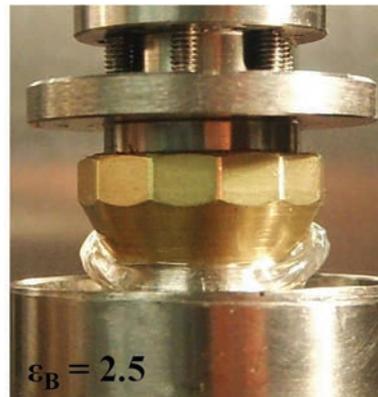
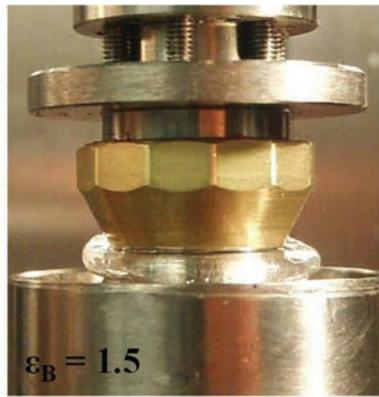
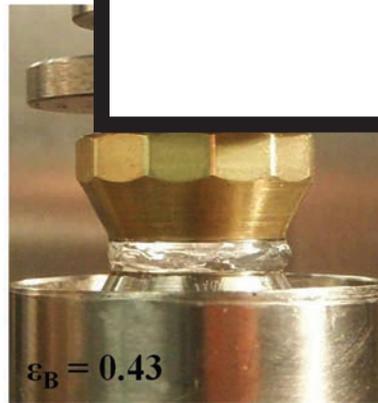
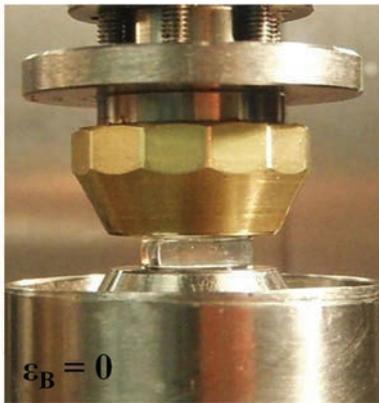
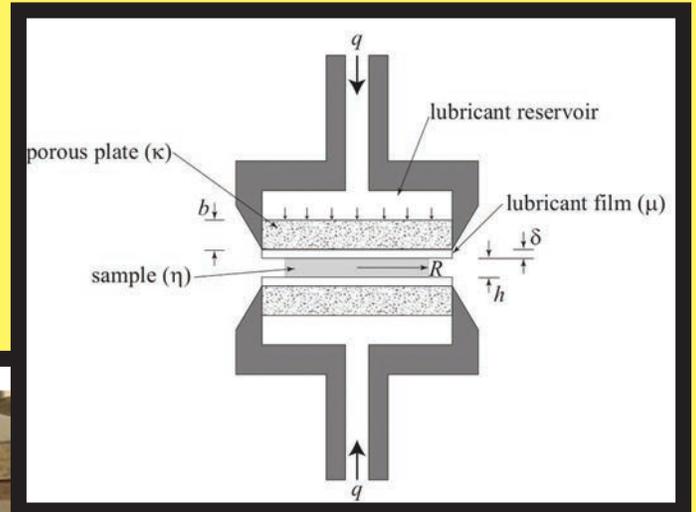


# Equibiaxial Elongational Rheometry:

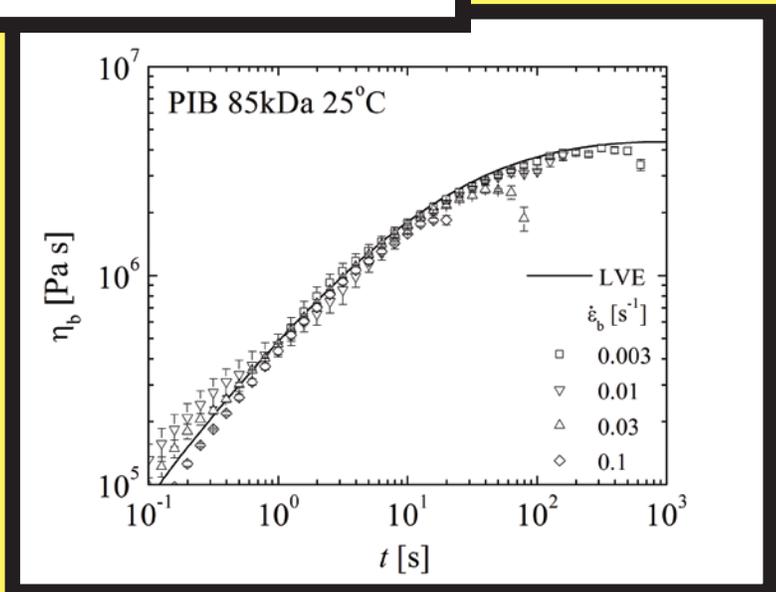


*Continuous  
Lubricated  
Squeezing*



**Inside:**

- Philly Report
- Technical Program Baltimore
- Acrivos on Brenner
- and more...



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## On the cover.

Continuous lubricated squeezing flow (CLSF) is a novel technique developed by researchers at Illinois Institute of Technology (Chicago) to study the rheological behavior of polymer melts in equibiaxial elongational flows. The sample is squeezed between thin lubricant films (~ 50 microns) maintained at a constant thickness by the uniform flow of lubricant through porous disks. The sample undergoes homogeneous equibiaxial deformation by appropriate selection of plate permeability and lubricant flow rate. The images show a test performed on a polyisobutylene melt ( $M_w = 85$  kDa,  $\eta_0 = 730$  kPa s,  $\tau_p = 60$  s) subjected to a constant strain rate of  $0.03$  s<sup>-1</sup>. The plot shows equibiaxial elongational viscosity  $\eta_B$  as a function of time for several Hencky strain rates. Presently, CLSF is the only technique for generating rheologically controlled equibiaxial deformations on polymeric liquids. (Images and data obtained by Rebecca Mick; for information contact David Venerus, [venerus@iit.edu](mailto:venerus@iit.edu).)

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# Rheology in Philadelphia, 2014

In 2014, the Society of Rheology held its largest annual meeting to date, as 547 rheologists gathered in the Loews Hotel in historic Philadelphia, hosted by Michael Mackay of the University of Delaware. The 87<sup>th</sup> meeting had local flavors such as a local Bingham medalist, U. Delaware's Norm Wagner (shown here with his wife Sabine, and parents, Norman and Gertrude Wagner), a first-of-its kind K-12 outreach event at the Franklin Institute, and the *Rocky Rheology Run*, conceived and organized by Mackay and Wes Burghardt (Northwestern University; see photo page 26). There was also plenty of what we have all come to expect from an SOR meeting: outstanding sessions (305 papers, 130 posters, 6 parallel sessions), industrial outreach, impressive technical displays of rheological equipment and expertise, fun, and fellowship.



The meeting was preceded by two successful short courses, *Colloidal Suspension Rheology* (28 registrants; Norm Wagner and Jan Mewis, instructors) and *Food Rheology* (25 registrants, Peter Fischer, Rakesh Gupta, and Mahesh Padmanabhan, instructors). Also before the official start of the meeting were two outreach events, the *Rheology in the Real World Industry/Faculty/Student Forum and Mixer*, and the first-ever Rheology K-12 Outreach event, *Panta Rei: Everything Flows*.

plan of the Committee is to bring together the practical know-how developed producing these events to create a how-to kit that SOR members could use to stage their own events. Based on smiles all around, the inaugural *Panta Rei* was a resounding success.

*Rheology in the Real World*, the third incarnation of the Industry/Faculty/Student Forum and Mixer, was held Sunday in the Loews Hotel and was sponsored by the American Institute of Physics and The Dow Chemical Company. Organizers Maryam Sepehr (Chevron), Amy Shen (Okinawa Institute of Science and Technology), Gerry Fuller (Stanford), and Matthew Reichert (Dow) brought together a panel of 5 practicing rheologists to tell about rheology in their worlds and to answer questions and socialize with students, faculty, and others in the audience. The event drew a standing-room only crowd.



The SOR Education Committee created the second outreach event, *Panta Rei: Everything Flows*, held in the entrance lobby of the Franklin Institute, the iconic science museum in Philadelphia. The event, developed and organized by the Education Committee and led by Jonathan Rothstein (University of Massachusetts), staged seven demonstration tables staffed by SOR volunteers and enjoyed by kids of all ages who passed by (see photos). The





As usual, industrial friends of rheology sponsored a whole slew of social events. The opening reception on Sunday was brought to us by TA Instruments and was held on the 33<sup>rd</sup> floor of the Loews hotel, providing spectacular views of the city. The awards reception preceding the banquet was sponsored by Xpansion Instruments. The Poster Session Reception was sponsored by Anton Paar USA, who also held drawings for valuable rheological equipment (see photo). The Society, as always, is very grateful for the ongoing and generous support of our sponsors and vendors. Additional meeting support was provided by Malvern Instruments, the Department of Chemical and Biomolecular Engineering and the Center of Molecular Engineering and Thermodynamics at the University of Delaware.



The banquet featured the customary roasting of the Bingham medalist, this year provided by Lynn Walker (Carnegie Mellon University), and greatly enjoyed by the roastee Wagner and his accompanying family. The banquet also included some thank-you gifts distributed by meeting organizer Michael

Mackay, who provided tee shirts with the phrase “Wid? or Widout?” referring to hometown Philly’s key inquiry when ordering the Philly cheese steak. For the sandwich, we may differ on whether we want it *wid* onions or *widout* ‘em, but as far as welcome, professional value, and pure good times, we definitely would say that the 87<sup>th</sup> SOR meeting was *wid*’em.

(see p26 for more meeting photos)

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**Rajesh Khare, Co-Chair**  
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*James Gilchrist*  
Lehigh University  
email: gilchrist@lehigh.edu

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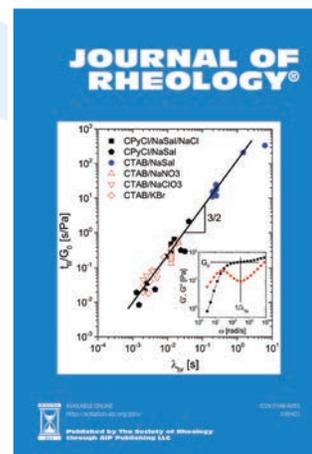
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# Reflections on a Rheologist: Howard Brenner (1929-2014)

*Andreas Acrivos*

*Levich Institute, City College of CUNY and FPCE,  
Stanford University*

With the passing of Howard Brenner on February 17, 2014, a month short of his 85th birthday, the international community of rheologists the world over lost one of its most extraordinary and accomplished members whose multifaceted, mostly theoretical and fundamental rather than applied, research contributions over half a century have had a profound impact over a large subset of the whole field of rheology. Examples include: low Reynolds number fluid-particle hydrodynamics, macro flow transport processes, microfluidics, complex fluids, interfacial transport phenomena, emulsion rheology, multiphase flow in porous media, and generalized Taylor dispersion phenomena. In point of fact, Howard dominated the field of *low Reynolds number hydrodynamics*, or LRNH for short, to such an extent that the words “Brenner” and LRNH have become synonymous, in that the mere mention of one immediately implies the other!

Howard Brenner was born, raised and educated in New York City or its suburbs and graduated from the Brooklyn Technical



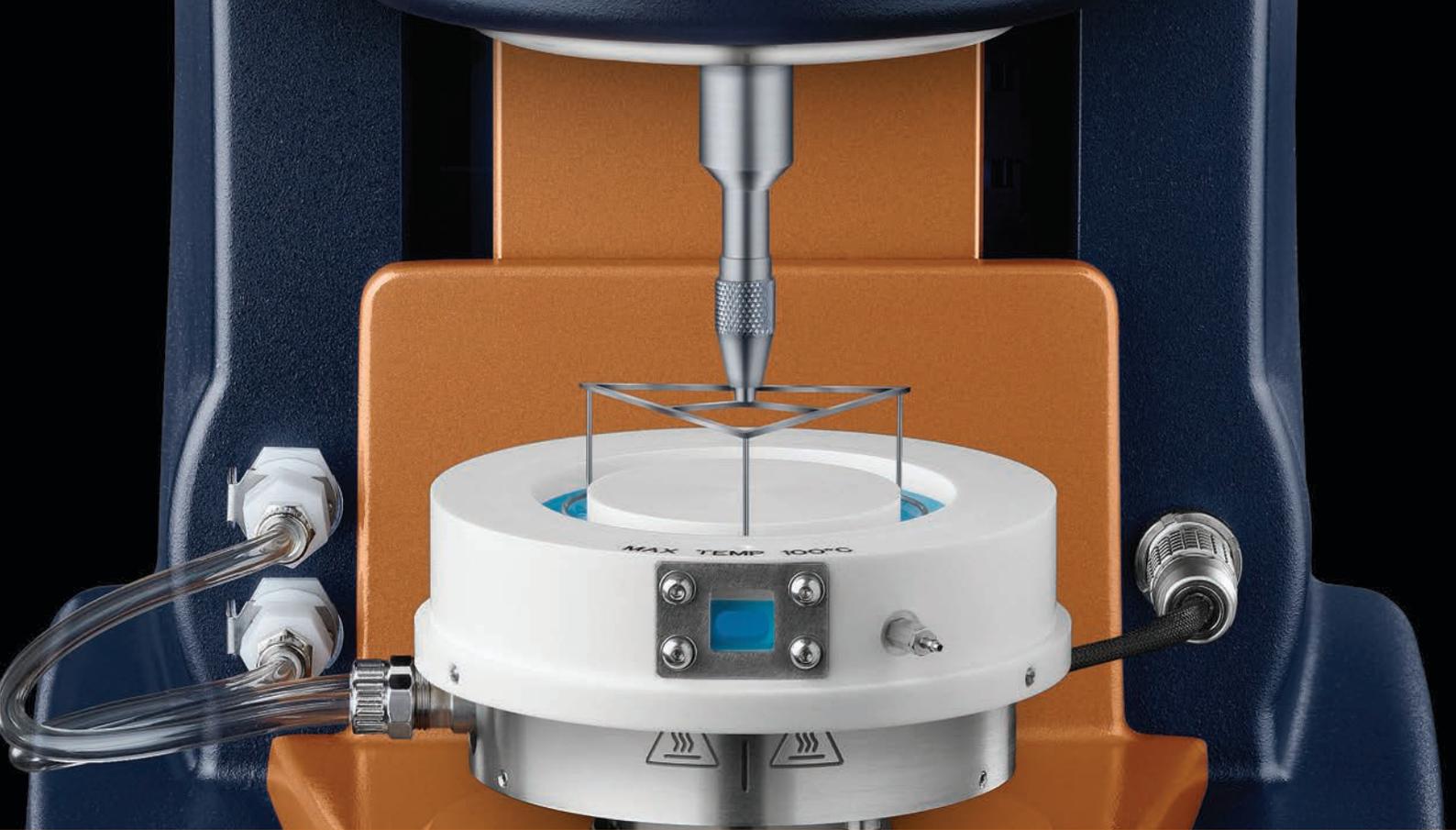
*Howard Brenner early on.*

High School in 1946. After working for a year for a chemical consulting firm, he enrolled at the Pratt Institute from where he graduated in 1950 with a B.S. in Chemical Engineering (ChE). He subsequently enrolled in the uptown campus of New York University (NYU) from where he received his MS & PhD degrees, both in ChE, in 1954 and 1957, respectively, with John Happel serving as his advisor. While still a graduate student, Howard was appointed as a full-time Instructor at NYU's ChE department and then, after receiving his PhD, he was promoted to Assistant Professor rising to the rank of full Professor in 1965. Shortly thereafter, Howard, already viewed as an upcoming “star”, was recruited by Carnegie-Mellon University (1966-1977), then by the University of Rochester

(1977-1981) where he served as the department's chair, and, finally, by MIT in 1981 as the William Henry Dow Professor of Chemical Engineering, becoming emeritus in 2005.

It is worth recalling that, when Howard began his graduate studies 60 years ago, the field of LRNH, and more specifically, the flow at Reynolds numbers  $Re$  equal to **zero** (or, as Howard himself use to say with a chuckle, “the dynamics of fluids at rest”) was considered far from being “hot”. Rather, it was viewed as being “dull”, mature and of limited practical relevance given that one's everyday experience with fluid mechanical phenomena pertains to flows way beyond the low, let alone **zero**, Reynolds number range. Consequently, whatever little research was done on the subject in those days was undertaken mostly by academics who focused on the relatively few highly specialized cases for which **analytical** solutions of the underlying Stokes linear equations could be obtained given that, any attempt to construct numerical solutions was bound to fail owing to the severe limitations of the then available calculating machines. In other words, academics often chose to focus on problems at low Reynolds numbers which could be solved analytically rather than because there existed a pressing or practical need for knowing the resulting solution. But, the gradual realization that continuum mechanics is able to model fluid systems to an astonishingly degree of accuracy down even to molecular dimensions, plus the emergence of the fields of “microfluidics” as well as several others with the words “nano” and/or “bio” in their respective titles, have transformed the subject of LRNH, or “creeping flow”, from being viewed as little more than a mathematical curiosity and limited to “fluids practically at rest”, into a very active field of research full of fascinating and counterintuitive results of very considerable physical as well as practical relevance to the world of “small scales”.

Thus, in the early part of his career, Howard, following the spirit of the times, focused on **zero Reynolds number hydrodynamics**, looked around for such special cases involving relatively simple geometries, typically spheres, and then proceeded to generate a large number of new results which, as was realized in later years, turned out to be of fundamental as well as practical importance. Examples, to name but a tiny fraction, include his deriving highly accurate and, in many instances, exact expressions for: (i) the settling velocity of a small sphere in a vertical cylindrical tube of much larger radius than that of the sphere, but with the center of the sphere located at a fractional distance from the longitudinal axis of the cylinder; (ii) the force and torque on a sphere moving either towards or parallel to a solid wall; and, (iii) the translational and rotational velocity of a neutrally buoyant sphere parallel to a solid wall



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in the presence of a uniform shear flow. It is worth emphasizing that, all these studies could be performed successfully only by somebody having exceptional mathematical skills which, just like the rest of the chemical engineers of that period, Howard had to learn on his own given that, in those early days, the typical chemical engineering curriculum did not include courses requiring the use of any mathematics aside from arithmetic, logarithms and, very occasionally, the evaluation of integrals in one dimension!

But concurrently, and thanks to his discovery of a remarkable theorem, the so-called “reciprocal theorem”, Howard’s research moved to a higher plane in that he was able to derive results of surprising generality and, therefore, usefulness. The theorem had appeared in 1897 in a paper in a Dutch journal (written in Dutch) by the great physicist Lorentz, but had been ignored to a large extent by the fluid mechanics community until Howard came across it in Henri Villat’s book (in French) which his advisor, John Happel, had lent him. Howard began to study the book in depth and, on seeing a derivation of the theorem and, being trained as an engineer, immediately perceived its practical value. He thereby derived, in a series of papers, a large number of general linear relations between the force and torque on a stationary particle of “arbitrary shape” (an “Arbitron” as he used to call it) in the presence of any “undisturbed” Stokes flow at infinity which were subsequently used by John Brady and others to construct powerful numerical techniques for modeling the dynamics of an effective infinite number of interacting particles in confined geometries. And shortly, thereafter, using the then recently developed method of “inner and outer expansions”, he also extended his studies to non-zero but still small values of the Reynolds number  $Re$  and was able to derive, often in collaboration with Raymond Cox, a number of remarkable results such as, for example that: knowledge of the Stokes resistance tensor between the Stokes force on a stationary “Arbitron” and a uniform flow at infinity suffices to give the drag on the “Arbitron” up to and including terms of order  $Re^2(\log Re)$ .

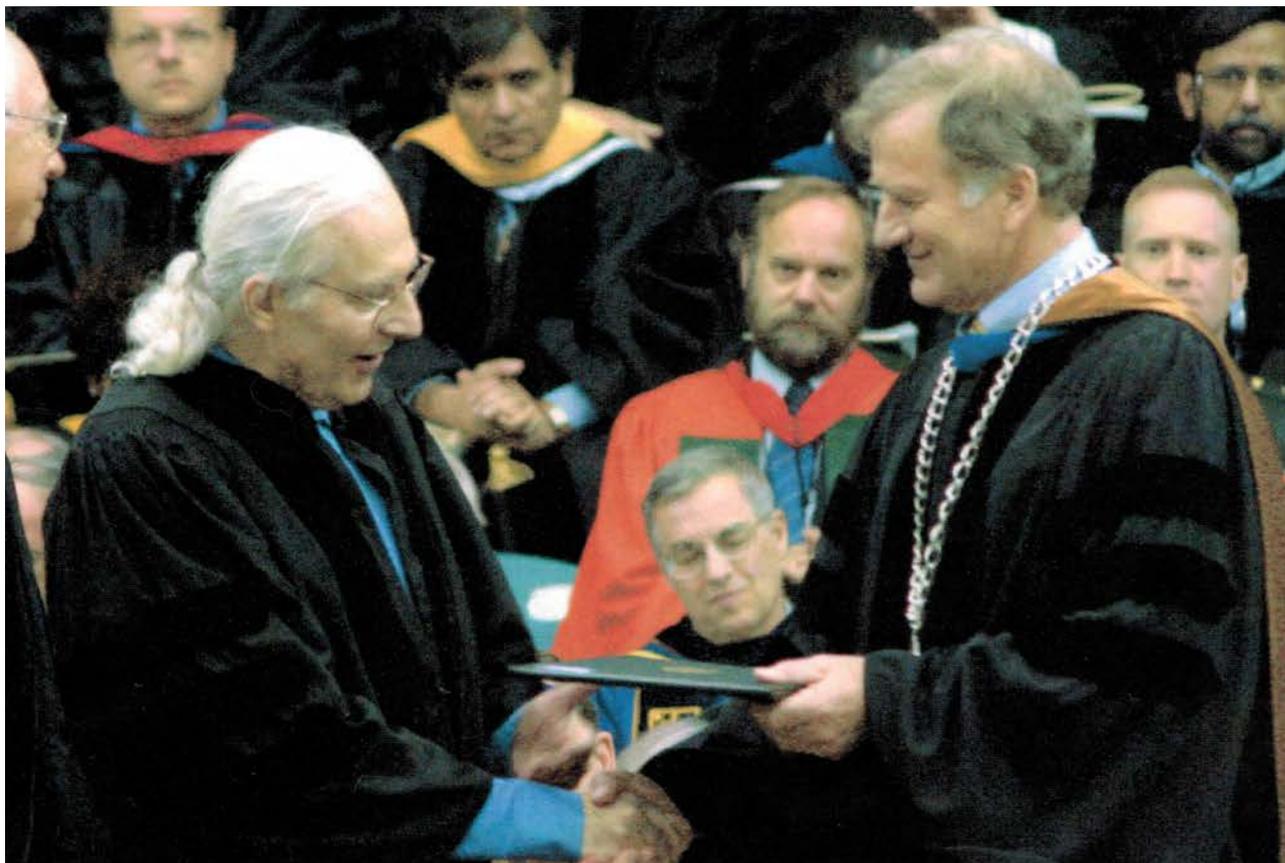
Several of Howard’s early results found their way into the book *Low Reynolds Number Hydrodynamics* by Happel and Brenner (1965) the 50<sup>th</sup> birthday of which all of us looked forward to celebrating next year, especially so Howard. It is of interest to point out that the



Howard Brenner in “mid-career.”

book (which is actually restricted to flows at **zero** Reynolds number!) was not exactly an instant best seller when it first hit the bookstores. It was much too “heavy” mathematically for most engineers, the field itself was considered far too narrow and more of a curiosity and the review which it received in the *Journal of Fluid Mechanics* was anything but positive, the book having been judged as being “boring”. Yet, it is now one of the most widely cited books in fluid mechanics, it is being acknowledged as **the** bible in the field for generations of rapidly and steadily increasing numbers of researchers and, although it has not been revised in any meaningful way, its annual sales have been on a positive slope ever since its inception, which is something that cannot be said for the large majority of 50-year old books.

But Howard’s research accomplishments did not remain confined within the realm of LRNH for, after leaving NYU and continuing through retirement, he published a series of groundbreaking papers on the motion of colloidal bodies including that of solid, flexible, and aggregated particle systems subject to Brownian motion of relevance to diverse fields ranging from biology to engineering separations and aerosol physics. In addition, by incorporating his earlier results pertaining to the zero Reynolds number hydrodynamics of particles, he extended the well-known Taylor-Aris dispersion theory for the spreading, in the long-time limit, of a solute flowing in a circular tube, to suspensions containing finite-sized particles of “arbitrary” shape in a tube of “arbitrary” cross-section, as well as to periodic systems, unbounded flows, time-dependent flows, reactive systems, and discrete networks! This impressive body of literature, produced over almost 20 years’ time in collaboration with a number of students and postdocs, has received somewhat less attention to-date than Howard’s results in low Reynolds number hydrodynamics. To a large extent, this is due to the fact that Howard’s macro-transport theory leads to partial differential equations which need to be solved for a specific system, whereas his earlier zero Reynolds number hydrodynamic results are often in terms of hydrodynamic resistances which can be more readily employed. That being said, when the macro-transport equations are solved, they produce accurate results for the long-time transport phenomena that are difficult (and sometimes impossible) to obtain by other



*Howard Brenner receiving an Honorary Doctor's Degree from Clarkson University in 2004.*

methods except, perhaps, via the use of brute-force computational techniques.

Several of these studies were eventually incorporated in Howard's two other books "Interfacial Transport Processes and Rheology," coauthored with David A. Edwards and Darsh T. Wasan (1991), and "Macro-transport Processes," coauthored with David A. Edwards (1993).

Howard also received wide recognition for his remarkable scientific and engineering achievements in that his numerous major Awards include: Election to US National Academy of Engineering (1980), the American Academy of Arts and Sciences (1999) and the US National Academy of Sciences (2000); the Alpha Chi Sigma (1976), W.H.Walker (1985) and W.K.Lewis (1999) Awards from the American Institute of Chemical Engineers; the Bingham Medal (1980) from the Society of Rheology; the Colloidal and Surface Chemistry Award (1980) from the American Chemical Society; and the Fluid Dynamics Prize (2001) from the American Physical Society.

Howard Brenner was an enthusiastic researcher whose lifetime work did not end with his retirement in that, three days before his death and in spite of back-breaking physical challenges, he was making the final revisions on a paper that reflected the culmination of almost 10 years' work, much of it done after he became emeritus. Of this project, he said that he could always continue to find needed revisions, but, in essence, was done with what he believed to be a seminal piece which overturned a theoretical underpinning of fluid dynamics several hundred years old.

Clearly, Howard Brenner was one of a kind, the likes of whom we do not encounter except, perhaps, once in a very long while.

*Acknowledgement:* I wish to acknowledge my debt to Lisa Glucksman, Melanie Kaufman, Ronnie Probst, David Edwards and Kevin Dorfman for providing me with background material and for their helpful comments on an earlier draft of this memoir.

# Some Reflections on the Journey to AIP Governance Restructure

*Louis J. Lanzerotti, Chair, AIP Board of Directors*

As of 21 November 2014, the AIP Governing Board and AIP Member Societies approved a restructure of AIP's governance, a historic achievement for the Institute. Among other changes, the membership of the corporation's Board of Directors will be 22 or fewer members (currently 15) from the previous 40-plus members of the Governing Board. The revised bylaws also eliminate AIP's longstanding managing board—the Executive Committee. The new board with its key committees (such as Finance, Audit, Membership) will be strategic and engaged, capable of streamlined oversight and decision-making. A more effective board will ensure the value proposition for AIP's Member Societies (MS), as well as enabling AIP's ability to keep pace with the fast-changing global environment of physical science communication, education, and outreach.



AIP's basic governance structure had been in place essentially since the 1930s, AIP's founding decade. This governance had served AIP, its MS, and the physical science community well until recent times. In recent years, significant legal changes have occurred in the governance responsibilities for profit and nonprofit corporations, and dramatic changes have occurred in the distribution of technical publications and data. Thus, it was evident from many directions that AIP's governance required deep examination—and possibly revolutionary revamping. It was also evident that such an examination was a board-level responsibility. AIP's CEO Fred Dylla fully agreed with the need for governance examination and for its residence in the board. As such, beginning in 2010 with meetings I held with Eva Adams (corporate strategist) and Ben Snavelly (corporate secretary), a decision was made to examine AIP Board member perceptions and MS views. This was accomplished under the auspices of a board-sanctioned Governance Task Force (GTF). CEO Dylla joined the GTF in 2012 following an initial board self-examination. Judith Flippen-Anderson assumed Ben's responsibilities upon his retirement in 2013.

## AIP Matters

The Governance Task Force retained legal advisors and governance experts on contemporary best practices (notably, Suzanne Ross McDowell of Steptoe & Johnson and Michael Daigneault of Quantum Governance). The AIP Board responded to the GTF's suggestion of a more extensive independent and transparent governance review by commissioning a Special Committee of ten board members to focus the board's efforts.

An important governance waypoint occurred in November 2012 when the AIP Board approved the Special Committee's recommendation to spin off AIP's publishing division into a wholly owned subsidiary. This subsidiary, AIP Publishing LLC (AIPP), governed by an autonomous board populated by a significant portion of business and science experts, has been operating since February 2013 as the AIP Board envisioned.

In the fall of 2013, the Special Committee recommended to the AIP Board a revised mission statement for AIP that reaffirmed AIP's original corporate purpose while supplying needed clarification and emphasis. At the same time, the Special Committee also recommended a general concept of a new governance structure. The board adopted both in March 2014. Over the following months, under the direction of the Special Committee and working with AIP's legal counsel, the GTF drafted the new bylaws. The board recommended on November 4 that the Member Societies ratify these bylaws, which they did on November 21.

The Governing Board members involved over the years deserve much credit for accomplishing the difficult task of governance restructuring, all the while accommodating diverse interests among the Member Societies. The long journey of analysis and change has already benefited several of AIP's Member Societies, who have borrowed from our corporate strategies in implementing their own governance analyses and reforms.

I fully expect AIP's governance enhancements to have significant and long-lasting benefits for the health, success, and growth of the federation. This in turn will make AIP a must-belong-to federation of physical science societies for the benefit of this nation and humanity.

*These reflections appeared first in AIP Matters, a weekly update for the staff of the American Institute of Physics, on 1 December 2014. Reprinted with permission. The Society of Rheology is a founding member of the American Institute of Physics (AIP).*



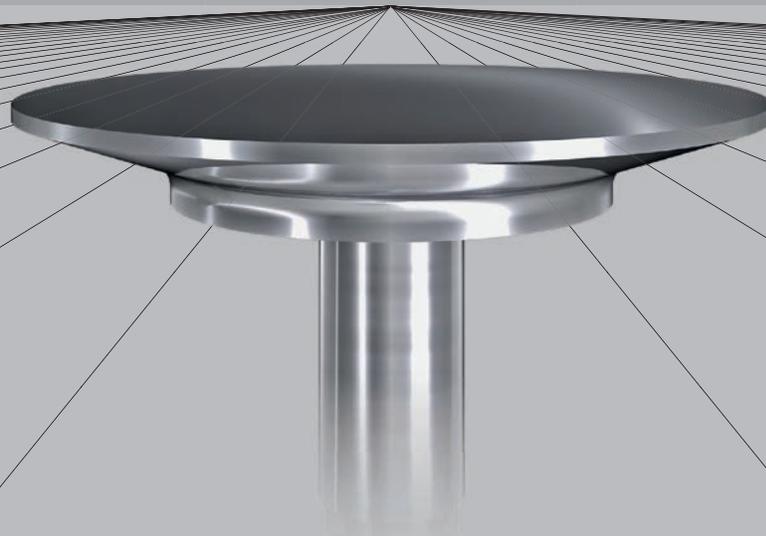
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# A Hitchhikers Guide to Complex Fluids

Gareth H. McKinley  
Massachusetts Institute of Technology, USA

“A map does not just chart, it unlocks and formulates meaning; it forms bridges between here and there, between disparate ideas that we did not know were previously connected.” Reif Larsen, *The Collected Works of T.S.Spivet*



I’m sure we have all been faced with the question at some point at a cocktail party, or a company outing, or a faculty reception of the form, “so what exactly do rheologists work on?” My usual answer is to either quote Bingham’s (and our Society’s) definition of rheology,



or just note that we like to play with our food! But the idea of being able to succinctly convey some of the finer-scale distinctions of rheology and the different classes of materials response has challenged nascent rheologists since the very early days of the field.

Perhaps the earliest such existential sentiment was expressed by W.H. Herschel (of the Herschel-Bulkley model) at the Third Plasticity Symposium (organized by Eugene Bingham at Lafayette College) who proclaimed “I have always wondered what I am; now I know, ‘I am a RHEOLOGIST’ (Bingham, 1960). A number of fundamental properties and distinctions were discussed by Vernon Harrison in his original letter to *Nature* (1940) arguing the case for establishment of a society of rheology in the UK. In 1942, L. Bilmes published a wonderful one page graphical chart (also in *Nature*) that strived to depict, graphically, the connections between some of the many phenomena that people were struggling to understand, and that could help differentiate between different classes of material responses (Figure 1). The classification was apparently first espoused by the famous rubber rheologist L. R. G. Treloar and was developed further by the British

Rheologist’s Club that was founded in Reading during the Second World War by George Walker Scott Blair, Vernon Harrison and Herbert Lang – and whose inaugural chairman was G.I. Taylor (See the report on the first meeting from *Nature* 1940).

I first became aware of this figure from reading the excellent book *Rheology: An Historical Perspective* by Ken Walters and Roger Tanner that was written in large part during the six month program on “Dynamics of Complex Liquids” at the Newton Institute in 1996. As shown in Figure 1, and the world is divided roughly into two hemispheres of liquids and solids. Bilmes notes, cartographically, that “ideal properties therefore lie north and south, and real ones east and west.” In his survey of modes of deformation, Scott Blair proposed dividing materials based on their responses to standard inputs such as step stresses or strains and provided a series of useful pictograms of characteristic material responses (Scott Blair, 1944 p42). An alternate way of visualizing connections between different classes of materials was put forward by Reiner in his 1971 book on *Advanced Rheology* who focused instead on defining classes of properties (Reiner, pp.72-74). He divided the properties of complex fluids into two classes; firstly “essential rheological properties” (“the investigation of which has reached the stage when they can be

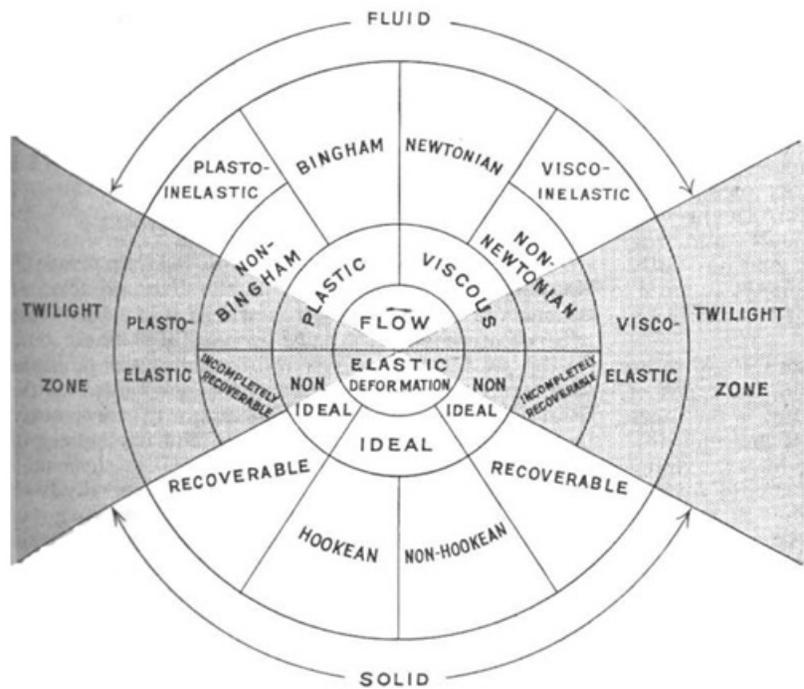


Figure 1: A Rheological Chart that mapped the continuum world of complex fluids and soft solids soon after the birth of rheology (L. Bilmes, 1942).



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# A Hitchhikers Guide to Complex Fluids

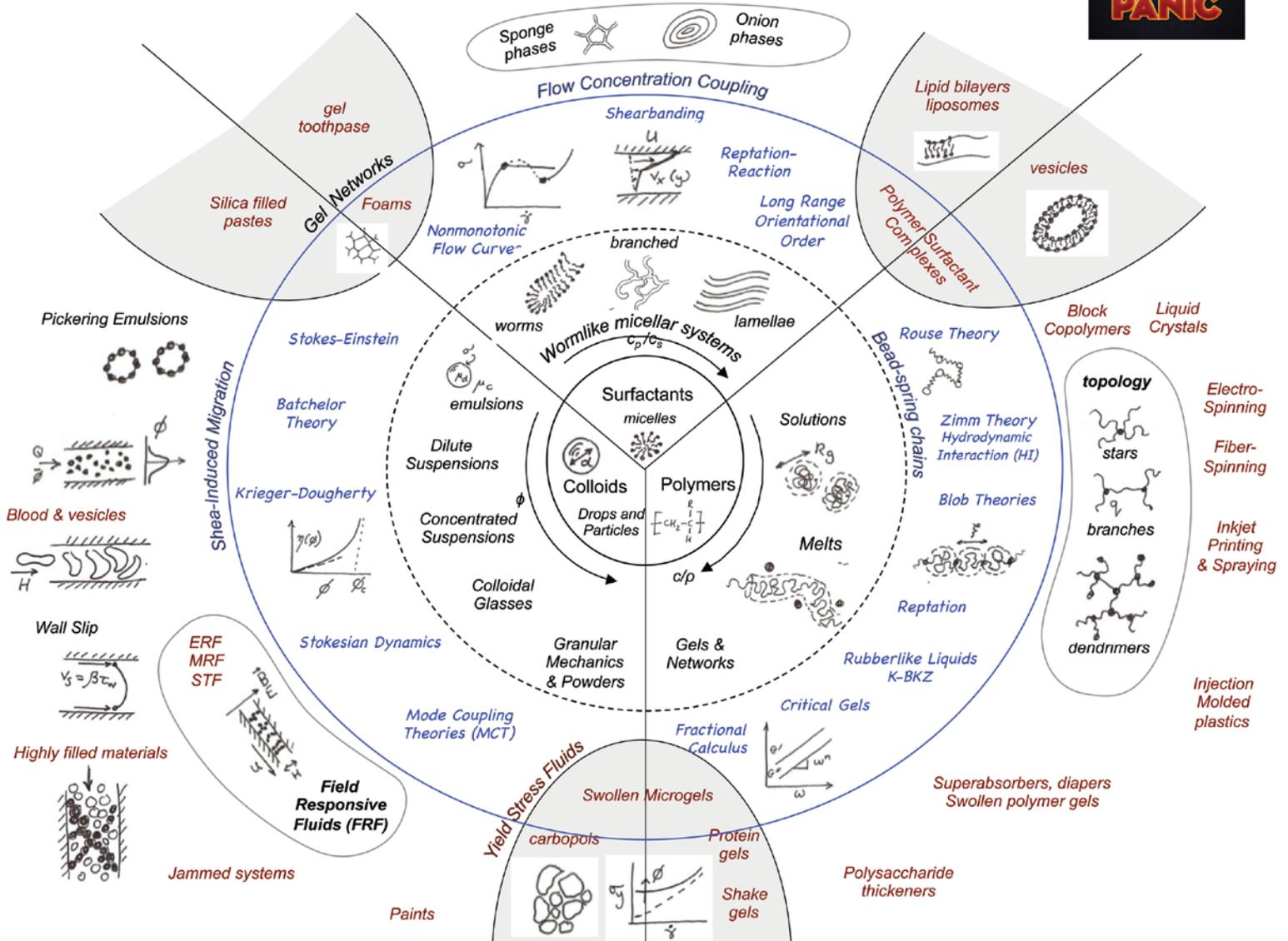


Figure 2: A one-page (and highly subjective) ‘Hitchhikers Guide’ to the Universe of Complex Fluids. At its core, the world of complex fluids can be divided (at its most elementary level) into three constituents; surfactants, polymers and colloids depending on the class of materials being studied. Within each segment, concentration or volume fraction mediate the specifics of the material response. As one moves outwards, finer scale structure and increasing complexity becomes apparent. The blue shell tries to indicate some of the most prevalent models and underpinning concepts that describe each class of complex fluids. In the outer shells, finer scale structures and many local exotica appear. Particularly interesting phenomena appear at the interfaces between the different material classes, giving rise to gels, soft solid materials with yield stresses and elastoviscoplastic characteristics. With thanks to Will Hartt, Lori Bacca and Liz Hollingdale for some of the inspiration and ideas contained herein.

(*Hitchhiker's Guide*, continued from p. 14)

exactly defined as parameters in a postulated rheological equation”) and, secondly, technological properties (“those for which a method of measurement has been devised, but of which the theoretical investigation has not yet reached a stage where the property is shown either to be fundamental or to be expressible in terms of known fundamental properties”). This latter class of properties leads to what I referred to in my Bingham lecture last year as “the language of ‘nesses’” and might include heuristic concepts as “stickiness, stringiness, sliminess, springiness, slipperiness...” Incidentally, Reiner also provided what I believe to be the first definition of microrheology as a systematic approach which “derives the rheological behavior of two- and multiphase systems from the known rheological behavior of their constituents.” Working together as close friends, Scott Blair & Reiner (1967) also proposed a systematic nomenclature and symbol list for rheologists and a tree or flow chart showing the interconnected responses of different “rheological bodies” (i.e. prototypical constitutive models).

As an alternate way of trying to represent some of the expanding universe of materials and models and methods that rheologists work on I have attempted the sketch or “Hitchhikers Guide” shown in Figure 2. When first confronted with such a drawing it is, perhaps, worth recalling the advice of Douglas Adam’s classic *The Hitchhikers Guide to the Galaxy* (HG2G); “Don’t Panic”. In contrast to the continuum viewpoint sketched by Bilmes, this map attempts to incorporate the underlying molecular composition of complex fluids and soft solids. At its core, the universe of complex fluids can be divided (at its most primitive level) into three basic elements; surfactants, polymers and colloids, depending on the class of materials being worked on; one might therefore refer to this universe as SuPoCo! Within each of these domains, the concentration or volume fraction of the constituent mediates the specific characteristics of the material response. As one moves outwards from the center, finer scale structure and increasing complexity becomes apparent. The blue shell tries to indicate some of the most prevalent models, jargon, and underpinning concepts that describe the dynamics of each class of complex fluid. In the outer shells, finer scale structures and many local exotica appear. To illustrate this, in each of the three materials domains I have given just one example (of many possible choices) that a rheologist might be interested in (based purely on personal interests); for example field-response or ‘smart’ colloidal fluids (such as magnetorheological (MR), electrorheological (ER) and shear-thickening fluids (STF)), or different classes of topologically-connected polymer chains. The panoplies of different liquid crystalline states of matter and block copolymer morphologies are additional wonderful examples of the local richness and subtleties that exist at

all points in the map.

Just as Bilmes noted, at the boundaries between the different constituent domains, “a twilight zone exists where solid and liquid properties subsist together.” Particularly interesting phenomena appear at these interfaces or twilight zones between the different material classes, and give rise to soft matter systems such as vesicles, gels, pastes, waxes, inks, and other soft solids that are characterized by the existence of (real or apparent) yield stresses and, more broadly, elastoviscoplastic (EVP) characteristics. Many of the most interesting materials and most complex phenomena currently being studied in our field arise in these inter-phase regions or ‘twilight’ zones (Figure 1).

Overlaid on this basic guide or map, one may also superimpose products and brands that typify a specific field of interest; for example, in my research group we have made alternate versions of this atlas for consumer products, for food systems and for complex fluid problems and products in the oil/gas domain. Other SOR members may want to make their own versions to help explain to their managers or department heads in a suitably visual way the context and complexity of the materials they work on.

I am sure that everyone reading this article and studying this proposed map will identify something essential that they can’t possibly believe I have omitted, or that absolutely must be added! In many ways that is precisely the point; every atlas or guide has to be selective in the features it includes and excludes. Different maps reveal different features. A map is supposed to guide the way forward while unlocking and revealing connections. I hope this Hitchhikers Guide will stimulate further discussions in how to concisely but completely characterize the ever-expanding rheological universe of soft matter.

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## NEWS

### Hatzikiriakos to Receive 2014 Mason Award

Marianna Kontopoulou

Queen's University, Kingston, Ontario, Canada

The Canadian Society of Rheology is pleased to announce that Savvas G. Hatzikiriakos, from the Department of Chemical & Biological Engineering at the University of British Columbia, is the 2014 Stanley Mason Awardee for his outstanding contributions to the advancement of the science of rheology. The award will be presented at the Mason Award Symposium, 20 May 2015 at McGill University, Montréal.



Hatzikiriakos obtained his diploma in chemical engineering from the Aristotelean University of Thessaloniki (1983), his M.A.Sc. in chemical engineering from the University of Toronto (1988) and his Ph.D. in chemical engineering from McGill University. Since 1991 he has been a professor in the Department of Chemical and Biological Engineering at the University of British Columbia. His main research interests are in the area of polymer rheology, polymer processing and surface science with emphasis on superhydrophobic/superoleophobic surfaces. He has published 170 referred journal papers, 95 papers in conference proceedings, 130 conference presentations, three patents and one book on polymer processing instabilities. His awards include two best papers in *Journal of Rheology* (1994 and 2011), a Killam research fellowship in 1995, and a future technology award in ANTEC 2000. Hatzikiriakos is a member of the Canadian Academy of Engineering.

Hatzikiriakos has also been an instrumental member of the Canadian Society of Rheology and an active member of the SOR. He was the President of the CSR for the period 2004-2008, and served as the Vice President (2001-2004), past President – Executive member (2008-2012), and Executive member of the Canadian Rheology Group (1997-2001).

### SOR Officer Elections 2015

Officer elections will be held in 2015. The SOR election process directs the SOR president to appoint a 3-person Nominating Committee and a Nominating Committee chair. The Nominating Committee reports a slate to the membership by at least one hundred forty-five (145) days prior to the date of the Annual Meeting at which the results of an election are to be announced. For the October Baltimore meeting this date is 21 May 2015. Members interested in being nominated for office or interested in nominating candidates are encouraged to contact members of the Nominating Committee (see page 3 of this *Bulletin* for a list of committee members).

### Plastics Academy to Induct Nine into the Plastics Hall of Fame

The Plastics Academy announced that it would honor nine individuals for their contributions to the plastics industry by inducting them into the Plastics Hall of Fame at a ceremony to be hosted in Orlando, Florida at NPE2015. The Plastics Academy is under the auspices of SPI: The Plastics Industry Trade Association. This year's inductees are:

John Beaumont of Beaumont Technologies, Inc.

Terry Browitt, director and founder of Terinex International, Inc.

William Carteaux, president and CEO of SPI: The Plastics Industry Trade Association

Robert DeLong of Blasformen Consulting

Eugen Hehl, co-founder of ARBURG GmbH & Co.

Edward Hunerberg of Uniloy Milacron

Manfred Lupke, president and CEO of Corma, Inc.

Donald Norwood, retired chemical engineer formerly of Phillips Petroleum  
Maureen Steinwall, president and owner of Steinwall, Inc.

Founded in 1937, SPI: The Plastics Industry Trade Association promotes growth in the \$373 billion U.S. plastics industry.

## Bingham Award 2015 Nominations Sought

Nominations are invited for the 2015 Bingham Award of The Society of Rheology. Prior award winners are listed on the web: [www.rheology.org/sor/awards/bingham/](http://www.rheology.org/sor/awards/bingham/).

The Bingham Award is presented annually to an individual who has made outstanding contributions to the field of rheology. The award consists of a medal, a certificate, and a \$15,000 honorarium. Additional information and guidelines for preparing a nomination can be found on the SOR website at [www.rheology.org/sor/awards/Bingham/nom2015.htm](http://www.rheology.org/sor/awards/Bingham/nom2015.htm).

Nomination materials should be submitted electronically as a single concatenated PDF file by 1 February 2015 to the chair of the Bingham Award Committee:

Lynn Walker  
Department of Chemical Engineering  
Carnegie Mellon University  
email: [lwalker@andrew.cmu.edu](mailto:lwalker@andrew.cmu.edu)

Award announcement will precede the 87<sup>th</sup> Annual Meeting of the Society of Rheology in Baltimore, Maryland USA (11-15 October 2015), and the medal will be presented at that meeting.

## Nominations Sought for 7<sup>th</sup> Metzner Early Career Award

Nominations are invited for the Metzner Award of The Society of Rheology. Prior award winners are listed on the web: [www.rheology.org/sor/awards/Metzner/](http://www.rheology.org/sor/awards/Metzner/).

The Arthur B. Metzner Early Career Award is given, at most annually, to a young person who has distinguished him/herself in rheological research, rheological practice, or service to rheology. The year of a nominee's terminal degree cannot be earlier than the twelfth year prior to the year of the award for which he/she is a candidate. The award consists of a plaque and a \$7,500 honorarium.



Additional information and guidelines for preparing a nomination can be found on the SOR website at [www.rheology.org/sor/awards/Metzner/nom2015.htm](http://www.rheology.org/sor/awards/Metzner/nom2015.htm).

Nomination materials should be submitted electronically as a single concatenated PDF file by 1 February 2015 to the chair of the Metzner Award Committee:

Victor Breedveld  
School of Chemical and Biomolecular Engineering  
Georgia Institute of Technology  
email: [victor.breedveld@chbe.gatech.edu](mailto:victor.breedveld@chbe.gatech.edu)

All nomination packages must be accompanied by a letter of support from a nominator. Award announcement will precede the 87<sup>th</sup> Annual Meeting of the Society of Rheology in Baltimore, Maryland USA (11-15 October 2015), and the plaque will be presented at that meeting.

## Tam Sridhar Fêted at the 2014 Pac Rim Conference

At the 6<sup>th</sup> Pacific Rim Conference on Rheology held 20-25 July 2014 in Melbourne, Australia, a group of rheologists celebrated (via a symposium and a dinner) Tam Sridhar's 65<sup>th</sup> birthday. Many happy returns! (photo credit Gareth McKinley).



Back rows (standing, from left to right): David Boger, Reba Boger, Rakesh Gupta, Eric Shaqfeh, Susan Muller, Ron Larson, David James, Beverley James, Peter Scales, Gareth McKinley (vice president of the Society of Rheology), Rahul Gupta (new president of the Australian Society of Rheology), Gary Leal, Duc At Nguyen, Pradipto Bhattacharjee, Prabhakar Ranganathan, Neelam Gupta.

Front rows (seated): Raj Chhabra, J. Ravi Prakash, Radhika Prakash, Tam Sridhar (birthday celebrant), Kalyani Sridhar, Pino Marrucci, Adriana Marrucci.

Awardees in the *Student Poster Award Competition* are shown: Giovannantonio Natale (1<sup>st</sup> place; École Polytechnique de Montréal, second from left), Jingsi Gao (2<sup>nd</sup> place, University of Delaware, second from right), Nichoals A. Rorrer (3<sup>rd</sup> place, Colorado School of Mines, center). At the far left is Matthew Reichert (The Dow Chemical Company, representing the judges) and on the far right is Greg McKenna (Texas Tech University, President, SOR).



## SOR 2014 Poster Competition Results

As part of the 86<sup>th</sup> Annual SOR Meeting in Philadelphia, two poster competitions were held, one for graduate students and one for postdoctoral researchers. The organizers of the Philadelphia poster session and the poster competitions were John Dorgan (Colorado School of Mines), Seher Ozkan (Ashland Inc.), and Matthew D. Reichert (The Dow Chemical Company). Participants in the competition submitted PowerPoint summaries of their posters several months ahead of the meeting, and finalists were selected by the organizing committee; each poster was visited by a panel of judges. The Society's *Best Student Poster Award* has been awarded annually since 2001 and the *Best Postdoctoral Fellow Poster Award* was inaugurated in 2009. The Society of Rheology sponsors both poster competitions to encourage participation in the meetings and to recognize excellence. At the 86<sup>th</sup> Annual Meeting, the recipients of the poster awards were:

### Best Student Poster Award Recipients

#### *Giovannantonio Natale (1<sup>st</sup> Place)*

"Modeling interactions in carbon nanotube suspensions: Transient flows;" Giovannantonio Natale(1), Julien Ferec(2), Gilles Ausias(2), Marie-Claude Heuzey(1), and Pierre J. Carreau(1); (1) Chemical Engineering, École Polytechnique de Montréal, Montréal, Québec, Canada; (2) Mechanical Engineering, Université de Bretagne du Sud, Lorient, France.

#### *Jingsi Gao (2<sup>nd</sup> Place)*

"Rheology of dispersions in the ionic liquid;" Jingsi Gao(1), Mark B. Shiflett(2), and Norman J. Wagner(1); (1)Department of Chemical and Biomolecular Engineering, University of Delaware, Newark, DE; (2)Central Research and Development, DuPont, Newark, DE.

#### *Nichoals A. Rorrer (3<sup>rd</sup> Place)*

"Molecular scale simulation of shear, parabolic, and extensional flow: Implementation and findings;" Nichoals A. Rorrer and John R. Dorgan; Chemical and Biological Engineering Department Colorado School of Mines, Golden, CO.

### Best Postdoctoral Fellow Poster Award Recipients

#### *Folarin Latinwo (1<sup>st</sup> Place)*

"Generalized work relations for polymer solution rheology;" Folarin Latinwo(1), Patrick Corona(2), Joshua Moller(2), and Charles M. Schroeder(2); (1) Chemical and Biological Engineering, Princeton University, Princeton, NJ; (2)Department of Chemical & Biomolecular Engineering, University of Illinois at Urbana-Champaign, Urbana, IL.

#### *David Nieto Simavilla (2<sup>nd</sup> Place)*

"Investigation of thermal transport in polymers using infrared thermography;" David Nieto Simavilla, David C. Venerus, and Jay D. Schieber; Chemical and Biological Engineering, Illinois Institute of Technology, Chicago, IL.



Awardees in the *Postdoctoral Fellow Poster Award Competition*, from left to right: Matthew Reichert (The Dow Chemical Company, representing the judges), Folarin Latinwo (1<sup>st</sup> place; Princeton University), David Nieto Simavilla (2<sup>nd</sup> place, Illinois Institute of Technology), Greg McKenna (Texas Tech University, President, SOR)

## TA names *Distinguished Young Rheologists*

In December 2014 TA Instruments announced the two latest recipients of the company's *Distinguished Young Rheologist* award: Kendra Erk, Assistant Professor of Materials Engineering at Purdue University and Kelly Schultz, Assistant Professor at the Department of Chemical and Biomolecular Engineering at Lehigh University. Erk and Schultz each received her award in recognition of early career achievements in the field of experimental rheology.

Erk works to develop structure-property-processing relationships in superabsorbent hydrogels and polymer-tethered nanoparticles. Schultz studies hydrogel materials for wound healing and tissue regeneration.

Award recipients are nominated by an international panel of academic researchers from the Society of Rheology. The *Distinguished Young Rheologist* program is designed to help accelerate the research of new academics through grants for rheometer systems.

## Minutes of the ExCom Meeting

Sunday, 5 October 2014

Roberts Boardroom, Loews Hotel, Philadelphia, Pennsylvania

Attending: Greg McKenna, Gareth McKinley, Albert Co, Monty Shaw, Ralph Colby, Shelley Anna, Dimitris Vlassopoulos, Norm Wagner, Jeffrey Giacomini, Faith Morrison, Andy Kraynik, Gerry Fuller, Chris White, Jason Maxey, Jonathan Rothstein, Michael Mackay, Maryam Sepehr, Kalman Migler, Jai Pathak, Susan Muller, Don Baird, Bridget D'Amelio (AIPP), Marcy Fowler (JOR), Paulo R. de Souza Mendes, Mônica Naccache, Verônica Calado, Abdellah Ajji, Savvas Hatzikiriakos, Marie-Claude Heuzey.

President Greg McKenna called the meeting to order at 7:52 a.m. in the Roberts Boardroom, Loews Philadelphia Hotel, Philadelphia, Pennsylvania.

The minutes of 18 May 2014 meeting were read by Secretary Albert Co. A motion to accept the minutes passed.

Monty Shaw reported on the financial status of the Society and *JOR*. Shaw showed spreadsheets of receipts and disbursements, as well as budgets for 2014 and 2015. Several entries were discussed. The income and expenses of *JOR* were discussed. Several items on the Society budget were also discussed. A motion to accept the treasurer's report passed.

Ralph Colby gave the *JOR* Editor report. Colby showed the special issue of the *Journal of Rheology* on colloidal gels. Thanks were extended to the guest editor George Petekidis, who did a wonderful job for this special issue. Colby showed various graphs on *JOR* statistics. New manuscript submissions has risen for 2013 and 2014.

# Secretary's Report

Most submissions are from the US, followed by China. The number of days to decision remains the same as in the previous year. The number of published pages will rise a bit. The estimate for 2014 is 2,000 to 2,100 pages. The impact factor of *JOR* for 2013 is 3.276. The five-year impact factor is 3.179. A motion to accept the Editor's report passed.

Faith Morrison gave the *Rheology Bulletin* editor report. Morrison provided a list of deadlines for the *Rheology Bulletin*.

Gareth McKinley reported for the ad hoc Committee on Electronic Publishing and Open Access Policies, composed of McKinley, Tom McLeish, Roseanna Zia, and Faith Morrison. The differences among gold open access journals, green open access journals, and hybrid journals were reviewed. *JOR* is presently a hybrid journal. The open letter that appeared in the July 2014 issue of *Rheology Bulletin* did not get any response. McKinley reported that the DOE Public Access Plan was announced in July of 2014. The final publisher version of a paper is now known as the Version of Record (VoR). DOE will setup a new portal – Public Access Gateway to Energy and Sciences (PAGES). McKinley showed the latest version of the proposed SOR Copyright Transfer Agreement (CTA). A motion to conduct the vote for the proposed CTA in the open session of the ExCom meeting passed, with one opposed and one abstention. A motion to adopt the proposed CTA as of 1 January 2015 passed.



Bridget D'Amelio provided updates of AIP Publishing (AIPP) matters and statistics of *JOR Online Access*. Efforts to improve the performance of Scitation is ongoing. New features that can be implemented include “30 days free” and “article gifting.” D'Amelio reported that the effects of the bankruptcy of SWETS was minimal.

Jonathan Rothstein reported for the Education Committee. The short courses at the Philadelphia meeting went smoothly. The *Colloidal Suspension Rheology* course had 20 registrants and the *Food Rheology* course had 25 registrants. In addition, 8 registrants took the first day of the *Colloidal Suspension Rheology* course and the *Food Rheology* course on the second day. A short course on *Active and Passive Microrheology: Theory and Experimental Applications* (by Eric Furst and Roseanna Zia) is planned for the Baltimore meeting. The Education Committee is soliciting proposals for future meetings.

A K-12 Outreach Program is scheduled at the Franklin Institute on Sunday 5 October from 1 to 4 pm.

Jason Maxey reported for the Membership Committee. Statistics on the number of members over the months in 2013 and 2014 were shown. The number of student members has held steady over the last few years. Works to be done include e-mailing lapsed members, continuing the student survey and graduation survey and outreaching to industrial connections.

Albert Co gave the webmaster's report. Statistics of abstract submission in annual meetings since 1997 and meeting attendance since 2005 were shown. The Philadelphia meeting has the highest number of abstract submissions and the highest meeting attendance yet recorded for an SOR meeting.

Developing an app for the annual meeting was discussed. McKenna will appoint an ad hoc committee to make a list of specifications of the app.

Michael Mackay reported that the Philadelphia meeting was all set.

Faith Morrison (as SOR Designate to the American Institute of Physics Governing Board) reported on the changes in AIP governance.

Jeffrey Giacomini (as SOR Designate to the AIP Publishing Board of Manager) reported on AIPP matters.

Maryam Sepehr reported on the status of the Technical Program at the Philadelphia meeting. Statistics for the Technical Program were shown.

Kalman Migler reported on the local arrangements of the Baltimore meeting (October 2015). The meeting will be held at the Hyatt Regency, which was renovated in 2006. The meeting room layout and budget were discussed.

Susan Muller reported on the Technical Program for the Baltimore meeting and the selection of session chairs. The suggestions for the Plenary Speakers were discussed. The Industry Forum will be continued.

Don Baird reported on the local arrangements of the Tampa meeting (February 2017). The meeting will be held at the Grand Hyatt Tampa Bay. The facilities and accessibility were discussed.

Andy Kraynik reported for Matt Liberatore on the local arrangements of the Denver meeting (October 2017). The facilities and meeting spaces were discussed.

Jason Maxey reported on the local arrangements of the Houston meeting (October 2018). The meeting will

be held at the Westin Galleria. The meeting spaces, room blocks, and possibilities for banquet venue were discussed.

Gareth McKinley is seeking proposals for meetings in Fall 2019, Spring 2021, and beyond.

Gerry Fuller reported on international outreach activities. He plans to visit Brazil and Argentina in October or November 2015. The Israeli Rheological Society is now back and up and running.

Paulo R. de Souza Mendes, Mônica Naccache, and Verônica Calado presented a proposal to hold the 2020 International Congress on Rheology (ICR) in Rio de Janeiro, Brazil. The location, meeting spaces, and budget were discussed.

Abdellah Ajji, Savvas Hatzikiriakos, and Marie-Claude Heuzey presented a proposal to hold the 2020 ICR in Montreal, Canada. The location, meeting spaces, and budget were discussed.

The meeting entered into executive session at 4 pm.

A motion to allow retired members free access to the electronic version of *JOR* passed.

A request by an SOR member was discussed and tabled.

A motion to increase the Bingham Medal prize money to \$15K, starting in 2015, passed with seven yes votes and two no votes.

The meeting was adjourned at 4:37 pm.

Submitted by Albert Co, Secretary

## Minutes of the Business Meeting

Tuesday, 7 October 2014

Loews Philadelphia Hotel, Philadelphia, Pennsylvania

President Greg McKenna called the meeting to order at 12:10 p.m. in Commonwealth D (91 in attendance). The minutes of the previous Business Meeting in Montréal, Québec, Canada were read by Albert Co and approved without addition or correction.

Monty Shaw presented the Treasurer's Report. Shaw showed the budget and answered questions on several entries. A motion to accept the report was seconded and passed.

Ralph Colby presented the *JOR* Editor Report. Colby displayed the special issue of the *Journal of Rheology* on colloidal gels. Thanks were extended to the guest editor George Petekidis, who did a wonderful job for

this special issue. Colby showed various graphs on *JOR* statistics and trends. The number of submissions for 2014 is similar to 2013. The current impact factor of *JOR* is 3.276; the five-year impact factor is 3.179. A motion to accept the report was seconded and passed.

Michael Mackay reported on the local arrangements of the Philadelphia meeting. At the time of the Business Meeting, 547 had registered.

Maryam Sepehr reported on the Technical Program of the Philadelphia meeting. There are 305 papers, 130 posters, 6 parallel sessions, and 3 50-paper sessions.

Faith Morrison reported on the *Rheology Bulletin*. Morrison is seeking color photos for the cover; general articles are encouraged.

The proposed "Fellow" category was discussed at length (Faith Morrison presented for the committee chaired by Gerry Fuller). The pros and cons of the proposed category were brought up. A straw-poll vote to pursue or not to pursue establishing a "Fellow" category came out evenly divided.

Gareth McKinley reported on electronic publishing. The differences among gold open access journals, green open access journals, and hybrid journals were reviewed. McKinley reported that the DOE Public Access Plan was announced in July of 2014. He showed the newly adopted SOR Copyright Transfer Agreement (CTA) that will be effective on January 1, 2015.

The meeting was adjourned at 1:25 p.m.

Submitted by Albert Co, Secretary

## Treasurer's Report

To the Membership:

The tables provided depict the financial state of The Society of Rheology as reported to the Membership at the 2014 Annual Meeting in Philadelphia. While a deficit for 2013 was a known and accepted result of the two annual meetings, the projected position for 2014 falls short of the budget. Reasons include lower-than-anticipated *JOR* royalty income and increased publication costs. We also awarded a record number of student travel grants in 2014, although this expense was partially offset by a generous grant from Dow Chemical Co. The 2015 budget is not encouraging and cuts will be required for 2016 to bring income and expenses into balance.

Respectfully submitted,  
Montgomery T. Shaw, Treasurer



Treasurer's Report

**The Society of Rheology, Inc.  
Balance Sheet**

(all amounts, USD)	<b>2014 August</b>	<b>2013 Year End</b>	<b>2013 August</b>	<b>2012 Year End</b>	<b>2012 August</b>
<b>Assets</b>					
Cash in checking account(s)	229,475	147,077	114,608	73,886	1,162
Securities	0	0	0	0	0
Balance in AIP account	1,623,395	1,595,079	1,667,341	1,685,279	1,585,355
<b>Total Assets</b>	<b>1,852,870</b>	<b>1,742,155</b>	<b>1,781,949</b>	<b>1,759,165</b>	<b>1,586,517</b>
<b>Liabilities and Net Assets</b>					
<b>Liabilities</b>					
Deferred subscription revenue					
Deferred member dues					
Deferred revenue	0	100,652	0	114,980	0
<b>Total Liabilities</b>	<b>0</b>	<b>100,652</b>	<b>0</b>	<b>114,980</b>	<b>0</b>
<b>Net Assets</b>					
Publication reserve	450,000	450,000	450,000	450,000	450,000
Student travel grant reserve	30,000	30,000	30,000	30,000	30,000
Annual Meeting reserve	300,000	300,000	300,000	300,000	300,000
Operating reserve	150,000	150,000	150,000	150,000	150,000
<b>Unrestricted</b>	<b>922,870</b>	<b>711,503</b>	<b>851,949</b>	<b>714,185</b>	<b>656,517</b>
<b>Total Net Assets</b>	<b>1,852,870</b>	<b>1,641,503</b>	<b>1,781,949</b>	<b>1,644,185</b>	<b>1,586,517</b>
<b>Total liabilities and net assets</b>	<b>1,852,870</b>	<b>1,742,155</b>	<b>1,781,949</b>	<b>1,759,165</b>	<b>1,586,517</b>

**Journal of Rheology**

**Receipts and Disbursements**  
(all amounts, USD)

	<b>2015 Budget</b>	<b>2014 Projection</b>	<b>2014 August</b>	<b>2014 Budget</b>	<b>2013 YearEnd</b>
<b>RECEIPTS</b>					
Subscriptions	145,000	138,061	138,061	142,000	148,137
Royalties & Reprint Sales	30,000	45,078	1,259	80,000	69,736
Ad Sales	30,000	32,658	23,709	45,000	30,800
JORO revenue	70,000	100,584	100,584	78,000	72,872
Miscellaneous	2,000	2,097	2,097	2,000	4,105
<b>TOTAL RECEIPTS</b>	<b>277,000</b>	<b>318,478</b>	<b>265,709</b>	<b>347,000</b>	<b>325,649</b>
<b>DISBURSEMENTS</b>					
Ads	9,000	8,433	5,622	11,000	8,233
Reprints, Single Copy	700	383	263	1,300	464
Paper, Printing	30,000	26,475	17,650	27,600	35,858
JoR Editorial	45,000	57,845	26,563	46,000	42,550
Production	45,000	46,930	24,750	38,000	42,120
Fulfillment	5,215	6,503	4,128	5,215	5,118
Distribution	23,000	20,304	13,442	20,900	24,627
Electronic publishing	49,500	45,419	30,852	52,000	49,609
Miscellaneous	9,900	9,557	4,566	7,750	18,187
<b>TOTAL DISBURSEMENTS</b>	<b>217,315</b>	<b>221,851</b>	<b>127,836</b>	<b>209,765</b>	<b>226,765</b>
<b>Net</b>	<b>59,685</b>	<b>96,627</b>	<b>137,873</b>	<b>137,235</b>	<b>98,884</b>

## The Society of Rheology

### Receipts and Disbursements

	<u>2015 Budget</u>	<u>2014 Projection</u>	<u>2014 August</u>	<u>2014 Budget</u>	<u>2013 Year End</u>
<b>RECEIPTS</b>					
Dues	48,000	49,305	48,780	47,000	49,305
Interest	1,800	734	574	2,700	1,174
Journal of Rheology	277,000	318,478	265,709	347,000	325,649
Mailing List Sales	0	0	0	0	0
Donations	0	0	0	0	0
Bulletin Advertising	7,200	6,600	6,600	8,000	6,340
Annual Meeting (net)	0	-216	99,448	0	-10,789
Short Course (net)	0	7,896	15,023	0	-6,376
<b>TOTAL RECEIPTS</b>	<b>334,000</b>	<b>382,797</b>	<b>436,134</b>	<b>404,700</b>	<b>365,303</b>
<b>DISBURSEMENTS</b>					
AIP Dues Bill & Collect.	11,000	11,033	7,157	11,000	11,033
AIP Adm. Services	7,500	7,500	0	8,000	7,500
AIP Mem. Soc. Dues	14,000	14,089	9,393	9,000	13,886
Contributions and Prizes	3,000	3,300	3,300	4,000	1,500
Early Career Award	8,500	7,620	120	9,000	15,100
Journal of Rheology	217,315	221,851	127,836	209,765	226,765
Bulletin	17,000	18,464	18,464	18,000	16,836
Bingham Award	15,000	20,700	10,700	10,000	20,000
Executive Cmt. Meetings	15,000	13,841	11,020	18,000	10,710
Pres. Discretionary Fund	1,500	0	0	1,500	919
Treas. Discr. Fund	1,500	500	0	1,500	0
Bulletin Editor Discr. Fund	1,500	3,000	0	1,500	0
Progr. Chm. Discr. Fund	3,000	3,000	0	3,000	1,395
Webmaster Discr. Fund	3,000	3,000	0	3,000	3,000
International Activities Fund	5,000	0	0	5,000	1,313
Office Expenses	1,700	192	192	1,500	1,614
Banking Services	120	0	0	400	0
Liability Insurance	5,600	5,400	1,258	5,500	5,413
Membership Broch. & Appl.	500	0	0	0	62
Accountant	2,300	2,400	2,400	2,400	2,210
Student member travel	30,000	36,000	0	25,000	37,675
Annual meetings, future	4,000	2,925	2,925	6,000	1,076
Website	1,000	0	0	200	819
Miscellaneous	100	0	0	100	0
<b>TOTAL DISBURSEMENTS</b>	<b>369,135</b>	<b>374,816</b>	<b>194,765</b>	<b>353,365</b>	<b>378,825</b>
<b>Net</b>	<b>-35,135</b>	<b>7,981</b>	<b>241,368</b>	<b>51,335</b>	<b>-13,522</b>

# Treasurer's Report

end

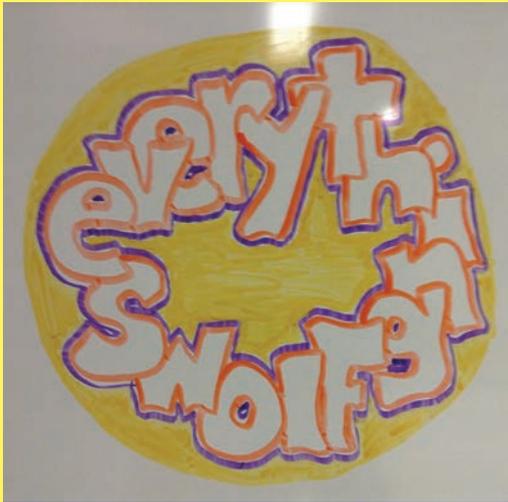
# Philadelphia 2014



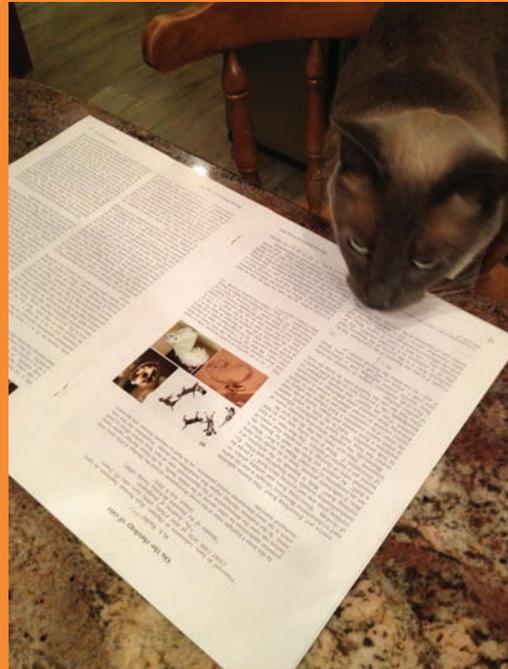
Memories from the 86<sup>th</sup> Annual Meeting. Clockwise from top: Bingham medalists present, (rear) J. Dealy, C. Macosko, R. Larson, G. McKinley, M. Denn, G. McKenna, J. Mewis, J. Brady, G. Fuller, (front) R. Colby, E. Shaqfeh, W. Russel, N. Wagner, A. Acrivos, W. Schowalter; Metzner awardees present, P. Underhill, R. Ewoldt, and J. Rothstein; long-time *JOR* assistant Marcy Fowler at the *JOR* booth; official *Run* photographer and *Bulletin Editor* Faith Morrison with Rheology Run finishers; *JOR* Editor Ralph Colby with 2014 Publication Award winners Roger Bonnacaze, Michel Cloitre, Charlotte Pellet, and Lavanya Mohan.



During the run-up to the Philadelphia SOR meeting, things were "all rheology, all the time" around the University of Delaware, home of Local Arrangments Chair Michael Mackay. So much so that UD staffer Matt Darron penned this white-board tribute to the motto of the SOR, *Everything Flows*. Rheology fever spreads!



There's at least one close reader of the July 2014 *Rheology Bulletin*. Pictured: Obe. Photo credit: Alexander Barbati.



(Calendar, continued from page 28)

## 2016

*June 2016*

Rheological Measurements Short Course, University of Minnesota, Minneapolis, MN USA, Chris Macosko. ([research.cems.umn.edu/rheology/](http://research.cems.umn.edu/rheology/))

*19-22 July 2016*

32<sup>nd</sup> International Conference of the Polymer Processing Society (PPS32), Lyon, France, A. Maazouz. ([www.pps-32.com](http://www.pps-32.com))

*8-13 August 2016*

XVII<sup>th</sup> International Congress on Rheology, Kyoto, Japan, Hiroshi Watanabe (every four years). ([icr2016.com/](http://icr2016.com/))

*21-26 August 2016*

International Congress of Theoretical and Applied Mechanics, ICTAM, Montréal, Québec, Canada. ([iutam.org](http://iutam.org))

## 2017

*11-12 February 2017*

SOR Short Course on Rheology (topic TBA), Tampa Bay, Florida USA.

*12-16 February 2017*

88<sup>th</sup> Annual Meeting of The Society of Rheology, Tampa Bay, Florida USA, Don Baird, Technical Program by Kalman Migler and Anke Lindner.

*April 2017*

10<sup>th</sup> Annual European Rheology Conference AERC2017, location TBA.

*7-8 October 2017*

SOR Short Course on Rheology (topic TBA), Denver, Colorado, USA

*8-12 October 2017*

89<sup>th</sup> Annual Meeting of The Society of Rheology, Denver, Colorado, USA, Matt Liberatore.

## 2018

*13-14 October 2018*

SOR Short Course on Rheology (topic TBA), Houston, Texas, USA.

*14-18 October 2018*

90<sup>th</sup> Annual Meeting of The Society of Rheology, Houston, Texas, USA, Jason Maxey.

*August 2020*

XVIII<sup>th</sup> International Congress on Rheology, Americas (every four years).

*For other meeting notices, see also:*

[www.rheology.org/sor/info/Other\\_Meetings.htm](http://www.rheology.org/sor/info/Other_Meetings.htm)

[www.rheology-esr.org/Meetings.php](http://www.rheology-esr.org/Meetings.php)

[www.appliedrheology.org/](http://www.appliedrheology.org/) (click on conferences)



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# CALENDAR OF RHEOLOGY CONFERENCES AND COURSES

2015

*11-16 January 2015*

Gordon Research Conference on Macromolecular Materials: From Synthesis to Application, Ventura, CA. Michael Mackay and Ronald L. Jones.  
([www.grc.org/programs.aspx?id=12004](http://www.grc.org/programs.aspx?id=12004))

*30 March-1 April 2015*

Institute of Non-Newtonian Fluid Mechanics Annual Conference on Rheology of Structured Fluids, Ruthin, North Wales, Ken Walters.  
([www.innfm.org.uk](http://www.innfm.org.uk)).

*14-17 April 2015*

10<sup>th</sup> Annual European Rheology Conference AERC2015, Nantes, France, Michel Cloitre, Lionel Choplin, Jean-François Tassin.  
([rheology-esr.net/events/aerc-2015-nantes/](http://rheology-esr.net/events/aerc-2015-nantes/))

*24-28 May 2015*

15<sup>th</sup> International Congress of Biorheology and 8<sup>th</sup> International Conference on Clinical Hemorheology, Seoul, Herb Lipowski and Sehyun Shin.  
([isb-isch2015.org](http://isb-isch2015.org))

*7-11 June 2015*

31<sup>st</sup> International Conference of The Polymer Processing Society (PPS 31), Jeju City, South Korea, Jae Wook Lee and Jin Kon Kim.  
([www.pps-31.com/](http://www.pps-31.com/))

*5-9 October 2015*

2nd International Conference on Rheology and Modeling of Materials (IC-RMM2), Miskolc-Lillafüred, Hungary, László A. Gomze  
([www.ic-cmtp3.eu](http://www.ic-cmtp3.eu))

*10-11 October 2015*

Short Course *Active and Passive Microrheology: Theory and Experimental Applications*, by Eric Furst and Roseanna Zia Baltimore, Maryland USA.

*11-15 October 2015*

87<sup>th</sup> Annual Meeting of The Society of Rheology, Baltimore, Maryland USA, Kalman Migler and Jai Pathak. Technical program by Rajesh Khare and Susan Muller.

(continues, page 27)