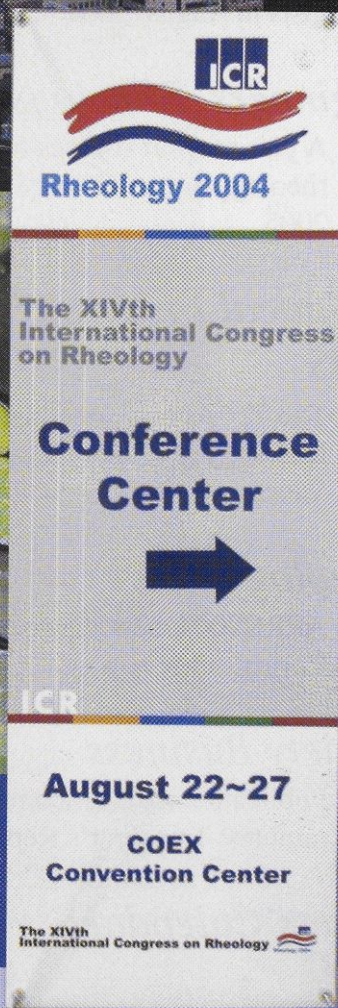
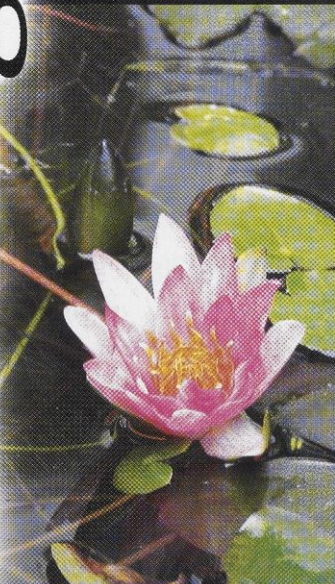
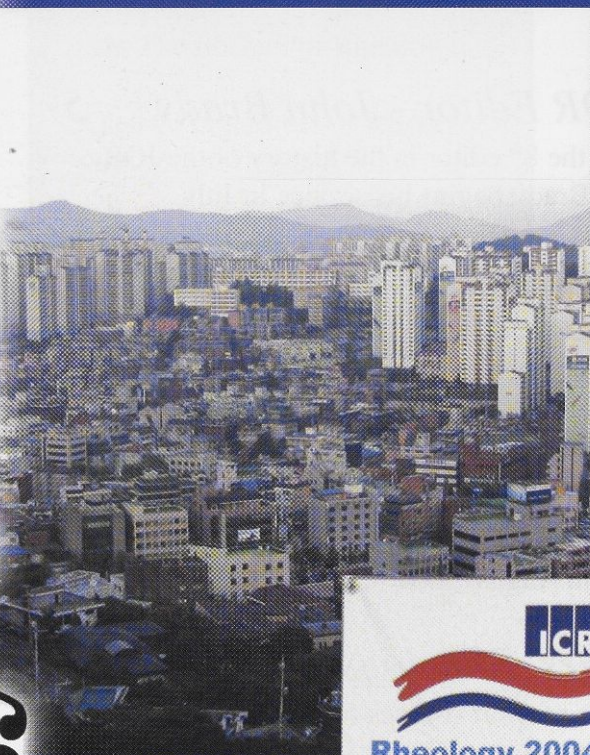


The News and Information Publication of The Society of Rheology
Volume 74, Number 1, January 2005

SEOUL 2004

Rheology Bulletin



Also Inside:

New JOR Editor John Brady
Beginner's Short Courses in Lubbock
Rheology-Fun with Bubbles

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On the Cover

(clockwise) an aerial view of Seoul from the Shilla Hotel, one of the numerous ice sculptures that decorated ICR2004 events, Professor Seung Jong Lee, Secretary of the Organizing Committee, a guard at the royal palace, a meeting poster, and a lotus flower that graced a street garden in Insa-dong, a tourist shopping district.



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The Rheology Bulletin is the news and information publication of The Society of Rheology (SOR), and is published twice a year in January and July. Subscription is free on membership in The Society of Rheology

Change of address or letters to the editor: rheology@aip.org

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Delegate to International Committee on Rheology

Albert Co

Faith A. Morrison

A. Jeffrey Giacomin

Arthur B. Metzner

Kalman Migler

Andrew M. Kraynik

Report from the President

Dear Society of Rheology Members:

I am delighted to announce that John Brady has agreed to serve as the next Editor of the *Journal of Rheology*. We are very fortunate that John is willing to take on this important role in the Society; in addition to John's distinguished stature as a researcher and educator, he has extensive editorial experience through his long association with the *Journal of Fluid Mechanics*. John was the first choice of a Search Committee consisting of Kurt Wissbrun (chair), Gary Leal, and Bill Russel, and was asked to serve as the next Editor by vote of the Executive Committee. John will serve as Editor designate from July 1, 2005 until the next election in October 2005.

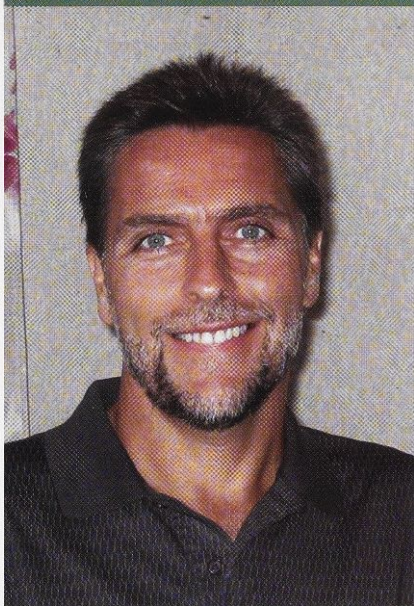
John will replace Mort Denn, who will officially be ending his tenure as *Journal of Rheology* Editor on July 1, as announced in the most recent *Rheology Bulletin*. We are all indebted to Mort for his exemplary service as Editor over the past ten years. Under Mort's leadership, the Journal has maintained the highest ISI Impact Factor of any research journal in the entire field of mechanics, manuscript review and processing times have been kept to a minimum due to his diligence and judgment, and the quality of papers published in the *Journal* has been exceptional. In addition, Mort's advice and counsel as a member of the Executive Committee have been invaluable. I hope you will all take this opportunity to thank Mort for his tremendous service to the Society.

I would also like to thank Kurt Wissbrun, Gary Leal, and Bill Russel for their very careful, thoughtful, and thorough efforts in conducting the search process for the new Editor.

Sincerely,
Susan J. Muller
President, The Society of Rheology



Distinguished Suspension Rheologist is New JOR Editor



John F. Brady, Chevron Professor of Chemical Engineering at California Institute of Technology, has agreed to serve as editor of the *Journal of Rheology*. The current editor, Morton M. Denn, announced in April that he would step down from that position at the end of June, 2005. Brady, currently associate editor of the *Journal of Fluid Mechanics*, has been appointed by the SOR Executive Committee to serve out the remainder of Denn's term of office, which expires in October, 2005. Brady will stand for election to the editor's position in the fall

2005 Society of Rheology officer elections.

Brady received his M.S. and Ph.D. in chemical engineering from Stanford University and spent four years at the Massachusetts Institute of Technology before moving to the California Institute of Technology in Pasadena, CA USA. He was promoted to full professor at Caltech in 1990, served as departmental executive officer from 1993-1999, and in 1999 was appointed Chevron Professor of Chemical Engineering at Caltech. Brady is a member of the U.S. National Academy of Engineering and a Fellow of the American Physical Society, and has received numerous awards for his professional accomplishments. He has published 89 papers, four book chapters, and many conference proceedings.

Brady's work is in the area of suspension rheology, and he is well known as the originator, with G. Bossis, of the simulation

technique known as Stokesian dynamics (*J. Chem. Phys.* 80, 5141-5154, 1984). The Stokesian dynamics technique provides a method of simulating the dynamics of dense systems with accurate hydrodynamics and with the contributions of interparticle forces factored in. The development of the Stokesian dynamics technique is considered to be one of the key developments in suspension mechanics of the last 25 years. Stokesian dynamics addresses the kinematics of systems that are not approachable in other ways. Suspensions operate at length scales that are at the boundary between classical continuum mechanics length scales and smaller length scales that require consideration of individual particles (usually addressed in statistical mechanics). In the colloidal regime, microstructural elements

Continued page 23

Fun

with

Bubbles

Who has not seen air bubbles rising in an aquarium, discrete, detached bubbles providing needed oxygen for the colorful fishes swimming nearby? Most would ignore the bubbles and watch the fish flitting around the tank, but for someone with his mind on fluid mechanics, it is the bubbles that capture the imagination. What kind of bubbles would be produced if instead of water, some other fluid were used? Maybe an interesting fluid could be found at the local superstore, perhaps regular liquid hand soap would do the trick?

The question seems unremarkable, and on first guess the answer is obvious: probably nothing would happen, except that

the bubbles would rise more slowly. While the bubbles do certainly rise more slowly, that's not the half of it, as discovered by Professor Igor Kliakhandler of the Department of Mathematical Sciences at Michigan Technological University USA. Kliakhandler bought the hand soap and a small aquarium pump and bubbled air through the fluid. He discovered that air rising in liquid hand soap does not always produce discrete bubbles; instead, under certain conditions the air bubbles form long, stable, connected chains. These bubble necklaces or sausage-links were just the beginning of a chain of surprises produced by this simple experiment.

In Newtonian liquids such connected sausage-links do not appear. As Kliakhandler found, the presence of long-chain polymers is critical to bubble-chain formation. He believes that the elastic properties of the polymers help the bubbles to stay connected (*Phys. Fluids* 14, 3375-3379, 2002). Many basic questions about the phenomenon are not yet answered; Kliakhandler continues his studies of these bubble chains with the support of a grant from the U. S. National Science Foundation. Direct application of the phenomenon thus far is in the manufacture of toys or novelty items such as a version of a lava lamp. Kliakhandler has applied for a patent for his discov-

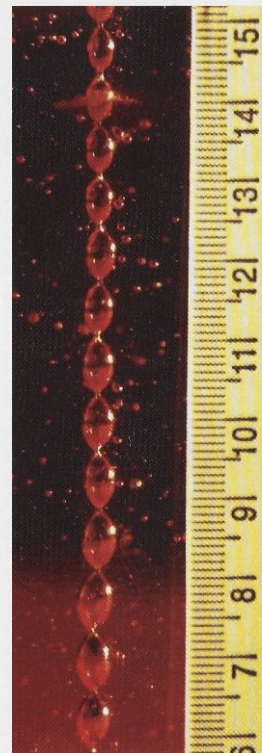
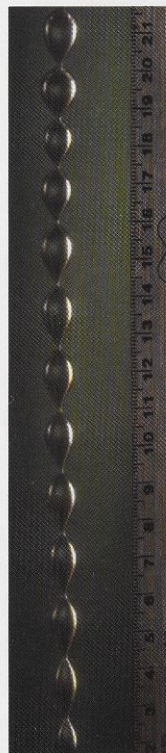
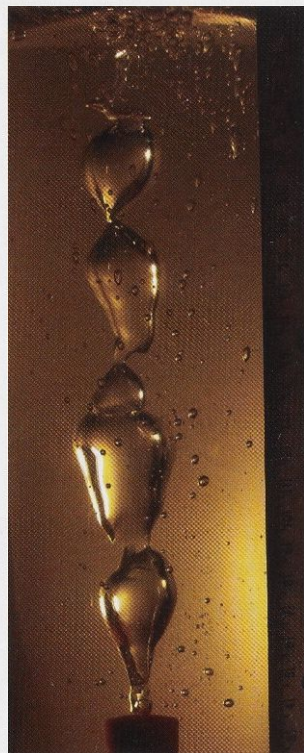
ery (submitted). He continues to study bubble effects in both water-based and organic polymer solutions.

Every year the journal *Physics of Fluids* features award-winning photographs and videos chosen from among numerous entries in the Gallery of Fluid Motion exhibit. Kliakhandler's photo of a bubble chain in hand soap was included in the Gallery of Fluid Motion 2002, and was published in *Physics of Fluids*, 15, S14, 2003 (see all winning entries in the Gallery of Fluid Motion at pof.aip.org/pof/gallery/). Photographs and videos included in the Gallery of Fluid Motion illustrate both experimental and numerical investigations of a wide variety of flow phenomena and are judged by a distinguished

international panel of referees. Winning entries are selected based upon criteria of scientific merit, originality, and artistry/aesthetic appeal.

Kliakhandler's photo of linked bubbles was his second award-winning photo in the Gallery of

pump and a length of fishing line (*JFM*, 429, 381-390, 2001). The fishing-line photo was included in the Gallery of Fluid Motion in 2000. These photos and more are available on the web at www.math.mtu.edu/~igor.



Left to right - large bubbles in a solution of organic polymer in mineral oil; regular chain of bubbles in aqueous solution of Methocel; regular chain of bubbles in red colored liquid hand soap. Marks on the ruler are 1 cm long. Copyright 2002 of American Institute of Physics.

Fluid Motion. The first contribution was also the result of a very simple flow system: Kliakhandler created viscous liquid beads on a vertical fiber, using just an aquarium

Kliakhandler continues to play with rheologically interesting liquids. The fact that his results have come from simple experiments is by design and by necessity, since Kliakhandler does not consider himself much of an experimentalist.

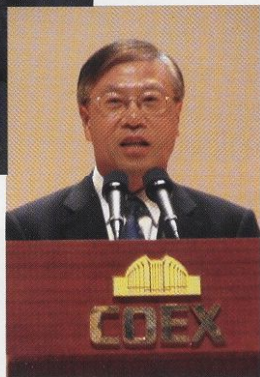
"I'm pleased that there are some simple phenomena that are still around to be discovered," says Kliakhandler.





More than 600 rheologists convened in Seoul South Korea 22-27 August 2004 for the XIVth International Congress on Rheology. Hosted by the Korean Society of Rheology, this event was a phenomenal success.

Professor Jae Chun Hyun, Chairman of the ICR2004 Organizing Committee (above) welcomed delegates to the technical program and chaired the opening plenary delivered by David Boger from the University of Melbourne Australia. Over the five



days of technical talks, 490 papers were presented. Attendees were well cared for in the luxury hotels of downtown Seoul, and the con-

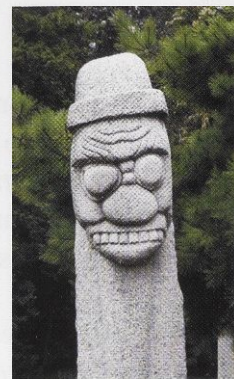
vention site, the COEX center, was situated on top of an extensive subterranean mall that catered to

every need.

The meeting organizers arranged a social program that began with the opening reception on Sunday and included excursions on Wednesday to either then Changdukgyung or Kyungbokgyung royal palaces. The afternoon excursions were followed by a barbecue dinner, the scope of which overwhelmed participants. The outdoor location at the Water Stage, Olympic Park, was picture-perfect. The weather cooperated and attendees feasted on roast pork, kim chi and other Korean specialties as well as sushi and sashimi. The dinner was followed by a drumming performance in front of Mongchon Lake, constructed for the 1988 Seoul Olympic Games. Nearby, local teenagers were enjoying the Olympic venue,

racing around on in-line skates or performing intricate balancing maneuvers on skates.

The crowning social event of ICR2004 was the Thursday banquet back at the COEX Intercon Hotel. Delegates heard a report from David James (University of Toronto Canada), Secretary to the International Committee on Rheology, indicating that the state of rheology world-wide was good, although the number of members of national societies of rheology has slightly declined. James was thanked for his many years of service to rheology as secretary to the ICR. Prof. Hyun was elected by the

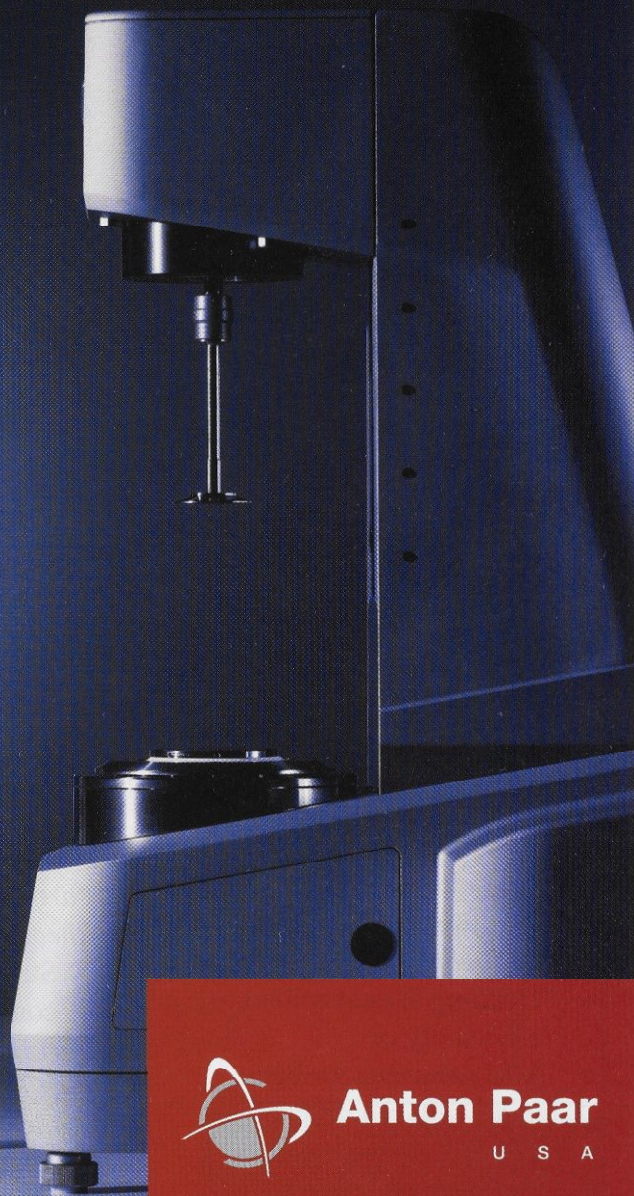


Committee as the new chairman of the ICR, and Manfred Wagner from Technische Universität Berlin Germany was elected to serve as the new secretary.



A little "street rheology" was found at the noodle shop.

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In a break with tradition, there will be two short courses offered at the next meeting of The Society of Rheology. “*Beginning Rheology*,” a two-day short course on rheology basics, will be offered on February 12 and 13, 2005. The instructors for the course will be Professor Faith Morrison from Michigan Technological University and Professor A. Jeffrey Giacomini from the University of Wisconsin Madison.

The second course will be a one-day class on “*Rheological Data Analysis and Comparison to Theory*,” by Professor Henning Winter of the University of Massachusetts Amherst, and it will run on February 13, 2005. Students may mix and match between the two short courses, attending Day 1 of the *Beginning Rheology* course and moving on to the *Data Analysis* course for the second day.

All classes will convene at the Holiday Inn and Towers in Lubbock, Texas; details are on the web at www.rheology.org/sor/short_course/2005Feb/. The short courses are held in conjunction with the Annual SOR Meeting.

Two Beginners’ Short Courses Offered in Lubbock

The *Beginning Rheology* course is meant for those with little or no background in rheology or rheological modeling. The course content is based on the text *Understanding Rheology*, by Faith Morrison (Oxford, 2001), which may be ordered at a discount at the time of registration for delivery at the short course. *Beginning Rheology* links rheological modeling with industrial applications. An abbreviated outline of the course is listed below; details may be found on the web.

Beginning Rheology (Morrison, Giacomini)

Day 1: Introduction to Course and Course Structure

Part Ia: Newtonian Fluids and the Analytical Tools of Rheology

Standard flows, material functions, Newtonian constitutive equation, predictions in 3D flows

Part Ib: Low De , Low We Flow Applications

Part IIa: Purely Viscous (Inelastic) Non-Newtonian Fluids

Generalized Newtonian constitutive equation, Bingham model for viscosity, Power-law model for viscosity, Carreau-Yassuda model for viscosity

Part IIb: Low De , Moderate to High We Flow Applications

Day 2: Part IIIa: Linear Viscoelastic Fluid Modeling

Hooke’s law, Memory fluid models (simple), Maxwell model/Jeffreys model, Generalized Maxwell model, Generalized linear-viscoelastic constitutive equation, Linear-viscoelastic measurements

Part IIIb: High De , low-moderate We Applications

Part IVa: Non-Linear Viscoelastic Fluid Modeling

Transient elongational viscosity, reversing flows, recoil, strain tensors, convected derivatives, advanced constitutive equations

Part IVb: High De , High We – Non-Linear Viscoelastic Modeling Applications

The ***Rheological Data Analysis and Comparison to Theory*** short course offers an

introduction to user-friendly methods for rheological data analysis. Students in this short course will work with a computer platform that allows a detailed analysis of experimental data and allows predictions from the newest theories in rheology. This tutorial course is intended for researchers and practitioners with an interest in rheology. Only the most basic knowledge of rheology is required, and this may be obtained by attending Day 1 of the *Beginning Rheology* course the previous day. Participants are asked to bring a laptop computer on which the appropriate software can be installed. Teaching tool is the IRIS software which will be provided to all participants during the course (+3 months after completion of the course). An abbreviated outline of the course is listed here; details may be found on the web.

Rheological Data Analysis and Comparison to Theory (Winter)
Part I: Experimental

- I.1. Steady Shear and Yield Stress
- I.2. Dynamic Mechanical Spectroscopy - Shifting of G' , G'' -Data, Determination of Relaxation Time Spectra and Retardation Time Spectra, Rheological Constants and Material Functions, Time-Dependent Functions (modulus $G(t)$ and $J(t)$), Cole-Cole, Han plot, van Gurp Palmen, Predictions of Large Strain Behavior from Linear Viscoelasticity, Time Resolved Rheology Methods

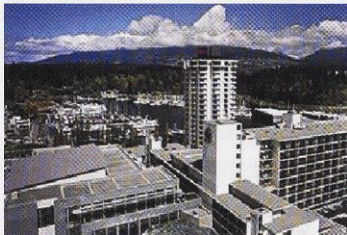
Part II: Graphical Representation of Theory and Comparison to Experiments

- II.1. Linear Viscoelasticity-Classical Theories: Maxwell, Rouse, Doi-Edwards, Empirical Models: BSW, CW, Tube Dilation: (Blackwell/McLeish), Polymer Emulsion (Paliarne)
- II.2. Non-linear Viscoelasticity-Tube Dilation: (Blackwell/McLeish), Molecular Stress Function Theory (Wagner/ Berlin)

Details on how to register for the courses may be found on the web at www.rheology.org/sor/short_course/2005Feb/

77th Annual SOR Meeting to be held October 16-20, 2005 Vancouver, B.C. Canada

The 77th Annual Meeting of The Society of Rheology will be held in Vancouver, BC, Canada from 16-20 October 2005; the associated short course on "Microrheology" by Michael Solomon and James Harder will be offered on 15 and 16 October. Plan to attend. All sessions will be held at the Westin Bayshore Hotel in down-



town Vancouver, located beside the famous Stanley Park.

As usual, the meeting will begin with a Welcome Reception in the hotel on Sunday evening. The Bingham Award will be presented at a dinner on Monday evening. We will hold the poster session on Wednesday evening. Plenary speakers will be Bamin Khomami of Washington University St. Louis, Stephen Quake from CalTech, and the Bingham medalist (TBA).

The Westin Bayshore is approximately 25 minutes from the Vancouver International airport. Taxis and an Airporter shuttle can be picked up at the front of the airport. Please visit www.yvrairporter.com for more information on the Airporter shuttle.

Hotel reservations can be made directly with the Westin Bayshore Resort and Marina by calling 604-682-3377 or 1-800-WESTIN-1. Please reserve by September 15, 2005, and please indicate that you are an attendee of the 77th Annual Meeting of the Society of Rheology to receive the group rate.

Main Building - Single/
Double \$199.00Cdn
Tower Building - Single/
Double \$229.00Cdn
Extra Person \$25.00Cdn

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TECHNICAL PROGRAM SOR'05 VANCOUVER CANADA

Program Chair

Eric S. G. Shaqfeh
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Technical Symposia & Organizers

1. NonNewtonian Fluid Mechanics and Stability

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2. Suspensions, Colloids, and Multiphase Fluids

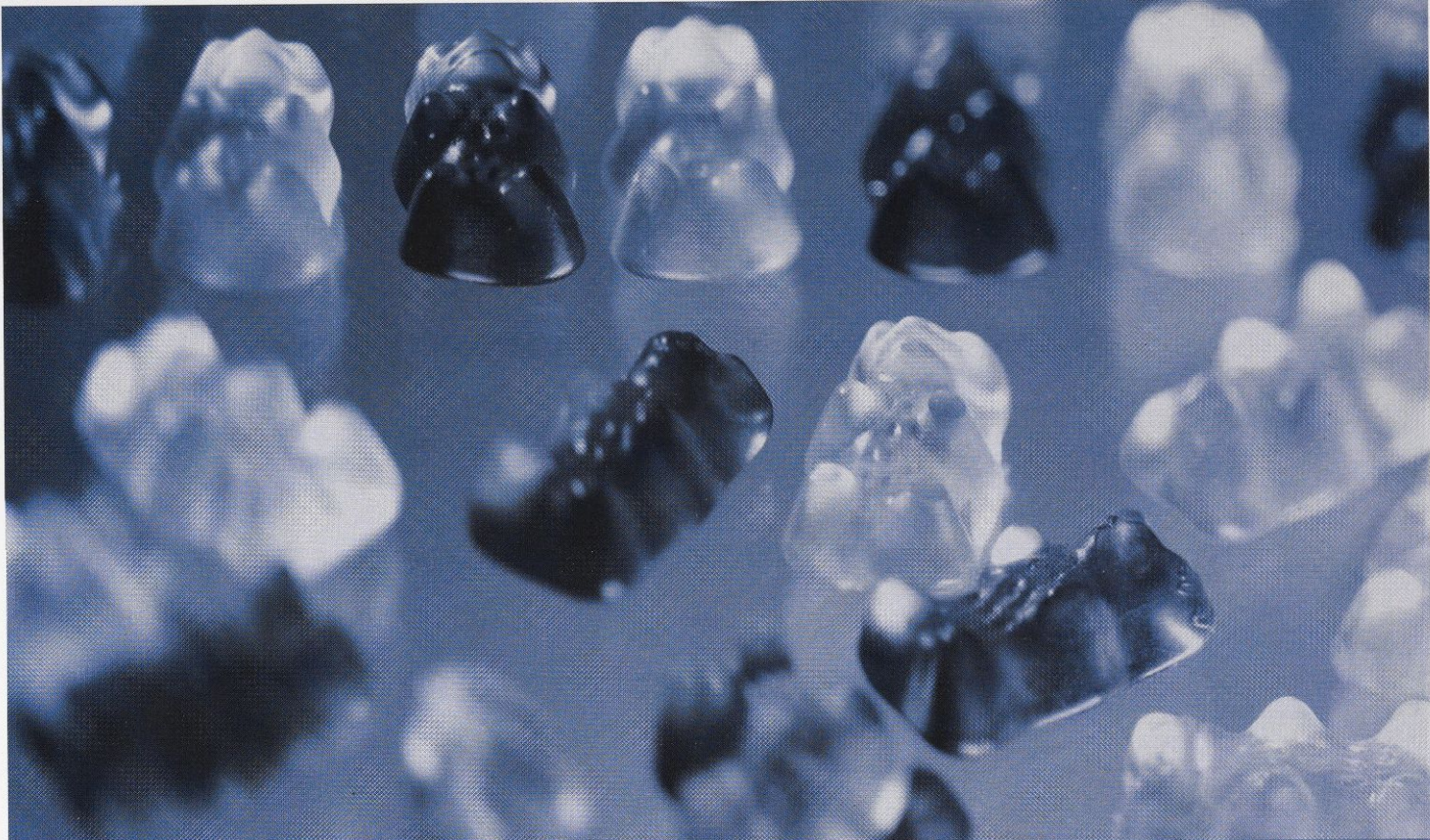
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3. Rheology of Biomaterials and Biological Systems

Denis Wirtz
Dept of Chem & Biomolec Eng

Continued page 15



Understand the structure

HAAKE MARS rheometer, an innovative concept

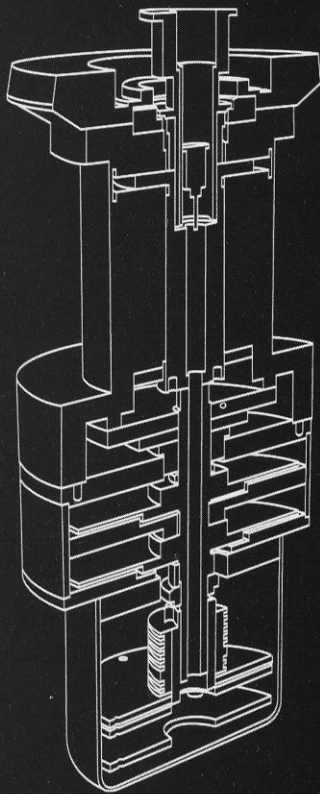
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For instructions on submitting abstracts, go to www.rheology.org/sor/

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5. Solution Rheology

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6. Entangled Solutions and Melts

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7. Interfacial Problems in Rheology

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8. Session on Molecular Structure and Rheology Honoring John Dealy at his Retirement

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9. Molecular Modeling and Simulation in Rheology

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Antony Beris
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10. Industrial Rheology

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Will Hartt

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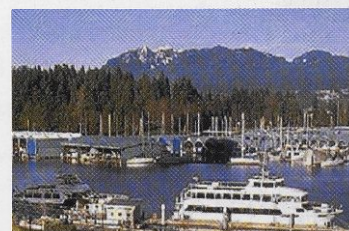
11. Viscoplasticity and Viscoelasticity of Solids and Semi-Solids

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12. Poster Session

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Rheology News

Annual European Rheology Conference to run this Spring in Grenoble

The Annual European Rheology Conference will be held April 21-23, 2005 in Grenoble France. The 2nd Circular and more details are available on the web at www.rheology-esr.org/AERC/2005/files/2nd_circular.pdf. Early registration for AERC 2005 closes February 28th 2005.

Dueling Elongational Rheometer Fixtures

In July 2004 TA Instruments announced the development of an attachment to their ARES shear-rheometry platform that allows the measurement of elongational viscosity (www.tainst.com/email/hotline/summer2004/). Dubbed the ARES-EVF –

for Elongational Viscosity Fixture - this fixture performs extensional measurements up to a Henky strain of 4.9 at elongational rates of up to 10 s^{-1} .

The development of the ARES-EVF follows the 2003 introduction by Xpansion Instruments of the Sentmanat Extensional Rheometer Universal Testing Platform (SER-UTS). That instrument is also designed to measure elongational viscosity on the ARES platform (*Rheol. Bull.* 73(1) 12 (2004); *Rheol. Acta.* 43 657 (2004); www.xinst.com). Both instruments translate the rotational motion and torque measurement capability of the ARES into elongation motion by winding up and stretching samples on two counter-rotating drums. Xpansion also makes versions of the SER that work on the Rheometrics (now TA) RDA-2, RDA-3, and RMS-800 as well as versions for the Paar Physical MCR and the Bohlin (Malvern) VOR.

Priced comparably (\$14,500 for the ARES-EVF and \$13,900 for the SER-UTS) both instruments are currently in production. The SER device (US patent 6 691 569) produces a flow in which the deformation zone is in a fixed plane. This allows the strain to be validated and produces a flow that is easy to visualize and to adapt to optical techniques. The ARES-EVF produces its flow by putting one drum in motion, wrapping itself around its counter-rotating partner.

New PiezoRheometer Developed

The University of Louis Pasteur Strasbourg, France announces the development of a shear and compression piezo-rheometer. The piezo-rheometer uses piezoelectrical ceramics to apply a strain to a small sample (less than 30 mg) and to subsequently measure the stress generated. The device is targeted at the measurement of the dynamics of soft condensed matter systems such as materials near the sol-gel transition,

polymers, liquid-crystalline polymers and elastomers, particles dispersed in gels and biological materials. For more information contact Nicolas.Langlet@ulp-industrie.u-strasbg.fr.

JOR Submission Goes Electronic

The *Journal of Rheology* will transition to exclusive electronic submission and handling of journal articles over the next 6 months. The change to mandatory electronic submission, adopted by the SOR Executive Committee in April 2004, will reduce the paperwork associated with manuscript handling and is projected to reduce costs at the *Journal*.

To handle this change, the SOR Exec Com authorized the purchase of PeerX-Press (PXP), software recommended by SOR staff at the American Institute of Physics. The next Editor of the

Continued page 23



Student Poster Competition in Lubbock

The deadline for submitting materials to the SOR Student Poster Competition in Lubbock is midnight (EST) January 17, 2005. The SOR sponsors a student poster competition to encourage student presentations and participation in SOR meetings and to recognize excellence. In order to be considered in the competition, student poster presenters must also submit a PowerPoint-type poster in PDF format to the chair of the poster session.

A panel of judges will select up to 8 finalists based on the entries, with the final selection of the winner to be made at the poster session. An award of \$200 will be made to the winner. For more details see www.rheology.org/sor/annual_meeting/2005Feb/poster_competition.htm.

Student

APS Congressional Science Fellow Awards

The American Physical Society invites applications for Congressional Science Fellow positions. Through this program APS aims to bring together Members of Congress and individuals with scientific knowledge and skills. In addition, the program enables scientists to broaden their experience through direct involvement with the legislative and political processes. Qualifications include a PhD in physics or closely related field, a strong interest in science and technology policy, and preferably some experience in applying scientific knowledge toward the solution of societal problems. Fellows are required to be US citizens and members of APS. Please visit www.aps.org/public_affairs/fellow/

Corner





NEWS

Macosko and Zhao Receive the 2004 SOR Publication Award

Christopher Macosko and Rui Zhao have been selected to receive the 2004 Society of Rheology Publication Award for their paper "Slip at polymer-polymer interfaces: Rheological measurements on coextruded multilayers," *J. Rheology*, 46, 145-167 (2002). The award, which consists of a certificate and US \$1000 shared among the coauthors, will be presented at the Lubbock meeting in February 2005. Macosko will also be receiving the Bingham Medal of The Society of Rheology in Lubbock, marking the first time that an individual has been so doubly honored in one meeting.

The *Journal of Rheology* Publication Award Committee annually selects an outstanding paper published in the *Journal of Rheology*

during the preceding two years for special recognition at the annual meeting. The 2004 Publication Award Committee consisted of Journal Editor Morton Denn, two at-large members of the ExCom, and two former winners. The Publication Award, first presented in 1994, is currently sponsored by TA Instruments of New Castle, Delaware.

Nominations Invited for the 2005 Bingham Award

Nominations for the Society's highest honor, the Bingham Medal, should be submitted before 15 January 2005 to the chair of the Bingham Award Committee:

William Tuminello
Western Research Institute
365 North 9th Street
Laramie, WY 82072 USA
wtuminel@uwyo.edu

Rules and some guidelines governing the Award are on the web at www.rheology.org/sor/awards/bingham/nom2004.htm.

2005 Nominating Com- mittee to be Formed

The SOR will hold officer elections in 2005, and the Nominating Committee for those elections will be formed in Spring 2004. The SOR constitution provides for a three-member nominating committee to report its recommendations at least 145 days prior to the Annual Meeting, approximately 24 May 2005. Members interested in serving on the Nominating Committee should indicate their interest to a member of the SOR Executive Committee. International and industrial members are particularly encouraged to serve.

Graham Represents Society at USNCTAM

Michael D. Graham, Professor of Chemical Engineering at the University of Wisconsin Madison, has agreed to serve as the SOR representative to the U.S. National Committee on Theoretical and Applied Mechanics (USNC/TAM).

Graham is succeeding Sangtae Kim (Donald W. Feddersen Distinguished Professor of Chemical Engineering at Purdue University), who served in this capacity for many years. The USNC/TAM represents the National Academy of Sciences in international scientific activities relating to mechanics and also serves as the national forum for defining and addressing major issues in mechanics research, technology and education.

**Minutes of the Executive Committee Meeting
Sunday, August 22, 2004**

An informal meeting of the Executive Committee was held on Sunday, August 22, 2004 in the PT room of the COEX Convention Center in Seoul, Korea, the site of the XIVth International Congress on Rheology. Committee members in attendance were Susan Muller, Bill Russel, Andy Kraynik, Monty Shaw, and Wes Burghardt. Invited guests were Greg McKenna, Bob Powell, and Faith Morrison. Bob Powell provided an update on the proposal to hold the 2008 International Congress on Rheology in Monterey, CA. Powell also previewed the presentation

of the Monterey proposal for the International Committee on Rheology; the official presentation to the International Committee took place the following Tuesday. Greg McKenna reported that preparations for the Lubbock meeting in February 2005 are progressing nicely; meeting details are now available at The Society of Rheology website. Susan Muller reported on the technical program for the Vancouver meeting in October 2005 for Technical Program Chair Eric Shaqfeh. Andy Kraynik led a discussion of issues before the International Committee on Rheology. The next formal Executive Committee meeting will be held in February 2005, in conjunction with the annual meeting in Lubbock, TX.

Submitted by Susan Muller, President

Treasurer's Report

To the Membership,

The story of the finances of the Society is one of constant change, which has brought mixed fortune. Against the background of constantly decreasing institutional subscriptions, we have bright points of

favorable financial results for the annual meetings and short courses, as well as two developments for the *Journal of Rheology*. These two developments, both of which are currently favorable, are a major downward adjustment of AIP production charges and accelerating sales of consortia agreements for online service. The latter is somewhat worrisome because it can cap the number of institutional subscriptions if there were a recovery (unlikely) to the good old days of 600+ institutional subscriptions. On the downside, though, we will eventually have a solid floor for the number of subscriptions. Hopefully we can operate at that level and still provide a quality print journal along with electronic access.

There are other publication developments in the offing that may seriously affect our bottom line; more discussion of these will come. One that has been instituted is web-based Editorial Management. Associated with this are startup and maintenance costs, but we anticipate a savings in labor. Thus our 2005 budget shows only a minor increase in this item.

Webmaster Albert Co and I have been filling out innumerable forms to establish a web-based merchant account for use at the annual meetings, and for other services. The cost of a merchant account is estimated to run about \$600 per year, but will provide members with increased convenience.

Even the casual reader will note that the actual year-end positions of the Society consistently exceed the budgets. On comparing these two item-by-item it can be seen that the major sources of these differences are the profitable annual meetings/short courses and lower-than-anticipated

Journal costs, due mainly to low page counts. Minor sources include mandated budgeted expenses for the discretionary funds, which are rarely used. While these windfalls are agreeable, they obviously cannot be counted on year after year.

Respectfully submitted,
Montgomery Shaw,
Treasurer

The Society of Rheology
Receipts and Disbursements

	Budget 2005	Projection 2004	Budget 2004	Actual 2003	Budget 2003
RECEIPTS					
Dues	55,000	55,136	55,000	58,271	60,000
Interest	9,000	8,133	9,000	8,266	14,000
Journal of Rheology	253,250	256,301	238,500	261,770	256,300
Mailing List Sales	1,000	500	1,000	697	500
Donations	0	0	0	0	0
Bulletin Advertising	2,000	3,504	2,000	1,488	2,000
Annual Meeting (net)	0	23,003	0	11,099	0
Short Course (net)	0	6,885	0	15,061	0
TOTAL RECEIPTS	320,250	353,462	305,500	356,651	332,800
DISBURSEMENTS					
AIP Dues Bill & Collect.	10,000	15,237	7,000	10,106	6,000
AIP Adm. Services	9,500	9,613	9,500	9,549	9,500
AIP Mem. Soc. Dues	7,600	8,343	7,600	7,585	7,500
Contributions and Prizes	3,000	1,700	3,000	1,994	3,000
Journal of Rheology	231,002	225,415	256,197	247,382	259,847
Bulletin	3,500	6,804	4,000	3,302	7,000
Bingham Award	14,000	5,446	7,500	5,015	7,500
Executive Cmt. Meetings	13,000	0	9,000	12,464	7,500
Pres. Discretionary Fund	1,500	0	1,500	0	1,500
Treas. Discr. Fund	1,500	286	1,500	0	1,500
Progr. Chm. Discr. Fund	4,000	0	2,000	1,895	2,000
Office Expenses	3,000	3,222	6,000	5,270	2,000
Banking Services	100	350	100	78	100
Liability Insurance	7,500	5,500	6,000	4,330	4,000
Membership Broch. & Appl.	1,000	427	200	0	200
Accountant	2,200	1,910	2,200	1,920	2,200
Student member travel	24,000	13,113	600	0	5,000
Annual meetings, future	7,000	7,532	3,000	1,000	3,000
Website	1,000	3,824	1,000	0	1,000
Miscellaneous	1,000	600	1,500	425	1,500
TOTAL DISBURSEMENTS	345,402	309,323	326,397	312,315	331,847
Net	-25,152	44,139	-23,897	44,337	953

Journal of Rheology

Report to the membership,

January 2005

(All amounts: USD)

	2005 Budget	2004 Projection	2004 Budget	2003 Actual	2003 Budget
RECEIPTS					
Subscriptions	184,250	192,500	187,000	204,598	209,000
Reprint Sales	7,000	7,664	5,500	5,876	6,500
Ad Sales	33,000	28,751	32,000	33,052	35,000
CD sales (net)	0	0	0	0	0
JORO revenue	27,000	26,523	13,000	17,034	4,300
Miscellaneous	2,000	863	1,000	1,210	1,500
TOTAL RECEIPTS	253,250	256,301	238,500	261,770	256,300
DISBURSEMENTS					
Ads	9,000	8,123	9,000	7,360	9,000
Reprints, Single Copy	5,400	5,053	5,400	5,445	6,532
Paper, Printing	33,578	29,307	38,000	34,853	39,484
SOR Editorial	49,000	47,000	49,897	52,388	47,000
Production	52,500	61,664	73,500	73,179	78,400
Fulfillment	7,600	6,677	6,300	6,924	8,300
Distribution	18,524	19,346	20,500	19,226	21,031
Electronic publishing	48,000	44,139	48,000	42,332	44,000
Miscellaneous	7,400	4,107	5,600	5,675	6,100
TOTAL DISBURSEMENTS	231,002	225,415	256,197	247,382	259,847
Net	22,248	30,886	-17,697	14,388	-3,547

The Society of Rheology, Inc.

Balance Sheet
(all amounts, USD)

	2004 August	2003	2003 August	2002	2001
Assets					
Cash in checking account	11,572	2,047	14,334	466	9,374
Securities	0	0	0	0	0
Balance in AIP account	907,495	938,047	853,135	915,334	843,151
Total Assets	919,067	940,094	867,469	915,800	852,525
Liabilities and Net Assets					
Liabilities					
Deferred revenue	95,735	143,603	88,092	162,363	137,468
Total Liabilities	95,735	143,603	88,092	162,363	137,468
Net Assets					
Publication reserve	450,000	450,000	450,000	450,000	450,000
Student travel grant reserve	10,000	10,000	10,000	10,000	10,000
Annual Meeting reserve	100,000	100,000	70,000	70,000	70,000
Operating reserve	100,000	70,000	70,000	70,000	70,000
Unrestricted	163,331	166,491	179,376	153,437	115,057
Total Net Assets	823,331	796,491	779,376	753,437	715,057
Total liabilities and net assets	919,067	940,094	867,469	915,800	852,525

the end

CALENDAR OF RHEOLOGY CONFERENCES AND COURSES

2005

12-13 February 2005

SOR Short Course on *Beginning Rheology*, by Faith A. Morrison and A. Jeffrey Giacomin, Lubbock, Texas USA

13 February 2005

SOR Short Course on *Rheological Data Analysis and Comparison to Theory*, by H. Henning Winter, Lubbock, Texas USA

13-17 February 2005

76th Annual Meeting of The Society of Rheology, Lubbock, Texas USA

21-23 April 2005

2nd Annual European Rheology Conference AERC 2005, Grenoble France

30 May - 3 June 2005

12th International Congress of Biorheology (12thICB) and 5th International Conference on Clinical Hemorheology (5thICCH), Chongqing China

19-23 June 2005

21st Meeting of the Polymer Processing Society, Leipzig Germany

26-29 June 2005

13th European Conference on Clinical Hemorheology, Siena Italy

7-11 August 2005

4th Pacific Rim Conference on Rheology (PRCR4), Purple Mountain Hotel, Shanghai, China (www.prcr4.org.cn/)

15-16 October 2005

SOR Short Course on *Microrheology*, by Michael Solomon and James Harder, Vancouver Canada

16-20 October 2005

77th Annual Meeting of The Society of Rheology, Vancouver Canada

2005 TBA

IUTAM Symposium on Flow Control with MEMS, London, UK, Symposium Chairman: Dr. J.F. (Jonathan) Morrison

2006

27-29 April 2006

3rd Annual European Rheology Conference AERC 2006, Hersonissos Crete

7-8 October 2006

SOR Short Course on Rheology (topic TBA), Portland, Maine USA

8-12 October 2006

78th Annual Meeting of The Society of Rheology, Portland, Maine USA

2006 TBA

IUTAM Symposium on Interactions for Dispersed Systems in Newtonian and Viscoelastic Fluids, Santa Barbara, CA, USA, Symposium Chairman: Prof. G.M. (George) Homsy

2007

Spring 2007

4th Annual European Rheology Conference AERC 2007, location TBA

6-8 September 2007

IUTAM Symposium on Advances in Micro- and Nanofluidics, Dresden, Germany, Symposium Chairman: Prof. N.A. (Nikolaus) Adams

6-7 October 2007

SOR Short Course on Rheology (topic TBA), Salt Lake City, Utah USA

7-11 October 2007

79th Annual Meeting of The Society of Rheology, Salt Lake City, Utah USA

2008

17-23 August 2008

XVth International Congress on Rheology and 80th Annual Meeting of The Society of Rheology, Monterey, California USA

2009

October 2009

81st Annual Meeting of The Society of Rheology, Madison, Wisconsin USA

Rheology News

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JoR, John Brady, will oversee the transition of the *Journal* to the new system, which will be optional between January and July 2005, and mandatory after July 2005.

Brady new JOR Editor

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(particles, discrete phases, individual molecules) interact via colloidal, hydrodynamic, and Brownian forces. Examples of fluids for which these length scales are important include suspensions, colloidal dispersions, liquid crystals, ferro- and electrorheological fluids, polymer solutions, and polymer melts.

Modeling using the Stokesian dynamics technique begins with the Langevin equation (mixed continuum/Brownian expression for forces on

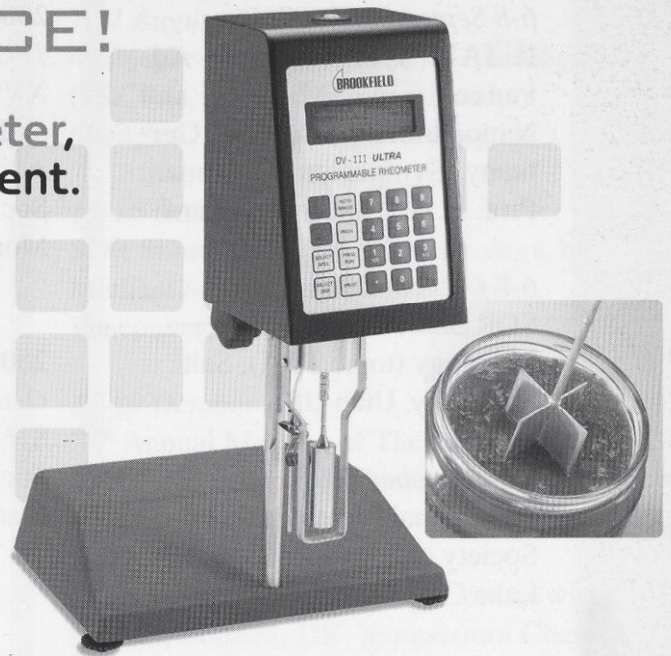
particles) with inertia neglected. The further assumption is made that the fluid obeys the Stokes equation; that is, that particles are within the low Reynolds-number regime. This assumption allows the hydrodynamic forces to be written as a linear function of the velocity. Particles are followed as they interact from one time-step to another, and velocities are calculated for a large number of particles. This technique has been employed by research groups around the world and has been extended to deformable particles and to include inertial effects.

The search for a new JOR editor was conducted by a committee consisting of SOR members (and Bingham medalists) Kurt Wissbrun (chair), Gary Leal, and Bill Russel. "John was the first choice of a Search Committee," said SOR President Susan Muller in a letter to the membership. "We are very fortunate that John is willing to take on this important role in the Society." "I look forward to continuing the excellent work of my predecessor," says Brady, "and to increasing JOR's reach and impact as rheology expands into new areas of complex material behavior."

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