

# Rheology Bulletin

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- Tampa



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(2015-2017)

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**On the cover:** Brendan Blackwell, Athrey Nadhan, and Randy Ewoldt's work (University of Illinois at Urbana-Champaign, USA) shooting yield-stress fluids at screens produces the enchanting image on our cover. Shown is a drop of yield-stress fluid just after impact with an open screen; mesh openings are 1.5 mm. The fluid, an aqueous suspension of Carbopol 940 microgel particles, splits into several threads if the incoming momentum exceeds the sum of yield stress and viscous effects (drop mass 0.4 g, velocity 3 m/s, yield stress 12 Pa). For slower speeds, drops cannot penetrate, and the open screen seems closed. For more information, including videos and a dimensionless group to classify the behavior, see Blackwell et al. *J. Non-Newtonian Fluid Mech.* (2016) DOI:10.1016/j.jnnfm.2016.06.012.

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Gerald G. Fuller  
Roseanna Zia, Gerald G. Fuller



When the international rheology community gathers, it is like a family reunion, a food fest, and a meeting of the minds, all wrapped in one fantastic package. In Kyoto this past summer, the XVII<sup>th</sup> International Congress on Rheology brought together friends and colleagues, mixed in sake and sushi, and even included in a little sword play. We frankly had a great time.

Hiroshi Watanabe and his local arrangements team brought us together at the Kyoto TERRSA conference center, a short walk from Kyoto station. The weather was warm—no surprise for Kyoto in August—but the TERRSA kept us cool and sessions were easily accessible with plenty of space for conversations and socializing. The vendors set up outside the plenary hall, and there was plenty of space to grab a coffee and check out the latest wares.



*ICR Chairman Hiroshi Watanabe (Kyoto University), samurai style, with organizing committee colleagues Yuichi Masubuchi (Nagoya University) and Takashi Taniguchi (Kyoto University).*



*Friendly maiko performers were generous with their time, bringing the wonder of their art to the Congress attendees.*

ICR 2016 opened with the welcoming reception at the TERRSA, supported by Kyoto Electronics Manufacturing (KEM); attendees left with KEM branded wooden sake cups. Sessions brought the usual good science, but more fun to report on were the social events. On Tuesday, TA Instruments invited us to a beer party at Uzumasa Studio Park, a theme park in which movie sets depict a Japanese town in the 18<sup>th</sup> century. Included in the Uzumasa experience was seeing some of our best known rheologists decked out as daimyo (lord) family members, samurai, or other figures from Japanese history or folklore. It was a multi-hour costume, makeup, hair-styling commitment on the part of the “models,” and the final effect was much appreciated by the attendees.



The sake barrel was tapped and a toast raised by Kiyohito Koyama (honorary Chair of the ICR, Yamagata University, second from right) and Kyoko Kishimoto (president and CEO of KEM and sponsor of the reception, right) with the help of Congress attendees (left to right) Chris Macosko, Roger Tanner, and David James.

Excursions were scheduled for Thursday, concluding with a beer party, both supported by Anton Paar. Buses took attendees to: Hozu-gawa River for rafting; Uji for hot springs; around Kyoto for historic and temple-centered sightseeing; or lastly to Fushimi for sake tasting. The Congress dinner was on August 12<sup>th</sup> at the Westin Miyako Kyoto Hotel. There, several maiko, the name for apprentice geiko (not exactly geisha, but a related role) entertained the Congress attendees, playing instruments, singing, and dancing in an elegant style. After the musical performance, the maiko and musicians came out to the audience to talk, answer questions, and pose for photographs. According to the literature (ok, according to Wikipedia), maiko are usually aged 15 to 20 years old and become geiko after learning how to dance the traditional kyomai dances and play the shamisen. Geiko all must learn Kyō-kotoba, the dialect of the city of Kyoto.

We had a great time in Kyoto. The Congress attracted 521 full delegates, 226 student delegates, and 60 accompanying persons from 42 countries. To our hosts: Arigatōgozaimashita! The discipline of rheology is robust and growing; we look forward to the next time we gather for an international congress: on to Brazil in 2020!

See page 19 for more photos from the Congress.

In 2020, we will gather in Brazil for the XVIII<sup>th</sup> ICR, guests of Roney Thompson.



Posters and exhibits were well attended, meeting the purpose of the Congress, to exchange ideas about rheology.



# Come to Tampa Bay



The 88<sup>th</sup> Annual Meeting of the Society of Rheology will be held in Tampa Bay, Florida 12-16 February 2017 hosted by Don Baird from Virginia Polytechnic Institute and State University and his local arrangements team; please

join us! All sessions and events will take place at the Grand Hyatt Tampa Bay, which is set along a nature preserve on the Bay's upper shores on 35 acres of unspoiled beauty in one of Florida's most picturesque locales. ([www.rheology.org/sor/annual\\_meeting/2017Feb/](http://www.rheology.org/sor/annual_meeting/2017Feb/))

The technical program in Tampa Bay has been assembled by Program co-chairs Kalman Migler (NIST, Gaithersburg, MD USA) and Anke Lindner



*The University of Tampa's Plant Hall and its distinctive minarets (above); Tampa Museum of Art located at the heart of Downtown Tampa (left). Images courtesy of [www.visittampabay.com](http://www.visittampabay.com).*

(ESPCI, Paris). The Bingham Award Reception and Banquet celebrating 2016 Bingham medalist Mike Cates will be held on Tuesday, February 14<sup>th</sup>. The SOR business meeting will be held on Tuesday February 14<sup>th</sup> beginning at 12:05 pm. The 88<sup>th</sup> Annual Meeting will have nine thematic sessions and a poster session, which includes the annual student/post-doc poster competition. The plenary lectures will be given by Eric Furst, (University of Delaware), Zvonimir Dogic (Brandeis University) and the

2016 Bingham Medalist, Michael Cates (University of Cambridge). A presentation will also be given on Thursday by the 2016 Metzner awardee, Evelyne van Ruymbeke (Université catholique de Louvain).

The SOR short course on *Interfacial Rheology* is to be offered on February 11<sup>th</sup> and 12<sup>th</sup>, the weekend before the meeting. The instructors are Gerry Fuller (Stanford University) and Jan Vermant (ETH Zürich). For more on the short course, please see the meeting website: [www.rheology.org/sor/annual\\_meeting/2017Feb/](http://www.rheology.org/sor/annual_meeting/2017Feb/).

The average high and low temperatures in Tampa during February are 72°F and 54°F, respectively, so put away your stompers and take to the beaches! After the meeting, stay on in Tampa Bay to see Busch Gardens or explore the historic Ybor City neighborhood, founded by Cuban, Italian, and Spanish cigar-factory workers. This popular tourist destination has many bars, restaurants, nightclubs, and other nightlife attractions. If museums are more your thing, there's the Tampa Museum of Art, the Henry B. Plant Museum, and the Dali Museum, all in Tampa Bay. The surprising Moorish Revival architecture of the Plant Museum was chosen by railroad developer Henry B. Plant to offer something special to Victorian travelers who had seen just about everything. There is also a bicycle path starting at the hotel and going out to the beaches on the Gulf of Mexico (17 miles) with bicycles available for rent at the hotel.

We look forward to seeing you in Tampa Bay!

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# Report from the International Committee on Rheology

Gerald Fuller, ICR Secretary

Following twelve years of distinguished service as Secretary of the International Committee on Rheology, Professor Manfred Wagner stepped away from that position at the ICR in Kyoto. The Chairman of the Committee, Professor Igor Emri, also completed his four-year term of office. Those in attendance at the Congress banquet recognized their work on behalf of the community of rheologists with a well-deserved round of applause. I am honored to assume the responsibilities of Secretary and look forward to working with our new Chairman, Professor Hiroshi Watanabe. Manfred's last official task as Secretary was to prepare the minutes of the meeting of the delegates of the Committee that was held during the Kyoto Congress. They serve as an excellent summary of the state of the international rheological community, and I will summarize some of the highlights here.

We had the pleasure of voting our unanimous approval of admitting the Iranian Society of Rheology into membership of the ICR. This active society is led by its President, Professor Fatemeh Goharpey, and has a solid record of hosting domestic meetings with the most recent event boasting an attendance of 150 participants. Fatemeh can often be found in attendance at the

*Incoming ICR secretary Gerry Fuller confers with outgoing secretary Manfred Wagner at the ICR2016 banquet, Kyoto.*

SOR and AERC meetings, so be sure to speak with her about rheology in Iran. With the addition of the Iranian Society of Rheology, there are a total of 28 societies worldwide. Hiroshi Watanabe reported on the Kyoto Congress and informed us that 521 delegates, 226 students and 60 accompanying persons from 42 countries had registered. The conclusion of this very successful Congress has us now looking forward to 2020 when the Brazilian Society of Rheology, led by President Roney Thompson, will host the ICR in Rio de Janeiro scheduled for 2-7 August 2020.

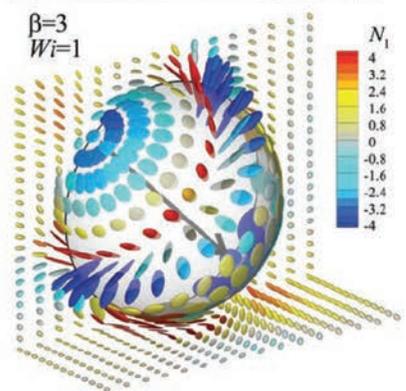
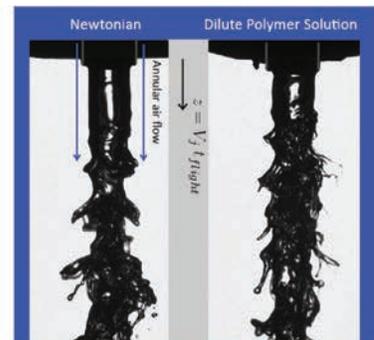
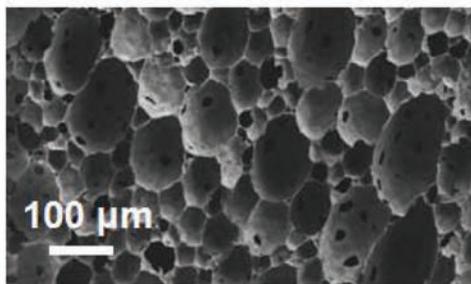


Coming in  
October 2017!

## Gallery of Rheology Contest

- Flows of complex materials are not only scientifically intriguing, but can also be visually striking. At the SOR Annual Meeting in Denver this fall, you will have the opportunity to have your work recognized as the most engaging image or movie of rheology for 2017.
- The winner will be featured on the cover of the Rheology Bulletin.
- Stay tuned for more details in the July Bulletin

Anne M. Grillet & Randy H. Ewoldt  
Technical Organizers for Denver Meeting



# What else will you do with your RHEOMETER TODAY?



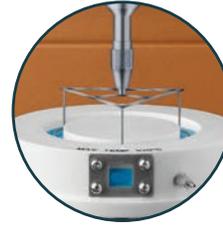
Advanced Microscopy



Magnetorheology



Tribology



Interfacial



DMA



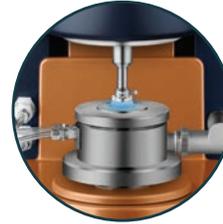
Dielectric



High Pressure



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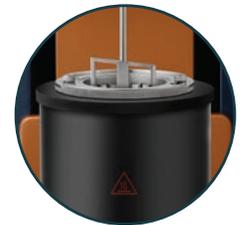
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# 89<sup>th</sup> SOR Meeting: Denver, Colorado 8-12 October 2017

## **Technical Program Chairs:**

Anne M. Grillet  
Sandia National Laboratories  
amgrill@sandia.gov  
Randy H. Ewoldt  
University of Illinois at Urbana-Champaign  
ewoldt@illinois.edu

## **Plenary Speakers:**

**Kristi Anseth**  
Department of Chemical and Biological Eng.,  
the Howard Hughes Medical Institute, and the  
BioFrontiers Institute, Univ. of Colorado at Boulder

**Roger Bonnecaze**  
McKetta Department of Chemical Engineering  
The University of Texas at Austin

**2017 Bingham Medalist - TBD!**

## **Sessions:**

### *Suspensions and Colloids*

Cari Dutcher  
University of Minnesota  
cdutcher@umn.edu

Lilian Hsiao  
North Carolina State University  
lilian\_hsiao@ncsu.edu

### *Polymer Solutions and Melts*

Suraj Deshmukh  
Dow Chemical Company  
SDeshmukh@dow.com

Reza Foudazi  
New Mexico State University  
rfoudazi@nmsu.edu

### *Emulsions, Foams, and Interfacial Rheology*

Nicholas Alvarez  
Drexel University  
nja49@drexel.edu

Vivek Sharma  
University of Illinois at Chicago  
viveks@uic.edu

### *Active, Motile, and Field Responsive Materials*

Dan Klingenberg  
University of Wisconsin  
klingen@engr.wisc.edu

Patrick T. Underhill  
Rensselaer Polytechnic Institute  
underhill@rpi.edu

### *Gels and Self-Assembled Systems*

Kendra Erk  
Purdue University  
erk@purdue.edu  
Simon Rogers  
University of Illinois at Urbana-Champaign  
sarogers@illinois.edu

### *Solids, Glasses, and Composites*

Jonathan Stickel  
National Renewable Energy Laboratory  
Jonathan.Stickel@nrel.gov

Xiaolong Yin  
Colorado School of Mines  
xyin@mines.edu

### *Microrheology and Microfluidics*

Charles M. Schroeder  
University of Illinois at Urbana-Champaign  
cms@illinois.edu

Travis Walker  
Oregon State University  
travis.walker@oregonstate.edu

### *Inverse Problems and Material Design*

Ron Larson  
University of Michigan  
rlarson@umich.edu  
Florian Nettesheim  
Dupont  
florian.nettesheim@dupont.com

### *Computational Methods and Applications*

Rekha R. Rao  
Sandia National Laboratories  
rrao@sandia.gov  
James Swan  
Massachusetts Institute of Technology  
jswan@mit.edu

### *Biomaterials and Biological Systems*

Kelly Schultz  
Lehigh University  
kes513@lehigh.edu

Keith Neeves  
Colorado School of Mines  
kneeves@mines.edu

### *Non-Newtonian Fluid Mechanics*

Christopher Dimitriou  
Nike  
cdimitriou@gmail.com

Paolo Arratia  
University of Pennsylvania  
parratia@seas.upenn.edu

### *Poster Session*

James F. Gilchrist  
Lehigh University  
gilchrist@lehigh.edu

Scott A Roberts  
Sandia National Laboratories  
sarober@sandia.gov

### *Industrial Careers Panel*

Maryam Sepehr  
Chevron Oronite Company LLC  
nvgj@chevron.com

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CALL FOR PAPERS AND EXPRESSIONS OF INTENT

## Special Issue on Associating Polymers

EDITOR-IN-CHIEF: **Ralph H. Colby**, *The Pennsylvania State University*

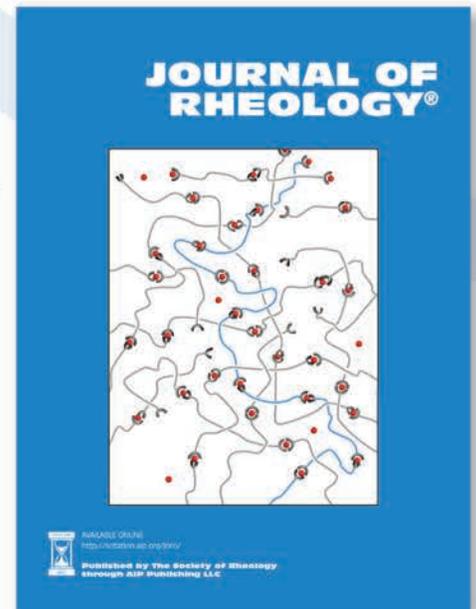
GUEST EDITOR: **Evelyne van Ruymbeke**, *Université catholique de Louvain*

Expressions of intent to submit a paper are invited for a special issue of the *Journal of Rheology*. Scheduled for publication in fall 2017, this issue will focus on the dynamics of associating polymers, with particular emphasis on systems which combine entanglements and supramolecular reversible junctions. Papers addressing self-healing properties and/or rheology of supramolecular polymers are also encouraged. Submissions are welcome from the whole spectrum (experiments, simulations, and theory).



This special issue marks the final meeting of the European *Initial Training Network* SUPOLEN. The peer-reviewed articles

from this special issue may be presented by invitation in a focused discussion workshop, which will be held in Crete on 20-23 September 2017 (for more details and registration, see [supolen.eu](http://supolen.eu)). Accepted articles will be circulated among all authors participating in the special issue or the workshop, for comments and questions that will be published following the article, with replies from the authors.



### EXPRESSION OF INTENT

If you plan to submit a paper, expressions of intent are encouraged at your earliest opportunity, as it would be useful for us to have a list of potential contributors far in advance of the submission deadline.

- Please inform Ms. Marcy Fowler, Editorial Assistant, by email to [JOR-EditorialOffice@aip.org](mailto:JOR-EditorialOffice@aip.org)
- Please use **INTENT — Special Issue/Associating Polymers** in the subject header of your message.
- Please indicate a tentative title for your manuscript.
- Please include the contact author's name, institution, and email, and those of known or proposed co-authors.

### SUBMISSION OF PAPERS

ONLINE AT: <http://jor.peerx-press.org>

SELECT: **Special Issue/Associating Polymers** when completing submission data online

**DEADLINE FOR SUBMISSIONS: MARCH 1, 2017**

*Early submission is strongly encouraged.*



## NEWS

### SOR Elections in 2017

Officers of The Society of Rheology are elected every two years. The 2017 elections will commence this spring, with the report of the Nominating Committee: Wes Burghardt (chair), Nina Shapley, Dimitris Vlassopoulos, and Florian Nettesheim. Nominees are sought for all officer positions and three members at large of the Executive Committee. Members who would like to serve, or who have suggestions for candidates for officer positions, should contact Wes Burghardt ([w-burghardt@northwestern.edu](mailto:w-burghardt@northwestern.edu)).

### AERC2017: Annual European Rheology Conference 3-6 April 2017

The Annual European Rheology Conference for 2017 will take place 3-6 April 2017 in Copenhagen Denmark, in conjunction with the 26<sup>th</sup> Nordic Rheology Conference. The organizing committee includes Ole Hassager, Johanna Aho, Stefania Baldursdottir, Kristoffer Almdal, Per Andersen, Richard Ipsen, Qian Huang, Kell Mortensen, Henrik Rasmussen, Peter Szabo, and Niall Young.

AERC2017 begins with a short-course 11am-4pm Monday (tentatively covering: Introduction to Rheology, Rheology and Scattering Methods, and Rheology in Extension), followed by an opening reception in the evening. Sessions take place Tuesday, Wednesday, and Thursday, with the Conference dinner scheduled for Wednesday evening. Contributors are encouraged to publish their conference papers in the Annual Transactions of the Nordic Rheology Society.

For more information see the conference website ([www.aerc2017.dk](http://www.aerc2017.dk)) or contact Johanna Aho, [johanna.aho@sund.ku.dk](mailto:johanna.aho@sund.ku.dk).

### Polymers Special Issue: Complex Fluid Rheology

A special issue of the journal *Polymers* dedicated to the complex fluid rheology of polymeric materials is being organized by guest editor Patrick Underhill. The special issue aims to reflect the current work and progress in how microstructure causes the rheological response and how the rheology influences other properties of the system. Contributions with experimental work, computational work, or combinations of the two were solicited. Articles were submitted in November 2016 and the special issue is scheduled to appear in 2017. *Polymers* is an open-access journal founded in 2009.

### Student Member Travel Grants for SOR Annual Meeting, Denver, October 2017

The SOR is pleased to offer student member travel grants for the 89<sup>th</sup> Annual Meeting to be held in Denver, Colorado in October 2017. Students and advisors must be members of Society in good standing as of 1 March 2017. Students cannot have received a prior travel grant, and the program is restricted to one grant per faculty advisor per meeting. This program is funded in part by generous donations by SOR members. The application process will be available on the SOR meeting web site along with meeting registration sometime this spring.

### AIP Venture Partnership Fund Seeks to Support the Physical Sciences (including Rheology)

In August 2016 the American Institute of Physics (AIP) announced a request for proposals (RFP) for projects to be funded by the new AIP/Member Society Venture

Partnership Fund (VPF). The Society of Rheology is a founding member of the AIP, a consortium of member societies dedicated to the advancement of the physical sciences.

The purpose of the Venture Partnership Fund is to advance the physical sciences through projects that also encourage collaborative partnerships between AIP and one or more Member Societies (MS). The RFP is directed at AIP member societies, and the proposals are to be developed in concert with AIP staff, who have expertise in many areas, including history of science, science journalism, statistical research and analysis, government relations, and employee and volunteer relations.

AIP anticipates awards of \$20,000 to \$40,000 per project, depending on the number of proposals and the amounts requested. Funded projects will last a maximum of two years; total spending on the VPF will be \$100,000/year. The VPF selection committee consists of volunteers from the AIP member societies along with AIP staff.

Ten proposals were received for the 2016 funding cycle, including one from SOR. The funding decision was made in December, with a press release to follow (after the *Bulletin* went to press).

## Rheology on the Radio: Silly Putty<sup>(R)</sup> Makes a Sensor

Rheological effects make great science demonstrations, and every now and then they make good radio. National Public Radio (NPR) on 9 December 2016 featured a story about Trinity College, Dublin physicist Jonathan Coleman's work with graphene-filled Silly Putty<sup>(R)</sup>. Turns out, it is highly pressure-responsive, and they are using the material to develop sensors, including for blood-pressure applications. For more, see [www.npr.org](http://www.npr.org) or the research article in *Science*, (DOI: 10.1126/science.aag2879).

## Molasses Tsunami? (No, really, I'm not making this up!)

The year was 1919 and the place was Boston. The event? 2.3 million gallons of molasses bursting from storage tanks. See the modeling of the event reported on in the *New York Times* (Science Section), 26 November 2016. Rheology is everywhere!

## Minutes of the ExCom Meeting

Wednesday, 10 August 2016

Japanese Room, Kyoto TERRSA, Kyoto, Japan

Attending: Gareth McKinley, Norm Wagner, Albert Co, Michael Solomon, Patrick Anderson, Greg McKenna, Jeffrey Giacomini, Faith Morrison, Gerry Fuller, Susan Muller, Monty Shaw, Jonathan Rothstein, Kalman Migler, Randy Ewoldt, Lynn Walker, Roseanna Zia, and Hiroshi Watanabe.

President Gareth McKinley called the meeting to order at 1:32 pm in the Japanese Room, Kyoto TERRSA, Kyoto, Japan.

A question was brought up for the upcoming AIPP Publishing Partners meeting. If one elects to get the electronic subscription, and receives an e-copy of the current *Journal of Rheology*, can one also get archive issues/backcopies?

President McKinley reviewed several of the items and announcements published in the July 2016 issue of *Rheology Bulletin*. Saad Khan will host the October 2019 Annual Meeting in Raleigh, North Carolina.

Albert Co will host the October 2021 Annual Meeting in Bangor, Maine.

Gerry Fuller reported on the meeting of the International Committee on Rheology (ICR). Manfred Wagner will be stepping down as the ICR Secretary. A vote is scheduled for later this week to elect the next Secretary. Fuller is one of the candidates. If elected, Fuller prefers that a new SOR delegate be appointed, and he will serve as a non-voting member of the Committee. Fuller also reported that the Iranian Society of Rheology will be joining ICR.

Jeffrey Giacomini (Society Historian) reported that the oral history with Bob Bird has been completed. The year 2029 will be the centennial of SOR and the goal is to record a number of oral histories with distinguished senior members of the Society.

Names of members for the Nominating Committee are solicited. Suggestions for vice-president candidates are also welcomed.

Randy Ewoldt described the concept of a "rheology gallery" that will be featured for the first time at the Fall 2017 Meeting in Denver.

The meeting was adjourned at 2:00 pm.

Submitted by Albert Co, Secretary



Secretary's Report

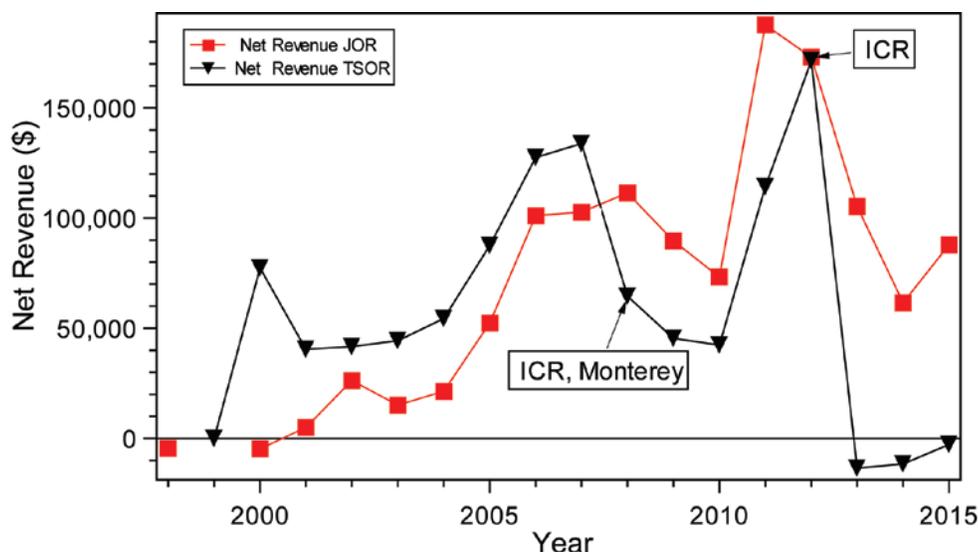


Figure 1. The annual net revenue from The Society of Rheology and Journal of Rheology from 1999 to present. The integrated area of the JOR curve is \$1.2M and SOR is \$1.0 M. In 1999 SOR had \$700k in reserves.

## Treasurer's Report

Dear Society Members,

This Treasurer's report is very similar to the June Report as we did not have a meeting in October and the final 2016 numbers from AIP are not yet available. A complete report on 2016 will be presented at the business meeting in February in Tampa.

The Society of Rheology (SOR) is in a solid financial position right now. SOR has significant financial reserves, a strong brand and dedicated following. The accompanying charts document expenditures and revenues for the past years including the 2017 budget proposal. Preliminary examination shows for 2016 expenditures were in line with expectations, including ~\$20k in student travel support for the ICR meeting in August, \$17k for the *Rheology Bulletin*, and \$9k for Executive Committee meeting expenses in May. All of the revenues and expenses will be detailed once the year-end numbers are available.



In the receipts and disbursements report, additional details on the sources and amounts for the revenue have been added, and for 2015 the *Journal* expenses have been aggregated into three categories for this report; fixed expenses for producing the JOR in any form, plus direct print and online expenses. The fixed JOR expenses (\$114,966) include:

Service Fee \$1,651, Direct Marketing \$23, Fulfillment expenses for copies of back issues \$368, Processing fee from RightsLink \$213, Permissions \$15, Editorial Management \$32,963, Storage space \$1,298, Credit card

fees for JOR \$2,560, Credit card Fees (other) \$1,273, Admin Services (JOR) \$7,875, PS standard page charges \$22,603 (this is \$22/page, and increases with the number of pages), PXP manuscript fee \$5,408 (\$26 per manuscript). The on-line expenses (\$22,166) are: \$316 charges for articles deposited on Cross Ref. and \$21,850 web hosting (This is the cost of our hosting platform). The print expenses (\$59,134) are: paper \$11,543, printing and binding \$24,608, mailing services, \$4,356, international shipping \$13,493, postage \$5,134

A further breakdown of each of these categories is available from the Treasurer on request and has been presented to the Executive Committee.

The membership passed a dues increase from \$40 to \$65, which will be effective starting in 2017. This report is an opportunity to detail how those revenues and expenses related to membership. Currently SOR has ~1124 paying members (estimate). Each of those members contribute \$40 annually (2016) to be a part of SOR. There are expenses with AIP associated with the dues collection. These total \$23k. So the income from membership dues is \$45k and the related expenses are \$23k without the JOR, the *Bulletin* or *Physics Today*. So another way to state this revenue is that the SOR receives about \$15/member after expenses related to collecting the dues. Production and delivery of the JOR costs SOR about \$120/member in 2015 (normalized to a standard page count ~1600). Additionally, each member receives two issues of the *Rheology Bulletin* at a cost of \$10/member yr. SOR also pays \$5/member to AIP for *Physics Today*. This results in a subsidy of approximately \$120/member every year. Raising the rate to \$65/member in 2017 should reduce the current subsidy to ~\$100/member.

Another initiative approved by the Executive Committee this year was to proceed with a third way to sell the *Journal of Rheology*. For background, currently there are two ways that libraries subscribe to the JOR. The first is that a library will contact AIP and buy it directly (\$600/yr. print and electronic access; This is the solo Library Subscription line item at \$117,763). The second is a group of libraries will join in a consortium and the entire consortium will purchase a subscription to the JOR (\$600/yr. print and electronic access (\$37,160), or just electronic access (\$58,769)). A third way is now being explored in a one-year experiment. For 2017, the JOR will be combined with PoF (*Physics of Fluids* - now edited by Jeff Giacomin) & also PoP (*Physics of Plasmas*) and sold as a bundle to either individual libraries or consortia of libraries. The SOR will discount our price to be part of this bundle and receive \$480 per additional bundle subscription. An analysis presented to the Executive Committee showed that there are approximately 60 libraries that subscribe to both PoP and PoF already and who may be interested in this bundle. It presents some revenue risk if libraries ultimately change from individual subscriptions to the bundle causing a decrease in revenue, but it may increase total subscription numbers and thereby increase revenue. The JOR revenue and subscriptions will be something that the Executive Committee will be paying close attention to during this experiment.

**Longer term analysis** The longer term prospects for SOR have significant concerns. SOR is dependent on the surplus revenue from the JOR to support annual operating expenses. This trend is evident from Figure 1. Prior to 2008, SOR ran a consistent surplus as related to the JOR net revenue. This trend has been reversed since 2008. Going forward there is considerable uncertainty in the out year revenue projections for JOR. Open access, bundling, decreases in library subscriptions, increasing costs of collection may challenge the net revenue of JOR in future years. Even a small change in projected revenue of the JOR may severely impact the balance sheet of the Society as a whole. The SOR has taken some steps to accommodate these risks, such as the formation of a finance committee charged to develop an investment strategy for generating revenue based on investment of the financial reserves currently held at AIP in a cash account bearing little return. This may yield up to \$25k/yr. but carries downside or upside risk on principle. Additionally, the increase in the dues to \$65 should increase the revenue by slightly more than \$28K/yr. (This is an estimate  $\sim 1124 \times 25 = \$28k$ ). All of these efforts will be overrun by even a slight negative change in the revenue model for JOR. Additional efforts to increase the sales of JOR are being considered, specifically bundling the *Journal* (described previously). This too carries a downside risk as it will be selling the JOR at less than current market rates. Some additional changes have been implemented to reduce the cost of the *Journal*

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

(all amounts, USD)	2015 Year End	2014 Year End	2013 Year End	2012 Year End	2010 Year End	2009 Year End
<b>Assets</b>						
Cash in checking account(s)	25,181	69,163	147,077	73,886	13,257	18,330
Balance in AIP account	1,731,373	1,665,049	1,595,079	1,685,279	1,435,019	1,425,005
<b>Total Assets</b>	<b>1,756,554</b>	<b>1,734,212</b>	<b>1,742,155</b>	<b>1,759,165</b>	<b>1,448,276</b>	<b>1,443,335</b>
<b>Liabilities and Net Assets</b>						
<b>Liabilities</b>						
Deferred revenue	132,440	104,337	100,652	114,980	89,283	125,501
<b>Total Liabilities</b>	<b>132,440</b>	<b>104,337</b>	<b>100,652</b>	<b>114,980</b>	<b>89,283</b>	<b>125,501</b>
<b>Net Assets</b>						
Publication reserve	450,000	450,000	450,000	450,000	450,000	450,000
Student travel grant reserve	30,000	30,000	30,000	30,000	30,000	30,000
Annual Meeting reserve	300,000	300,000	300,000	300,000	300,000	300,000
Operating reserve	150,000	150,000	150,000	150,000	150,000	150,000
Unrestricted	826,554	699,875	711,503	714,185	428,994	387,834
<b>Total Net Assets</b>	<b>1,624,114</b>	<b>1,629,875</b>	<b>1,641,503</b>	<b>1,644,185</b>	<b>1,358,994</b>	<b>1,317,834</b>
<b>Total liabilities and net assets</b>	<b>\$ 1,756,554</b>	<b>1,734,212</b>	<b>1,742,155</b>	<b>1,759,165</b>	<b>1,448,276</b>	<b>1,443,335</b>

such as the new page format. Other proposals such as switching from a print-based distribution to members (\$120/member) to online distribution (\$93/member) may save on the direct print costs, but it will negatively affect the advertising revenue from the print JOR (~\$30k/yr). It will be important for SOR to consider a future without the consistent significant revenue from the JOR. This

will require significant changes in both the revenue and expense sides of the ledger. The SOR has sufficient reserves to manage for up to three years after a collapse in the JOR revenue so the situation requires careful observation but not extreme action.

Respectfully submitted,  
Christopher C. White, Treasurer

<b>The Society of Rheology</b>						
<b>Receipts and Disbursements</b>						
	<b>2017</b>	<b>2016</b>	<b>2015</b>	<b>2015</b>	<b>2014</b>	<b>2013</b>
	<b>Budget</b>	<b>Budget</b>	<b>Year end</b>	<b>Budget</b>	<b>Year End</b>	<b>Year End</b>
<b>RECEIPTS</b>						
Dues	73,060	46,000	44,980	48,000	45,590	49,305
Interest	2,000	1,200	2,092	1,800	942	1,174
Journal of Rheology	285,000	293,100	284,180	277,000	297,016	325,649
Mailing List Sales		0		0	0	0
Donations	1,000	0		0	0	0
Bulletin Advertising	9,000	7,600	9,505	7,200	8,092	6,340
Annual Meeting (net)	-	0	-14,589	0	2,181	-10,789
Short Course (net)	-	0	2,195	0	10,385	-6,376
<b>TOTAL RECEIPTS</b>	<b>370,060</b>	<b>347,900</b>	<b>328,363</b>	<b>334,000</b>	<b>364,207</b>	<b>365,303</b>
<b>DISBURSEMENTS</b>						
AIP Dues Bill & Collect.	30,000	11,000	27,876	11,000	10,287	11,033
AIP Adm. Services		1,200		7,500	1,106	7,500
AIP Mem. Soc. Dues		14,000		14,000	14,089	13,886
Contributions and Prizes	1,650	1,600	1,650	3,000	1,650	1,500
Early Career Award	15,250		7,625	8,500	7,620	15,100
Journal of Rheology	200,000	224,300	196,266	217,315	247,550	226,765
Bulletin	19,000	17,500	19,664	17,000	18,590	16,836
Bingham Award	32,000	0	16,126	15,000	10,000	20,000
Executive Cmt. Meetings	20,000	5,200	18,713	15,000	16,063	10,710
Pres. Discretionary Fund	1,500	1,500		1,500	1,824	919
Treas. Discr. Fund	1,500	1,500	197	1,500	288	0
Bulletin Editor Discr. Fund	1,500	1,500		1,500	517	0
Progr. Chm. Discr. Fund	3,000	3,000		3,000	-1,554	1,395
Webmaster Discr. Fund	3,000	3,000		3,000	1,447	3,000
International Activities Fund	5,000	5,000		5,000	0	1,313
Office Expenses	1,700	1,700		1,700	11,487	1,614
Banking Services		0		120	0	0
Liability Insurance	6,300	5,600	6,300	5,600	5,406	5,413
Membership Broch. & Appl.		100		500	0	62
Accountant	3,000	2,500	2,660	2,300	2,400	2,210
Student member travel	50,000	20,000	31,000	30,000	22,497	37,675
Annual meetings, future	3,000	3,000		4,000	2,925	1,076
Website	1,500	1,500	3,074	1,500	1,602	819
Miscellaneous	100	100		100	0	0
<b>TOTAL DISBURSEMENTS</b>	<b>399,000</b>	<b>324,800</b>	<b>331,151</b>	<b>369,635</b>	<b>375,793</b>	<b>378,825</b>
<b>Net</b>	<b>-\$28,940</b>	<b>23,100</b>	<b>-2,788</b>	<b>-35,635</b>	<b>-11,586</b>	<b>-13,522</b>

<i>Journal of Rheology</i>						
<b>Receipts and Disbursements</b>						
	<b>2015</b>	<b>2014</b>	<b>2013</b>	<b>2012</b>	<b>2011</b>	<b>2010</b>
<b>REVENUES (AIPP report)</b>						
Advertising Sales(print)	32,141	35,886	30,800	39,602	51,856	49,814
Advertising Sales(on-line)	4,930					
Royalties	28,369	33,197	69,736	108,919	88,162	4,277
Reprint Sales	2,548	0	0	0	0	1,060
Single-Copy Sales		0	105	0	0	105
Consortium		75,569	72,872	84,695	94,242	70,946
Consortium On-line only Income	58,769					
Consortium On-line+print	37,160					
Solo Library Subscriptions	117,763	150,364	148,137	145,850	150,980	159,285
<b>Total Revenue</b>	<b>284,180</b>	<b>295,016</b>	<b>321,649</b>	<b>379,066</b>	<b>385,240</b>	<b>285,488</b>
<b>EXPENSES (AIPP report)</b>						
Fixed Expenses	114,966					
Online Expenses	22,166					
Print Expenses	59,134					
Adv. Prod. and Hand.		8,433	8,233	10,305	13,033	13,180
Production		53,010	42,120	35,955	38,250	36,322
Cash Discounts & Rebates		917	2,030	1,972	1,313	1,839
Legal Fees		0	0	0	0	0
Editorial Management		41,124	42,550	50,272	40,914	46,217
Reprint Printing and Mailing		91	0	221	630	679
Printing and Binding		29,425	25,123	17,839	17,398	20,124
Paper		12,968	10,735	9,501	8,869	8,480
Mailing Expense		19,857	18,598	14,465	12,493	4,523
Postage		5,081	5,066	5,154	6,751	15,609
Single Copies		0	15	0	0	15
Back copy expense		434	449	1,967	0	688
Subscription Ful'ment, Member		4,263	3,284	3,377	3,491	3,788
Subscription Ful'ment, Nonmem.		2,112	1,818	1,811	1,848	2,072
Subscription Ful'ment, Comp/Ex		0	15	14	11	22
Marketing Expense		1,965	2,900	1,209	652	735
Storage		1,252	962	1,011	781	723
JOROL Expense		51,785	49,609	49,239	47,830	55,765
Vendor Management Fee		272	1,470	1,213	2,972	984
One-time setups		0	900			0
Credit Card and Bank Fees		494	460	473	393	528
<b>Total Expenses</b>	<b>196,266</b>	<b>233,483</b>	<b>216,337</b>	<b>205,998</b>	<b>197,630</b>	<b>212,294</b>
<b>NET</b>	<b>87,914</b>	<b>61,533</b>	<b>105,313</b>	<b>173,068</b>	<b>187,609</b>	<b>73,194</b>

# Treasurer's Report

end



The receptions in the TERRSA were filled to the brim with people and good cheer (above). Good sports Peter Fisher, Amy Shen, Julia Kornfield, and João Maia allowed the make-up and costume artists at Uzumasa Studio Park to transform them to Japanese characters ready for a historical drama (left). Joining them is the uncostumed David James. Kinkaku-ji, the Golden Pavillion, Kyoto; photo taken during ICR2016 (below).



*(Calendar, continued from page 20)*

*19-20 October 2019*

SOR Short Course on Rheology (topic TBA), Raleigh, North Carolina USA.

*20-24 October 2019*

91<sup>st</sup> Annual Meeting of The Society of Rheology, Raleigh, North Carolina, USA, Saad Khan.

**2020**

*August 2020*

XVIII<sup>th</sup> International Congress on Rheology, Rio de Janeiro, Brazil, Paulo de Souza Mendes and Roney Thompson (every four years); in Europe in 2024.

**2021**

*February 2021*

92<sup>nd</sup> Annual Meeting of The Society of Rheology, location TBA.

*October 2021*

93<sup>rd</sup> Annual Meeting of The Society of Rheology, Bangor, Maine, USA, Albert Co.

*For other meeting notices, see also:*

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

[www.appliedrheology.org](http://www.appliedrheology.org)



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# CALENDAR OF RHEOLOGY CONFERENCES AND COURSES

## 2017

*11-12 February 2017*

SOR Short Course *Interfacial Rheology* by Gerry Fuller and Jan Vermant, 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 ([www.rheology.org/sor/annual\\_meeting/2017Feb/](http://www.rheology.org/sor/annual_meeting/2017Feb/)).

*3-6 April 2017*

Annual European Rheology Conference AERC2017, Copenhagen, Denmark, contact Johanna Aho, ([johanna.aho@sund.ku.dk](mailto:johanna.aho@sund.ku.dk); [www.aerc2017.dk](http://www.aerc2017.dk))

*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. Technical Program by Anne Grillet and Randy Ewoldt.

## 2018

*17-20 April 2018*

Annual European Rheology Conference, AERC2018, Sorrento, Naples, Italy. ([www.rheology-esr.org](http://www.rheology-esr.org))

*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.

## 2019

*April 2019*

Annual European Rheology Conference, AERC2019. Location TBA.

*(continues, page 19)*