

RHEOLOGY BULLETIN

Published by The Society of Rheology

Vol. 67 No. 2



July 1998

**THE SOCIETY OF RHEOLOGY
EXECUTIVE COMMITTEE - 1997-99**

| | |
|----------------------------|-------------------------------------|
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**70th ANNUAL MEETING
MONTEREY, CA
OCTOBER 4 - 8, 1998**

The Autumn 1998 meeting of the Society of Rheology will be held at the Monterey Marriott Hotel in Monterey, California. Details of the technical program may be found on the Society's web page at <http://www.umecheme.maine.edu/sor/> while other details are given inside this issue of Rheology Bulletin. Also enclosed are the meeting registration and hotel reservation forms. The meeting organizers are:

Technical Program Chairs:

Patrick T. Mather
Air Force Research Lab
AFRL/MLBP, Building 654
2941 P Street, Ste 1
Wright Patterson AFB, OH 45433
(937) 255-9152; Fax: (937) 255-9157
e-mail: matherpt@ml.wpafb.af.mil

Ralph H. Colby
Dept. of Materials Science & Engineering
The Pennsylvania State University
University Park, PA 16802-5007
(814) 863-3457; Fax: (814) 865-2917
e-mail: RHC@plmsc.psu.edu

Local Arrangements Chair:

Gerald G. Fuller
Department of Chemical Engineering
Stanford University
Stanford, CA 94305
(650) 723-9243; Fax: (650) 725-7294
e-mail: gjf@chemeng.stanford.edu

INSTRUMENT EXHIBIT Several companies will exhibit rheological instrumentation at the annual meeting.

POSTER SESSION A poster session will be held in Monterey. Abstracts should be submitted to the session chair, Professor S.J. Muller of the University of California at Berkeley, by August 21, 1998. Please use the web-based procedure at

<http://www.umecheme.maine.edu/sor/>

COMMITTEES*Membership:*

W.E. VanArsdale, chair
S. Drappel
A.J. Giacomini
P. Moldenaers
L.E. Wedgewood

Education:

S.J. Muller, chair
D.G. Baird
P.E. Clark
E.A. Collins
W.M. Prest
W.E. VanArsdale
R. Webber

Meetings Policy:

R.G. Larson, chair
G.G. Fuller
A.J. Giacomini
A.M. Kraynik
R.L. Powell

Bingham Award:

A. Chow, chair
G.C. Berry
D.F. James
A.J. McHugh
W.M. Prest, Jr.

Nominations for the 1999 Bingham Medal

Nominations are invited for the 1999 Bingham award. These should be submitted before **January 15, 1999** to the next chair of the Bingham award Committee, Dr. Andrea Chow, at Caliper Technologies Corp., 1275 California Ave., Palo Alto, CA 94305. Award guidelines may be found at <http://www.umecheme.maine.edu/sor/awards/bingham/rules.htm>

**JOHN M. DEALY
1998 BINGHAM MEDALIST**

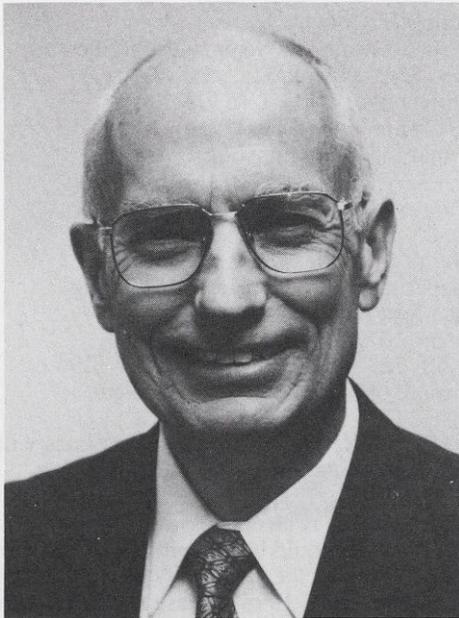
The Bingham medal of the Society for 1998 will be awarded at the Monterey meeting to Professor John M. Dealy of McGill University. A write-up appears inside this issue of the Bulletin. Congratulations John!

RHEOLOGY BULLETIN
 Rakesh K. Gupta, Editor
 Department of Chemical Engineering
 West Virginia University
 P.O. Box 6102
 Morgantown, WV 26506
 (304) 293-2111 Ext. 427
 Fax: (304) 293-4139
 Email: rgupta@wvu.edu

Visit the Society of Rheology on the web at
<http://www.umecheme.maine.edu/sor/>

1998 BINGHAM MEDAL GOES TO JOHN DEALY

John M. Dealy of McGill University has been chosen to receive the 1998 Bingham medal. John has made numerous outstanding contributions to the science of rheology. These include the invention of new experimental techniques by building innovative equipment to advance knowledge in the science, his clear and instructive papers and his two excellent books on rheology. The invention of the shear stress transducer and its successful incorporation into a sliding plate rheometer is one of the most significant contributions to experimental melt rheology. It solved many problems previously encountered in conventional sliding plate rheometers and marked the advent of the measurement of non-linear viscoelasticity in concentrated polymer solutions and melts. As an example, the use of exponential shear flow as a strong flow and its comparison with extensional flows and unsteady shear flows were first recognized by John M. Dealy.



Professor John M. Dealy

John M. Dealy is a leader among rheologists serving the industrial community. His excellent knowledge and understanding of both rheology and polymer processing operations rank him amongst the most influential rheologists in the processing of polymer melts. He is a leader in developing correlations between rheological measurements and processability, and on how rheology can be used to understand polymer performance. His careful and innovative work on measuring die swell of molten polymers flowing through diverging and converging annular dies is classic literature. His recent work on the wall slip and melt fracture of molten polyethylenes and elastomers is another outstanding contribution to the science of rheology. Most recently, Professor John M. Dealy developed the pressurized sliding plate rheometer, the only rheometer that can measure clearly the effects of pressure on the rheological properties and slip velocity of molten polymers and elastomers. Its development took genius, dedication and patience. Professor John M. Dealy is not only a fine scholar but also a master teacher who makes rheology understandable and logical. Many of his manuscripts and his two books on rheology demonstrate this. In particular, his last book with Kurt Wissbrun, "Melt Rheology and its Role in Plastics Processing", is a model of clarity. His tutorial lectures in scientific meetings are considered amongst the best delivered papers. This is mainly due to his abilities to communicate complicated concepts in an incisive and simple way. Please join the Society in Monterey to celebrate John's success.

Savvas G. Hatzikiriakos and Jeffrey A. Giacomin

JOURNAL OF RHEOLOGY ARCHIVAL CD-ROM

Those of you who attended the Business Meeting in Columbus, or who actually read the minutes of the Meeting in the January 1998 Bulletin, will not be surprised to see an insert in the mailing of this Bulletin offering a set of four CD-ROMs containing Volumes 1-41 (1957-1997) of the Journal of Rheology at a special pre-publication price.

At the time of the Columbus meeting this Archival CD-ROM was only a concept. We have now seen the product and think that you will be delighted with it. One immediate, obvious advantage to those of you who have been members for a long time is that it will save you many feet of shelf space; for newer members it provides inexpensive, ready access to years of valuable publications.

However, the most valuable feature of this product is that it makes it possible to search this extensive literature electronically. An Adobe Acrobat 3.0 Reader is installed directly from the CD-ROM. Every paper has been scanned and converted to searchable text by sophisticated optical character recognition (OCR) software. Even the small print of the references is searchable! For example, it is possible to find the name "Sensenbaugh" in a reference in a classic paper by Markovitz in Volume 1 of the Journal. In addition, it is possible to search not only the entire text on the CD-ROM, but also to limit the searches to specific fields, such as Title, Author, Subject, and Keywords. And the searches may be narrowed as desired by combining search requirements. For instance, a search of CD-1 (Vols. 1-19) on "Bagley" in the Author field turned up six papers (out of a total of 722). Combining "Bagley" in the Author field with the word "swell" in the text field narrowed the result to one highly relevant paper.

Once you have found a desired article, you can view it at various magnifications on your PC monitor. The article, or any selected pages, may be printed to a printer or to a file. Or, the text of the entire paper or selected portions may be copied into other documents such as MS Word. If desired, the entire printable image of the paper, in the form of a "PDF" file, may be copied from the CD-ROM onto the computer hard disk.

There are some drawbacks that need to be mentioned. The scanned image is not as sharp, either on the monitor screen or when printed, as the original. It is, however, quite readable on the screen by using the available magnification. Also, printing the large PDF files may be relatively slow, depending on the capabilities of your PC and printer. Finally, the OCR software can never be 100% reliable, in effect producing occasional "typos" in the text. And, of course, there are some typos in the original (e.g. "Silt" Rheometer) as well. Searchers need to develop suitable strategies, therefore, to find all the relevant articles by searching on more than one term. It still beats searching manually!

We hope that many of you are as enthusiastic about this product as we are, and that it will facilitate your use of the great literature that has been generated in more than forty years of the Journal.

COMMENTS FROM THE PRESIDENT RON LARSON

HOW IS THE SOR DOING?

I am pleased to assume the Presidency of the Society at this time. Our Society is healthy, by all accounts. Membership is growing, to around 1800 at last count, about 70% higher than a decade ago. Our meetings continue to be well attended, typically drawing around 300, a number which has held steady for several years now at a time of decline for some societies. Thanks to energetic efforts of the meeting organizers (Bill VanArsdale in Galveston and Jack Zakin in Columbus), and program organizers, the meetings continue to provide an excellent value for our members. In the capable hands of our editor Mort Denn, the Journal of Rheology continues to flourish as the premier journal in the field. Here, too, the rate of publication is holding steady at around 50 articles per year, and the quality seems only to get better. The relatively new "best paper" award also adds a dash of class, with last year's award going to the Belgian group of Vinckier, Moldenaers, and Mewis, for a seminal publication on blend rheology. This last item hints at another happy trend in our Society, that of growing international participation. Around 40% of the members are international, and similar percentages of the papers and talks involve international participants. It is thus entirely fitting that our members have, for the first time, voted an international scientist, Paula Moldenaers, to the Executive Committee as a Member at Large.

In addition to maintaining the quality of its "bread and butter" functions, namely the Journal and annual meetings, the SoR is adding additional member value through its biannual Rheology Bulletin, edited by Rakesh Gupta. The Bulletin is now publishing advertisements and short, practical, articles of wide interest to rheologists. The Society web pages (<http://www.umecheme.maine.edu/sor/>), managed adroitly by Albert Co, are garnering several thousand hits per month. The Society's education committee, now chaired by Susan Muller, membership committee, headed by Bill VanArsdale, and

constitution committee, led by Faith Morrison, are helping our Society advance into the 21st century. We are also continually renewing our Society by bringing active young members, as well as experienced hands, onto our various committees.

WHAT CHALLENGES DOES THE SOR FACE?

I believe there are several issues that we must successfully confront over the next few years, if we are to continue to perform optimally. The first is the challenge of electronic publishing, which both threatens our revenue base and offers great opportunities for new services to benefit our members. Fortunately, thanks to careful stewardship of our finances by past treasurer Ed Collins, and present treasurer Monty Shaw, the SoR is financially well prepared to move aggressively in this area. This year, libraries are receiving with their subscription to JoR domain licenses for electronic access to the Journal at <http://ojps.aip.org/>. This will permit downloading of PDF files of articles, as well as access to AIP and IEEE data bases such as INSPEC and SPIN. Soon, you will be able to click on a reference in a JoR article and bring up the abstract of the referenced paper. If the library subscribes to that journal, free viewing of the article will be available to everyone logging in from the library's domain. For everyone without an institutional subscription, a pay-per-view option will permit the article to be purchased. Thus, from your office or home, you will be able to "daisy chain" from one reference to the next. Full-text searchability of the JoR is on the (somewhat more distant) horizon as well. It may be the case that JoR readers will spend more time with electronic copy than with the printed text. In parallel with our expanding efforts in the electronic arena, the SoR will this year make available to its members a CD-ROM containing all back issues of the JoR, for an introductory price of only \$130. The CD-ROM will not only free up shelf space, but is searchable as well, and thus offers additional advantages over the printed page. All members are urged to avail themselves both of the CD-ROM, and of electronic access to JoR. If your library is slow to subscribe to the free electronic access to which it is entitled, our resident bulldog Jeff Giacomini will act as your ombudsman.

The second challenge I see is to maintain a balance between academic and industrial participation in the SoR. Continuing changes in industry challenge our Society to remain relevant, even as it advances the science of rheology. Fortunately, our subject matter is inherently valuable to industry, and graduate students in the field of rheology are in demand. By listening more closely to our industrial members and monitoring and encouraging their participation in our meetings, I am optimistic that the SoR will remain a vital forum for industrially relevant research.

In addition to these priorities, we must find new ways to educate our members and the public to our Society's offerings, through web pages, videos, and courses. And we plan to update our constitution. Stay tuned; you will be hearing much more about these exciting developments in the very near future.

Meeting Announcement

September 13-15, 1998: North American Thermal Analysis Society 26th Annual Conference, Cleveland, OH. Symposia include characterization of polymers by TA. For information check www.mindspring.com/~natasinfo/ or call Shana Henry at (916) 922-7032.

MINUTES OF THE EXECUTIVE COMMITTEE MEETING March 29, 1998

The meeting was called to order at 8:00 a.m. in the Las Colinas Courtyard by Marriott, Dallas, Texas. Executive Committee Members in attendance included: Ron Larson, Gerry Fuller, Monty Shaw, Kurt Wissbrun, Paula Moldenaers, Don Baird, and Andy Kraynik. Morton Denn joined discussions by conference call. Invited guests included: Jeff Giacomini, Rakesh Gupta, Susan Muller, Bill VanArsdale, Greg McKenna, and Carolyn Barry. The minutes of the October 19, 1997 Executive Committee Meeting, which appeared in the January 1998 Rheology Bulletin, were approved as read.

Carolyn Barry, representing AIP Internet Publishing, provided a stimulating demonstration of AIP on-line journal features.

Morton Denn indicated that editorial activities for the Journal continue to run smoothly. He did not anticipate significant editorial delays because of his upcoming sabbatical leave in Israel. We voted to put volumes 40 and 41 of the Journal on-line for an estimated cost of \$1,400. Kurt Wissbrun indicated that production was on schedule for archival CD-ROMs of back issues of the Journal. We voted to add a \$9 handling charge for each set of CDs. We also voted to budget \$1,750 for AIP to promote the CD-ROMs through mailings. Jeff Giacomini, Associate Editor for Finance, reported on nonmember subscriptions to the Journal. We voted to raise paper reprint and electronic reprint charges to \$20. We also voted to increase the reprint royalty rate on Journal articles. We voted to pay \$300 to cover costs of developing a list of libraries

that are receiving the Journal through fraudulent memberships. We voted to convert the on-line Journal to model 2, which includes SGML for references; cost will be limited to \$6,000. We will study long-term pricing issues for electronic access to the Journal.

Gerry Fuller discussed local arrangements for the upcoming meeting in Monterey, California, October 4-8, 1998. Jeff Giacomini provided an update of plans for the meeting in Madison, Wisconsin, October 17-21, 1999. Don Baird proposed alternative venues for the Winter 2001 meeting in Florida. We accepted Greg McKenna's offer to organize the Fall 2001 meeting in Bethesda, Maryland to coincide with the NIST Centennial.

Monty Shaw delivered the Treasurer's report. Details of our sound financial condition can be found in the Rheology Bulletin. Monty is considering enhanced liability insurance coverage for the Society. We also discussed Student Member Travel Grants.

Rakesh Gupta discussed his activities as Editor of the Rheology Bulletin, which now contains paid advertising. Bill VanArsdale reported on activities of the Membership Committee. Susan Muller, who chairs the Education Committee, is seeking suggestions for the Short Course in Madison. Greg McKenna, who serves on the AIP Governing Board, provided an update on AIP activities of concern to the Society.

We voted that foreign members will have the choice of paying \$15/year for air freight delivery of Physics Today. The annual dues invoice will include this option.

John Dealy will receive the Bingham Medal in Monterey. The meeting was adjourned at 2:50 p.m.

Versatility

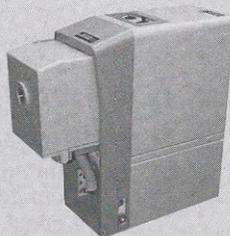
Dynamic Mechanical Analyzer

Versatility

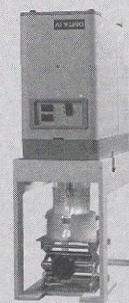
Multiple Orientations



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Standard Operation**



**Horizontal for
Shear Sandwich**



**Inverted for
Immersion Studies**

Rheometric Scientific's 4th Generation Dynamic Mechanical Thermal Analyzer (DMTA IV) can be oriented in any direction to test a wide range of materials. The design features include six sample deformation modes (3-point bending, single/dual cantilever bending, tensile, compression

and shear), easily interchangeable tools, and the ability to operate in multiple orientations. Versatility and sensitivity allow the DMTA to be used in a wide range of applications ranging from soft solids, films and fibers to composites.

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Web: www.rheosci.com



Meeting Information

The Society of Rheology 70th Annual Meeting October 4 - 8, The Monterey Marriott, Monterey, California

Location

The Autumn 1998 meeting of the Society of Rheology will be held at the Monterey Marriott in Monterey, California, October 4 to 8, 1998. A mailer registration form for the hotel is enclosed. Rates are \$135 (single) and 145 (double) plus tax. The Marriott is located in downtown Monterey, within walking distance of Fisherman's Wharf. The town itself is at the heart of the celebrated Monterey peninsula just a two hours drive from the San Francisco Bay Area. The hotel has been recently extensively renovated and features a swimming pool and exercise facilities. This downtown location will provide the attendees with easy access to Monterey's marvelous collection of restaurants and shops. The world renown Fisherman's Wharf (the location of Steinbeck's novel, Cannery Row) is right at hand and the famous Monterey Bay Aquarium can be reached by foot or using abundant city transportation.

The Monterey peninsula is well known for the natural beauty of its rugged coastline. It is home to the famous Pebble Beach Golf Course and nearby 17 Mile Drive offers wonderful views of the coast and the cypress groves. Also within striking distance is the delightful seaside community of Carmel.

Transportation

The Monterey Peninsula Airport is served by a number of major carriers, including United Airlines, American Airlines, Delta, US Air and Northwest. The meeting hotel is easily access by ground transportation services from the airport. Normally the incremental cost to include Monterey Airport as a final destination from major airports such as San Francisco is quite modest.

If you choose to drive by automobile from the San Francisco Bay area, the driving time will be between 2 and 3 hours.

Registration

The registration fee of \$100.00 includes the meeting program booklet containing the abstracts of the papers. Registration also entitles you to attend the technical program, the plenary lectures, the Bingham Award Address, the social events and the poster session. For an addition cost of \$40 you can attend the Bingham Award Banquet on Tuesday evening. Please purchase tickets for the banquet prior to the meeting using the attached registration form. The registration form should be completed in full and mailed along with your payment to the address listed on the form. Payment by check or money order should be made payable to the Society of Rheology. If you choose to pay by VISA or Mastercard, you may do so by faxing the form to 650-322-9708. Registration materials received after September 13 will incur a late fee.

Registration at the meeting will take place at the Monterey Marriott beginning at 3:00 to 7:00 pm, Sunday, October 4. From October 5 to 8 registration to the meeting will take place after 8 am.

Welcoming Reception

A welcoming reception hosted by TA Instruments will take place at the Ferrante's restaurant at the top of the Monterey Marriott on Sunday, October 4 from 6 - 8 pm.

Society Reception

Rheometric Scientific will host a reception at the Memory Gardens new Fisherman's Wharf from 7:00 - 8:30 pm on Monday, October 5.

Society Business Meeting

All attendees are encouraged to attend the annual business meeting of the Society of Rheology on Tuesday, October 6. This meeting will start at approximately 5:30 pm in San Carlos III Ballroom.

Bingham Award Banquet

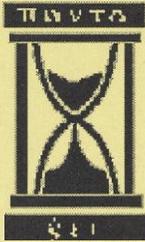
Haake will host a reception beginning at 7 pm on Tuesday, October 6 prior to the Bingham Award Banquet. The reception and banquet will be held in the San Carlos III Ballroom of the Monterey Marriott Hotel. Dinner will be served at 8 pm for those attending the banquet. The Reception is in the North Foyer outside of San Carlos III.

Poster Session

Paar Physica will sponsor a reception in conjunction with the poster session on Wednesday, October 7 at the Marriott. This event will start at the conclusion of the technical session. Posters will be on display in the foyer area outside of the ballrooms.

Exhibits

Vendors will demonstrate their products in the San Carlos IV ballroom adjacent to the meeting rooms. Coffee will be served in this room.



**Society of Rheology
70th Annual Meeting (October 1998)**

Annual Meeting Registration Form

Please print form, then neatly print appropriate information, and fax or mail to: Donnasue Jacobi, 228 Haight Street, Menlo Park, CA, USA 94025.

FAX 650-322-9708 (available 24 hours) or 650-725-7294

| | |
|--------------------|---|
| Name: _____ | Badge Name: _____ |
| Affiliation: _____ | Address: _____ |
| City, State: _____ | Zip, Country: _____ |
| Telephone: _____ | Fax: _____ |
| Email: _____ | Are you presenting a poster: <input type="checkbox"/> yes <input type="checkbox"/> no |

Registration Fee: Conference registration includes program as well as access to the vendor display, all technical sessions, coffee breaks and receptions. The registration fee does not include the Banquet, which is subject to limited seating. Please indicate the number of tickets you are purchasing for this event. Cancellations received in writing by September 13, 1998, will be subject to a \$25 administrative charge. No refunds will be granted after that date.

| | Fee (before 9/13/98) | Fee (after 9/13/98) |
|---|----------------------|---------------------|
| <input type="checkbox"/> Member | \$100 | \$125 |
| <input type="checkbox"/> Non-Member (includes membership) | \$160* | \$175* |
| <input type="checkbox"/> Non-Member | \$160 | \$175 |
| <input type="checkbox"/> Student (includes membership) | \$55* | \$55* |
| <input type="checkbox"/> Student | \$30 | \$30 |
| <input type="checkbox"/> Retired Member | \$30 | \$30 |
| <input type="checkbox"/> Banquet Ticket | \$40 | \$40 |

*Non-Member registration includes an optional 1-year membership in the Society of Rheology. Students can become members for an additional \$25. Members receive the *Rheology Bulletin*, the *Journal of Rheology* (6 issues) and *Physics Today* (12 issues).

Method of Payment: check or money order (payable to The Society of Rheology) Mastercard Visa

Account #: _____
 Expiration Date: _____ Cardholder Name: _____
 Signature (required for credit card transaction): _____

Early registrations will be confirmed with a printed receipt by mail. Late registrations will receive a printed receipt in your conference packet. Forms with credit card information may be faxed to 650-322-9708 (M-F, 8am-6pm PST) or 650-725-7294. Attendees will pay their own room, tax and incidentals incurred by them at Hotel.

Special Requests

Any accommodation requirements: _____ Dietary requests: _____

Marriott Monterey
 350 Calle Principal; Monterey, CA 93940
 Hotel Phone: 408-649-4234
 Reservations: 408-647-4000
Guest Fax: 408-372-2968

The Society of Rheology Annual Meeting
October 2-9, 1998

| | | |
|--|---|--|
| <input type="checkbox"/> \$135 Single Occupancy | <input type="checkbox"/> \$145 Double Occupancy | <input type="checkbox"/> \$250 to \$600 Suites |
| Please check room type preference (not guaranteed) | <input type="checkbox"/> (1) King Bed | <input type="checkbox"/> (2) Double Beds |
| Rates do not include state and local taxes of 10% | <input type="checkbox"/> Smoking | <input type="checkbox"/> Non-Smoking |

Thank you for requesting reservations at the Monterey Marriott. Our entire staff would like to take this opportunity to extend a warm welcome to you during your stay. Please print out this form, neatly fill in appropriate information and fax to Betsie Elwood, Convention/Catering Manager, at **408-372-2968**.

| | |
|-------------------------------|--------------------------|
| Name: _____ | HGA#: _____ |
| Affiliation: _____ | Address: _____ |
| City, State: _____ | Zip, Country: _____ |
| Telephone: _____ | Fax: _____ |
| Arrival Date: _____ | Departure Date: _____ |
| Estimated Arrival Time: _____ | Sharing room with: _____ |

If rate requested has sold out before the cut-off date, the next available rate will apply. Reservations received after the cut-off date will be accommodated on a rate and space availability basis only. Reservation cut-off date is **September 13, 1998**. Deposit refundable only if hotel is notified by 6:00 pm date of arrival, (hotel time) and cancellation number is required. Check-in time is 3:00 pm; check-out time is 12:00 pm. No charge for children under 18 years of age when accompanied by adults. Reservations not guaranteed by first night deposit or major credit cards will not be accepted.

Mastercard Visa

Account #: _____

Expiration Date: _____ Cardholder Name: _____

Signature (required for credit card transaction): _____

Early registrations will be confirmed with a printed receipt by mail. Late registrations will receive a printed receipt in your conference packet. Forms with credit card information may be faxed to **650-322-9708 (available 24 hours)** or 650-725-7294.

Parking: Valet parking is available at a current cost of \$12 per day with in and out privileges and is subject to change. The prevailing rate at the time of your conference will apply. Public Parking is available nearby at a current rate of \$3.00-\$5.00 per day.

The Society of Rheology

Presents

A Two-Day Short Course on

Extensional Rheology of Polymer Melts and Solutions

by

Donald G. Baird

**Virginia Polytechnic Institute
& State University**

David F. James

University of Toronto

Gareth H. McKinley

Massachusetts Institute of Technology

To be held Saturday & Sunday, October 3 & 4, 1998 in conjunction with the 70th Annual Meeting of the Society of Rheology, October 4-8, 1998, in Monterey, California.

COURSE DESCRIPTION

The processing of polymer melts and solutions involves both shear and extensional (*i.e.* shearfree) deformations. While transport processes are generally dominated by shear, it is the extensional component which often governs the processing performance of a fluid. A fluid's extensional behavior is most likely related to many processing and flow problems such as melt fracture which originates in the die entry, draw resonance in fiber spinning and film casting, fluctuations in the frost-line and bubble diameter in film blowing, and variations in film thickness in coating processes, tack problems in printing, and droplet size distribution in spraying. However, in most laboratories the material functions most commonly measured are the shear properties and in industrial laboratories or quality-control applications the primary emphasis is on the shear viscosity and linear viscoelastic properties of a material. Yet, there are a number of

documented instances in which two fluids have similar viscous behavior and apparent molecular weights, but do not process in the same way. Large differences in the material characteristics are only manifested in the tensile stress growth observed during elongational flow.

In this course, we begin by describing the differences between extensional and shear kinematics. We then turn our attention to the wide variety of experimental techniques for measuring the extensional properties of polymer solutions and then polymer melts. Both rigorous and approximate techniques are discussed. Throughout the course examples of applications of the measurements are provided. A portion of the course will be devoted to a discussion of constitutive equations appropriate for handling the various classes of extensional rheological response observed for melts and solutions and their importance in computational modeling of polymer processing operations.

The course is designed to be suitable for a wide range of professionals including engineers, chemists, and physicists, as well as students in these disciplines. Although the emphasis will be on experimental techniques and applications of the measurements, discussion of constitutive equations which are suitable for both shear and extension will be included.

About the instructors:

Donald G. Baird is the Harry C. Wyatt Professor of Chemical Engineering at Virginia Tech whose primary interest is in the application of rheology to the processing of polymer melts. He is the co-author of a recent book entitled "Polymer Processing: Principles and Design".

Gareth H. McKinley is the Lord Associate Professor of Mechanical Engineering at the Massachusetts Institute of Technology. His primary research interests focus on the extensional rheology of polymer solutions and the stability of viscoelastic flows.

David F. James is Professor of Mechanical Engineering at the University of Toronto and is internationally recognized for his work in the extensional flow of polymer solutions.

Registration

The fee for the two-day course is \$375 prior to September 15, 1998. For registration after September 15, the fee will be \$425. Student rates are half of the above.

Checks should be made payable to The Society of Rheology and sent together with the enclosed registration form to Professor Susan J. Muller, Department of Chemical Engineering, University of California, Berkeley, Berkeley, CA 94720-1462.

Reservations for lodging should be made by the participant.

REGISTRATION FORM

The Society of Rheology Short Course on *Extensional Rheology of Polymer Melts and Solutions*

Date _____

Name _____

Company _____

Address _____

Telephone _____

e-mail _____

Date of Arrival _____

NOTE: The course will begin at 8:30 am, Saturday, October 3, 1998.

Please make checks payable to The Society of Rheology

Return this registration form together with payment to:

**Professor Susan J. Muller
Department of Chemical Engineering
University of California, Berkeley
Berkeley, CA 94720-1462**

The Society of Rheology
Statement of Revenue and Expense as of
December 31, 1997

| REVENUES | <u>1996 Budget</u> | <u>1996 Actual</u> | <u>1997 Budget</u> | <u>1997 Actual</u> | <u>1998 Budget</u> |
|---------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| Dues | 56,000 | 57,468 | 56,000 | 51,017 | 58,000 |
| Interest | 16,500 | 34,184 | 28,000 | 30,399 | 35,000 |
| Journal of Rheology | 220,250 | 234,527 | 208,350 | 231,133 | 244,100 |
| Mailing List Sales | 400 | 1,292 | 400 | 337 | 1,300 |
| Bulletin Advertising | 0 | 0 | 0 | 425 | 0 |
| Annual Meeting | 0 | 15,889 | 6,000 | -1032 | 5,000 |
| Short Course | 0 | 0 | 10,000 | 3950 | 5,000 |
| TOTAL REVENUE | 293,150 | 343,360 | 308,750 | 316,229 | 348,400 |
| EXPENSES | | | | | |
| AIP Adm. Services | 7,000 | 7,000 | 7,000 | 9,000 | 7,000 |
| AIP Mem. Soc. Dues | 5,600 | 5,700 | 5,600 | 6,000 | 5,800 |
| AIP Financial Handling | 4,000 | 4,015 | 5,000 | 4,146 | 4,500 |
| AIP Phys. Team Olympiad | 1,000 | 1,500 | 1,500 | 0 | 1,500 |
| Renewal Billing | 1,500 | 1,842 | 1,500 | 2,744 | 2,000 |
| Journal of Rheology | 222,135 | 185,046 | 208,350 | 187,825 | 295,970 |
| Bulletins and Abstracts | 3,000 | 15,240 | 15,000 | 11,801 | 10,000 |
| Short Courses | 0 | 0 | 10,000 | 3,100 | 5,000 |
| Bingham Award | 0 | 0 | 6,000 | 5,360 | 2,500 |
| Executive Cmt. Meeting | 6,500 | 6,693 | 7,500 | 4,037 | 7,500 |
| Pres. Discretionary Fund | 1,500 | 0 | 1,500 | 964 | 1,500 |
| Treas. Discretionary Fund | 1,500 | 0 | 1,500 | 0 | 1,500 |
| Program Chm. Discr. Fund | 0 | 0 | 4,000 | 553 | 2,000 |
| Secretarial Services | 1,000 | 0 | 1,000 | 0 | 1,000 |
| Mailing | 2,000 | 311 | 3,500 | 3,137 | 2,000 |
| Office Expense | 1,500 | 3,819 | 2,000 | 1,197 | 4,000 |
| Banking Services | 120 | 50 | 150 | 81 | 250 |
| Liability Insurance | 169 | 0 | 169 | 169 | 170 |
| Membership Directory | 6,500 | 12,685 | 5,500 | 0 | 13,500 |
| Membership Brochure | 1,000 | 0 | 1,000 | 150 | 1,500 |
| Accountant | 1,500 | 1,328 | 1,500 | 1,635 | 1,500 |
| Student member travel | 5,000 | 4,695 | 10,000 | 8,287 | 5,000 |
| Adv. Dep. for future mtg. | 2,500 | 0 | 3,000 | 0 | 1,500 |
| Miscellaneous | 1,500 | 2,111 | 1,500 | 1,072 | 3,000 |
| TOTAL EXPENSE | 276,524 | 252,035 | 303,769 | 251,258 | 380,190 |
| Net Income, \$ | 16,626 | 91,325 | 4,981 | 64,971 | (31,790) |

The Society of Rheology
Assets and Liabilities
December 31, 1997

ASSETS

| | |
|--------------------------|----------------|
| Cash in checking account | 6,779 |
| Due from AIP | <u>696,818</u> |
| | 703,597 |

LIABILITIES and RESERVES

| | |
|-------------------------------|---------------|
| Deferred subscription revenue | 104,090 |
| Deferred membership dues | 27,125 |
| Publication reserve | 250,000 |
| Student travel grant reserve | 10,000 |
| CD Rom contract | 58,000 |
| Annual Meeting reserve | 25,000 |
| Operating reserve | <u>60,000</u> |
| | 534,215 |

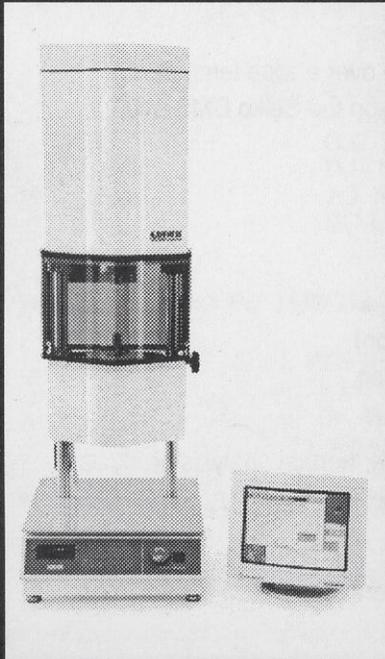
Net available funds, \$ **169,382**

Journal of Rheology

Statements of Revenue and Expense, and Proposed 1999 Budget December 31, 1997

| 1. | 1997 Actual | 1997 Budget | 1998 Budget | 1999 Budget |
|---------------------------|----------------|----------------|----------------|----------------|
| 2. Subscriptions | 201 | 187 | 215 | 214 |
| 3. Reprint Sales | 9 | 4 | 7 | 10 |
| 4. Advertisements | 19 | 16 | 21 | 18 |
| 5. Miscellaneous | 3 | 2 | 1 | 2 |
| 6. TOTAL REVENUES, k\$ | 232 | 209 | 244 | 244 |
| 7. | | | | |
| 8. Advertising/Marketing | 10 | 12 | 14 | 10 |
| 9. Reprints, Single Copy | 8 | 7 | 8 | 8 |
| 10. Paper, Printing | 35 | 45 | 37 | 36 |
| 11. SOR Editorial | 44 | 45 | 45 | 45 |
| 12. Production | 56 | 65 | 74 | 69 |
| 13. Fulfillment | 16 | 13 | 15 | 16 |
| 14. Distribution | 20 | 18 | 19 | 20 |
| 15. Electronic publishing | 0 | 0 | 84 | 15 |
| 16. TOTAL COSTS, k\$ | 189 | 205 | 296 | 219 |
| 17. Profit, k\$ | 43 | 4 | -52 | 25 |

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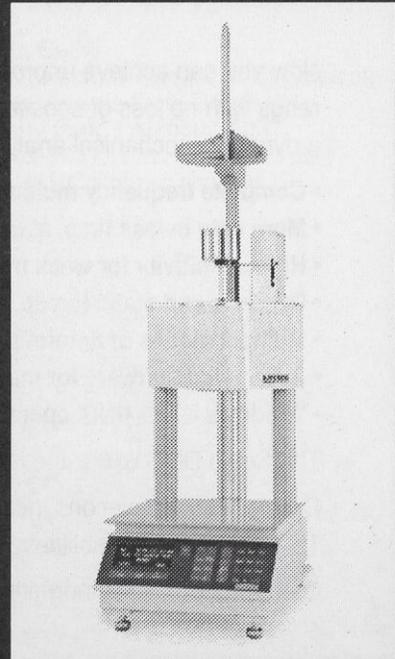
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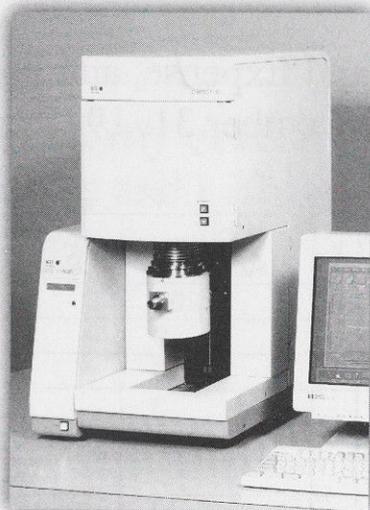
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