

Rheology Bulletin

Baltimore 2015



Inside:

- Inaugural class of SOR Fellows
- Morrison Receives Distinguished Service Award
- Shaw Reflects on a Long Career of SOR Service
- Fifth Rheology Career Forum a Success

Executive Committee

(2015-2017)

President

Gareth H. McKinley

Vice President

Norman J. Wagner

Secretary

Albert Co

Treasurer

Christopher C. White

Editor

Ralph H. Colby

Past-President

Gregory B. McKenna

Members-at-Large

Patrick D. Anderson

Maryam Sepehr

Michael J. Solomon

Table of Contents

2015 SOR Baltimore	4
A Foreword from the President: The Past, the Present, and the Future <i>by Gareth McKinley</i>	8
Faith Morrison Receives SOR Distinguished Service Award <i>Profile by Susan Muller</i>	10
Careers Panel highlights breadth of rheology applications <i>by Joseph N. York, AIP</i>	12
Montgomery T. Shaw and The Society of Rheology <i>by Monty Shaw</i>	14
Inaugural Class of SOR Fellows	16
Obituary: Alexei Likhtman	18
News/Business <i>Elections, News, Awards, ExCom minutes, Treasurer's report</i>	19
Events Calendar	28

On the cover:

Baltimore's Inner Harbor was the site and Kalman Migler and his Local Arrangements team were our hosts in Baltimore. The Sunday before sessions, the Education Committee sponsored a K-12 outreach event at the Maryland Science Center. Jonathan Rothstein and his army of helpers greeted scores of visitors and showed them the tubeless syphon, oobleck (cornstarch/water), and many more rheological phenomena.

The *Rheology Bulletin* is the news and information publication of The Society of Rheology (SOR) and is published twice yearly in January and July. Subscription is free on membership in The Society of Rheology. Letters to the editor: rheology@aip.org.

Serial Key Title: Rheology Bulletin
LC Control No.: 48011534
Published for The Society of Rheology by AIP Publishing LLC
(AIPP) a subsidiary of the American Institute of Physics
ISSN: 0035-4538 CODEN: RHBUAU
CALL NUMBER: QCI .R45

The *Rheology Bulletin* is archived at www.rheology.org/sor/publications/rheology_b/issues.htm
and is also available through the *iRheology* app for iOS products.

Committees

Membership Committee (2015-2017)

Gordon Christopher
Cari Dutcher
Jason Maxey, chair
Charles Schroeder
Kelly Schultz
Patrick Spicer

Education Committee (2015-2017)

Ross Clark
Jacinta Conrad
Chris Dimitriou
Marie-Claude Heuzey
Jonathan P. Rothstein, chair
Maryam Sepehr
Johannes Soulages

Bingham Award Committee (2016)

Lynden Archer (2013-2016), chair
James Caruthers (2014-2017)
Eric Furst (2014-2017)
Marie-Claude Heuzey (2013-2016)
Jai Pathak (2016-2018)
William Russel (2016-2018)
Evelyne van Ruymbeke (2014-2017)

Metzner Award Committee (2016)

Roger Bonnecaze (2013-2016), chair
Christian Clasen (2016-2018)
Morton Denn (2013-2016)
George Petekidis (2014-2017)
Patrick Underhill (2016-2018)

Meetings Policy Committee (2016)

Norman Wagner, co-chair (VP)
Andrew M. Kraynik, co-chair
Albert Co (Secretary)
Donald Baird (88th Local)
Kalman Migler (88th Program)
Anke Lindner (88th Program)
Matthew Liberatore (89th Local)
TBD (89th Technical Program)

Nominating Committee (2017)

TBD

Journal Publication Award Committee (2016)

Patrick Anderson (MAL)
Ralph Colby, chair
Jeffrey Morris
Michael Solomon (MAL)

Ad hoc Committee on Electronic Publishing and Open Access Policies (2015-2017)

Ralph Colby (*Editor, ex officio*)
Jeffrey Giacomini
Tom McLeish
Faith A. Morrison
Michael Solomon (MAL)
Roseanna Zia, chair

Ad hoc Financial Committee (2015-2017)

Anne M. Grillet, chair
Montgomery T. Shaw
Chris C. White (*Treasurer, ex officio*)

Fellowship Committee (2016)

Donald Baird (2016)
Ron Larson (2016-2017), chair
Chris Macosko (2016-2018)
Susan Muller (2016-2018)
Hans Christian Öttinger (2016)

Webmaster (2015-2017)

Editor, Rheology Bulletin (2015-2017)

Director, International Outreach Program (2015-2017)

Student Travel Grants Coordinator (2015-2017)

Associations with External Committees/Organizations:

SOR Designee to AIP Governing Board (2015-2017)

SOR Member Representative

U.S. National Committee on Theoretical and Applied Mechanics (2015-2017)

International Committee on Rheology (2012-2016)

AIPP Publishing Partners Committee (2015-2017)

Albert Co

Faith A. Morrison

Gerald G. Fuller

Norman J. Wagner

Faith A. Morrison

Gareth H. McKinley (*ex officio*)

Eric Shaqfeh

Gerald G. Fuller

A. Jeffrey Giacomini,

Gerald G. Fuller

87th Annual Meeting of the Society of Rheology: Baltimore



SOR President Greg McKenna presents the Bingham medal to Hiroshi Watanabe (above). Below, attendees enjoy the Wednesday poster session in the Atrium of the Hyatt.



The 87th Annual Meeting of The Society of Rheology was held in Baltimore, Maryland on 11-15 October 2015. The meeting hotel was the Hyatt Regency Baltimore in the Inner Harbor. The hotel was practically on the water and a very short walk (by skyway) to restaurants, shopping, the National Aquarium, the Maryland Science Center, and other points of interest. The weather was cooperative all week, with blue skies and mild temperatures.

Our hosts in Baltimore were Kalman Migler (NIST) and his local arrangements team: Steven Hudson, Andy Kraynik, Jai A. Pathak (co-chair), Srinivasa Raghavan, and Christopher

White (co-chair). The technical program was the work of Susan Muller and Rajesh Khare, who also arranged for the “Careers in Rheology” event with partners from Dow Chemical and the American Institute of Physics (see page 12). There were 489 registrants, 124 poster presentations, and 266 oral presentations with 37% of attendees from outside the US.

The meeting began the weekend before the sessions with a very busy schedule including K-12 outreach, social events, short courses, and career development. There was really something for everyone. The meeting kicked off with two short courses, which were well attended and received. The two-day course, *Active and Passive Microrheology: Theory and Experimental Application*, was taught by Eric Furst (University of Delaware) and Roseanna Zia (Cornell University). En-

rollment was 19. A second course on *Just-in-Time Beginning Rheology* (a one-and-a-half-day course) was taught by Faith Morrison (Michigan Tech) and Ronald Larson (University of Michigan), and enrollment was 16.

Sunday was the second day of the short courses, and there were numerous other activities in addition. Following up on the successful outreach event in Philadelphia, the Education Committee once again wrangled volunteers to spread the joy of rheology to the under 14 crowd. The event was held at the Maryland Science Center from 1 - 4 pm. As before, the SOR provided hands-on

Many, Many Thanks to our Sponsors!

Gold Level

TA Instruments
**National Institute of Standards
and Technology (NIST)**

Silver level

ExxonMobil
MedImmune

Event Sponsors

Anton Paar USA (*sponsor of the
Poster Session Reception*)

TA Instruments (*host of the Wel-
coming Reception*)

Xpansion Instruments (*sponsor
of the Award Reception*)

Formulation (*sponsor of the
Monday and Wednesday
Plenary Lectures*)

**Dow Chemical and the Ameri-
can Institute of Physics
(AIP)** (*Sponsors of "Ca-
reers in Rheology"*)



A nearly complete set of Metzner Early Career Awardees assembled. Front: Suzanne Fielding, Anson Ma, Charles Schroeder; rear: Jonathan Rothstein, Randy Ewoldt, and Patrick Underhill. Unable to attend: Richard Graham.

SOR volunteers explain the tubeless syphon to visitors—the red fluid is being drawn from the reservoir even as the tip is raised several centimeters above the free surface.





Recipients of the Society of Rheology Distinguished Service Award assembled. Front: Monty Shaw, Gerry Fuller, Faith Morrison, Albert Co; rear: Mort Denn, Andy Kraynik.

demonstrations aimed at children and adults. Jonathan Rothstein was in charge of more than 30 volunteers who enjoyed sharing their passion with the visitors.

A networking panel on “Careers in Rheology” was organized for 4-6pm Sunday by the Technical Program Committee with support from the American Institute of Physics and Dow Chemical Company. The forum featured a panel of scientists representing industry and US national labs. Panelists each gave a brief talk on using rheology in the commercial sector, their careers in rheology, and the role that rheology plays in their company’s products and processes. A reception was held after the panel discussion on the top floor of the Hyatt at the Pisces lounge. For more on this event, see the article on page 12.

Sunday was also when the ASTM-E37.08 Subcommittee on Rheology met (3-4pm; see page 21), and of course, Sunday was when attendees enjoyed the Annual Meeting Welcoming Reception (6:30-8:30pm). There was certainly no reason to stay in your room on Sunday, with so many interesting events to choose from.



Editor Ralph Colby presented the Journal of Rheology Publication Award to Romain Mari, Jeff Morris, and Mort Denn at the banquet in Baltimore. They received the 2015 award for their paper "Shear thickening, frictionless and frictional rheologies in non-Brownian suspensions," coauthored with Ryohei Seto, who could not attend. The cited article, along with all Publication Award articles, is posted open access at the JOR website: J. Rheol. 58, 1693 (2014); <http://dx.doi.org/10.1122/1.4890747>.

The technical portion of the meeting began on Monday with a plenary Lecture by Jan Vermant (ETH Zürich). Monday evening featured a special reception at the National Aquarium, one of the top aquariums in the country. Tuesday brought the Bingham lecture by Hiroshi Watanabe (Kyoto University), the lively Society Business Meeting (approximately 100 attendees), the Bingham Award Reception, and the much anticipated Awards Banquet, which featured the roasting of Hiroshi Watanabe by Tim Lodge (University of Minnesota).

Wednesday’s technical sessions were led off by the plenary of Mark Robbins (John Hopkins University, Department of Physics and Astronomy), and the day was capped off by the Poster Session and Reception.

The final day of the meeting included the technical presentation by the 2015 Metzner Award recipient Anson Ma (University of Connecticut).

The Exhibits were well attended Monday through Wednesday in the Constellation Ballroom AB where the coffee breaks were also held. A great meeting! Thanks to the local arrangements and technical program teams for a job well done.



Anton Paar

YES



MCR rheometers give you countless options for the future.

Here's another: With an **Evaporation Unit** connected to your MCR, you can control the temperature around your sample down to a minimum of $-150\text{ }^{\circ}\text{C}$.

MCR. Your future-proof rheometer.
www.anton-paar.com/temperature-control

A Foreword from the President

The Past, the Present, and the Future

Gareth McKinley, MIT
President, Society of Rheology 2015-2017

One hundred years ago, in 1916, a young scientist at the National Bureau of Standards published a long paper as *Scientific Report Number 278* “An Investigation of the Laws of Plastic Flow”¹ in which he notes in the introduction that “the property of plasticity, like ductility and malleability is not at present strictly definable...” With these words of Eugene Bingham, and the accompanying pipe flow experiments described in his report, the science of rheology in this country began (even though this branch of science, like the term ‘plasticity’, was not yet strictly definable)! At the very end of his 1916 paper, Bingham concludes “Any substance which requires a shearing stress of finite magnitude to produce permanent deformation is plastic,” and so also began the debate regarding ‘is there (or isn’t there) a yield stress?’

A little more than a decade after Bingham’s 1916 paper appeared, The Society of Rheology was formally constituted and our first annual meeting took place at the US Bureau of Standards in Washington D.C. on December 19/20, 1926, exactly 87 years prior to the date I am writing this note. As we begin to approach our centenary, I want to ensure that the history of the Society’s first century and the unique contributions of our predecessors are suitably preserved. Bingham wrote a wonderful historical note² regarding the first 20 years of rheological activity (1924-1944) which is preserved in the Society’s records at the Niels Bohr Library & Archives



at AIP’s Headquarters in College Park, MD, and we will shortly make a PDF of this available on the SOR website. While exploring those archives, I also stumbled upon a number of oral history recordings (with rheological giants from our early years such as George Scott Blair, Herman Mark and John Dillon) that were undertaken by P. Sherman, R. S. Marvin, H. Markowitz and other colleagues in the late 1970s as the Society approached its golden anniversary in 1979. Nothing was formally published from these recordings, but I hope that we will be able to make them more accessible to interested readers in the near future through a History Portal³ that we will be developing and launching on The Society of Rheology website in 2016.

- *Approaching our Centenary*
- *Treasure trove of Oral Histories at Niels Bohr Library (AIP)*
- *Giacomin designated SOR Historian*

As we look towards our centenary year, I have also asked A. Jeffrey Giacomin (Queens University) to serve in an *ad hoc* capacity as the official Historian of the Society, and we will be beginning efforts to collect and preserve the memories of senior leading rheological scientists and engineers who helped the society get to where it is today. Your ideas and input on different ways we can best preserve our history are welcome. One idea that I have often thought would be nice is to have a rheometry museum. The sheer physical size of

The SOR logo has been revised recently to include a better-rendered version of the Greek motto of the Society, "πάντα ῥεῖ: Everything Flows." Jeff Giacomini (Queens University) has had a long-standing interest in improving the logo, and with coauthor Antony Beris (University of Delaware) has published several notes on the topic (see *J. Rheol.* **59**, 473 (2015) and references therein).



early instruments and the cost of real estate makes an actual museum space impractical. However, a virtual museum or online 'petting zoo' with images of instruments, their specifications and a few key references, that could be updated and edited wiki-style by Society members would be a wonderful addition, if any reader of this note, or historian of the science of rheology were so inspired. Howard Barnes, together with Derek Bell (of Carrimed, and subsequently TA Instruments) made an excellent start to this topic in a review of Controlled Stress Rheometers.⁴

Kurt Vonnegut (who's own brother was arguably an experimental rheologist⁵) noted that "if you investigate the history of science, ... I think you'll find that most of the really big ideas have come from intelligent playfulness," and for those of you who know me, this certainly embodies my approach to science broadly and to rheology more specifically. I hope everyone who reads the *Bulletin* and joins the Society continues to retain their own sense of intelligent playfulness. Despite the complexity of many of the molecular theories and frame-invariant equations of state we use to describe the materials we study, rheology remains both a visual and tactile science, with abundant adjectives such as 'sticky' and 'slimy' to describe the materials we seek to understand and describe. The recent outreach activities pioneered by

our Education Committee and the excited faces (and sticky fingers) of the young attendees vouch for the excitement that



In 2004, Tomas Co (Michigan Tech University) drew a sumi ink version of the SOR Hourglass; this version appears often in the *Bulletin*. Although not a rheologist, Co gets plenty of exposure to rheology through his wife, *Bulletin* editor Faith Morrison (also Michigan Tech University).

accompanies experiments with rheologically-complex materials. The rapid explosion of the Soft Matter groups in the physics and chemistry communities over the past decade also speaks to the large academic and industrial interest in such systems. For those of you who have read (or seen) Andy Weirs' *The Martian* (Crown, 2014), you might note to colleagues that both of the key single-point failures that threaten Mark Watney's survival involve the mechanical response of soft materials.⁶ The Society of Rheology is the natural venue for studying and learning about such systems; our *Journal of Rheology* continues to feature high impact articles, thanks to the efforts of the Editor and the peer reviewers, and the *Rheology Bulletin* remains a great venue for exchanging short ideas and informal articles about emergent topics of interest. The membership's recent approval of our first dues increase in over 20 years will enable us to continue all of these activities, and the Executive Committee thanks you all for your vote of support. As we approach the last decade of our first century, I look forward to hearing from you by email or at our upcoming Annual Meetings with emerging issues of importance or concern as well as with ideas for properly celebrating our centenary in 2029. We would especially like to receive copies of any items that might be of historical significance to the Society (e.g. programs/bulletins from very early meetings or photographs of Society events, Bingham banquets etc.—the first picture of any Society event that we have seems to be of the 1948 Annual Meeting).

Notes

1. A precis of this report was also published as: Bingham, E.C. "Plastic Flow," *J. Franklin Institute*, **181**(6), 845-848 (1916).
2. Bingham, E. C., "The History of the Society of Rheology from 1924-1944," Niels Bohr Library & Archive (NBLA).
3. See www.aip.org/history-programs/niels-bohr-library/oral-histories.
4. Barnes, H., Bell, D. "Controlled Stress Rotational Rheometry: An Historical Review," *Korea-Aust. Rheology J.* **15**(4), 187-196 (2003).
5. Bernard Vonnegut developed an instrument (now usually known as a 'spinning drop tensiometer') and an approximate analysis for measuring very low interfacial tensions between two immiscible materials (e.g. two polymer melts or solutions); Vonnegut, B., "Rotating Bubble Method for the Determination of Surface and Interfacial Tensions," *Rev. Sci. Inst.* **13**(1), 6-9 (1942).4.
6. Thanks to Will Hartt, a fellow Sci-Fi fan, for pointing this out to me.

Faith A. Morrison Receives SOR Distinguished Service Award

by Susan Muller, University of California, Berkeley

In a surprise presentation by SOR President Greg McKenna at the Bingham Banquet in Baltimore, Maryland, the Distinguished Service Award of The Society of Rheology was bestowed on Faith A. Morrison of Michigan Technological University. Faith is the tenth recipient of this award, which is given infrequently at the discretion of the Executive Committee in recognition of exceptional service to the Society. The announcement was greeted with a thunderous round of applause, as everyone in the banquet room had no doubt noticed Faith's dedicated, ubiquitous, and admirable service to the Society.



Faith began her formal service to SOR as chair of the *ad hoc* Committee on Constitutional Reform in the late 1990's and then as chair of the Membership Committee from 1999-2003. Faith was elected Vice President from 2007 to 2009, President from 2009 to 2011, and Past President from 2011 to 2013.

Perhaps Faith's most lasting legacy to the Society began in late 2003, when she followed Rakesh Gupta as editor of the *Rheology Bulletin*. The January 2004 issue boasted a completely revamped format and color printing. The *Bulletin* quickly expanded from around 12 to 24 to 32 pages, and now includes articles of general



interest to members, such as "Biofluid Rheology," "Fun with Bubbles," and "Dimensional Analysis of Free Surface Flows." Through the *Bulletin*, Faith also introduced a rich photographic legacy to the SOR, including the annual group portraits of Bingham medalists and Metzner awardees, and an extensive archive of candid photos from plenary lectures, banquets,

receptions, and poster sessions. A measure of how indispensable we now consider this photographic record – and Faith as photographer – was apparent when Greg had to recruit a volunteer to document Faith's receipt of the Distinguished Service Award and, subsequently, her induction into the Society's Inaugural class of Fellows.

In addition to her continuing service as *Rheology Bulletin* editor, Faith currently serves the Society as SOR Designee to the AIP Governing Board and is a vigorous and articulate participant in SOR business meetings.

She has taught several rheology short courses and is the author of the popular rheology text *Understanding Rheology* (Oxford, 2001) and the recent *An Introduction to Fluid Mechanics* (Cambridge, 2013). She maintains an active online teaching presence through iTunesU, where her rheology course can be watched in its entirety, and through her YouTube channel "DrMorrisonMTU."

Faith received her BSE in Chemical Engineering from Princeton University in 1983, and her PhD in 1988 from the University of Massachusetts, Amherst, where she studied under Henning Winter. Following postdoctoral research at AT&T Bell Laboratories and École Supérieure de Physique et de Chimie Industrielles de la Ville de Paris (ESPCI), Faith joined the faculty of Michigan Technological University, where she is now full professor. Faith has received numerous teaching awards at Michigan Tech and has spent sabbaticals at 3M, Korea University, and Princeton University. She and her husband Tom Co (also a professor of chemical engineering, and an artist who designed the ink wash version of SOR's hourglass logo), run an informal film series for friends, and enjoy travel, hiking, winter sports, and fine dining.



Faith and her husband Tom hiking in Michigan's Keweenaw peninsula.



Touch Screen Simplicity

*Viscosity Measurement and
Yield Stress Determination
at Your Fingertips*

DV3T™ Rheometer

*For results in a
whole new light!*

Full color display
for easy viewing

New capabilities for control
and programming

Perfect for QC and R&D

Controlled user access
and secure data integrity
complies with 21 CFR Part 11



Careers Panel highlights breadth of rheology applications

Joseph N. York
Manager, Industrial Outreach
American Institute of Physics

Planning a career is often scary, confusing, and a lot to handle as an individual. To describe it scientifically, the process inherently collapses your wave function of possibilities—future versions of you—because every decision eliminates (at least momentarily) other options from existing. This cascading effect of action-reaction ideally leads to one happy ending: your career as a(n) [insert professional title here].

Career planning for scientists—especially those who go into non-academic employment sectors—is even harder than for most graduates because scientists lack many of the support structures other academic majors have:

1. A broadly connected network (intra and inter) of teachers, alumni, career counselors
2. Well-defined and focused set of skills
 - A strength of scientists is their adaptability, but lacking a focused skill set can be a weakness if an employer cannot envision the possibilities
3. A working knowledge of transferrable and communication skills
 - Highly gifted individuals often lack the ability to identify or effectively communicate their skills or usefulness

To address the needs of early career scientists (and aspiring scientists), the American Institute of Physics works closely with its Member Societies to create venues and events that provide peer and mentor guidance and support for students and early career employees. The most recent collaboration took place 11 October 2015: The Society of Rheology and AIP hosted an industrial outreach panel at the 87th Annual Meeting of the SOR in Baltimore, MD. The session and reception that followed were cosponsored by AIP and Dow Chemical Company.



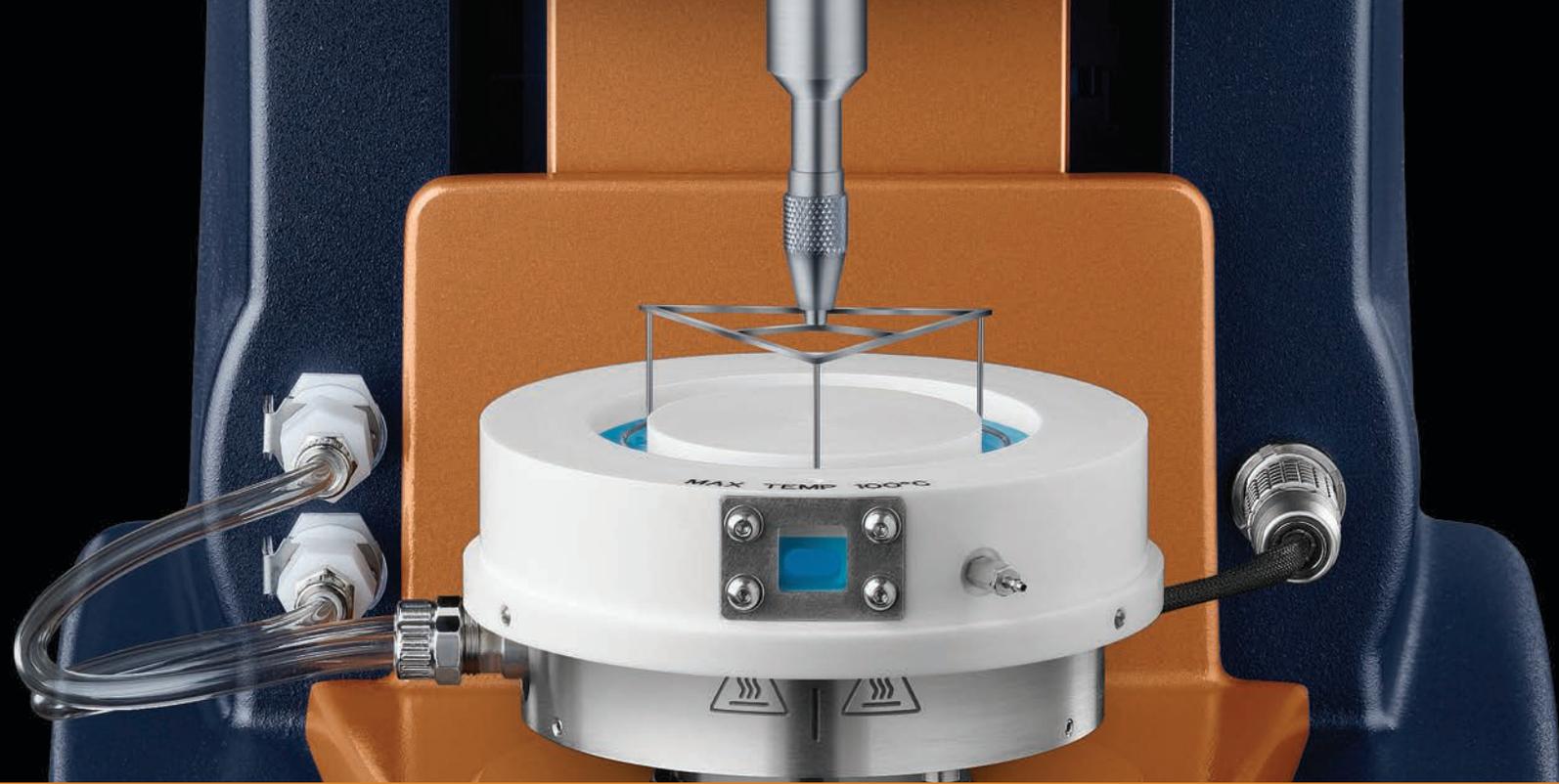
The five-person panel discussion, themed *Careers in Rheology*, focused on the use of rheology in the commercial sector, and participants included research scientists and engineers at various stages of their careers. The panelists shared experiences illustrating how rheology affects their jobs and their company products and processes. Along with Dow, the panel included representatives from NIST, ExxonMobil, DuPont, and Sandia National Laboratories.

The *Careers in Rheology* panel attracted 63 attendees, with a nearly even male–female ratio. The overarching message was that rheology is very useful due to its many applications and opportunities in the public and private sectors. As an example, rheology is a key component to marketing because it ensures the success of favorable consumer experiences with products like shampoos, conditioners, soaps, and toothpastes. The look and feel of a product are highly important to consumers, and the consideration of rheology in preparing these products for market helps to achieve customer satisfaction.

Following the panelists' introductory comments about their diverse careers using rheology, a Q&A session yielded many engaging exchanges. One student asked about how she should direct her job search in terms
(continues, p27)



Bo Hammer of AIP introduces the *Careers in Rheology* panelists. The session was moderated by Gerry Fuller of Stanford University (standing, at right) and largely attended by students.



Discover More Rheometer Versatility

The Discovery Hybrid Rheometer combines the most accurate rheological measurements with the most extensive line of easy-to-use environmental systems and accessories, ensuring you have the right rheometer for every job.

Accessories

- Axial DMA: Tension, 3-Point Bending, Cantilever and Compression
- Tribology
- Magnetorheology
- Microscopy including Counter-Rotation
- Interfacial
- Small Angle Light Scattering
- Electrorheology
- Dielectric
- UV Curing
- Extensional Viscosity
- Pressure Cell
- Starch Pasting Cell

Environmental Systems

- Standard Peltier Plate
- Stepped Peltier Plate
- Disposable Peltier Plate
- Extended Range Peltier Plate
- Peltier Concentric Cylinders
- Upper Heated Plate
- ETC Oven
- Electrically Heated Plates



Thanks for 18 years as Treasurer Monty!

The Society of Rheology is kept afloat by the hard work of its volunteers. Presidents serve on the Executive Committee for six years: vice president for two, then two years at the helm, and a final two years as past-president. Editors serve at least this long, often longer, ensuring the quality of our Journal (R. R. Meyers, 21 years; Art Metzner, 11 years; Mort Denn 10 years; John Brady 6 years; Ralph Colby 4 and still going). The longest serving officers historically have been the secretary and the treasurer. Our recent secretaries have served for 10 years (Andy Kraynik 10 years, Jeff Giacomini 10 years, Albert Co 6 years, and continuing) and our treasurers for longer. As Monty Shaw notes in his reflections here, his predecessor Ed Collins served for 24 years and Shaw served for 18, stepping down in October 2015.



It is impossible to overstate the value brought by all these volunteers, especially the ones of long-standing (including our webmaster Albert Co, who has now served us for 20 years in this capacity). Monty has kept our books, gotten our taxes filed, remembered our policies from one ExCom meeting to another, and personified the oh-so-necessary fiscal conservatism that has greatly contributed to the Society's enviable solvency. We bid Monty farewell from his duties, but we'll count on seeing him at meetings and receiving his counsel for many years to come. We asked him to reflect on his association with SOR; here he is in his own words.

Faith Morrison, Editor, Rheology Bulletin

Montgomery T. Shaw and The Society of Rheology

by Monty Shaw (University of Connecticut)

I got started with the SOR in the early 70's at the invitation of John Miller and Duane Marsh, while working at Union Carbide in Bound Brook, NJ. Having been recently graduated from the Tobolsky group (Arthur Tobolsky, Princeton University), I guess they figured I was destined to be the next company rheologist. In fact, I knew very little about rheology; I was more interested in polymer mixture thermodynamics at the time. But both John and Duane were quite influential and persuasive people, so I "agreed" to get involved. My first SOR meeting was "October 28-31, 1973 - Sheraton-Mount Royal Hotel, Montreal, Quebec, Canada." (That's straight from the website.) I think it was at this meeting that there was a special panel discussion on rheology problems in industry. John Miller presented one of the discussions; his talk concerned the inability of Union Carbide to get the weight of a milk bottle down in spite of having resins that were rheologically "identical" to those of the competition. This was, in fact, an important lesson: rheology can't solve all flow problems and can't even start on others. Anyway, I thought this type of discussion was quite neat, fun, and useful; it also eradicated my initial impression that the SOR was just a place to argue the merits of constitutive equations. Also, it was quite interesting that the meeting extended to include Halloween, although it was nice to learn this wasn't a requirement.

According to the record, John Miller was Secretary (and Treasurer!) from 1962 to 1965, and "just" Secretary from 1966 to 1973. In 1977 he was on the Nominating Committee, and so it was not too surprising to be asked to run for Secretary. The really surprising thing was winning the election! (I can't remember who the opposition was, and I am not anxious to find out.) Anyway, my SOR career was launched.

Following a few committee assignments [Member at Large (2 years), Program Chair in 1990 for Santa Fe, Bingham Awards Committee (3 years), Nominating Committee (1991), Education Committee (1995), Representative to AIP Education Policy Committee], President Bob Armstrong approached me with a new assignment: *JOR* Associate Editor, Finances. My job, clearly enough, was to keep track of the *JOR* finances. At the time, the *JOR* was a very fat cash cow, so it seemed like an easy job.

Recent Service History

JOR Editor

Metzner 1984-1995
Denn 1995-2005
Brady 2005-2011
Colby 2011-present

Treasurer

Collins 1973-1997
Shaw 1997-2015
White 2015-present

Secretary

Kraynik 1989-1999
Giacomini 1999-2009
Co 2009-present

Webmaster

Co 1995-present

Bulletin Editor

Gupta 1994-2003
Morrison 2003-present

Little did I know that the then Treasurer Ed Collins was taking the opportunity to train me to take over as Treasurer. When working up the *JOR* budget was added to the job description, I started to see the plan (I am really a very naïve person).

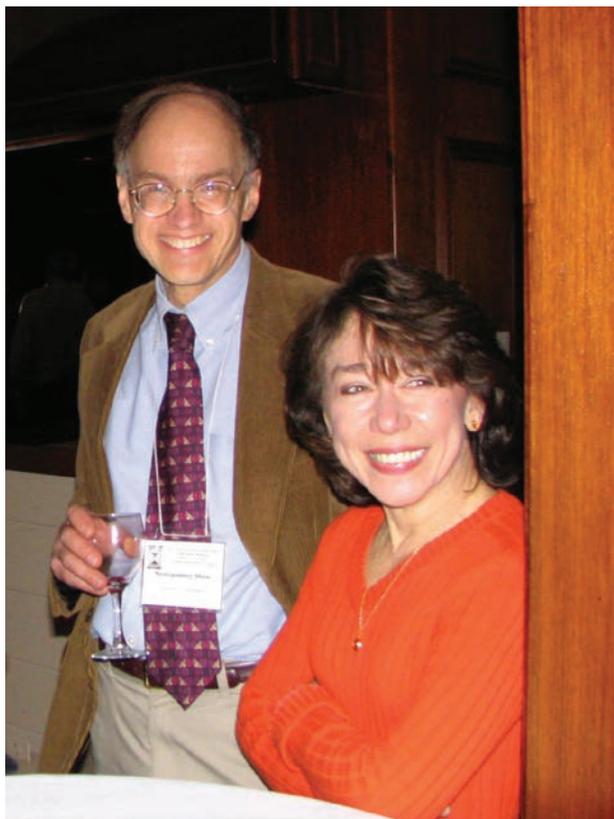
More, much more, should be said about Treasurer Ed Collins. He was *ex officio* member of every committee that had anything to do with money, so it is not an exaggeration to say he ran the Society. This he did for 24 years, which is a huge contribution, but could get tiring. Anyway, the inevitable transition was less trying than I expected. The Treasurer's records were limited to 3 banker boxes, including one very important single sheet: all the key numbers. After the 1997 Fall meeting, Ed closed his account in the Elyria Savings and Trust in Ohio, sent me a check for \$8023.28 along with useful advice, e.g., never use your own social security number even when the banks insist. They did, and I didn't, helped along by our Federal Tax ID. Anyway, I was on my own trying to analyze the recent Columbus meeting and pay the bills. Well, not quite on my own; I was aided by my accountant wife, Maripaz, who provided advice such as "be consistent." Of course, this implies that

procedures were correct in the first place, a questionable assumption at times for amateur volunteers.

Life always gets more complicated in spite of one's efforts to simplify. For example, Student Travel Awards are designed to get students to the Annual Meeting in one piece. To avoid the scenario of a SOR-funded van loaded with students careening off the road, we limited reimbursement to public transportation. Does that include rental vans? So, my solution was to instead limit reimbursement to 4 nights in the conference hotel. No checks to make out—or stop payments in case of loss—and the rooms booked by the students helped the SOR to meet the required guest-room pickup. Furthermore, the students would meet more of the rich and famous of the rheology world, because such never settled for a half-priced Hampton Inn a block away. This all works quite well except in cases where there is no single meeting hotel; then where do the students stay? The cheapest block of rooms? Anyway, in 1997, student travel costs were \$7,178 for a two-meeting year; in 2013 they were \$37,675 for our latest two-meeting year. In spite of these grim numbers, the students should not be relegated to the cheap seats; they are the future.

Another complication of modern life for an international organization is using money for the benefit of non-US persons. Here we get mixed up in international treaties, and such. Ever heard of a W-8BEN? Neither had I! With help from folks at the American Institute of Physics (AIP), we learned that is was what nonresidents had to fill out if the SOR paid them. It's like a W-9 for nonresidents, except that the instructions are impossible for humans with PhDs to understand. Like a W-9, it's not sent to the IRS, nor is it used for much of anything except to ascertain that the BENeficial Owner resides in a treaty country. Apparently, very few rheologists reside in non-treaty countries.

In short, one surprise after another, one learning experience after another. If the trend continues, the finances will need to be handled by a professional contractor. In the meantime, we have been fortunate to engage a volunteer professional, Chris White. Chris is our new Treasurer and is already hard at work probing the depths of the *JOR* business. When Wiley was the publisher, Wiley told us how much the *JOR* earned and that was that. Now with AIP-Publishing (AIPP) in charge, the problem may be too much information. It doesn't stop with understanding the information; the next step is what to do about income and expenses to keep the *JOR* solvent. And more importantly, can all this be done with volunteers alone? Let's hope so.



In addition to giving accounting advice to the treasurer, Monty's wife Maripaz brightens SOR social functions during most annual meetings.

Inaugural class of SOR Fellows

In July 2015 The Society of Rheology created the status of Fellow of the Society. The purpose of the creation of the Fellowship status is to recognize members of The Society of Rheology who have a history of distinguished scientific achievement, a significant technological accomplishment, and/or outstanding scholarship in the field of Rheology. A record of continued service to the Society is also an important component to Fellowship status. SOR members in good standing for at least 8 years are eligible for the award.

The process for identifying the inaugural class of fellows was specified by the Executive Committee's resolution as follows. Excluding current members of the Executive Committee, the inaugural class included all those who had served as President, Secretary, Treasurer, or Editor of the Society, as well as all Bingham Medalists. Current members of the Executive Committee are eligible to become Fellows two years after leaving the committee. The initial class numbers 36 members.

Additional fellows will be added to the status through the Nomination Procedure for Fellows. A Fellowship nomination packet is submitted containing: (1) a nomination letter, (2) one supporting letter, (3) a two-page description of contributions to rheology, and (4) a CV. All nominations and supporting documents are to be submitted to the Fellowship Committee Chair by 1 April 2016. The current Fellowship Committee Chair is Ron Larson (University of Michigan, rlarson@umich.edu).

The total number of Fellows in the Society will not by design exceed 5% of the membership; at most 0.5% of the membership may be offered fellowship in any given year. Fellows at the age of 75 years automatically become Fellows Emeriti. This is still a status of Fellow but does not count against the 5% limit on the total number of Fellows in the society.

Congratulations SOR Fellows!



Present in Baltimore, members of the first class of Society of Rheology Fellows. Front: Susan Muller, H. Henning Winter, Eric Shaqfeh, Hiroshi Watanabe, Hans Christian Öttinger, Don Baird, Ron Larson. Rear: Masao Doi, John Brady, Bill Schowalter, Mort Denn, Gerry Fuller, John Dealy, Chris Macosko, Faith Morrison, Andy Kraynik. A listing of all 36 SOR Fellows is available on the Society website at www.rheology.org/sor/Fellowship/.

AIP Media Team Covers Baltimore Meeting



The screenshot shows the 'INSIDE SCIENCE' logo with the tagline 'Reliable news for an expanding universe'. Below the logo is a navigation menu with items: News Articles, Videos, Guest Columns, Blog, Browse Topics, About Us, Subscribe, and Under. The article date is 'Thursday, December 03, 2015'. The title of the article is 'Bread Rises And Falls With Gluten'. Below the title are social media sharing buttons for Facebook (Like), Twitter (Share), and Google+ (G+). A large image shows hands kneading dough on a wooden rolling pin. Below the image is the text: 'Image credit: Africa Studio via shutterstock | http://shutr.bz/1ZITlOb'. Below that is the sub-headline: 'But starches could mask bad dough.' At the bottom, it says 'Originally published: Oct 16 2015 - 10:30am'.

The AIP media team wrote press releases on three of the contributed papers presented at the 2015 SOR meeting. "The Savory Secrets of Baked Bread" and "Spider Man Science: Tunable Web Glue and Smart Adhesives" enjoyed international pick-up; and "Microscopic View of Coughed-Up Mucus may be New Biomarker for Cystic Fibrosis Progression" was reposted to a number of online sources (see links below). The first of these releases was also covered by Inside Science (above).

www.newswise.com/articles/the-savory-secrets-of-baked-bread

www.newswise.com/articles/spider-man-science-tunable-web-glue-and-smart-adhesives

www.newswise.com/articles/microscopic-view-of-coughed-up-mucus-may-be-new-biomarker-for-cystic-fibrosis-progression

Alexei Likhtman 1971-2015

On 11 October 2015, Alexei Likhtman, 44, rheologist and professor in the Department of Mathematics and Statistics at the University of Reading, UK, died after a fall while hiking the weekend before the 87th Annual Meeting of The Society of Rheology. Likhtman, an enthusiast for hiking, climbing, and other outdoor activities, tripped while visiting Annapolis Rock, part of the Appalachian mountain trail system, 35 miles west of Baltimore. Likhtman was hiking with his graduate student and colleague; he was scheduled to present at the SOR meeting on Monday.

Likhtman was born in Moscow and moved to the UK in 1998. Likhtman worked as a lecturer at the University of Leeds between 1999 and 2007 where he collaborated with Tom McLeish. McLeish wrote a scientific tribute to Likhtman in the Guardian (www.theguardian.com/science/2016/jan/07/alexei-likhtman-obituary).

When McLeish was profiled in the *Rheology Bulletin* on the occasion of the presentation of his Bingham medal (July 2010), his profiler Ron Larson credited McLeish as someone who “knows how to spot, attract, and cultivate, talent,” and as evidence, Larson cited McLeish’s collaboration with Alexei Likhtman, whom Larson described as a “brilliant theorist.”

Likhtman’s accident was reported to the organizers of the Baltimore SOR meeting, and the next day at the opening session, an announcement was made and the assembled rheologists offered a minute of silence in tribute to their fallen colleague. On the final day of the conference (Thursday, noon) Likhtman collaborator Dimitris Vlassopoulos gave the last talk of the meeting. Baltimore meeting organizer Kalman Migler was present and reported that the “room was full because people whose sessions had already ended migrated over to his session. Dimitris put up a picture of Alexei and talked about his grief at the passing of his friend. It was a fitting way to end the meeting.”

Likhtman was part of a large interdisciplinary team that was awarded the *JOR* Publication Award for 2006. The paper, “Contraction flows of monodisperse linear entangled polymers: Multiscale modeling and flow visualization,” *J. Rheol.* **49**, 501-522 (2005), discusses a comprehensive set of experiments that seeks to link molecularly based model calculations to observed polymer behavior. Extensive experiments were performed in a complex flow cell (the Multipass Rheometer), and birefringence measurements were favorably compared with calculations made with the tube-based model of Likhtman and Richard Graham (*JNNFM*, **114**, 1, 2003). The results allowed the authors to differentiate between flow effects that arise from chain orientation and those ef-



Alexei recognized for the 2005 *JOR* Publication Award at the Portland, ME SOR meeting: Left to right, *JOR* Editor John Brady, Alexei Likhtman, and Oliver Harlen.

fects that are due to stretch (see *Rheology Bulletin* July 2006 for more on the article). At the Portland meeting in October 2006 *JOR* Editor John Brady presented the *JOR* Publication Award to representatives of the winning team, including Alexei Likhtman (photo above).

In the Guardian obituary, McLeish called Likhtman “a leading scientist” whose simulations sought to understand polymer entanglements and “showed how to ‘see’ these structures in simulations, in ways that avoided obscuration by irrelevant detail, and produced powerful design tools for industry.”

Likhtman received a diploma in physics with honors from Moscow State University in 1994, and subsequently took a PhD at the same institution. He married Katrina Belotserkovskaya in 1990, and they had two daughters, Sonya and Asya. In 1998 Likhtman arrived at Leeds as a research assistant in the Department of Applied Mathematics, moving the following year to the Department of Physics and Astronomy. His research focused on the physics of fast polymer flow and appearing in high quality journals, including the *Journal of Rheology*.

McLeish reports “Alexei strove to make his science accessible to others, creating a free software tool that enabled scientists in universities and industry to analyze polymer data, greatly accelerating research and its application.”

In 2007, Alexei moved to a chaired position in the department of mathematics and statistics at the University of Reading where he was also the departmental director of postgraduate research studies.

Tom McLeish said at Alexei’s standing-room-only funeral in the UK that he was one of those special scientists who remind the rest of us that just because an idea

(continues page 27)

Society Business



NEWS

New Officers Announced in Baltimore

The following members have been elected to serve as officers of The Society of Rheology for 2015-2017:

President:	Gareth H. McKinley
Vice-President:	Norman J. Wagner
Secretary:	Albert Co
Treasurer:	Christopher C. White
Editor:	Ralph H. Colby

Members-at-Large:
(in alphabetical order)

Patrick D. Anderson
Maryam Sepehr
Michael J. Solomon

The official announcement was made at the 87th Annual Meeting in Baltimore, Maryland.

Constitutional/Rules Vote: Results

Dear SOR Member:

In my formal capacity as Secretary of The Society of Rheology, and in accordance with Article VIII of our rule, this is to certify approval of the ballot to the Membership. Both the Constitutional Amendments on Officer Terms and the Rule Amendments on Membership Dues passed. The result was certified by David Baker of AIP on 11 December 2015. The tallies are as follows:

Constitutional Amendments on Officer Terms
(required 2/3 vote)
Yes 451; No 14

Rule Amendments on Membership Dues
(required majority vote)
Yes 295; No 170

The amendments are now incorporated in Section 4 of ARTICLE IV - Officers and Executive Committee - of the Constitution of the Society and in Section 1 of ARTICLE III - Dues and Privileges - of the Rules of the Society. See www.rheology.org/sor/info/Constitution.htm.

Sincerely, Albert Co
SOR Secretary and Webmaster



Announcement on XVIIth Congress on Rheology Kyoto 2016

Dear Fellow Rheologists,

The abstract submission for the XVIIth International Congress on Rheology, Kyoto, Japan, 8-13 August 2016, is now open. Please visit the Congress website at icr2016.com/index.php?ICR2016.

Important dates:

- Abstract submission for oral presentations ends 15 March 2016
- Abstract submission for posters ends 15 April 2016
- Early bird registration ends 15 March 2016

We look forward to seeing you in Kyoto this August.

Best regards from the
Organizing Committee of Kyoto 2016

SOR Student Travel Grants in the Works for Kyoto

The Executive Committee has approved the awarding of student travel funds for the International Congress on Rheology in Kyoto, Japan (ICR2016) through its

Student Meeting Travel Grant Program and is presently discussing how to implement this support with the ICR Organizers. In 2012, 36 students received grants paying for six nights in a conference hotel in Lisbon; it is proposed that the 2016 program be similar.

Only those presenting students who are SOR members as of 1 January 2016 and whose advisors are also SOR members by the same date will be eligible for the program. The funds available will be limited. In addition to helping students attend the International Congress, this program seeks to attract students to join the Society. More details of the program as well as instructions for applying will be published on the SOR website.

Best Student/PostDoc Poster Award Recipients Announced in Baltimore

The Society's Best Student/PostDoc Poster Prizes have been awarded annually since 2001 and 2009, respectively, to a student or postdoctoral researcher selected by a panel of judges at the Poster Session of

the Annual Meeting. The Society of Rheology sponsors the student poster competition to encourage student presentations and participation in the meeting and to recognize excellence. The recipients at the 87th Annual Meeting were:

1st place, Postdoctoral Category: **Gregg A. Duncan**, Johns Hopkins School of Medicine, "Altered sputum microstructure as a marker of airway obstruction in cystic fibrosis patients," with coauthors James Jung, Michael P. Boyle, Natalie E. West, Jung Soo Suk, and Justin Hanes.

1st place, Student Category: **Fawzi G. Hamad**, Pennsylvania State University, "Flow induced crystallization of isotactic polypropylene," with coauthors Ralph Colby and Scott Milner.

2nd place, Student Category: **Bruna Costa Leopércio**, Pontifícia Universidade Católica-RJ, Rio de Janeiro. "Kinetics of cyclopentane hydrate formation analysis through interfacial rheology," with coauthors Paulo R. de Souza Mendes and Gerald Fuller.

3rd place, Student Category: **Tamás A. Prileszky**, University of Delaware. "Particle-modified structured emulsion droplets," with coauthor Eric Furst.



Best Poster winners for the 87th Annual Meeting are congratulated by President Greg McKenna. From left, Fawzi G. Hamad (1st place, student), McKenna, Bruna Costa Leopércio (2nd place, student), Tamás A. Prileszky (3rd place, student), Gregg A. Duncan (1st place, post-doc).

SOR Smartphone App Debuts in Baltimore

Beginning in October 2014, the SOR *ad hoc* Committee on Meeting App(s) began work on smartphone software for both the iOS and Android platforms that could be used in conjunction with SOR annual meetings. The overall goal for the meeting app is to enhance the meeting experience by providing easy access to technical abstracts and up-to-date schedule information. The committee

is composed of Randy Ewoldt, chair, Matthew Reichert, Maryam Sepehr, Albert Co (*ex officio*, Secretary), and Jason Maxey (*ex officio*, Chair of the Membership Committee).

The first version of the mobile app was ready for SOR 2015 Baltimore. Developed by Core-Apps, the software registered a high usage rate. Usage data indicate 430 device downloads (including iOS, Android, and others); 13,235 visits to the app dashboard; 1,396 viewings of the map; and 4,096 visits to speaker/author bios. Core-Apps has also provided usage rates of other features within the app.

The committee continues its work and is overseeing production of a version of the app for the next SOR meeting in February 2017 in Tampa, Florida. The Committee invites feedback from members on how to improve this service. Please send comments and your app wishlist to committee chair Randy Ewoldt (ewoldt@illinois.edu).

SOR Education Committee Seeks Help with Rheology Outreach Efforts



The Education Subcommittee led by Jonathan Rothstein organized and ran an extremely successful outreach event in Baltimore at the Maryland Science Center. This event took place on 11 October 2015, the Sunday prior to the start of the SOR Annual Meeting. This outreach event was built off the experience and success of the 2014 outreach event at the

Franklin Institute in Philadelphia and is the start of an annual tradition for the SOR. As in year's past, the SOR provided hands-on demonstrations aimed at children of all ages and adults with the goal of teaching them about rheology and letting them play with some interesting materials. More than thirty SOR members volunteered their time and energy and expertise to the outreach event making it easy for the kids to discover just how cool Science can be. The SoR would like to thank all those who volunteered in Baltimore and encourage anyone who is interested in helping out in the future to contact Jonathan Rothstein (Rothstein@ecs.umass.edu). The next SOR outreach event will be take place ahead of the Denver meeting in October 2017.

Ruth Cardinaels Receives TA's Distinguished Young Rheologist Award

New Castle, Delaware, USA. October 1, 2015 - TA Instruments is pleased to announce the latest recipient of the *Distinguished Young Rheologist* award: Ruth Cardinaels, Assistant Professor in the Polymer Technology Group at Eindhoven University of Technology (The Netherlands). Cardinaels employs in-situ and time-resolved structure characterization techniques in combination with diagnostic flow types. Her research attempts to develop a fundamental understanding of flow-induced morphology development of multi-phasic materials such as polymer blends and nanocomposites, suspensions, emulsions and food products. In these studies, rheology plays a main role and its potential as an indirect structure probing technique is exploited and extended.

Award recipients are nominated by an international panel of the most established and respected academic researchers from The Society of Rheology, including four Bingham Medal recipients. The Distinguished Young Rheologist program is designed to help accelerate the research of new academics through grants for rheometer systems.

"TA recognizes academia as a source of product innovation and research into new materials and applications that continue to grow the rheometer market. Our strong commitment to the academic market has been demonstrated for many years through our Academic Matching Grant program. The Distinguished Young Rheologist award is our newest program in support of our vision to maintain our leading market position through strong partnerships with the academic community" commented Terry Kelly, President of TA Instruments.

SOR hosts ASTM E37-08: Academia meets Industry

by Sara Reynaud, Arkema Inc.
Chair, ASTM E37-08 Subcommittee on Rheology

It is the second year that SOR has hosted the ASTM E37-08 Subcommittee on Rheology. The meeting was held on Sunday, 11 October in room Constellation C of Hyatt Regency Baltimore. ASTM International is very grateful to the Local Arrangements Committee Chair, Kalman Migler, who once again made this meeting possible.

Some facts about ASTM International: ASTM is a non-profit organization headquartered in West Conshohocken, PA, and its primary objective is to develop and provide consensus standards, related technical information, and services having globally recognized quality and market relevance. The Technical Committee E37 was established in 1973 with the scope to develop standards of thermal measurements. More recently, subcommittee E37-08 has been founded to look into standardization of rheological testing.

Although highly regarded in the Industry, ASTM has historically had little communication with the academic world. With this conjoint meeting, we aim at bridging the gap between science and business by establishing collaborative ties and conducting in-depth discussions focused on development of better standard test methods, technical guides, nomenclature and definitions.

The meeting was opened by Tom O'Toole, manager at ASTM who gave an overview on the activities and goals of the organization. Following O'Toole's remarks, E37-08 Subcommittee chair Sara Reynaud coordinated a task group discussion on powder rheology, an emerging field which is quickly gaining importance in industrial research laboratories (examples are in the area of additive manufacturing, pharmaceuticals, and processing). The technical discussion was focused on dynamic powder testing; a new work item was introduced as the need to write an ASTM guide for users of different instruments. John Yin from Freeman Technology was invited to give an introduction on powder rheological testing and its challenges. The meeting concluded with a forum session; representatives from Brookfield and Mercury Scientific took part in the technical discussion providing insightful comments. The meeting was well attended and included members from universities, NIST, and industry.

We look forward to the continuing support of the SOR community and hope to meet again in 2017 on the occasion of the 88th Annual Meeting of The Society of Rheology in Tampa, Florida. More information on active standards, revisions, and new work items are posted on the ASTM website at www.astm.org.

Minutes of the ExCom Meeting

Sunday, 11 October 2015

Hyatt Regency Baltimore Inner Harbor, Baltimore

Attending: Greg McKenna, Gareth McKinley, Albert Co, Monty Shaw, Ralph Colby, Shelley Anna, Norm Wagner, Dimitris Vlassopoulos, Jeffrey Giacomini, Faith Morrison, Anne Grillet, Jason Maxey, Bridget D'Amelio

(AIPP), Kalman Migler, Anke Lindner (via Skype), Robert G. W. Brown (AIP), Rajesh Khare, Donald Baird, Randy Ewoldt, Jonathan Rothstein, Michael Solomon, Maryam Sepehr, and Andy Krainik.

President Greg McKenna called the meeting to order at 7:45 am in the President Room, Hyatt Regency Baltimore Inner Harbor, Baltimore, Maryland.

The minutes of the 3 May 2015 meeting were read by Secretary Albert Co. A motion to approve the minutes passed.

Monty Shaw reported on the financial status of the Society and *JOR*. Shaw showed spreadsheets of receipts and disbursements. Several items of concerns were discussed. A motion to approve the treasurer report passed.

Ralph Colby gave the *JOR* editor report. A special issue on shear banding is in the works. The guest editor is Suzanne Fielding. Various graphs showing *JOR* statistics were shown. The current impact factor of *JOR* is 3.358. The five-year impact factor is 3.195. Colby also thanked the members of the *JOR* Publication Award Committee (Dimitris Vlassopoulos, Shelley Anna, and Roger Bonnecaze). A motion to approve the editor report passed.



Gareth McKinley reported that the open access policy is in a holding pattern. He suggested that the ExCom should consider the charges should *JOR* become gold open access. He recommended that the *ad-hoc* Committee on Open Access and

Electronic Publishing should remain in place.

Jonathan Rothstein reported for the Committee on Education and Outreach. There are two short courses at the Baltimore meeting: *Just in Time Beginning Rheology* and *Active and Passive Microrheology*. Reducing the short course fees did not seem to increase attendance. A short course on *Interfacial Rheology* (Instructors: Gerry Fuller and Jan Vermant) is proposed for the Tampa February 2017 meeting. A motion to approve the proposed short course passed.

Suggestions for future short courses were discussed. At the Philadelphia meeting, the outreach at the Franklin Institute attracted 400+ kids. This year the outreach is planned at the Maryland Science Center with ten demonstration tables.

Jeffrey Giacomini reported that AIP Publishing is changing the supplier of its platform for online publishing.

Shelley Anna provided information on the journal *Phys-*

ics of Fluids.

Anne Grillet reported for the *ad-hoc* Financial Committee. Proposals to balance the budget without the revenues from the *JOR* were discussed. Increasing the member dues from \$40 to \$65 and the student member dues from \$25 to \$35 were discussed. Decision on increasing the institutional subscription fee for *JOR* was postponed to the spring meeting, pending analysis by AIPP. Support of students for the ICR 2016 was discussed. A motion to provide up to \$20K for ICR2016 meeting support for student members of good standing as of 1 January 2016 passed. A motion to add a voluntary charitable donation to the online member application/renewal form passed.

Montgomery Shaw discussed the proposal of changing the terms of officers to run from January 1st of the year immediately following the election to December 31st two years later. A motion to bring the proposal of the constitutional change to the business meeting for a vote passed.

Robert G. W. Brown (CEO of AIP) discussed existing and potential AIP interactions with SOR.

Bridget D'Amelio (AIPP) discussed the change in the vendor of publishing framework. Responsive design of Scitation will be rolled out in November. Possibility of changing the trim size and column format of *JOR* was discussed.

Kalman Migler reported for the Local Arrangement Committee for the Baltimore meeting.

Rajesh Khare reported for the Technical Program Committee for the Baltimore meeting. An earlier reminder to register to unregistered speakers might be helpful in rescheduling vacant slots due to cancellations.

Don Baird reported on the Local Arrangements of the 2017 Winter Tampa meeting, which will be held at the Grand Hyatt Tampa Bay. Meeting spaces were reviewed.

Kalman Migler reported for the Technical Program Committee for the 2017 Winter Tampa meeting. The plenary speakers will be Eric Furst and Zvonimir Dogic. Anke Lindner, Technical Program co-chair for Tampa with Migler, called in on Skype from Paris.

Matt Liberatore reported on the local arrangements of the 2017 Fall Denver meeting. Possible reception sites were discussed.

Jason Maxey reported on the local arrangements of the 2018 Houston meeting. The other members of the Local Arrangement Committee are Jacinta Conrad, Sibani Lisa Biswal, and Carlos Lopez-Barron. Meeting spaces were discussed.

Gareth McKinley reported on possible venues for the

2019 meeting.

Gerry Fuller reported on ICR and international outreach. ICR 2020 will be held in Brazil. The Indian society is hosting their next meeting in January. There are some activities in Mexico and interests in Argentina.

Faith Morrison reported for the *Rheology Bulletin*. The deadline for the January 2016 issue is December 1st.

Faith Morrison reported on her work as the AIP Designate. She suggested SOR may wish to examine its Constitution with respect to New York not-for-profit law. She will inquire if AIP can provide guidance.

Albert Co reported on the responsive web app for the Baltimore meeting. He demonstrated the capability for users to create their own personal programs.

Randy Ewoldt reported on the mobile app for the Baltimore meeting.

Jason Maxey reported for the Membership Committee. Several graphs of member statistics are shown. Results of lapsed member campaign were reviewed. From the lapsed member campaign in 2015 we had 70 lapsed members renew with the society. There were a total of 363 new members in 2015, with a final membership of 1547.

A motion to correct the Greek used for the SOR motto passed.

The meeting entered into Executive Session at 3:40 pm.

A motion to send the proposed dues increases (member dues from \$40 to \$65 and student member dues from \$25 to \$35) to the membership for voting passed.

A motion for continuing international outreach activity as proposed by Fuller passed.

A motion to move forward with the principle to change the trim size and column format of *JOR* (with the mock up to be sent by e-mail and then approval by e-mail) passed.

The meeting was adjourned at 4:17 pm.

Submitted by Albert Co, Secretary

Minutes of the Business Meeting

Tuesday, 13 October 2015
Baltimore, Maryland, USA

President Greg McKenna called the meeting to order at 12:10 p.m. in Constitution C of Hyatt Regency Inner Harbor, Baltimore, Maryland (92 in attendance). The minutes of the previous Business Meeting in Philadel-

phia, Pennsylvania were read by Albert Co and approved without addition or correction.

Monty Shaw presented the Treasurer Report. Shaw showed a graph that displayed the drop in SOR net earnings and spreadsheets of receipts and reimbursements for both SOR and *JOR*. He answered questions on several entries. A motion to accept the report was seconded and passed.

Ralph Colby presented the *JOR* Editor Report. A special issue on shear banding is in the works. The guest editor is Suzanne Fielding. Colby then showed various graphs on *JOR* statistics and trends. The number of submissions for 2015 is higher than last year. There is an increase of submissions from Asia, especially China. The published page count has reached 2000 in the last few years. The current impact factor of *JOR* is 3.358. The five-year impact factor is 3.195. A format change to 8½ in. × 11 in. and two columns is planned. A motion to accept the report was seconded and passed.

The results of the election were announced. Thanks were given to the outgoing officers: Jeffrey Giacomini, Monty Shaw, Shelley Anna, and Dimitris Vlassopoulos.

Faith Morrison reported on the *Rheology Bulletin*.

Jonathan Rothstein reported for the Education Committee. Based on feedback from instructors and students, both short courses (*Just in Time Beginning Rheology* and *Active and Passive Microrheology*) went very well. The K-12 Outreach Event on Sunday at the Maryland Science Center was a great success. There were 10 demonstration tables manned by 30+ volunteers.

Jason Maxey reported for the Membership Committee. The number of new student members has grown.

The proposed constitutional amendment to change the terms of officers to run from January 1st of the year immediately following the election to December 31st two years later was discussed. A motion to send the proposal to the membership for voting was seconded and passed.

Anne Grillet reported for the *ad-hoc* Financial Committee. Several issues were discussed.

McKenna reported that the Executive Committee had approved sending the proposed rule change to increase dues (member dues from \$40 to \$65 and student member dues from \$25 to \$35) to the membership for voting. The pros and cons of the proposed rule change were discussed.

The meeting was adjourned at 1:30 p.m.

Submitted by
Albert Co, Secretary

Treasurer's Report

Dear Society Members,

I appreciate the opportunity to serve the Society of Rheology as the next Treasurer. The SOR has been well served by previous Treasurers, and I would especially like to thank Monty for his 18 years of dedicated service as Treasurer. It is a difficult and thankless job. There is a lot to learn in this new responsibility. The most important aspect of this calling is to provide accurate informative data about the financial aspects of the Society to the Executive Committee and the membership. To this end I have taken several actions.



First, I have spent considerable time with the good folks from the American Institute of Physics and American Institute of Physics Publishing going over every accounting code related to the Society of Rheology and all of our activities. I really appreciate their patience. There is a lot to learn.

Second, I have combined all of the SOR financial information in one location, Quickbooks Online. There are still separate accounts such as our checking account, AIP accounts and AIPP accounts, but now all of the information is collected in one location. This allows several advantages: First, we now can use the reporting tools to develop a more complete understanding of our financial situation. Second, the other great advantage is transparency. Right now, because it is an online platform, both I and Gareth have full access to the complete SOR Quickbooks Online account and thus to all of the financial information related to the SOR. The data from AIP and AIPP will need to be entered periodically, but I am working with both AIP and AIPP to automate this process of data transfer.

I have included the three typical figures for the January *Bulletin* that discuss the financial position of the Society including estimates of the year end balances for 2015. The actual 2015 data will not be available until later in the first quarter of 2016.

In the coming months, I am going to prepare a more detailed financial description of each of the major activities of the SOR and how they are or are not interrelated. This is based on significant conversations with the previous Treasurer, the Financial Committee, the AIP folks and the AIPP folks. I appreciate all of their patience as I come up to speed. These new data

(continues p26)

**The Society of
Rheology, Inc.
Balance Sheet
(all amounts,
USD)**

	2015 August	2014 Year End	2014 August	2013 Year End	2013 August	2012 Year End	2010 Year End	2009 Year End	2008 Year End	2006 Year End
Assets										
Cash in checking account(s)	147,395	69,163	229,475	147,077	114,608	73,886	13,257	18,330	10,859	9,777
Balance in AIP account	1,695,367	1,665,049	1,623,395	1,595,079	1,667,341	1,685,279	1,435,019	1,425,005	1,342,819	1,185,978
Total Assets	1,842,762	1,734,212	1,852,870	1,742,155	1,781,949	1,759,165	1,448,276	1,443,335	1,353,678	1,195,755
Liabilities and Net Assets										
Liabilities										
Deferred revenue	102,495	104,337	0	100,652	0	114,980	89,283	125,501	87,675	129,339
Total Liabilities	102,495	104,337	0	100,652	0	114,980	89,283	125,501	87,675	129,339
Net Assets										
Pub reserve	450,000	450,000	450,000	450,000	450,000	450,000	450,000	450,000	450,000	450,000
Std travel	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	10,000	10,000
Annual Meeting	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	200,000
Operating	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	100,000	100,000
Unrestricted	810,267	699,875	922,870	711,503	851,949	714,185	428,994	387,834	406,003	306,416
Total Net Assets	1,740,267	1,629,875	1,852,870	1,641,503	1,781,949	1,644,185	1,358,994	1,317,834	1,266,003	1,066,416
Total liabilities and net assets	1,842,762	1,734,212	1,852,870	1,742,155	1,781,949	1,759,165	1,448,276	1,443,335	1,353,678	1,195,755

**Journal of
Rheology
Receipts and
Disbursements
(all amounts, USD)**

	2015 <u>August</u>	2015 <u>Budget</u>	2014 Year End	2014 <u>Projection</u>	2014 <u>August</u>	2014 <u>Budget</u>	2013
Journal of Rheology (All amounts: USD)							
RECEIPTS							
Subscriptions	83,601	145,000	75,569	138,061	138,061	142,000	148,137
Royalties & Reprint Sales	1,561	30,000	33,197	45,078	1,259	80,000	69,736
Ad Sales	21,427	30,000	35,886	32,658	23,709	45,000	30,800
CD sales (net)	0	0	0	0	0	0	0
JORO revenue	137,937	70,000	150,364	100,584	100,584	78,000	72,872
Miscellaneous	318	2,000	2,000	2,097	2,097	2,000	4,105
TOTAL RECEIPTS	244,843	277,000	297,016	318,478	265,709	347,000	325,649
DISBURSEMENTS							
Ads	5,571	9,000	8,433	8,433	5,622	11,000	8,233
Reprints, Single Copy	32	700	525	383	263	1,300	464
Paper, Printing	25,888	30,000	42,393	26,475	17,650	27,600	35,858
JoR Editorial	33,029	45,000	41,124	57,845	26,563	46,000	42,550
Production	18,968	45,000	53,010	46,930	24,750	38,000	42,120
Fulfillment	4,732	5,215	6,375	6,503	4,128	5,215	5,118
Distribution	16,333	23,000	26,189	20,304	13,442	20,900	24,627
Electronic publishing	27,925	49,500	51,785	45,419	30,852	52,000	49,609
Miscellaneous	1,713	9,900	17,715	9,557	4,566	7,750	18,187
TOTAL DISBURSEMENTS	134,190	217,315	247,550	221,851	127,836	209,765	226,765
Net	110,653	59,685	49,467	96,627	137,873	137,235	98,884

will look a bit different from those previously presented.
It is my hope that this new format allows us as a
community to understand the financial position of the
SOR in greater detail.

Respectfully submitted,
Christopher C. White, Treasurer



Treasurer's Report

The Society of Rheology Receipts and Disbursements

	2016 Budget	2015 Projection	2015 August	2015 Budget	2014 Year End
RECEIPTS					
Dues	46,000	41,782	44,705	48,000	45,590
Interest	1,200	1,782	1,188	1,800	942
Journal of Rheology	293,100	298,241	244,843	277,000	297,016
Mailing List Sales	0	0	0	0	0
Donations	0	0	0	0	0
Bulletin Advertising	7,600	7,880	6,428	7,200	8,092
Annual Meeting (net)	0	-216	99,448	0	2,181
Short Course (net)	0	7,896	15,023	0	10,385
TOTAL RECEIPTS	347,900	357,366	411,635	334,000	364,207
DISBURSEMENTS					
AIP Dues Bill & Collect.	11,000	13,137	9,140	11,000	10,287
AIP Adm. Services	1,200	4,000	0	7,500	1,106
AIP Mem. Soc. Dues	14,000	14,051	9,367	14,000	14,089
Contributions and Prizes	1,600	1,650	1,650	3,000	1,650
Early Career Award	8,500	7,500	0	8,500	7,620
Journal of Rheology	224,300	252,443	134,190	217,315	247,550
Bulletin	17,500	19,828	19,694	17,000	18,590
Bingham Award	0	20,700	10,700	15,000	10,000
Executive Cmt. Meetings	5,200	11,063	8,242	15,000	16,063
Pres. Discretionary Fund	1,500	0	0	1,500	1,824
Treas. Discr. Fund	1,500	500	197	1,500	288
Bulletin Editor Discr. Fund	1,500	3,000	0	1,500	517
Progr. Chm. Discr. Fund	3,000	3,000	0	3,000	-1,554
Webmaster Discr. Fund	3,000	3,000	0	3,000	1,447
International Activities Fund	5,000	0	0	5,000	0
Office Expenses	1,700	0	0	1,700	11,487
Banking Services	0	346	231	120	0
Liability Insurance	5,600	5,400	1,758	5,600	5,406
Membership Broch. & Appl.	100	0	230	500	0
Accountant	2,500	2,660	2,660	2,300	2,400
Student member travel	0	36,000	0	30,000	22,497
Annual meetings, future	3,000	0	0	4,000	2,925
Website	1,500	0	1,518	1,500	1,602
Miscellaneous	100	0	0	100	0
TOTAL DISBURSEMENTS	313,300	398,278	199,577	369,635	375,793
Net	34,600	-40,912	212,058	-35,635	-11,586

end

(Likhman, continued from p18)

is obvious doesn't make it true. His careful and deeply probing challenges of our current theories brought much richness to light, and did away with many wrong assumptions. Likhman was known for his mentorship as well. "Being mentored by Alexei was a formative experience for me," says Metzner awardee Richard Graham. "Alexei possessed a formidable intellect and held the highest possible scientific standards. At the same time he imparted great warmth, enthusiasm and the remarkable sense that, under his direction, breakthroughs were always achievable."

The Society of Rheology joins with Alexei's family and friends in mourning his passing. We send our deep condolences to his family.

(Careers, continued from p12)

of identifying different areas that pertain to rheology. Christine Roberts from Sandia Labs pointed her to the sessions at the upcoming meeting, noting that just about all of the research presented at the SOR meeting has immediate or potential applications in industry, and these areas should make themselves known within the first few minutes of each talk. The panel discussion affirmed that there are numerous career options for budding rheologists.

*This is the fifth industrial outreach panel put on in partnership with SOR. If you are interested in assisting or planning an event, please contact Joseph York at jjork@aip.org.



Bingham medalists present in Baltimore. Rear, left to right: Masao Doi, John Brady, Bill Schowalter, Mort Denn, Gerry Fuller, John Dealy, Chris Macosko, Ralph Colby, and Norman Wagner. Front: Greg McKenna, Henning Winter, Eric Shaqfeh, Hiroshi Watanabe, Hans Christian Öttinger, Gareth McKinley, and Ron Larson.

(Calendar, continued from page 28)

8-12 October 2017

89th 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

90th Annual Meeting of The Society of Rheology, Houston, Texas, USA, Jason Maxey.

2019

October 2019

91st Annual Meeting of The Society of Rheology, location to be announced.

2020

August 2020

XVIIIth International Congress on Rheology, Rio de Janeiro, Brazil, Paulo Mendes (every four years; in Europe in 2024).

For other meeting notices, see also:

www.rheology.org/sor/info/Other_Meetings.htm

rheology-esr.net/events/categories/conferences-seminars/

www.ar.ethz.ch/AR_conference_calendar.html



The Society of Rheology
AIP Publishing LLC
1305 Walt Whitman Road Suite 300
Melville, NY 11747 USA

Presorted Std.
US Postage
PAID
Presort Express

CALENDAR OF RHEOLOGY CONFERENCES AND COURSES

2016

19-24 June 2016
Rheological Measurements Short Course,
University of Minnesota, Minneapolis, MN USA,
Chris Macosko. (research.cems.umn.edu/rheology/)

19-22 July 2016
32nd International Conference of the Polymer
Processing Society (PPS32), Lyon, France, A.
Maazouz. (www.pps-32.com)

8-13 August 2016
XVIIth International Congress on Rheology, Kyoto,
Japan, Hiroshi Watanabe (every four years).
(icr2016.com/)

21-26 August 2016

International Congress of Theoretical and Applied
Mechanics, ICTAM, Montréal, Québec, Canada.
(iutam.org)

3-7 October 2016

4th International Conference on Competitive Materials
and Technology Processes, Miskolc-Lillafüred,
Hungary; László A. Gomze. (www.ic-cmtp4.eu)

2017

11-12 February 2017

SOR Short Course **Interfacial Rheology** by Gerry Fuller
and Jan Vermant, Tampa Bay, Florida USA.

12-16 February 2017

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

April 2017

10th Annual European Rheology Conference AERC2017,
location TBA.

7-8 October 2017

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

(continues, page 27)