, R. Mezzenga and P. Fischer
- PO32.** Stick-slip motion of the contact line of water droplets coated with insoluble surfactants. C. Dagallier, C. Monteux and G. G. Fuller
- PO33.** Collective behavior of active particles in an Oldroyd-B suspending fluid. Y. Bozorgi and P. T. Underhill
- PO34.** Rheology of photocrosslinkable alginate hydrogels with encapsulated mesenchymal stem cells. J. E. Samorezov, C. A. Bonino, S. A. Khan and E. Alsberg
- PO35.** Rheological properties of starch, passion fruit and nanoclay based suspensions used in flexible films. T. Nascimento, V. M. Calado and C. Carvalho
- PO36.** Rheological study of mixed juices with functional properties. S. Agibert, V. M. Calado and E. Ferreira
- PO37.** Rheological behavior of molten lignin. F. Souto, V. M. Calado and N. Pereira Jr.
- PO38.** Cellulase enzymes leveraged as micromechanical probes of cellulose surfaces. C. J. Dibble, K. J. Storslett, M. Reed, G. T. Beckham, A. Mittal, L. E. Taylor II, R. T. Elander and M. P. Tucker
- PO39.** Structure and biodegradability of PLA and PBSA blend. S. J. Park
- PO40.** Extensional rheology of active suspensions of motile microbes. A. G. McDonnell, G. Tilwawala, L. Y. Yeo, J. R. Friend, M. Danquah and R. Prabhakar
- PO41.** Shear and uniaxial extensional rheometry of aqueous solutions of hydrophobically modified polysaccharides. S. S. Vadodaria and R. English

- PO42.** Connecting large-amplitude shear rheology to unidirectional shear rheology and application to biomass slurries. *J. S. Knutsen, J. J. Stickel and M. W. Liberatore*
- PO43.** Preparation of spheroidal and ellipsoidal particles by extension of polymer films with spherical polymer particles. *H. Shin and C. Kim*
- PO44.** Transient gels in development of polypropylene nanocomposites with polyhedral oligomeric silsesquioxane. *J. E. Perilla and S. C. Jana*
- PO45.** Reversible photorheological fluids induced by transition between vesicles and wormlike micelles. *H. Oh, A. Ketner, R. Heymann, E. Kesselman, D. Danino, D. Falvey and S. Raghavan*
- PO46.** Structural and rheological investigation of fully hydrated fibrin gels: An in-situ neutron scattering study of structural transitions under shear deformation. *K. Weigandt, L. Porcar and D. C. Pozzo*
- PO47.** A study of flow-induced structure formation in wormlike micellar solutions using local micellar concentration measurements. *P. Cheung, N. Dubash and A. Shen*
- PO48.** Development of gel-structure in silica/PVA suspension during mixing. *J. Y. Moon, K. H. Ahn and S. J. Lee*
- PO49.** Self-assembled multicomponent plasmonic nanogels: Structure, rheology and optical properties. *T. Cong, S. Wani, G. Zhou, E. Baszczuk and R. Sureshkumar*
- PO50.** Elucidation of the structure and mechanical properties of ABA triblock copolymer hydrogels formed through complex coacervation. *D. V. Krogstad, S. Choi, J. Spruell, N. Lynd, E. Kramer and M. V. Tirrell*
- PO51.** Low-frequency dielectrophoretic response of a single particle in aqueous suspensions. *J. Wang and H. D. Ou-Yang*
- PO52.** Novel approaches to interfacial dilatational rheology. *T. Verwijlen, A. Vananroye and J. Vermant*
- PO53.** A study on relaxation time spectrum and linear viscoelasticity of interface. *M.-K. Kwon, J.-E. Bae and K. S. Cho*
- PO54.** Interfacial effects on droplet dynamics in Poiseuille flow. *J. T. Schwalbe, K. A. Erk, F. R. Phelan Jr., P. Vlahovska and S. D. Hudson*
- PO55.** The study of surface behavior of novel sodium dodecyl sulfate (SDS)/ polyethyleneimine (PEI) complex. *Y. Gao, D. Prajna and J.-T. Liang*
- PO56.** Time-resolved small-angle x-ray scattering studies of shear-induced orientation in wormlike micelle solutions subjected to step-strain deformation. *Y. Gao and W. R. Burghardt*
- PO57.** Microstructure, crystallization, and rheology of a model crystallizing surfactant system. *C. B. Street, P. Thareja, N. J. Wagner, Y. Yarovoy, K. D. Hermanson, M. S. Vethamuthu and K. P. Ananthapadmanabhan*
- PO58.** Additive turbulent drag reduction in high shear flow. *T. A. Nguyen and H. Mizunuma*
- PO59.** A comparison of the quiescent stability and structural rearrangement of particle-stabilized and surfactant-stabilized 2D foams. *A. P. Kotula, M. D. Reichert, S. M. Vuong, L. M. Walker and S. L. Anna*
- PO60.** A quantitative analysis of the effect of viscosity ratio on droplet formation and mixing in a  $\mu^2$  rheology device. *H. Han, C. Kim and E. M. Furst*
- PO61.** Determination of intrinsic viscosity using a viscometer for prediction of minimum fiber diameter in electrospinning. *D. C. Weed and P. T. Mather*
- PO62.** Deformation of CNT dispersing drop in a 4:1 microfluidic contraction channel. *J. S. Hong and J. H. Choi*
- PO63.** Numerical simulation of non-Newtonian fluid flows in double concentric cylinder rheometer with slotted rotor and vane rheometer. *W. Wang, D. De Kee and D. Khismatullin*
- PO64.** Numerical simulation of giant intracranial aneurysm embolization with a yield stress fluid material. *W. Wang, F. Graziano, V. Russo, A. Ulm, D. De Kee and D. Khismatullin*
- PO65.** Brownian dynamics simulation of large amplitude oscillatory shear flow of repulsive colloidal particle suspensions. *C. H. Park*
- PO66.** Rheological properties and microstructure of 10:1 bimodal dispersions under simple shear. *J. D. Park, K. H. Ahn and S. J. Lee*
- PO67.** Modeling of solute-exclusion zone: A dissipative particle dynamics study. *U. J. Luna, M. Yamanoi and J. Maia*
- PO68.** Simulation of rheological properties of liposomes. *K. Olavinka, F. Mensah and H. Seyoum*
- PO69.** Mesoscale simulation of colloidal particles during drying process. *Y. K. Lee, K. H. Ahn and S. J. Lee*
- PO70.** Mesoscopic simulation of co-polymeric systems: DPD and MDPD approach. *S. Jamali, M. Yamanoi and J. Maia*
- PO71.** A study on the flow instabilities in multiplier dies through direct visualization and flow simulation. *J. Patz, J. Silva, S. Armstrong, E. Chabert, J. Maia, R. T. Bonnecaze and E. Baer*
- PO72.** Non-monotonic stretch of isolated semiflexible polymer chains in ultra-fast shear flow. *A. Albaugh, I. S. Dalal and R. G. Larson*
- PO73.** Migration of particles in slit flow of suspension by 1-D simulation. *H. J. Koh, I. Kwon, H. W. Jung and J. C. Hyun*
- PO74.** Problem analysis of coarse-grained level tunable dissipative particle dynamics method. *S. Khani, M. Yamanoi and J. Maia*
- PO75.** A modified version of the tube model to include flow-induced disentanglements in monodisperse entangled polymer melts under extension. *P. S. Desai and R. G. Larson*
- PO76.** Linear and non-linear melt rheology of thermoplastic polyurethane /multi-walled carbon nanotube nanocomposites. *T. Hosseini Sianaki and H. Nazockdast*
- PO77.** A rheological study on the mutual diffusion between co-extruded soft and hard thermoplastic polyurethanes. *S. Lee, J. Silva, M. Cox, D. Meltzer and J. Maia*
- PO78.** The rheological footprint of the molecular structure of long-chain branched metallocene catalyzed polyethylenes. *E. K. Son, V. Karimkhani and F. J. Stadler*
- PO79.** Dynamic-mechanical and adhesive properties of styrene-isoprene block copolymers blended with tackifier resin: Effects of macromolecular architecture. *S. Coppola, A. Balducci and M. F. Pirini*
- PO80.** Viscoelastic catenaries. *S. Coppola, D. Visani and F. Bacchelli*

- PO81.** X-ray scattering investigation of structural relaxation in an ordered block copolymer melt subjected to uniaxial extensional flow. *E. McCreedy and W. R. Burghardt*
- PO82.** Droplet dynamics in a confined Poiseuille flow for polymer melts. *D. Moon and K. B. Migler*
- PO83.** New interfacial surface generator for the co-extrusion of micro- and nano-layered polymers. *P. Harris, J. Patz, J. Silva, E. Chabert, R. T. Bonnecaze and J. Maia*
- PO84.** Improvement of hydrophilicity of polyethylene by cold plasma treatment. *M. Meemusaw*
- PO85.** Study on flow induced nanoparticle orientation in polypropylene/organoclay nanocomposites films by means of rheological and birefringence techniques. *S. Akbarpoursarabi and H. Nazockdast*
- PO86.** Thermo-rheological behavior of BA-a and P-DDM benzoxazines. *R. Huang, S. Carson, T. Agag, H. Ishida and J. Maia*
- PO87.** Nonlinear rheology of high heat polycarbonate copolymer blends. *M. Chellamuthu, V. Ramakrishnan and P. Vollenberg*
- PO88.** Non-linear parameter Q from FT-rheology under LAOS flow for polymer composite systems. *K. Hyun, H. T. Lim, K. H. Ahn and S. J. Lee*
- PO89.** Measurement of rheological properties of polymer solution using dynamic light scattering (DLS) and diffusing wave spectroscopy (DWS) methods. *J. W. Hwang, J. Y. Lee, H. W. Jung and J. C. Hyun*
- PO90.** Two methods of coarse-graining solvent-polymer interactions in bead spring chains. *R. Radhakrishnan and P. T. Underhill*
- PO91.** Decay of elastic turbulence in a von Karman swirling flow. *C. Wagner, C. Schäfer and T. Burhelea*
- PO92.** Effect of extensional properties on air-blast atomization for very dilute polymeric solutions. *B. Keshavarz, G. H. McKinley, E. C. Houze, J. R. Moore, M. T. Pottiger and P. M. Cotts*
- PO93.** X-ray photon correlation spectroscopy during homogenous shear flow. *W. R. Burghardt, M. Sikorski, A. Sandy and S. Narayanan*
- PO94.** Slotted plate device to measure the yield stress of biofluids. *B. Meng, W. Wang, D. Khismatullin, D. Rice and D. De Kee*
- PO95.** Non-Newtonian displacement flow in a Hele-Shaw cell. *P. R. Varges, P. E. Azevedo, P. R. S. Mendes, M. F. Naccache, A. T. A. Waldmann and A. L. Martins*
- PO96.** Investigation of UV-induced and thermal curing reactions by simultaneous rheometry and FT-IR. *F. Meyer, J. P. Plog and N. Jint*
- PO97.** Determination of the brittle-ductile transition temperature using a direct strain controlled DMA. *M. Delancy*
- PO98.** The impact of thermal gradients in rheological measurements. *J. P. Eickhoff*
- PO99.** Review, validation, and recommendations for concentric cylinder viscosity measurements. *D. Giles, A. Trochez, C. W. Macosko, A. Elmoumni, D. Bohnsack and R. Ulbrich*
- PO100.** Optical encoder enhancements for better rheological measurements. *M. Namani, R. Smith, N. Doe and P. Foster*
- PO101.** Importance of true rate and strain for rheological testing. *P. A. Kamekar*
- PO102.** A new method to evaluate dynamic data near  $T_g$ . *B. Xu and G. B. McKenna*
- PO103.** Rheological analysis under pressure. *T. Chen*
- PO104.** A lubricated cross-slot channel with 2D complex flow kinematics as an optical rheometer for polymer melts. *M. Sadati, C. Luap, M. Kröger and H. C. Öttinger*
- PO105.** Linear and nonlinear rheology and morphology of LCST blends with high viscosity ratio. *J. Khademzadeh Yeganeh, F. Goharpey and R. Foudazi*
- PO106.** Ternary additives affect the gelation behavior and structural evolution of PEO-PPO-PEO gels as measured by rheology, DSC, and time-resolved SAXS. *N. A. Mezharich, K. A. Juggernaut, A. E. Gros, K. M. Batzli and B. J. Love*

## InterContinental Cleveland Floor Plan



## Social Program

**Sunday, October 9**

**Welcoming Reception**

7:00 PM – 9:00 PM      Founders Ballroom

*Sponsored by a generous contribution from TA Instruments*

**Monday, October 10**

**Society Business Meeting**

12:15 PM              Room 207

**Society Reception**

6:30 PM – 9:00 PM      Cleveland Museum of Natural History

*Sponsored by a generous contribution from Malvern Instruments*

**Tuesday, October 11**

**Awards Reception**

7:00 PM – 8:00 PM      Terrace Club Pub, Progressive Field

*Sponsored by a generous contribution from Xpansion Instruments*

**Awards Banquet**

8:00 PM                  Terrace Club, Progressive Field

**Wednesday, October 12**

**Poster Session Reception**

5:30 PM – 7:30 PM      Founders Ballroom

*Sponsored by a generous contribution from Anton-Paar USA*

*The Society gratefully acknowledges the generous contributions of  
Anton-Paar USA, Malvern Instruments, TA Instruments, Thermo Scientific, and Xpansion Instruments.*