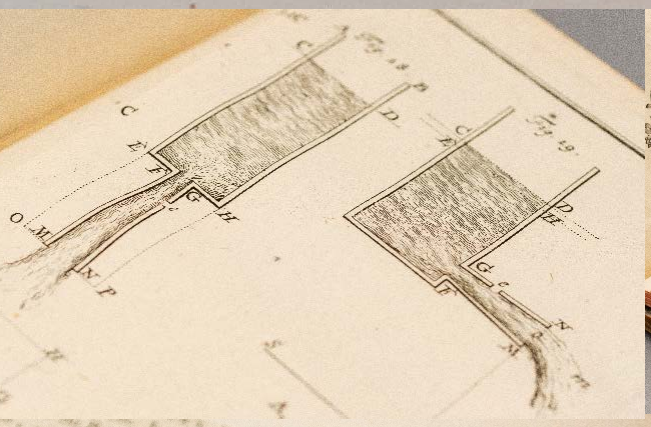
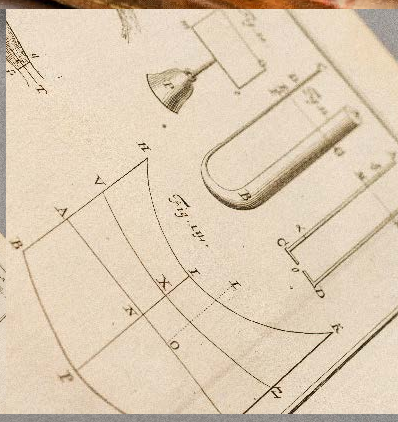
The News and Information Publication of The Society of Rheology
Volume 88 Number 2, July 2019

Rheology Bulletin

Inside:

- Awards: Vlassopoulos, Cheng
- Come to Raleigh in October
- SOR Diversity and Inclusion Efforts
- New! Rheology Research Symposium





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**ExCom appointment*

Table of Contents

On the Cover: *The cover features photos of Bernoulli's Hydrodynamica, sive De viribus et motibus fluidorum commentarii. Opus academicum ab auctore, dum Petropoli ageret, congestum (Hydrodynamica for short), a pioneering text on fluid mechanics and the kinetic theory of gases, published in 1738. This volume is part of the Wenner Collection of rare books and publications, acquired by the American Institute of Physics in 2018. The 3,800 items in the Wenner Collection were carefully curated by collector David Wenner and contain the most important discoveries in physical sciences over the past four centuries, featuring works by Ptolemy, Galileo, Huygens, Halley, Newton, Curie, LaPlace and more. Photos are courtesy of the Niels Bohr Library & Archives at AIP.*

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 may be sent to: *fmorriso@mtu.edu*

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Dimitris Vlassopoulos is 2019 Bingham Medalist

Profile by
Gary Leal, University of California Santa Barbara

It is a great honor to have the opportunity of writing to introduce the 2019 Bingham Medal recipient, Professor Dimitris Vlassopoulos, to the general membership of the SOR. Dimitris received his Diploma in Chemical Engineering from the NTU Athens in 1983, and then did his graduate work at Princeton where he worked for Bill Schowalter, primarily on the topic of drag reduction by dilute polymer solutions, completing his thesis in 1990. After a year at Mobil Research and Development Corporation in Paulsboro, he elected to return to Greece, initially as a contract researcher at the FORTH Institute in Crete, but in 1998 he simultaneously joined University of Crete, initially in the Department of Physics and subsequently in the Department of Material Science and Engineering. He has also held visiting professorships at the University of Delaware (USA), the University of California, Santa Barbara (USA), the ETH in Zürich (Switzerland), and held the Michelin Chair at the ESPCI (France).

Scientifically, he has published extensively on many subjects in rheology (more than 200 papers to date), and he has become an intellectual leader on a number of the most important topics in rheology, as I will discuss below. Beyond that, however, he has been active and a leader in rheology. He has served on the Executive Committee of the SOR. He has twice been on the editorial board of *Rheologica Acta* and served as an editor from 2006-2011. He is a member of the editorial board of *JOR* and also *Physics of Fluids,* and is associate editor of *Soft Matter*. He has been recognized twice by SOR for his research, once via the Publication Award in 2011 and this past year by election as a Fellow of the SOR. He is a former president of the Hellenic Society of Rheology. In 2015, he was awarded the Weissenberg Award of the European Society of Rheology.

Dimitris' research focuses on molecular engineering of soft matter with emphasis on fundamental aspects of polymer and suspension rheology as well as on bridging the gap between these two disciplines. His approach consists of devising strategies based on molecular design of model systems with adaptable molar mass and architecture or tunable interactions (from hard to ultrasoft), and developing appropriate protocols and rheometric tools for obtaining molecular insights into the rheology of polymers, supramolecular assemblies, and soft colloids. Some highlights (influenced by my own interests) include:

(1) *Interplay of thermodynamics and rheology in polymer blends*

By identifying and quantifying the contribution of enhanced pre-transitional composition fluctuations to the viscoelasticity of partially miscible polymer blends, Dimitris showed that rheology is a very sensitive tool for determining both the bimodal and spinodal phase boundaries of blends. This approach is now being used routinely. The role of dynamic asymmetry of the components has been elucidated, along with the role of shear in inducing mixing or demixing. Recently, a universal rheological diagnostic scheme for phase transitions was proposed.

(2) *Molecular rheology of branched polymers*

Dimitris' work represents the most comprehensive experimental study of the role of branches on entangled polymer rheology. This was achieved by designing and obtaining a library of well-characterized branched polymers with precise molar masses and architecture (size, position and distribution of branches). To test and advance tube-model theories, different model polymers like pom-pom and Cayley trees were investigated and the mechanism of hierarchical relaxation assessed, but the cornerstone of this effort is the comb polymers paradigm. Their methodological study under linear and nonlinear shear and extensional deformation, along with targeted modeling to correct tube theories, revealed important molecular insights into their rheology, such as the interplay of branch and backbone relaxation, the double shear stress overshoot for large branches, or the importance of dynamic dilution in both nonlinear damping and extension hardening. This work has motivated further academic and industrial developments. For example, the state-of-the-art BoB tube model has been successfully applied to branched polymers with marginally entangled branches, whereas molecular design parameters for tailoring the rheology of comb polymers have been proposed recently.

(3) *Ring polymers*

Dimitris' discovery that in the absence of free ends, entangled polymers do not form a network with a plateau modulus but instead exhibit a power-law stress relaxation, resolved a 30-years-old mystery, and revealed the crucial importance of appropriate material characterization for molecular rheology, opening the route for exploration of important biological problems such as the

Vlassopoulos family in Ithaca: Sissy, Nondas, Dimitris, Xenofon.

dynamics in chromosome territories. This has been one of the outstanding challenges in polymer physics and rheology. The extraordinary sensitivity of rings dynamics to traces of unlinked polymeric chains sets them apart from any other polymer and reflects the extreme sensitivity of rheology as a molecular probe. His most recent work focuses on their unusual nonlinear shear response, which is characterized by weaker thinning compared to their linear precursors, their uniaxial extensional rheology, as well as their remarkably efficient use as rheology modifiers of linear polymer matrices.

(4) *From polymers to colloids*

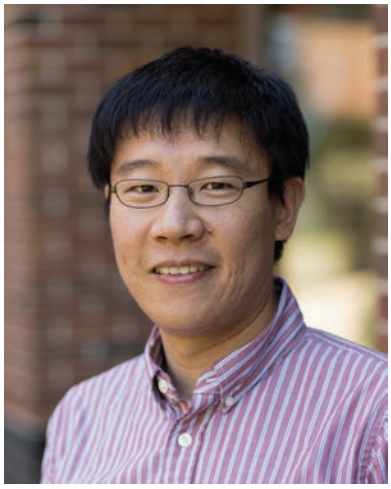
Due to their inherent density heterogeneity, certain types of hyperbranched polymers, like multi-arm stars in the melt, exhibit a complex viscoelastic response with dis-

(continues page 17)

In the boat: This is part of an excursion Dimitris had organized during a meeting of the European project (DoDyNet). In the boat, you may recognize other rheologists (Thanasis Athanasiou (the 'Captain' of the boat, also a PhD student of Dimitris'), Giuseppe Marrucci, Giovanni Ianniruberto, Sissy Vlassopoulos, Dimitris, Christian Ligoure (head hidden by sail), Laurence Ramos, Daniel Read, Renaud Nicolaÿ, and Eleni Livanou, assistant to the captain).

Xiang Cheng Receives the 2019 SOR Early Career Award

Profile by
Chris Macosko, University of Minnesota



Xiang Cheng, Associate Professor of Chemical Engineering and Materials Science at University of Minnesota, Twin Cities, is the recipient of the 2019 SOR Metzner Early Career Award. Cheng's research uses innovative imaging and keen physical insight to unravel the rheology of soft matter. He couples rheological measurements with state-of-the-art imaging techniques including high-speed photography, fast confocal microscopy, and digital inline holography to investigate the rheology of active fluids, jammed soft materials, and the impact of liquid drops.

Cheng received his BS in physics from Peking University in China in 2002 and his PhD in 2009, also in physics, at the University of Chicago under the supervision of Sidney Nagel and Heinrich Jaeger. His thesis focused on the flow of granular materials. This body of 10 publications, including two as a single author, has gained over 500 citations.

Cheng did his postdoctoral work with Itai Cohen at Cornell, where he studied the rheology of colloidal suspensions. He designed and built a planar shear cell integrated with a fast confocal microscope. He used it to image single particle dynamics as they transition from shear-thinning to shear-thickening in concentrated suspensions. In particular, he quantified the shear-driven distortion of uniform particle structures and experimentally demonstrated the entropic origin of shear-thinning flows. His results on particle dynamics in shear-thickening flows stimulate ongoing discussions on the microscopic origin of shear thickening. This work broke new ground in access to structure-property analysis in soft matter rheology. Published in *Science* in 2011, it has been cited nearly 300 times.

In 2013 Cheng joined the University of Minnesota as the inaugural Macosko Assistant Professor. He has initiated a very active and diverse research program, which has been recognized with early-career awards from Packard Foundation, DARPA, NSF, and 3M. He has continued granular-flow studies at Minnesota. Using high-speed photography and laser profilometry he has discovered a remarkable similarity between liquid drop impacts and asteroid craters; the YouTube video of this work has nearly 900,000 views. In a *PNAS* publication with three undergraduate researchers, he modeled crater diameters over 7 orders of magnitude, from raindrops on sand to asteroids on different planetary bodies. This work has important applications in soil erosion, drip irrigation, and powder coating.

Xiang has also applied his imaging expertise to real time visualization of polymer bigel formation. He showed that, initially, elastic modulus decreases due to coarsening after these polymers phase separate, but then it increases strongly due to particles jamming in the interface. His group received an NSF grant to apply these techniques to design graphene-stabilized co-continuous polymer blends. By localizing graphene at interfaces, electrical percolation occurs at as low as 0.025 wt% graphene. Xiang is also applying confocal microscopy to study the dynamics of colloids in strong confinement, breaking new ground in our understanding of glass-formation processes.

Recently Xiang launched a new research program on the rheology of active fluids using bacterial suspensions as a model system. His work revealed an unusual symmetric shear banding in concentrated bacterial suspensions and provided new insights on the microscopic dynamics leading to the emergence of active "superfluids." He also studied the rheology of bacterial suspensions under confinement and illustrated the

(continues, page 15)

The SOR Early Career Award, established in 2009, is named for Art Metzner, distinguished rheologist, university professor, Editor of the Journal of Rheology, and 1977 Bingham medalist. For a list of all recipients and the criteria of the Metzner award, see www.rheology.org.

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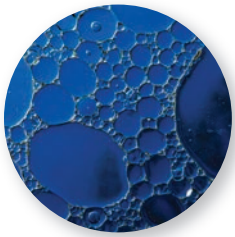




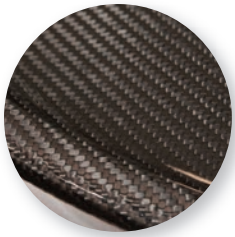

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Come to Raleigh!

We invite all industrial and academic rheologists and those interested in rheology to come to Raleigh, North Carolina for the 91st Annual Meeting of the Society of Rheology. The meeting, taking place for the first time in its history in the state of North Carolina, will occur from 19-24 October 2019 at the Raleigh Convention Center, a large 500,000 square-foot facility that features stunning window views of downtown. A room block has been reserved at the Raleigh Marriott City Center, a beautifully renovated hotel next to the Convention Center; within walking distance of this area food and entertainment options are plentiful. The weather in Raleigh will be pleasant in October, with an average high and low temperatures of 72°F (22°C) and 50°F (10°C) respectively. The Raleigh-Durham International Airport (RDU) is a major hub approximately 15-20 minutes car ride away from downtown.

A number of activities are scheduled in addition to the main conference:

1. Two short courses are offered 19-20 October (see pages 12-13). The first is a one-and-a-half-day short course on suspension and granular flows, led by Jeffrey Morris of City College New York and Karen Daniels of North Carolina State University; the second is a one-day short course on food rheology, led by Peter Fischer of ETH Zürich and Allen Foegeding of North Carolina State University.

2. The Rheology Research Symposium (RRS; see page 15) is a new initiative between The Society of Rheology and the American Institute of Physics to bring together students with professionals in an interactive and intimate setting. The RRS will be held 19-20 October, including happy hours at the Marriott on Saturday evening and a K-12 outreach event at the Museum of Natural Science on Sunday afternoon. The outreach event is organized together with the SOR Education Committee.

3. Based on past successes, there will again be a Student-Industrial Forum at lunchtime on Monday, with box lunches provided.

Team Raleigh:
Lilian Hsiao, Saad Khan, Michael Rubinstein

4. On Monday evening there will be a reception at the North Carolina Museum of Art, where visitors can enjoy a walk around the exhibits. The Annual Business Meeting of the Society will be held at lunchtime on Tuesday, with an evening reception and banquet to honor the Bingham Medalist Dimitris Vlassopoulos, to be held in the Convention Center. A poster session will be held on Wednesday night and, for the third year, the Gallery of Rheology competition will run parallel to the poster session.

Photos courtesy: visitRaleigh.com

In a continued effort to engage with industry, every technical session will include an industrial invited keynote speaker, presenting work on the application of rheology in that topic area (see page 18). The meeting will feature plenary talks by this year's Bingham medalist, Dimitris Vlassopoulos of the University of Crete and by the Metzner awardee, Xiang Cheng of the University of Minnesota. There will be additional plenary talks by Christoph Schmidt of Duke University and Emanuela del Gado of Georgetown University. The meeting will conclude on Thursday around noon. Details are available on the website. We look forward to a great meeting in Raleigh!

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A Letter from the SOR President

Dear Society Members,

Who are we? What do we do well or not so well? How can we do better? How can we better serve our mission to promote the rheological sciences as well as our members? How can we grow our membership to be more inclusive and diverse? With the leadership of our Diversity and Inclusion Committee, financial support from the AIP Venture Partnership Fund (VPF), and technical support from AIP's Statistical Research Center, a comprehensive survey of rheologists has been conducted to help answer these questions. With nearly one thousand respondents from current members as well as from those publishing in the *Journal of Rheology* more broadly, we now have quantitative answers to these questions and guidance for better serving our members, as well as for expanding the reach of the Society. The analysis of this survey will be presented at the Society's Business Meeting in Raleigh, and a summary will be published in the winter *Bulletin*.

The preliminary results are informative: For example, we are relatively young, with nearly 40% of the respondents having achieved their highest degree within the past decade. Chemical engineering is the most prevalent discipline, followed by physics, materials science, and mechanical engineering in nearly equal measures. Meanwhile, fewer than 1% identified with bioengineering. Most rheologists first identified as such while in graduate school, and respondents work over a quarter of their average workday on rheology. Respondents overwhelmingly cited being able to stay abreast of developments in the field as a key value of membership, as well as expressing a high level of satisfaction with the annual meetings. An ongoing, deeper analysis of the data will identify opportunities for growth and improvement.

This is an election year, and the volunteers being elected by you to the Executive Committee will serve two-year terms. For the sake of continuity, the secretary typically serves five consecutive terms. A special thanks to outgoing secretary, Albert Co, who has not only provided excellent support in his official role as secretary but continues to serve as our webmaster and writer of meeting apps and websites, among many critically important tasks. Also, a special thanks to our nominating committee, Patrick Anderson, Jacinta Conrad, and Chris Macosko, who have identified a strong slate of candidates willing to make time to serve. Please learn more about these volunteers via the election website that will be shared with you this summer, and please VOTE!

To further expand the voice of the graduate students in our Society, the Executive Committee selected Jennifer Mills (University of Delaware, USA) from a talented group of student nominees to serve as our first graduate student delegate to the Executive Committee for 2019-2020, and Jennifer Hofmann (Stanford) was selected, also from a talented slate of nominees, to serve on the Diversity and Inclusion Committee. Students, please reach out to either of these representatives, as well as any member of the Executive Committee with ideas and/or concerns. Further recommendations for opportunities for student service to the Society are forthcoming from the Executive Committee.

The survey also enabled self-identification of volunteers to help with Society activities - the most significant of which in the near term is the Rheology Research Symposium (RRS), which will be held in advance of the Annual Meeting. Modeled in part after the popular Graduate Research Symposia put on by the Gordon Research Conferences, the RRS provides a forum for graduate students to learn skills, develop careers, and gain mentoring from volunteers. Funded through an AIP Venture Partnership Fund grant, this is an experimental program designed to improve education and mentoring of students and increase the inclusion and diversity of the Society. You can read more about the exciting inaugural RRS program in the *Bulletin* article (page 15) written by the Diversity and Inclusion committee chair,

Society of Rheology
Diversity & Inclusion

Kelly Schultz, as well as on the committee's website. The RRS wraps together the Education Committee's highly successful K-12 program as well as the student-industry forum into a weekend of skill development, mentoring, and networking. Students, please apply - and members, please note that donations to the Society for student travel will help support more students at the RRS.

Our *Journal* continues to break records for quality publications, with special issues dedicated to timely topics as well as specialized reviews of value to those seeking knowledge about a topic in rheology. The new partnership with AIP Publishing continues to grow the reach of the *Journal* as well as provide income that helps to fund Society operations and initiatives.

Our history project continues with the engagement of another SOR/AIP History Intern, Megan Anderson, who will work in the SOR archives this summer with supervision from our Society's Historian Gareth McKinley to continue profiling earlier Bingham medalists and Society presidents. You can now read some of these on the new website. Our 100th anniversary of the Society will be upon us soon (2029) and these history efforts are projects in preparation for planning a gala centenary celebration of the Society.

Raleigh is the site of our October Annual Meeting, which already is setting records for submissions and programming. I hope you will attend and avail yourself of this unique opportunity for professional and personal growth and development. With excellent, affordable short courses, superb technical programming, vendor exhibits, student-industry networking, K-12 education outreach, and lots of networking time, the Annual Meeting is truly the best meeting for rheologists world-wide. Best wishes, and I hope to see you in Raleigh!

Norman Wagner
President, The Society of Rheology

The Society of Rheology

Our Vision

An international community of rheologists working towards common goals as articulated in our founding Constitution.

Values

We are the nexus of excellence in the theory and practice of rheology. We are committed to advancement and promotion of the rheological sciences and practice of rheology broadly across diverse groups of individuals, disciplines, and industries.

Mission

We aim to expand the knowledge and practice of rheology through education, partnership, and collaboration with associated fields, industries, and organizations, as well as to disseminate to diverse communities what rheology is, and how it impacts humanity and the world.

Adopted by the SOR Executive Committee, 10 June 2017

The Society of Rheology was founded in 1929 to foster the study of the mechanical properties of deformable materials. SOR is a founding member of the American Institute of Physics.
Visit our website *www.rheology.org/SOR/*

SHORT COURSES IN RALEIGH

19-20 October 2019
www.rheology.org/SOR/Annual_Meeting/2019Oct/

Suspension/Granular Rheology (1 1/2-Day Short Course)

Jeff Morris, Levich Institute
CUNY City College
Karen Daniels, Department of Physics
North Carolina State University

The rheology of suspensions and granular materials will be presented. This will begin with an overview of phenomena observed in these materials. The course will then provide a summary of the mechanics of rheometry and constitutive models, focusing on the models and techniques most commonly encountered in particulate and particle-laden systems. The mechanistic basis for particle-induced stresses will be discussed, beginning with viscosity and continuing to rate-dependent rheology and normal stresses. We will also address bulk phenomena such as clogging, jamming, particle migration, surface deformation, and instability. Established and novel methods of measurement will be demonstrated and described. We will provide presentation materials, including a list of key references, ahead of the course.

Outline

DAY 1

I. Flows of particulates: hands-on motivating examples
   - A. Suspensions vs. granular
   - B. Shear-thickening and shear-thinning

II. Rheology
   - A. Definition and goals
   - B. Basic framework: stress, strain, strain rate
   - C. Continuum models and bulk properties
   - D. Discrete models and microstructure

III. Rheometry
   - A. Classical fluid measurements
   - B. Particulate-specific methods

IV. Mechanisms of transmitting particle stress
   - A. Force chains and interparticle contacts
   - B. Role of particle size, size distribution, shape, stiffness
   - C. Role of the fluid

V. Bulk phenomena due to particulate rheology
   - A. Particle migration
   - B. Particle segregation
   - C. Boundary deflection

VI. Clogging and jamming
   - A. Hopper flow
   - B. Vibration effects

DAY 2

VII. Demonstrations from rheometer vendors

VIII. Technologies and geometries for rheometry
   - A. Rheometer plates vs. vanes
   - B. Tilted trough

IX. Colloidal effects and rheological control
   - A. Salts
   - B. Surfaces
   - C. Surfactants

X. Discussion and open questions

More on the *SOR* Instructors in Raleigh:

Jeff Morris' main research interests are in the microstructure, rheology, and bulk flow phenomena in colloids and suspensions.

Karen Daniels' main research interests center around experiments on the non-equilibrium and nonlinear dynamics of granular materials, fluids, and gels.

Peter Fischer's research focuses on rheology and structure of food ingredients, as well as the complex interactions present in food.

E. Allen Foegeding's career has focused on advancing the understanding of mechanisms for how molecules form food structures and how food structures deliver specific properties.

SHORT COURSES IN RALEIGH

Sunday 20 October 2019
www.rheology.org/SOR/Annual_Meeting/2019Oct/

Rheology of Foods (One-Day Short Course)

Peter Fischer
ETH Zurich, Switzerland
E. Allen Foegeding
North Carolina State University

Convenience, appearance, flavor, and texture together govern the human perception and acceptance of foods. However, the motivation to understand and quantify food properties such as texture – its creation, stability, perception and destruction – remains high since it is critical to the manufacture of food products that delight and satisfy food consumers, while delivering nutrition and health. Thus, the understanding of structure and mechanical properties of food products is critical to its overall properties and quality perception.

During processing, the formulated food system is physically and chemically modified while building the structure, all of which combine to impart the desired material properties and hence the texture to the final product. With health and nutrition becoming increasingly important, the role of foods in preventing and managing diseases has gained a great deal of attention – thus the understanding of the rheology from the destruction of the food in the mouth, its subsequent manipulation and transportation through the stomach, the gut, and beyond have become important fields of research today.

In view of the above, processing-structure-property relationships and materials science understanding of the observed rheology and texture are critical to the formulation, processing, product performance, and human consumption and satisfaction of foods.

This course builds on the fundamentals of rheology and seeks to introduce the participant to the intriguing world of complexities entangled in the bowl of food rheology and texture. Where appropriate, comparisons and contrasts are made to the behavior of polymeric fluids and colloidal systems.

Outline

I. Introduction (Feeding a world of 10 billions and what rheology can contribute)
   - A. Motivation and framework
   - B. Feeding the world
   - C. Pleasure, convenience and nutrition
   - D. Sustainability and environment
   - E. Moving from animal to plant material

II. Food rheology and texture measurements – the familiar and the unique
   - A. Fundamental rheometry
   - B. Food specific techniques and texture analysis

III. Structural characterization techniques
   - A. Microscopy and scattering
   - B. Interfacial rheology
   - C. Tribology
   - D. Other techniques: thermal analysis and spectroscopy

IV. Ingredients – fundamental rheological systems
   - A. Emulsions and suspensions
   - B. Gels and gel fracture
   - C. Foams

V. Recipes – food ingredients and their chemistry
   - A. Carbohydrates
   - B. Proteins
   - C. Fats

VI. Cooking – food processing rheology
   - A. Process transformations
   - B. Scale-up and process design
   - C. Process-line measurements
   - D. Dough

VII. Plating – selected food products
   - A. Bakery – breads and snacks
   - B. Dairy – yogurt, cheese, low fat dairy
   - C. Chocolate
   - D. Ice cream

VIII. Human experience – sensory science
   - A. Product quality and stability
   - B. Texture
   - C. Predicting human perception

IX. Unraveling length scales – food oral processing
   - A. Structure break down on different length scales
   - B. Influence of saliva
   - C. Addressing needs of specific populations

X. Closing – challenges and opportunities
   - A. Soft materials science
   - B. Digestion engineering
   - C. Challenges and opportunities

Special Issue on Dense Suspension Dynamics

Guest Editor: Jeff Morris, CCNY

Guest Co-Editor: Emanuela Del Gado, Georgetown University

Expressions of intent to submit a paper are invited for a special issue of the *Journal of Rheology*. Scheduled for publication in early 2020, this issue will focus on the dynamics of dense suspensions, systems at high solid fractions resulting in strong nonlinear material response, including large normal stresses, shear thickening, and jamming. We seek a broad array of contributions from experiments, theory and simulation, as well as academia, national labs, and industry. Contributions that elucidate structure, in particular at the particle scale, are particularly welcome.

This special issue follows recent focus meetings on the topic, including at the Kavli Institute for Theoretical Physics (Physics of Dense Suspensions) held at UCSB and organized by B. Chakraborty, E. Del Gado, J. Morris, advised by W. Poon, as well as the workshop on the Rheology of Dense Suspensions held at Georgetown University, organized by E. Del Gado, D. Blair, B. Chakraborty, & J. Morris, and the SoftComp workshop on Dense Suspension Flow at the University of Edinburgh, organized by W. Poon, M. Cates, and D. Vlassopoulos.

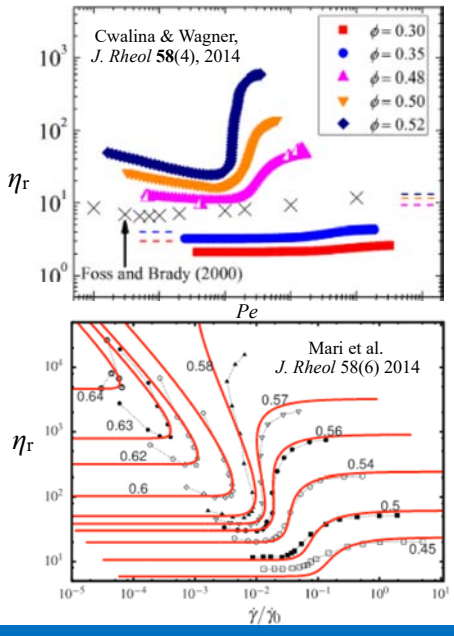
Accepted articles will be circulated among all authors participating in the special issue, for comments and questions that will be published following the article, with replies from the authors.

An Editorial Foreword will be co-written by B. Chakraborty, E. Del Gado, and J. Morris.

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 prior the submission deadline.

- Please inform Ania Bukowski , Editorial Assistant, by e-mail to JOR-EditorialOffice@aip.org
- Use **INTENT - Special Issue/Dense Suspensions** in the subject header of your message.
- Indicate a tentative title for your manuscript.
- Include contact author's name, institution and email, and those of known or proposed co-authors.



DEADLINE FOR SUBMISSIONS: **September 30, 2019**

Students- Be a part of the First Annual *Rheology Research Symposium* (RRS)

Kelly Schultz, Chair, SOR Diversity and Inclusion Committee

The first annual Rheology Research Symposium (RRS) will be held 19 – 20 October 2019, prior to the SOR Annual Meeting in Raleigh. The RRS is being developed by the Diversity and Inclusion Committee. The members of this committee are Jennifer Hofmann (Stanford U, graduate student member), Lilian Hsiao (North Carolina State U), Safa Jamali (Northeastern U), Matthew Liberatore (U Toledo), Susan Muller (UC Berkeley), Kelly Schultz, chair (Lehigh U), Maryam Sepehr (Chevron), and Norman Wagner (U Delaware). This program is required for students that apply for the student-member travel grant. The RRS is supported by an American Institute of Physics (AIP) Venture Partnership Fund grant and aims to follow the mission of the Society by broadening our community.

The RRS will build a mentoring community within SOR by creating a multi-tiered mentoring structure that includes young and established rheologists. These mentoring groups will give young rheologists the opportunity to learn about our community and will also integrate them into the fabric of SOR. This will also give established rheologists the opportunity to interface with the future of rheology. By establishing this program, we hope to increase inclusion within the Society and provide young rheologists an established avenue to have a voice in SOR.

The programming of the RRS will include career-mentoring talks, networking events, and a panel to discuss "Finding your scientific voice." Career-mentoring talks will present strategies and paths to starting careers in industry, academics, and at national labs. A networking event will be held with the Executive Committee; here, participants can learn more about the inner workings of the Society, its leaders, and how to become more involved in the SOR. The panel discussion on "Finding your scientific voice" will aim to tackle the question of how to become an independent scientist and explore your scientific creativity. Participants of the RRS will also participate in the K-12 outreach program on Sunday afternoon (organized by Jonathan Rothstein, U Massachusetts) and the Student-Industry Forum (organized by Maryam Sepehr of Chevron) held over lunch on Monday. This program will broaden the reach of rheology and continue to grow a diverse community within the Society.

For further information on the RRS please visit our website at *web.northeastern.edu/sordiversity/*. The application form and requirements for the student-member travel grant and RRS can be found at *www.che.udel.edu/forms/sor-stg.html*.

(Metzner Award, continued from page 6)

influence of bacteria-wall interactions on the flow of suspensions. In addition, he has collaborated with Kevin Dorfman on studying shear banding in entangled polymer solutions. They have investigated the diffusive modes in entangled DNA and shown the connection to inhomogeneous shear fields.

A goal of the Metzner award is to encourage the best young researchers to be engaged in the rheological community. Xiang is a perfect example of this, coming from just 'outside' and already showing a respect and wish to engage with the rheological community. He will continue to be a strong contributor to the Society for many years.

(Bingham Award, continued from page 5)

An excursion with Giovanni Ianniruberto and Evelyne Van Ruymbeke (quote due to Evelyne): "From his house, Dimitris has a very beautiful view, and we can see the Strumbula, a triangle mountain with a small church on the top. From this church, the view is wonderful. But Dimitris never takes the time to visit Crete! One day, he confessed that he never went to this place. So, we decided to bring him there."

tinct polymeric and colloidal contributions. As a result, appropriately designed star polymers with controlled number and size of arms have been established as model soft colloids with tunable interactions. This work forms the foundation of what has emerged as the field of solvent-free colloids and has impacted significantly the large field of nanocomposites. Colloidal star polymers (in melt or solution) constitute one of the two pillars in the field of soft colloids (the other being microgels), encompassing the key features of softness (shape adjustment and interpenetration) that affect their rheology.

(5) *Soft colloids: metastability, tunable rheology and flow instabilities*

Extensive work by Dimitris and his colleagues over several years with colloidal stars as the prime paradigm has addressed outstanding challenges associated with the flow of yield-stress fluids, colloidal glasses, pastes, and gels. Highlights include the observation of liquid-to-solid transition upon heating, the link among aging, yielding, and shear banding in soft colloidal glasses, the unusual two-step mechanisms of aging, yielding, and slow dynamics in glassy hairy nanoparticles, which are often studied by means of specially developed protocols, the shear-induced crystal-to-crystal transition without intermediate melting, and the analysis and exploitation of osmotic pressure effects in soft colloidal mixtures (which drive both particle compression and depletion). The latter has opened Pandora's box and enabled the use of appropriately designed mixtures for tailoring the flow properties of soft composites, driving the field into new territories. His most recent work addresses the questions of jamming and shape effects in hairy particle glasses.

(6) *Rheometry*

The redesign of cone-partitioned plate geometry for strain-controlled rheometers has revitalized the field of nonlinear shear rheology and, combined with enhanced molecular understanding, holds the premise for understanding the transient polymeric response in strong shear and especially the contributions of convective constraint release, stretching, and tumbling. More recently, both the first and second normal stresses were measured in melts of linear polymers at high temperatures. His most recent efforts are focusing on further improving the measurement of second normal stress differences at high temperatures.

It should be noted that this selection of topics is far from a comprehensive description of all that Dimitris has accomplished, as it overlooks some very important areas such as his work on associating polymers and recent work on polymer blends with architectural dispersity, including the use of interaction chromatography as an indispensable tool in molecular rheology along with advanced rheometry for true molecular understanding of polymer viscoelasticity and physics.

However, if I continued with any additional details of his professional accomplishments, I would not have any space remaining to talk about Dimitris, as seen by his many friends and former students. We honor Bingham medalists for their scientific feats, but I cannot help but believe that in the SOR, we also recognize the quality of the person. My own view of Dimitris is as a person who really values and works with his collaborators and students as friends. He is a fantastic host if you visit him in Crete, but I have to also recall a wonderful week that Bill and Jane Schowalter and my wife Mary and I spent staying in his family's historical home on the island of Ithaca at Dimitris' invitation. Not only did he allow us to use the family home, but our visit was preceded by Dimitris contacting restaurants and other places on the island to alert them to his "special" guests that they should treat well. The family name and reputation still mattered on Ithaca, even though they had not lived there for many years.

I took the liberty of asking some of his former students for their input on Dimitris. They did not expect to be quoted, so I will in fact reproduce some of what they told me without attributing the information to a specific student or collaborator. They sent me some wonderful notes and also pictures.

"He has an incredible number of collaborators - This is really part of his way to see the research. He is very attentive to his students (he calls them his 'kids' or his 'lab kids'). Often, he invites all his group to his house for a dinner or a party. This simplicity and proximity is something that is really appreciated. I think I was one of the first students working with him when he arrived in Crete. So I experienced his initial excitement, commitment and involvement in scientific research. The strange thing is that after several years and many publications and recognition his attitude did not change: He is still an excited, full of energy 'young' researcher seeking excellence. He always seeks new collaborations around the world that could share research interests. As a result, sharing work made him very productive with many publications, even though his group in Crete has always been a small one. Such a choice requires a lot of traveling and long hours at work. He does both but more importantly has a lot of understanding from his wife, Sissy."

"If you eat in Dimitris' company, especially in Crete, you cannot avoid some talk about food rheology. During my PhD in Crete, I learned about extensional properties of saganaki (molten cheese), the yield stress of the Greek yogurt, the viscosity of olive oil, and much more."

There is a funny story that his wife, Sissy, told me about rheology and food. When his elder son was 4-5 years old, Dimitris used to explain Bingham fluids to him by turning a bowl of chocolate pudding upside down and showing him that the pudding did not fall under its weight. Once Sissy's father came to visit their family while Dimitris was in US. The child wanted to explain Bingham fluids to the grandfather, but Sissy had cooked spaghetti for dinner. While she was busy with other cooking, her son took the bowl with the spaghetti and turned it upside down, pouring everything on the floor. This made Sissy very upset, so she called Dimitris in the US, ready for a fight. The conversation went more or less like this:

Sissy: "Hey there, your son made me furious today!"

Dimitris: "Oh, what did he do?"

Sissy: "Now he will tell you…," and passed the phone to the child, who reported the facts to his father. Then Sissy took the phone back, and said: "So?"

Dimitris: "Oh that's very wrong."

Sissy: "You see?"

Dimitris: "Of course. That's not a Bingham fluid but an example of polymer reptation."

As is always the case, we honor great scientific achievement with award of the Bingham Medal. In Dimitris' case, we also recognize a wonderful, thoughtful and kind human being, whose interest in rheology does not stop, even at the dinner table!

Recent group photo on the FORTH terrace, front row: Katerina Peponaki, Maria Karouzou, Esmaeel Moghimi, George Petekidis, Manos Vereroudakis, Emanuela Filippidi, Christina Pyromalli, Nikos Kalafatakis. Middle: Benoit Loppinet, Consiglia Carillo, Stelios Alexandris, Daniele Parisi, Antony Mavromonolakis, Dimitris Vlassopoulos, Nikos Burger, Leo Gury, Thanasis Bogris, Andrei Munteanu. Back row: Thasanis Athanasiou, Mohandas, Panagiota Bogri, Dimitra Founta, Antje Larsen.

Industrial Keynotes and Program Highlights: Raleigh 2019

Organizers:

Lisa Biswal
Department of Chemical and Biomedical Engineering, Rice University

Steven Hudson
National Institutes of Standards and Technology

91st Meeting of The Society of Rheology

Technical Program

Industrial keynotes were favorably received during last year's meeting, and our organizers have a new slate of industrial speakers for our upcoming meeting. Please keep the ideas coming and help organize future meetings. Thanks.

Industrial Keynote Speakers at SOR 2019 Raleigh: (by session)

Rheometry: Advanced Techniques and Methods
Zehra Parlak, Qatch Technologies, "Injectability screening for concentrated biologics by microfluidic quartz resonator"

Interfacial Rheology
Miguel Gonzalez, Aramco Services Co., "From macro to micro (to nano): mechanical resonators at all scales for rheology sensing in oil field fluids"

Microfluidic and Confined Flows
Tom de Haas, Interface Fluidics, "Development and commercialization of microfluidic flow assurance testing"

Flow-Induced Instabilities and Non-Newtonian Fluids
Andrei Potanin, Colgate-Palmolive, "Using rheometry and MRI to predict transfer of pastes and gels"

Suspensions, Colloids, and Granular Materials
Marco Caggioni, P&G, "Microstructure design in consumer products"

Surfactants, Foams, and Emulsions
Jeremy Fowler, Syngenta, "Rheology as a tool to assess long term stability and robustness in formulation development"

Polymers Solutions, Melts and Blends
Eugene Pashkovski, Lubrizol, "Using rheology, colloid force microscopy and mathematical modeling for understanding the role of associative polymers in lubrication"

Additive Manufacturing and Composites
Adam R. Pawloski, Advanced Materials at Stratasys, "Materials, systems, and software for thermoplastic additive manufacturing by FDM"

Out of Equilibrium Systems: Gels and Glasses
Will Hartt, P&G, "Reversible and irreversible stress induced rheological changes in complex fluids"

Biomaterials and Biofluid Dynamics
Matt Lynch, P&G, "Revealing processability of structured fluids comprising biopolymers by microfluidics"

Active and Directed Systems
Jim Stasiak, HP Labs, "Voxel-scale engineering of functional polymer nanocomposites using 3D printing methods"

Applied Rheology for Pharmaceuticals, Food, and Consumer Products
Michael Boehm, Pepsico, "Using in vitro measures to probe the responses of electrospun protein-polysaccharide conjugates to high-shear deformations"

Plenary Speakers at SOR 2019 Raleigh:

Christoph Schmidt (Duke University) "Statistical physics of active biological matter"

Emanuela del Gado (Georgetown University) "Rheology of gel networks: softness, rigidity and failure"

Bingham Medalist, Dimitris Vlassopoulos (University of Crete), "Molecular rheology and synthetic chemistry: a critical partnership for designing flow-responsive matter"

Society Business

NEWS

2019 SOR Fellows Elected

The SOR Executive Committee has designated seven distinguished rhelogists as members of the 2019 class of Fellows of the Society; the new Fellows are briefly profiled below.

The SOR Fellowship status recognizes a history of distinguished scientific achievement, a significant technological accomplishment, and/or outstanding scholarship in the field of rheology. Service to the Society is also an important component to Fellowship status. Presentations of certificates to the new Fellows will be made at the Awards Banquet at the Annual Meeting in Raleigh in October 2019. Congratulations to our rheological colleagues!

Class of 2019

Ian A. Frigaard, Professor of Mechanical Engineering, University of British Columbia. Cited for research in rheologically interesting flows connected with industrial applications. He has made highly significant contributions in the study of shear-thinning fluids, viscoelasticity, thixotropy, and the mechanics of yield-stress fluids. His studies range from fundamental theoretical mechanics/analysis through computations to lab-scale experiments. The key contributions are in hydrodynamic stability, multi-fluid flows, particles and bubbles, and analytical and numerical methods. He has made key contributions to the mechanics of yield-stress fluids, notably in the oil and gas industry.

Anne M.Grillet, Distinguished R&D Engineer at Sandia National Laboratories. Cited for applying computational and experimental rheological techniques to a wide variety of applications, ranging from energy storage (batteries and capacitors), algal biofuels, foams, metals, glasses and polymer adhesion and aging. She has developed experimental diagnostics for characterization of complex materials, including polymer gels for capacitors, rheology and interfacial adhesion of organic suspensions, curing epoxies for multiple encapsulation applications, and monitoring evolution of performance characteristics of polymers used in thermoelectric applications.

Ravi Prakash Jagadeeshan, Professor of Chemical Engineering at Monash University. Cited for his ability to take advantage of the existence of universal behavior in polymer solutions, independent of the chemistry of the monomer. He has shown how universality can be exploited to make quantitative predictions with Brownian dynamics simulations, based on simple coarse-grained models, and to interpret experimental observations with the help of scaling theories to produce master plots that collapse rheological data for a variety of systems. His experimental observations and simulations have revealed universal aspects of semidilute polymer solution behavior that were previously unknown.

Bamin Khomami, Head and Distinguished University Professor, Department of Chemical Engineering, University of Tennessee, Knoxville. Cited for his contributions in 1.) Understanding multilayer viscoelastic flows and their stability; 2) Methods for complex fluids calculation; 3) Thermal effects in elastic and thermo-elastic instabilities; and 4) Nonlinear Taylor-Couette flow instabilities driven by elasticity. He is the leader in the understanding of multi-layer complex parallel and nearly parallel flows and their stability. He discovered that an entirely new class of instabilities exists in "thermo-elastic flows" and established himself as a leader in the area of nonlinear Taylor-Couette flow, including being the first to calculate "turbulent" states that are engendered purely elastically.

Jörg Läuger, Lead Scientist Rheology, Anton Paar. Cited for his continuous and outstanding contributions in the development of rheological measuring equipment. His work with various external partners has led to outstanding new measuring devices and analytical methods. Examples are: measuring setup for magneto- and electro-rheology, interfacial rheology, neutron and x-ray scattering combined with rheometry, tribology, and shear induced polarized light imaging technique. Läuger also focused on large deformation testing and made large amplitude oscillatory shear and cone-partitioned-plate geometry available for commercial rheometer setups,

and currently he is also advancing the development of orthogonal superposition for melts.

Alexander Ya. Malkin, Professor of Polymer Science, Russian Academy of Sciences, Moscow. Cited for his investigations into the flow-to-rubbery transition in strong flows of viscoelastic polymeric fluids, e.g. the spurt effect in the flow of flexible-chain monodisperse polymer melts. He systematically studied uniaxial extension and constructed a universal envelope which presents the critical strain (at rupture) as a function of the Weissenberg number. His investigation of uniaxial extension demonstrated the effect of phase separation at high deformation rates. His studies of the rheology of rigid-chain polymer solutions have led to a discovery of isotropic-to-LC state transition (with V.G. Kulichikhin), which was the first experimental confirmation of the Flory theory.

Jeffrey F. Morris, Director and Professor, Levich Institute, City College of CUNY. Cited for his research contributions elucidating the microscopic mechanistic basis for the rheological properties of multi-phase mixtures and their influence on macroscopic flow phenomena. These contributions include the development of understanding of nonequilibrium microstructure in Stokes flow of Brownian colloidal suspensions, which has been explored through both the Stokesian Dynamics simulation technique and developed into a Smoluchowski equation theory for concentrated suspensions under shear or in active microrheology.

SOR Elections 2019: Officer Nominations

by Albert Co, Secretary

In accordance with Article V of the Constitution of The Society of Rheology, this is to inform the members of the Society of the list of nominees for January 2020-December 2021 Executive Committee, as reported by the Nominating Committee and added to by petition:

President: Michael D. Graham
Vice-President: (in alphabetical order)
Wesley Burghardt
Anne Mary Grillet
Secretary: Kalman Migler
Treasurer: Christopher C. White
Editor: Ralph H. Colby
Members-at-Large: (in alphabetical order, vote for THREE)
Gordon Christopher
William Hartt
Marie Claude Heuzey
Anke Lindner
Jason Maxey
Jonathan Rothstein

For a period of forty-five (45) days following the date of first notification (by email on 21 May 2019), additional nominees were permitted to be named by petition forwarded to the Secretary and signed by at least fifteen (15) members in good standing of the Society (deadline was thus 5 July 2019). One such petition was received.

Gallery of Rheology, Raleigh 2019

The Gallery of Rheology is becoming an institution. First held in Denver and subsequently in Houston, the Gallery event consists of a display of interesting images that show the fascinating world of rheology. First and second place awards are given; all the images are featured in the January *Rheology Bulletin*, with the first-place-awarded image on the cover. The details on how to participate in the Gallery of Rheology are on the meeting website.

Rheology Makes a Strong Showing at AIP Assembly in March

The Society of Rheology is the second smallest member of the American Institution of Physics federation (shout out to the American Crystallographic Association!), but you would not know it from rheology's strong participation in the 2019 Assembly of Society Officers held in March at the American Center for Physics in College Park, Maryland (*www.aip.org/aip/assembly*). Present were six rheologists: Anne Grillet (chair of the Financial Advisement Committee), president Norman Wagner, treasurer Chris White, Faith Morrison (sits on the AIP Board as the SOR-designated director), Jonathan Rothstein (co-chair Education Committee, who presented a lunchtime poster on the topic of the AIP supported SOR K-12 Outreach program; see photo), and Kelly Schultz (chair, SOR Diversity and Inclusion Committee; chair, Membership Committee). When the hands went up as each member society was called out, SOR made quite a statement with this good turnout.

The Assembly is an annual event at which AIP member and affiliated societies convene to discuss areas of mutual concern. Over the years, session topics have ranged from challenges/innovations in scientific publishing to public policy issues, from supporting/growing the membership base to trends in philanthropic

During the 2019 AIP Assembly of Society Officers, a new tradition was started, for the recipients of the Venture Partnership Fund grants to present a poster sharing the structure and accomplishments associated with the grant. SOR's Jonathan Rothstein was on hand to describe the Panta Rei videos and handouts that his team has created to reach out to young kids to get them interested in rheology.

giving, from supporting science education to promoting science as a viable career choice to a diverse population. The Assembly is also a forum where member and affiliated society representatives can become better acquainted and share ideas. Attendance is open to any interested parties; AIP pays the travel expenses of one SOR officer to attend the Assembly. The following scientific societies are members of the AIP federation:

1. *Acoustical Society of America (ACA)*
2. *American Association of Physicists in Medicine (AAPM)*
3. *American Association of Physics Teachers (AAPT)*
4. *American Astronomical Society (AAS)*
5. *American Crystallographic Association (ACA)*
6. *American Meteorological Society (AMS)*
7. *American Physical Society (APS)*
8. *AVS: Science & Technology of Materials, Interfaces, and Processing*
9. *The Optical Society*
10. *The Society of Rheology*

For more on AIP's programs, events, and awards, visit *www.aip.org*.

SOR Adopts Two New Meeting-Related Policies

At the spring meeting of the SOR Executive Committee, two policies were adopted, both of which come into force at the next SOR meeting, in October in Raleigh. The two policies are a meeting code of conduct (*www.rheology.org/SOR/Annual_Meeting/SORCodeOfConduct*) and a meeting photo policy (*www.rheology.org/SOR/Annual_Meeting/SORPhotoPolicies*). Both are posted on the Society's website.

Adopting meeting codes of conduct is now standard across professional societies, and all of our fellow AIP federation societies have adopted such policies. The new SOR policy joins the list of such documents hosted by AIP (*www.aip.org/diversity-initiatives/member-society-efforts-encourage-inclusion-equity-society-conferences*).

The photo policy is needed to clarify: first, that capturing images during presentations at SOR meetings is not permitted, and second, how photos taken in Society-sponsored events will be used, including in the *Bulletin*. Comments on the policies should be directed by e-mail to Society officers or expressed at the Business Meeting.

SOR Website Updates

At the spring ExCom meeting, Society webmaster Albert Co reported on the SOR websites. Several SOR documents and forms are now available in the Member App, which all members are encouraged to download. Videos of the Bingham lecture and Metzner presentation at the Houston Meeting were posted on YouTube and can be viewed from the Member App. The full archive of the Society's newsletter, the *Rheology Bulletin*, starting with the March 1937 issue of *The Rheology Leaflet*, will be available on the SOR website. The pre-2004 issues were obtained from the Niels Bohr Library & Archives, scanned, and posted.

Nominations Solicited: 2020 SOR Fellows

by the SOR Fellowship Committee

Outstanding members of The Society of Rheology who have contributed to rheology through science, technological accomplishments, peer-reviewed literature, and/or service can be nominated for Fellowship in The Society of Rheology. The Society is particularly focused on maintaining a broadly inclusive list of Fellows, representing rheological practitioners, international rheologists, and contributers from groups that are sometimes overlooked. Nominations are due in March 2020; see the Society website for details or contact a member of the Fellowship Committee (listed on page 3 of this *Bulletin*).

Roy W. Tess Award in Coatings for 2019

Ray Fernando has been named winner of the 2019 Roy W. Tess Award in Coatings. Fernando is professor and Arthur C. Edwards Endowed Chair and the Director of the Polymers and Coatings Program in the Department of Chemistry and Biochemistry at California Polytechnic State University, San Luis Obispo, California. Previously he was a lead research chemist at Air Products and Chemicals, Inc., principal scientist at Armstrong World Industries Inc. USA; and research officer at USA and Rubber Technology Division of Ceylon Institute of Scientific and Industrial Research Colombo, Sri Lanka.

Much of Fernando's work has focused on industrially important associative thickeners, which are used extensively in latex-based waterborne coatings. He made important contributions to understanding the role of dynamic uniaxial extensional viscosity in properties like splatter of roller-applied coatings that dominate the architectural market, as well as the behavior of spray applied waterborne coatings used extensively in industrial applications.

Fernando will receive the Tess Award in August 2019 during the 258th National Meeting of the American Chemical Society in San Diego, CA.

The Tess Award is presented annually by the Division of Polymeric Materials: Science and Engineering in recognition of outstanding contributions to coatings science, engineering and technology. The purpose of the award is to encourage interest and progress in coatings science technology and engineering and to recognize significant contributions to the field.

Student Member Travel Grants for SOR Annual Meeting in Raleigh

The Society of Rheology is offering student-member travel grants to support the cost of attending its 91st Annual Meeting in Raleigh, North Carolina USA. New for this year, students accepting the SOR student member travel award are expected to participate in the Rheology Research Symposium, as described in the article in this *Bulletin* (see page 15). The Rheology Research Symposium (RRS), which will be held in advance of the Annual Meeting, is modeled in part after the popular Graduate Research Symposia put on by the Gordon Research Conferences. The RSS is designed to provide a forum for graduate students to learn skills, develop careers, and gain mentoring from volunteer colleagues. The symposium will start Saturday noon and includes participation in the K-12 outreach event on Sunday and the Student-Industry Forum on Monday. Funded through a grant from AIP through its Venture Partnership Fund, the RRS is running for the first time in Raleigh. This experimental program is designed to improve education and mentoring of students and increase the inclusion and diversity of the Society. The application form for the Student Travel Grant/RRS is available at this link: *www.che.udel.edu/forms/sor-stg.html.*

Report from the SOR Historian

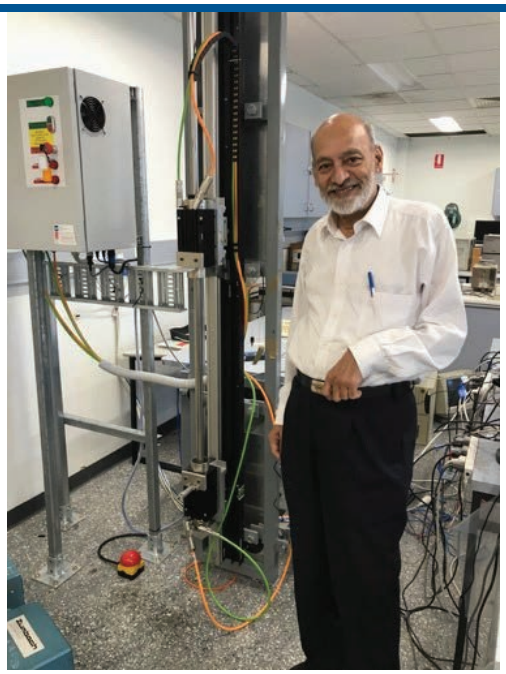
by Gareth McKinley

In May I went to work for several weeks at Monash University with newly-elected SOR Fellow, J. Ravi Prakash, on a joint research project related to the rheology of physically-crosslinked polymer gels. While I was there, I took the opportunity to visit with a number of Australia's most famous rheologists. I recorded oral histories with Roger Tanner in Roseville/Sydney; with David Boger in Harkaway just outside Melbourne, and with Tam Sridhar, at Monash University. All of these oral history recordings have been uploaded to the Niels Bohr Library & Archive (NBL&A) at AIP and are presently being transcribed. I'm also including a few pictures from the fun days I spent with Roger, David and Tam hearing about the early days of rheology in Australia (which started as an Australian Chapter of the British Society of Rheology). After we all review the written transcripts together for accuracy, both the recording and the transcript will be made available through NBL&A's online resource. For the first SOR oral history recording (featuring R. B. Bird speaking with A.J. Giacomin) see: *www.aip.org/history-programs/niels-bohr-library/oral-histories/42771-1*.

More recently, our second AIP/SOR Summer Intern has just started her summer position at NBL&A working with me and AIP's Chip Calhoun. Megan Anderson graduated from William Jewett College with a degree in physics in May 2019 and is heavily involved with leadership activities in the Society for Physics Students (SPS), including serving on the Executive Committee for the upcoming SPS PhysCon in Providence RI in

SOR/AIP Summer intern Megan Anderson, who, among other projects, is continuing the work on biographical sketches of Bingham award winners.

Visits with Tam Sridhar (near right), David Boger (far right), and Roger Tanner, (below, with McKinley) allowed SOR Historian Gareth McKinley to add three significant oral histories to the SOR archives at AIP.



October 2019. For more about Megan please see *www.spsnational.org/programs/internships/2019/megan-anderson.* Megan will be completing the short one-page biographies of our Bingham Medalists which are now being hosted on the new SOR website. See *www.rheology.org/sor/Awards/Bingham/Medalists* for the first 25 biographies prepared last summer. Megan will also occasionally be posting items on SOR's Twitter and Facebook channels as she uncovers interesting items in the SOR Archives.

The 100th Annual Meeting of the Society of Rheology will occur in October 2028, and SOR will officially celebrate its 100th birthday in 2029. The Executive Committee is very interested in hearing from the membership with possible ideas for how we should properly celebrate a Centenary of Rheology.

SOR History Portal

SOR is keeping track of its history, especially as our 100th year approaches. SOR historian Gareth McKinley reports above on his work with the staff at the American Institute of Physics to create oral histories and to uncover SOR's history through its archives. Check out the progress of the history project online at the SOR history portal (*history.aip.org/society-portals/sor/sor.html*) or on your phone with link on the SOR web app.

Minutes of the ExCom Meeting

Minutes of the ExCom Meeting

Sunday, 28 April 2019

Attending: Norm Wagner, Michael Graham, Gareth McKinley, Albert Co, Chris White, Michel Cloitre, Jennifer Mills, Andy Kraynik, Kelly Schultz, Peter Olmsted, Steve Hudson, Jason Wilde (AIPP), and Liz Dart Caron (AIP). Via Zoom: Ralph Colby, Anne Grillet, Monty Shaw, Jonathan Rothstein, Maryam Sepehr, Saad Khan, Lilian Hsiao, Lisa Biswal, and Roger Bonnecaze.

President Norm Wagner called the meeting to order at 9:00 am in Room C, American Center for Physics, College Park, Maryland.

Wagner presented the goals of the meeting.

Wagner introduced Jennifer Mills, the first student delegate to the ExCom meeting.

A motion to approve the minutes of 8 October 2018 meeting, as published in the *Rheology Bulletin* January 2019 issue, was seconded and passed.

Ralph Colby presented the *JOR* Editor's report. He went over the initiative of including an invited review article per issue. Five review articles have been published and two are scheduled to be published. A special issue on "Physics of Dense Suspensions" is planned. Roseanna Zia will serve as primary editor for this special issue. Jeffrey Morris and Emanuela Del Gado will be guest editors. Paper submissions are currently open. The anticipated publication date is the beginning of 2020. Another initiative is the rolling communication campaign to authors of previously-published *JOR* articles about their article's performance and asking them to submit again. Data on manuscript submissions, processing time, and publications were presented. Submissions in the first quarter of 2019 are 29% behind those in 2018. *JOR* received high scores (9.13 to 9.22) from authors in the Post-Publication Surveys. The current impact factor for *JOR* is 3.437. Jason Wilde of AIPP described the difference between "open access" and "free access." A motion to accept the Editor's report was seconded and passed.

Chris White presented the Treasurer's report. SOR ran a surplus of $66k for last year. Advertisement fee and *JOR* other expenses were discussed. A motion to accept the Treasurer's report was seconded and passed with one abstention. White will follow up on the clarifications of issues discussed.

Monty Shaw presented the Audit Committee report. No major irregularities were found. Several minor suggestions for improvement were reviewed. A motion to accept the report was seconded and passed.

Anne Grillet presented the Financial Advisement Committee report. The committee recommends investing $700k and maintaining the reserves of $930k in FDIC insured CDs. The committee will get a formal financial plan from a certified financial planner, at a cost of $1500. A motion to accept the report was seconded and passed.

Maryam Sepehr reported on the short courses for the Education Committee. Two short courses will be offered at the Raleigh meeting. A one-day short course on "Rheology of Foods" will be held on Saturday 19 October 2019. The instructors are Peter Fischer (ETH Zürich) and E. Allen Foegeding (North Carolina State University). A one-and-a half-day short course on "Suspension/Granular Rheology" will be held on Saturday 19 October 2019 and Sunday 20 October 2019. The instructors are Jeff Morris (CUNY City College) and Karen Daniels (North Carolina State University). A motion to accept the proposals and to fund advertisements was seconded and passed.

Jonathan Rothstein reported on the K-12 outreach activities for the Education Committee. A K-12 outreach event is planned on October 20 for the Raleigh meeting. Information on the K-12 outreach kits are available on the web.

Norm Wagner reported for Faith Morrison on the *Rheology Bulletin*.

Gareth McKinley reported on SOR history projects. Oral interviews with Ken Walters and Bill Schowalter have been completed. An interview with Roger Tanner in Australia has been scheduled. Gareth requested funds for part of the travelling in Australia. An interview with Mort Denn is planned in July. SOR will again have an AIP Summer Intern to work on history projects from 1 June 2019 to 3 August 2019. A motion to approve the fund request was seconded and passed.

Jason Wilde (AIPP) gave updates on the AIPP Publishing Agreement. Some *JOR* financial items were discussed. Wilde also discussed the Altmetric Explorer. Wilde requested the Executive Committee to authorize the "unique selling point" e-mail campaign. A motion to authorize the campaign was seconded and passed.

Wilde also presented a proposal for AIPP to do the registrations for SOR annual meetings. For the AIPP proposal

Secretary's Report

presented, SOR organizers will get updates of registrations by files e-mailed from AIPP staff. It was pointed out this would create an extra burden to SOR organizers, as tracking of the registration status of presenters would have to be done manually. In the current SOR meeting-registration system, the tracking of registration status of presenters is done automatically, as the meeting registration system is integrated with the abstract-submission system. The current SOR meeting-registration system also provides real-time status of registrations through web access and instantaneous access to lists for name badges, instead of relying on files through e-mail. It was suggested that AIPP update the proposal to include features that tie-in with the SOR abstract-submission system.

Peter Olmsted provided updates on the AIPP Publishing Partners Committee. Open access and "Plan S" (an initiative for open-access publishing launched by a consortium of major European national research agencies and funders in September 2018) were discussed. Olmsted also reported on digital books, social media audit, and development funds.

Kelly Schultz gave reports on the Membership Committee and the AIP Venture Partnership Fund award on the Diversity and Inclusion Initiative. The 2019 Raleigh meeting will introduce the Rheology Research Symposium for student members. The symposium will start Saturday noon and includes participation in the K-12 outreach event on Sunday and the Student-Industry Forum on Monday. Attendance at the symposium is required to receive a student-member travel grant.

Liz Dart Caron of AIP provided updates on the activities of AIP. The report of the Board's strategy consultants, dPrism, and the AIP Board strategy "consensus" statements were described. Also mentioned were the Wenner rare-book collection at AIP, the AIP Endowed Professorship on History of Natural Sciences at the University of Maryland, the member society highlights, the AIP's Statistical Research Center, and AIP's newsletter FYI.

Michael Graham and Andy Kraynik chaired the afternoon session on future SOR Meetings.

Saad Khan and Lilian Hsiao gave the report for the Local Arrangements Committee of the 2019 Raleigh Meeting. The room layouts for the meeting were discussed. The meeting registration fees will remain the same as those for the 2018 Houston meeting.

Steve Hudson and Lisa Biswal gave the report for the Technical Program Committee of the 2019 Raleigh Meeting.

Secretary's Report

Roger Bonnecaze gave updates on the Local Arrangements of the Winter 2021 Austin Meeting. The meeting will be held at the Marriott Austin, Downtown (which is currently under construction and is scheduled to be completed in July 2020). Evening event planning will begin this summer.

Albert Co gave updates on the Local Arrangements of the Fall 2021 Bangor Meeting. The meeting will be held at the Cross Insurance Center. Several hotels near the Cross Insurance Center were described.

Michael Graham led the discussion on the "code of conduct" and photo policy at SOR meetings. A motion to adopt the proposed policies, with some minor revisions, was seconded and passed.

Albert Co reported on the SOR websites. Several SOR documents and forms are available in the Member App. Videos of the Bingham lecture and Metzner presentation at the Houston Meeting were posted on YouTube and can be viewed from the Member App. The full collection of the *Rheology Bulletin*, starting with the March 1937 issue of *The Rheology Leaflet*, will be available on the SOR website. The pre-2004 issues were obtained from the Niels Bohr Library & Archives.

The general session ended and the executive session started at 2:45 pm.

A motion to approve the list of 2019 Fellows recommended by the Fellowship Committee was seconded and passed.

A nomination for the Service Award was approved.

Norm Wagner discussed the request by the Editors of *JNNFM* regarding the Walters award.

The sponsorships of the SPS Student Conference and the Physics Olympiad were approved.

The sponsorship of the SPS "Physics of Food" Symposium for $1500 was approved.

Sending of a formal letter of appreciation, a certificate and an hour-glass to departing SOR liaison Fred Kontur of AIPP was discussed and approved.

The list of nominees for the 2020-2021 Executive Committee, as recommended by the Nominating Committee, was presented.

Michel Cloitre gave updates on the European Society of Rheology. AERC 2021 will be held in Seville, Spain and AERC 2022 will be held in Leeds, UK.

The executive session was adjourned at 3:33 pm.

Submitted by
Albert Co, Secretary

Treasurer's Report

To the Society:

The Society of Rheology is currently in good financial condition. There are significant concerns going forward, but these have been mitigated in the short term. For the year 2018 the SOR ran a surplus of $66,104. This increase in net revenue is partially attributed to an increase in interest income, annual dues, and revenue from the *Journal of Rheology*.

In a year with one annual meeting and healthy revenue from the *Journal*, the SOR ran a surplus of $66k. In 2019, the SOR will host one meeting. An ongoing concern is building a consensus about the financial direction of the SOR/*JOR*. This will require significant discussion about the financial goals of The Society of Rheology and how they support the mission of The Society of Rheology more broadly. A financial advisement committee (Anne Grillet, John Brady, Mike Solomon) has been working steadily to develop proposals to present to both the Executive Committee and the Society. The treasurer will operate on the assumption that the goal is to run a cost-neutral annual budget while anticipating and preparing for potential financial shocks to The Society of Rheology and the *Journal of Rheology*.

Below is a simplified summary of the major accounts and totals for 2018. A detailed accounting is presented following this summary.

SOR Statement of Activity January - December 2018			
Revenue		**Expenditures**	
Net Meeting Revenue (Houston)	$ 12,144	AIP Dues Expenses	$ 21,918
Dues	$ 79,840	Awards	$ 22,572
Journal of Rheology	$ 308,773	Journal of Rhelogy	$ 202,662
Contibutions	$ 2,500	Excom	$ 11,494
Interest Income	$ 19,089	Student Travel Grants	$ 22,000
Total Revenue	**$ 670,375**	**Total Expenditures**	**$ 604,270**
		Net Revenue	**$ 66,105**

A second major change for 2018 was the formal creation of an audit committee (Rao Rekha, Bamin Khomami, Monty Shaw). This committee has access to the SOR books. In a report to the Executive Committee, they stated: "The books were examined independently by the three members of the Audit Committee. Our impression was that the SOR treasury is being well-managed and has sufficient transparency for most purposes. No major irregularities were found." Additionally, they had several suggestions to enhance transparency and access, which will be implemented. Additionally, the SOR engages a CPA firm to examine the Quickbooks, AIP, AIPP, and Schwab accounting for irregularities, make suggestions to the accounting practices, and prepare our annual tax filings.

A much more detailed treasurer's report details the major activities of The Society of Rheology and how they are accounted for in the American Institute of Physics (AIP), the American Institute of Physics Publishing (AIPP), the Schwab account, and QuickBooks online account. This report is available to any member (please contact the treasurer) and is presented and discussed at the Executive Committee meeting in May.

The five-year balance sheet, Society of Rheology and *Journal of Rheology* reports are included below. The figures are the final accounting for 2018.

Longer term analysis

This report details the last year of the period of The Society of Rheology producing the *Journal of Rheology*. Starting in 2019, AIPP and SOR will have a 5-year partnership agreement. By entering into an agreement with AIPP, the major uncertainty associated with *JOR* revenue has been eliminated for the next five years. Under the agreement, *JOR* will receive $100k + a ½ share of profits over expenses. AIP projects the SOR share of the profit to be ~$50k to ~$100k/yr. The *JOR*/SOR still retains ~$80k in production costs. So the net revenue of the *Journal of Rheology* is conservatively estimated to be similar to prior years. This agreement ensures financial stability while maintaining full editorial control of the *Journal of Rheology*.

Increasing Revenue:

There are several actions in progress to increase revenue. The dues increase has been effective in increasing the dues revenue as shown. The Financial Advisement Committee is proposing investment strategies to provide increased security of our retained earnings. A byproduct of this increased security is an increase in revenue from interest. This increased revenue from interest on the Treasury bonds is shown.

Decreasing Expenses:

There is a shift away from delivering a print version to all members. This is evident in the decreased expenses related to print *Journal* relative to previous years shown above. It is instructive to note that the fixed cost of producing the *Journal* is $83/copy. The variable costs

Treasurer's Report

of delivering an on-line copy is ~$20/copy for a cost of $104/copy. Delivering the paper copy is $124/copy. A significant decrease in the volume of printed copies will result in a decrease in print advertising revenue as is evident in the 27% drop in revenue from $34k (2017) to $27k (2018).

Summary:

The Society of Rheology is blessed with substantial financial reserves. It has an active passionate membership that will work to provide long-term stability for the SOR. Recent actions such as the agreement with AIPP have removed considerable uncertainty about future *Journal* revenue. These actions and others continue to provide a solid financial footing that allows for SOR to continue to pursue our mission.

Sincerely,
Christopher White, Treasurer

The Society of Rheology Receipts and Disbursements	**2018**	**2017**	**2016**	**2015**	**2014**
				-	-
RECEIPTS					
Dues	$ 79,840	$ 63,935	$ 42,892	$ 44,980	$ -
Interest	$ 19,089	$ 6,817	$ 6,812	$ 2,092	$ -
Journal of Rheology	$ 308,773	$ 321,436	$ 270,858	$ 284,180	$ -
Donations	$ 2,500		$ -	$ -	$ 69,163
Bulletin Advertising	$ 9,265	$ 10,855	$ 9,113	$ 9,505	$ 145,572
Annual Meeting (net)	$ (4,355)	$ 38,975	$ -	$ (14,589)	$ -
Short Course (net)	$ 10,500	$ 10,575	$ -	$ 2,195	$ -
TOTAL RECEIPTS	**$ 425,612**	**$452,593**	**$ 329,675**	**$ 328,363**	**$ 214,735**
DISBURSEMENTS					
AIP Dues Bill & Collect.	$ 38,547	$ 28,561	$ 25,942	$ 27,876	$ -
AIP Adm. Services			$ -	$ -	$ -
AIP Mem. Soc. Dues			$ -	$ -	$ 349,640
Contributions and Prizes	$ 1,650	$ 1,650	$ 2,150	$ 1,650	$ -
Early Career Award	$ 7,500	$ 15,130	$ 1,452	$ 7,625	$ -
Journal of Rheology	$ 202,662	$ 219,043	$ 200,372	$ 196,266	$ -
Bulletin	$ 14,471	$ 17,036	$ 19,770	$ 19,664	$ -
Bingham Award	$ 15,572	$ 33,048	$ -	$ 16,126	$ -
Executive Cmt. Meetings	$ 11,493	$ 18,163	$ 9,028	$ 18,713	$ -
Pres. Discretionary Fund		$ 462	$ 897	$ -	$ -
Treas. Discr. Fund	$ 125	$ 479	$ 281	$ 197	$ -
Bulletin Editor Discr. Fund	$ 1,500		$ -	$ -	$ -
Progr. Chm. Discr. Fund	$ 3,000		$ -	$ -	$ -
Webmaster Discr. Fund	$ 1,368	$ 3,025	$ 3,147	$ -	$ -
International Activities Fund	$ 3,065	$ 2,963	$ 4,469	$ -	$ -
Office Expenses	$ 1,700		$ -		$ -
Banking Services			$ -		$ -
Liability Insurance	$ 5,928	$ 5,928	$ 5,921	$ 6,300	$ -
Membership Broch. & Appl.			$ -	$ -	$ -
Accountant	$ 2,720	$ 2,580	$ 2,900	$ 2,660	$ -
Student member travel	$ 22,000	$ 31,767	$ 15,097	$ 31,000	$ -
Annual meetings, future	$ 25,610	$ 3,000	$ 3,049	$ -	$ -
Website	$ 497	$ 99	$ -	$ 3,074	$ -
Miscellaneous	$ 100	$ 21,930	$ -	$ -	$ -
TOTAL DISBURSEMENTS	**$ 359,508**	**$ 404,864**	**$ 294,475**	**$ 331,151**	**$ 349,640**
Net	**$ 66,104**	**$ 47,729**	**$ 35,200**	**$ (2,788)**	**$ (134,906)**

Journal of Rheology
Receipts and Disbursements

	2018	2017	2016	2015	2014
REVENUES (AIP report)					
Advertising Sales	$ 27,085	33,000	$ 33,603	$ 32,141	$ 35,886
Royalties	$ 18,285	22,000	$ 21,340	$ 28,369	$ 33,197
Single-Copy Sales	$ 343		$ 3,342	$ -	$ -
Consortium Access Fees	$ 54,432	53,169	$ 52,081	$ 60,007	
Consortium Subscription	$ 94,025	86,663	$ 45,734	$ 35,766	
JOROL Income	$ 40,257		$ -	$ -	$ 150,364
Subscriptions	$ 74,346	100,340	$ 99,385	$110,170	$ 75,569
Total Revenue	**$ 308,773**	**$ 295,172**	**$ 255,485**	**$266,453**	**$ 295,016**
EXPENSES (AIP report)					
Adv. Prod. and Hand.					$ 8,433
Production					$ 53,010
Cash Discounts & Rebates					$ 917
Editorial Management	$ 30,075	$ 30,000	$ 30,381	$ 32,963	$ 41,124
Reprint Printing and Mailing					$ 91
Back copy expense					$ 434
Subscription Ful'ment, Member		$ 7,000	$ 5,845	$ 7,239	$ 4,263
Subscription Ful'ment, Nonmem.					$ 2,112
Subscription Ful'ment, Comp/Ex		$ 4,000	$ 4,256	$ 4,399	$ -
Marketing Expense(consortium)		$ 12,000			$ 1,965
Storage	$ 1,608	$ 1,400	$ 1,360	$ 1,298	$ 1,252
Vendor Management Fee		$ 7,000	$ 6,939	$ 7,986	$ 272
One-time setups					$ -
Credit Card and Bank Fees					$ 494
Agency rebate/service fee	$ 797	$ 1,200	$ 1,210	$ 1,651	
Direct Marketing	$ 1,229			$ 23	
Back number expense	$ 169	$ 300	$ 218	$ 386	
Open Access Article Fees		$ 500	$ 425	$ 213	
Open Access Permission Fee				$ 15	
Shipping				$ 782	
Admin Services	$ 7,875	$ 7,875	$ 7,875	$ 7,875	
Single-Copy Sales	$ 252	$ 500	$ 300	$ 483	
Standard Page Charges	$ 37,125	$ 35,000	$ 33,143	$ 23,603	
PXP MANUSCRIPT	$ 4,992	$ 5,000	$ 4,160	$ 5,408	
PXP Platform Fee	$ 2,700	$ 2,700	$ 2,700	$ 2,700	
OP adv Journal Fee	$ 1,000	$ 1,000	$ 9,728	$ 9,618	
JOR MERCHANT account fee	$ 3,000	$ 3,000	$ 2,732	$ 2,561	
JOR CC fees	$ 2,007	$ 1,000	$ 678	$ 1,273	
JOR Other (best paper, CHORUS, et	$ 35,989	$ 1,000	$ 550	$ 1,503	
Fixed Expenses Total	**$ 128,818**	**$ 120,475**	**$ 112,500**	**$111,979**	**$ 114,367**
Print Expeses					
Printing and Binding	$ 23,913	$ 25,000	$ 24,608	$ 30,222	$ 29,425
Paper	$ 8,585	$ 12,000	$ 11,543	$ 12,732	$ 12,968
Mailing Expense	$ 9,658	$ 5,000	$ 4,356	$ 3,347	$ 19,857
SHIPPING international		$ 13,000	$ 13,493	$ 12,918	
Postage	$ 3,814	$ 6,000	$ 5,134	$ 4,385	$ 5,081
Subscription Ful'ment, Nonmem.	$ 3,101	$ 3,000	$ 2,987	$ 2,362	
Print total	**$ 49,071**	**$ 64,000**	**$ 62,121**	**$ 65,966**	**$ 67,330**
Online Expenses					
JOROL Expense					$ 51,785
Cross Ref Fee	$ 2,924	$ 400	$ 316	$ 53	
OL hosting fee	$ 21,849	$ 21,850	$ 21,850	$ 21,850	
Online Total	**$ 24,773**	**$ 22,250**	**$ 22,166**	**$ 21,903**	**$ 51,785**
Total Expenses	**$ 202,662**	**$ 206,725**	**$ 196,787**	**$199,848**	**$ 233,483**
NET	**$ 106,111**	**$ 88,447**	**$ 58,698**	**$ 66,605**	**$ 61,534**

The Society of Rheology, Inc.
Balance Sheet

(all amounts, USD)	2018	2017	2016	2015	2014
Assets					
Cash in checking account(s)	$ 27,774	$ 7,096.35	$ 45,027	25,181	69,163
Balance in AIP account	$ 862,081	$ 850,906	$ 1,807,110	1,627,036	1,665,049
Schwab	$ 1,018,793	$ 1,003,872			
Accounts Receivable	$ 1,197		$ 5,000	10,000	
Prepaid Expense	$ 36	$ 36.00	$ 10,269		
Total Assets	**$ 1,909,880**	**$ 1,861,911**	**$ 1,867,406**	1,662,217	1,734,212
Liabilities and Net Assets					
Liabilities					
Deferred revenue	$ 122,190	$ 140,325	$ 193,550	28,103	104,337
Total Liabilities	$ 122,190	$ 140,325	$ 193,550	$ 28,103	104,337
Net Assets					
Publication reserve	$ 450,000	$ 450,000	$ 450,000	450,000	450,000
Student travel grant reserve	$ 30,000	$ 30,000	$ 30,000	30,000	30,000
Annual Meeting reserve	$ 300,000	$ 300,000	$ 300,000	300,000	300,000
Operating reserve	$ 150,000	$ 150,000	$ 150,000	150,000	150,000
Unrestricted	$ 791,586	$ 743,857	$ 704,114	699,875	699,875
Net Revenue	$ 66,105	$ 47,729	$ 39,743	4,239	
Total Net Assets	$ 1,787,690	$ 1,721,586	$ 1,673,857	$ 1,634,114	1,629,875
Total liabilities and net assets	**$ 1,909,880**	**$ 1,861,910**	**$ 1,867,407**	**$ 1,662,217**	1,734,212

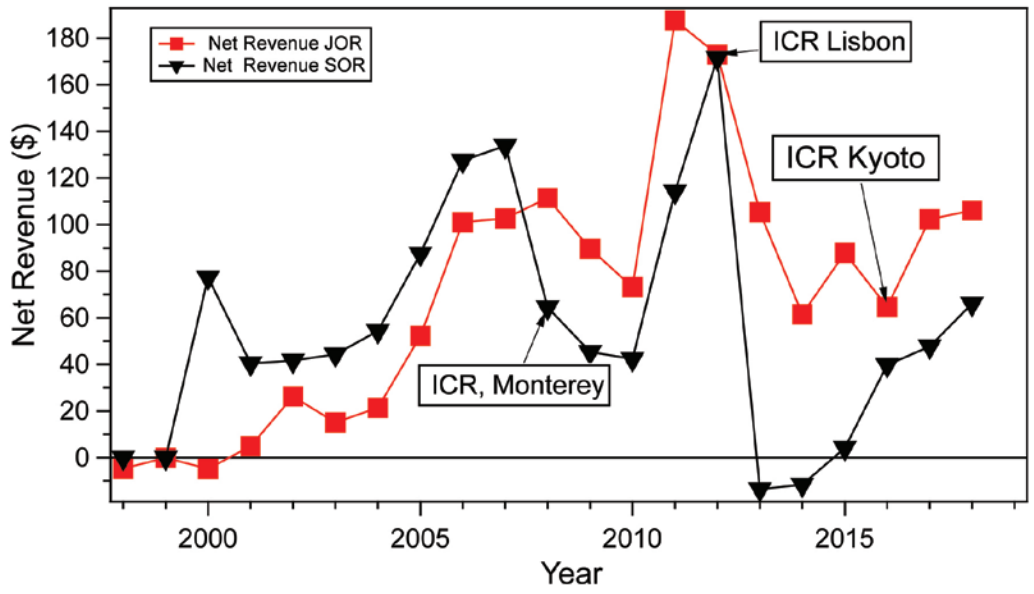


Figure 1, The annual net revenue from the Society of Rheology and Journal of Rheology from 1999 to present.

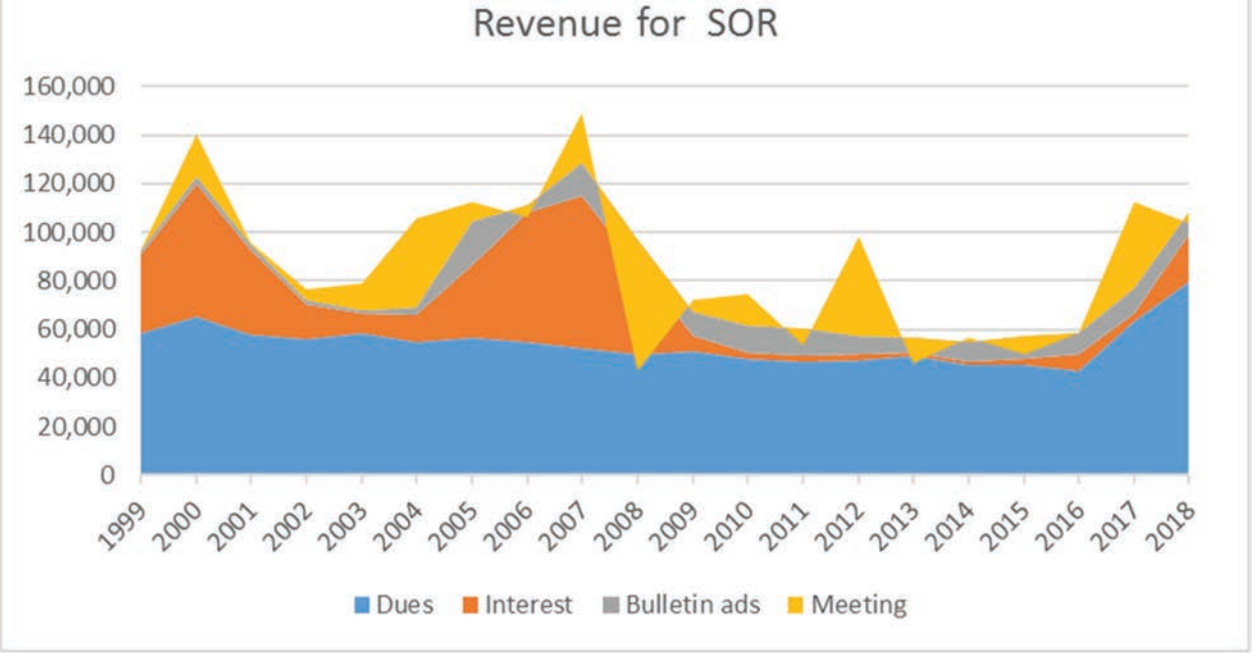


Figure 2. The revenue from the Society of Rheology without the JOR.

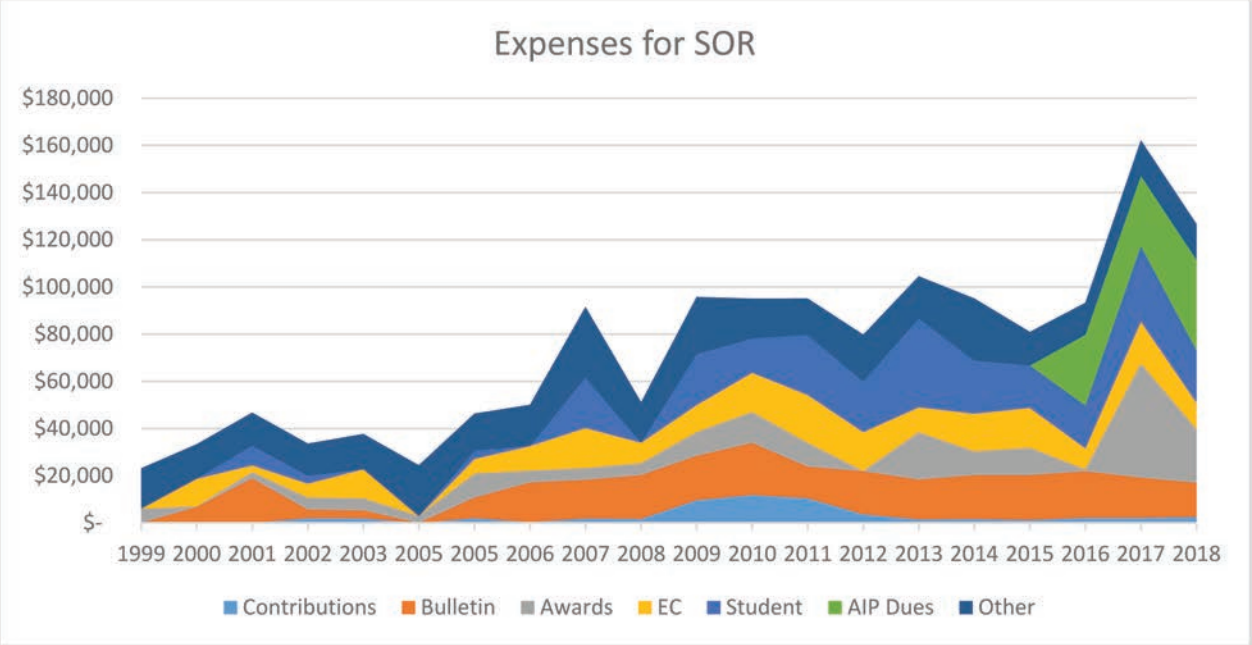


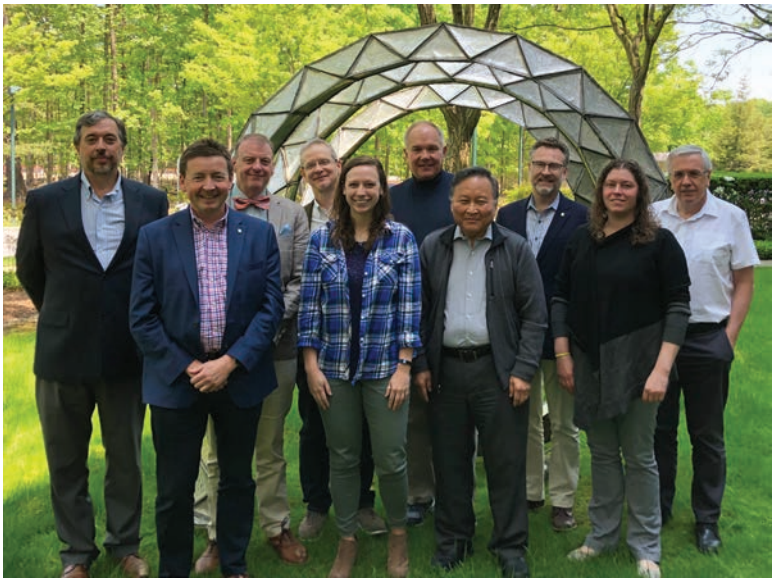
Figure 3. The annual expenses for the SOR excluding the JOR.

end

Treasurer's Report

The SOR ExCom has, for the last few years, held its spring meeting at the American Center for Physics, the home base of AIP, the American Institute of Physics, a federation of scientific societies, founded in 1931 by SOR and several other physical-science-oriented societies. Present at the May 2019 SOR ExCom meeting were (from left): Norman Wagner, Gareth McKinley, Chris White, Peter Olmsted, Jennifer Mills, Andy Kraynik, Albert Co, Michael Graham, Kelly Schultz, and Michel Cloitre.

The sculpture behind the rheologists is "Sixteen Billion Years," by Pat Monk (1921-2013; *patmonk.com/Artist.html*). On the accompanying plaque is written: "*Sixteen billion years, time enough for the universe to reach you, but where it will end, nobody knows*."



The "SOR Table" at the 2019 AIP Assembly of Society officers included rheologists (from extreme right) Anne Grillet (only partially visible), Chris White, Kelly Schultz, and Norm Wagner. Also sitting with the rheologists were members of an AIP affiliated society, the Society of Vacuum Coaters.

(Calendar, continued from page 32)

2022

April 2022

Annual European Rheology Conference, AERC 2022, Leeds, UK.

October 2022

94th Annual Meeting of The Society of Rheology, location, TBA.

2023

29 July-4 August 2023

XIXth International Congress on Rheology (every four years), in conjunction with the Annual European Rheology Conference, AERC 2023, Athens, Greece, Dimitris Vlassopoulos. This meeting was moved forward one year to eliminate a regular scheduling conflict with the quadrennial ICTAM scheduled in 2024.

2024

February 2024

95th Annual Meeting of The Society of Rheology, location, TBA.

August 2024

25th International Congress of Theoretical and Applied Mechanics (ICTAM; every four years).

October 2024

96th Annual Meeting of The Society of Rheology, location, TBA.

2025

October 2025

97th Annual Meeting of The Society of Rheology, location, TBA.

2026

October 2026

98th Annual Meeting of The Society of Rheology, location, TBA.

2027

August 2027

XXth International Congress on Rheology, Asia.

For other meeting notices, see also www.appliedrheology.org

The Society of Rheology
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CALENDAR OF RHEOLOGY CONFERENCES AND COURSES

2019

2-6 September 2019
European School on Rheology, Leuven, Belgium *(cit.kuleuven.be/smart/rheoschool)*.

6-7 September 2019
ECIS Training Course "Microfluidics and Surface Rheology," Leuven, Belgium *(ecis2019.com)*.

8-13 September 2019
Conference of the European Colloid and Interface Society, ECIS 2019, Leuven, Belgium *(ecis2019.com)*.

19-20 October 2019
SOR Short Courses on Rheology, Suspension/ Granular Rheology (1-1/2 days), Food Rheology (Saturday only), Raleigh, North Carolina USA. See article in this *Bulletin*.

20-24 October 2019
91st Annual Meeting of The Society of Rheology, Raleigh, North Carolina, USA, Lilian Hsiao, Saad Khan, Michael Rubinstein.

2020

2-7 August 2020
XVIIIth International Congress on Rheology, Rio de Janeiro, Brazil, Paulo de Souza Mendes and Roney Thompson (*icr2020.com*).

23-28 August 2020
25th International Congress of Theoretical and Applied Mechanics (ICTAM), Milano, Italy, Alberto Corigliano (*www.ictam2020.org*).

2021

21-25 February 2021
92nd Annual Meeting of The Society of Rheology, Austin, Texas USA, Roger Bonnecaze.

7-9 April February 2021
Annual European Rheology Conference, AERC 2021, Sevilla, Spain (*rheology-esr.org/aercs/*).

10-14 October 2021
93rd Annual Meeting of The Society of Rheology, Bangor, Maine USA, Albert Co.

(continues, page 31)