# RHEOLOGY BULLETIN

# **Published by The Society of Rheology**

Vol. 65 No. 1



# January 1996

# THE SOCIETY OF RHEOLOGY EXECUTIVE COMMITTEE - 1995-97

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# XIIth International Congress on Rheology Quebec City, Canada August 18 - 23, 1996

Preparations for the next International Congress on Rheology are now in the final stages. In addition to plenary and keynote addresses, 275 oral presentations and 230 poster presentations have been scheduled. There will be special symposia on:

the thermodynamic approach to modeling and simulation industrial and process rheology rheology and flow of fiber suspensions

diffusion and biorheology as well as the Raymond Cox memorial symposium.

Further information can be obtained from

Professor D. De Kee, Conference Chairman Department of Chemical Engineering University of Sherbrooke Sherbrooke, Canada J1K 2R1 (819) 821-7904; Fax: (819) 821-7955 e-mail: ddekee@coupal.gcm.usherb.ca

Dr. Michel M. Dumoulin Industrial Materials Institute, NRC - Canada 75, de Mortagne, Boucherville, Canada J4B 6Y4 (514) 641-5181; Fax: (514) 641-5103 e-mail: michel.dumoulin@nrc.ca

# 68th ANNUAL MEETING GALVESTON, TX FEBRUARY 16 - 20, 1997

The annual meeting of the Society of Rheology will be held in Galveston, Texas. The meeting organizers are:

# Technical Program Chairmen:

Donald G. Baird Department of Chemical Engineering Virginia Tech Blacksburg, VA 24061-0211 (540) 231-5998; Fax: (540) 231-2732 e-mail: dbaird@vt.edu

Jay D. Schieber
Department of Chemical Engineering
Illinois Institute of Technology
124 Perlstein Hall
10 W. 33rd Street
Chicago, IL 60616
(312) 567-3046; Fax: (312) 567-8874
e-mail: cheschieber@iit.edu

# Local Arrangements Chairman:

William E. VanArsdale Department of Mechanical Engineering University of Houston Houston, TX 77204-4792 (713) 743-4525; Fax: (713) 743-4503 e-mail: vanarsdale@uh.edu RHEOLOGY BULLETIN
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Fax: (304) 293-4139

Email: gupta@cemr.wvu.edu

Galveston Island is located about 50 miles southeast of Houston along the Texas gulf coast. The island has a romantic history, Victorian architecture, 32 miles of beaches, and a variety of attractions. The climate is temperate with a mean temperature of 56 degrees in February. The meeting will be held at the San Luis Hotel, where all rooms have a private balcony and a view of the Gulf of Mexico.

# TECHNICAL PROGRAM FOR GALVESTON

Authors wishing to present a paper in Galveston should submit a camera-ready abstract on the enclosed form to the Technical Program Co-chairman, Donald G. Baird, before September 13, 1996. A copy of the abstract should also be sent to the appropriate symposium organizer. The planned symposia and their organizers follow:

# 1. DRILLING FLUIDS:

J. George Savins
Baroid Drillings Fluids
1828 Shady Glen Lane
Dallas, TX 75232
(214) 337-5929
Fax: (214) 337-5929 [folionized]

Fax: (214) 337-5929 [follow instructions]

Henry V. Nickens Amoco Exploration Technology 3000 North Sam Houston Pkwy, East P.O. Box 1675 Houston, TX 77251 (713) 987-5900 Fax: (214) 337-5929

# 2. COMPRESSION RHEOLOGY, AND POROUS MEDIA FLOW:

Chip Zukowski
Department of Chemical Engineering
University of Illinois
1209 W. California Street
Urbana, IL 61801
(217) 333-7379
Fax: (217) 244-8068

David V. Boger
D.V. Boger and Associates
71-73 Baker Rd.
Harkaway, Victoria 3806, AUSTRALIA
61 3 344-7440
Fax: 61 3 344-4153 e-mail:
david\_boger.chem\_eng@muwaye.unimelb.edu.au

# 3. RHEOLOGY OF SOLIDS:

Gregory B. McKenna National Institute of Standards and Technology A-2089 Bldg 224 Gaithersburg, MD 20899 (301) 975-6752; Fax: (301) 977-2018 e-mail: greg@micf.mist.gov

# 4. NONISOTHERMAL FLOWS, AND THERMO-DYNAMICS OF FLOWING SYSTEMS:

Juan dePablo
Department of Chemical Engineering
University of Wisconsin
1415 Johnson Drive
Madison, WI 53706
(608) 262-7727; Fax: (608) 262-5434
e-mail: depablo@coefac.engr.wisc.edu

# 5. POLYOLEFINS AND INDUSTRIAL RHEOLOGY:

William Hartt 3M, Building 208-1-01 St. Paul, MN 55144-1000 (612) 736-0238; Fax: (612) 733-3304 e-mail: whartt@mmm.com

Skip Rochefort Oregon State University Chemical Engineering Department Gleeson Hall 103 Corvallis, OR 97331-2702 (503) 737-2408; Fax: (503) 737-4600 e-mail: rochefsk@engr.orst.edu

### 6. GRANULAR MATERIALS:

Norman J. Wagner
Department of Chemical Engineering
University of Delware
Newark, DE 19716
(302) 831-8079; Fax: (302) 831-1048
e-mail: wagner@che.udel.edu

Gianni Astarita
Department of Chemical Engineering
Piazzale Tecchio
Napoli, ITALY 80125
39 81 768-2268
Fax: 39 81 611-800
e-mail: astarita@ds.cised.unina.it

# 7. CHARGED SYSTEMS AND COLLOIDS:

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

### 8. EXPERIMENTAL METHODS IN RHEOLOGY:

Anthony J. McHugh Department of Chemical Engineering University of Illinois Urbana, IL 61801 (217) 333-1178; Fax: (217) 333-5052 e-mail: a-mchugh@uiuc.edu

Ali Berker 3M Center, 3M Building St. Paul, MN 55144-1000 (612) 737-7728; Fax: (612) 736-6377 e-mail: aberker@mmm.com

### 9. NUMERICAL SIMULATION:

Michael Graham Department of Chemical Engineering University of Wisconsin Madison, WI 53706 (608) 265-3780; Fax: (608) 262-5434 e-mail: graham@engr.wisc.edu

Bamin Khomami
Department of Chemical Engineering
Washington University
Campus Box 1087
St. Louis, MO 63130
(314) 935-6065
Fax: (314) 935-4434
e-mail: bam@wuchel.wustl.edu

# 10. VISUALIZATION AND OPTICAL METHODS:

Jan van Egmond Department of Chemical Engineering University of Massachusetts Amherst, MA 01003-3310 (413) 545-0593; Fax: (413) 545-1647 e-mail: vanegmon@ecs.umass.edu

# 11. CONSTITUTIVE EQUATIONS, NON-NEWTONIAN FLUID MECHANICS:

Henning H. Winter Department of Chemical Engineering University of Massachusetts Amherst, MA 01003-3310 (413) 545-0922; Fax: (413) 545-1647 e-mail: winter@ecs.umass.edu

# 12. COMPOSITES, LCPs, AND BLOCK COPOLYMERS:

Patrick T. Mather
Phillips Laboratory
OLAC PL/RKFE
10 E. Saturn Blvd.
Edwards AFB, CA 93524-7680
(805) 275-5416; Fax: (805) 275-5471
e-mail: Matherp@lablink.ple.af.mil

David Mead
Department of Mechanical Engineering
University of Michigan
2350 Hayward Street
Ann Arbor, MI 48109-2125
(313) 936-0431
e-mail: dmead@engin.umich.edu

### 13. EXTENSIONAL RHEOMETRY:

Gareth McKinley Division of Applied Sciences Harvard University Pierce Hall 316 Cambridge, MA 02138 (617) 496-5167; Fax: (617) 495-9837 e-mail: gareth@stokes.harvard.edu

David C. Venerus
Department of Chemical Engineering
Illinois Institute of Technology
124 Perlstein Hall
10 W. 33rd Street
Chicago, IL 60616
(312) 567-5177; Fax: (312) 567-8874
e-mail: chevenerus@iit.edu

# 14. PROCESSING RHEOLOGY:

A. Jeffrey Giacomin
Department of Mechanical Engineering
University of Wisconsin
1513 University Avenue
Madison, WI 53706-1572
(608) 262-7473; Fax: (608) 265-2316
e-mail: giacomin@ie.engr.wisc.edu

Hugh O'Donnel Procter and Gamble Company 6110 Center Hill Cincinnati, OH 45224 (513) 634-6920; Fax: (513) 634-5712

# 15. INTERFACIAL RHEOLOGY AND TRIBOLOGY:

Matthew Tirrell
Dept. of Chemical Engrg. & Material Science
University of Minnesota
Minneapolis, MN 55455
(612) 625-5823; Fax: (612) 624-6564
e-mail: tirrell@maroon.tc.umn.edu

# 16. FOOD PROCESSING RHEOLOGY:

Jozef L. Kokini Food Science Department Rutgers University New Brunswick, NJ 08903 (908) 932-9669

Fax: (908) 932-6776

# MINUTES OF THE EXECUTIVE COMMITTEE MEETING October 8, 1995

The Executive Committee Meeting was called to order at 9:00 a.m. in the Hyatt Regency Hotel, Sacramento. Executive Committee Members in attendance included: Bob Armstrong, Kurt Wissbrun, Art Metzner, Ed Collins, Ron Larson, Bill

Russel and Andy Kraynik.

The minutes of the March 19, 1995 Executive Committee Meeting, which appeared in the July 1995 Rheology Bulletin, were corrected as read as follows. In the Editor's report, Art Metzner noted that the average time from receipt of a manuscript to the date the Journal appears on a U.S. member's desk was about nine months for the most recent issue of the Journal.

The Secretary announced that the following candidates were elected to office for the term beginning October 1995: Kurt Wissbrun (President), Ron Larson (Vice President), Mort Denn (Editor), Ed Collins (Treasurer), Andy Kraynik (Secretary), and Gerry Fuller and Jeff Giacomin (Members at Large).

In the Editor's report, Art Metzner indicated that Mort Denn had assumed Editorial responsibility for the Journal of Rheology in July 1995. Denn discussed several topics including: editorial mechanics, electronic submission and publication of manuscripts, copyright issues, and composition of the editorial board. Monty Shaw, in his capacity as Associate Editor for Finance, presented a three-year summary of financial statistics for the Journal, which led to discussion on non-member subscriptions. Rakesh Gupta summarized his activities as Rheology Bulletin Editor.

In the Treasurer's report, Ed Collins presented a balance sheet of Society finances as of December 31, 1994 and proposed 1996 budgets for the Journal and the Society. These reports can be found in the January 1996 Rheology Bulletin.

Janis Bennett summarized AIP issues.

Kurt Wissbrun led discussion on future meetings. Bob Powell reported on local arrangements for the Sacramento meeting and Gerry Fuller reviewed the technical program. The International Congress on Rheology will convene in Quebec City, Canada, August 18-23, 1996. Bill VanArsdale presented a budget for the annual meeting in Galveston, Texas, February 16-20, 1997 where Don Baird and Jay Schieber will coordinate the technical program. Jack Zakin will serve as local arrangements chair for the October 1997 meeting in Columbus, Ohio and Gerry Fuller will serve in the same capacity for a 1998 meeting in the San Francisco Bay Area.

Jeff Giacomin provided copies of a Handbook for the Membership Committee, which he chairs. Peter Clark provided a report on the Education Committee. Ron Larson indicated that 18 student members would receive travel grants to the Sacramento meeting. The committee voted to provide up to \$5,000 for this purpose in conjunction with the ICR in Quebec

City.

Bob Armstrong discussed rapid response to AIP concerns. Greg McKenna reported on public policy concerns at AIP.

Albert Co provided copies of contents on the new Society of Rheology Home Page on the World Wide Web

(http://www.umecheme.maine.edu/sor/).

Gianni Astarita was invited to report on rheology activities within the European Federation of Chemical Engineering where a Working Party on Industrial Rheology has surveyed rheology research in academia and outstanding industrial research problems.

The meeting was adjourned at 5:18 p.m.

# MINUTES OF THE BUSINESS MEETING October 10, 1995

The meeting was called to order at 6:00 p.m. in the Hyatt

Regency Hotel, Sacramento.

The minutes of the October 4, 1994 Business Meeting, which was held in Philadelphia, were read as they appeared in the January 1995 Rheology Bulletin and corrected to indicate that the meeting was held on October 4.

The Secretary announced the following newly elected officers: Kurt Wissbrun (President), Ron Larson (Vice President), Morton Denn (Editor), Ed Collins (Treasurer), Andy Kraynik (Secretary), and Gerry Fuller and Jeff Giacomin (Members at

Large).

President Bob Armstrong reported on the financial health of the Society and noted intentions to run Society finances at zero net income. He indicated that Rakesh Gupta was considering various ideas for improving the Rheology Bulletin such as electronic publication and columns addressing practical issues of interest to members. Members were invited to visit the Society of Rheology Home Page on the World Wide Web set up by Albert Co.

In the Editor's report, Art Metzner remarked that nonmember reviewers often respond faster than members. Several new editorial policies for the Journal were announced. Five copies of each manuscript should be submitted to the new Editor, Morton Denn, and not to members of the Editorial Board. Two dates will be published for each article, those relating to receipt of manuscripts and final revisions. Abstracts of accepted papers will be posted on the WWW. Accepted manuscripts can be submitted in electronic form. Art Metzner emphasized Society policy to publish all accepted papers and not set an annual page limit. About half of all published manuscripts come from outside North America. Journal impact factors indicate strong and improving performance. Everyone thanked Art for outstanding service as Editor!

In the Treasurer's report, Ed Collins noted a net loss of about \$10,000 for the Society in 1994 despite a shortfall of about \$31,000 for the Journal and a \$5,000 loss resulting from financial troubles with a subscription service; our potential exposure was much larger. Budgets for the Journal and the

Jeff Giacomin, who chairs the Membership Committe, reported that Society membership had increased continuously since 1989 and is now approaching 1500, with 183 student

The meeting was adjourned at 7:00 p.m.

Society for 1996 were presented.

# SOCIETY OF RHEOLOG

# **CHANGES ARE PLANNED!**

In order to make the Rheology Bulletin a more effective vehicle of communication, the Executive Committee of the Society has charged the Bulletin Editor with the task of broadening the nature and scope of the contents of the Bulletin. Initially, it is planned to include "how to" articles dealing with the practical aspects of rheology. Such articles would be complemented by a question and answer column where short technical questions could be addressed. In addition, it is proposed to print educational articles describing the experience of members in introducing rheology into the classroom, whether in fluid mechanics/ transport phenomena courses or in undergraduate laboratory subjects. Book reviews will also be printed.

The Bulletin Editor (gupta@cemr.wvu.edu) invites potential contributors to contact him with specific topics and ideas. He also invites members to comment on the proposed changes in the Bulletin and to suggest other appropriate enhancements.

# SOR HOME PAGE ON THE WORLD WIDE WEB

The Society now has its own home page on the World Wide Web due mainly to the efforts of Professor Albert Co. You are invited to sample what is available at http://www.umecheme.maine.edu/sor/ The home page of the American Institute of Physics is located at http://www.aip.org/Your comments and suggestions are welcome. These may be sent to Albert (albertco@umecheme.maine.edu) or to Kurt Wissbrun (kfw@aip.org), the Society President.

# Student-Member Travel Grants Available for Quebec City

The Society of Rheology is offering grants to support the cost of public transportation to the International Congress on Rheology to any second or third year graduate student who is a member of the Society as of July 1, 1996, and whose faculty advisor is also a member as of that date. Each grant will be a maximum of \$350, available on a first-come, first-served basis, until available funds are exhausted. To apply, the student should write a letter requesting the grant. The student's faculty advisor should add a letter of support, certifying that both the advisor and the student are members of the Society of Rheology, and that the student is a second or third year graduate student. Only one application per faculty advisor will be accepted. The letters from the student and the advisor should be mailed in the same envelope before July 1, 1996 to:

Gerald G. Fuller Department of Chemical Engineering Stanford University Stanford, CA 94305-5025 (415) 723-9243 Fax: (415) 725-7294 e-mail: ggf@rio.stanford.edu

# Comments from the Treasurer Ed Collins

Your Treasurer is pleased to report The Society of Rheology to be financially sound (see the financial statements on the following pages). Year end 1995 projections were not estimated because current financial records were not available at the time the budgets were prepared. However, all the data that were available indicate that in 1995 the Society will end up in the black.

# **Meeting Announcements**

May 14-15, 1996: Rheology/Chain Structure Relationships in Polymers, Cambridge, UK. Contact: Ms. A. Cartwright, Isaac Newton Inst., 20 Clarkson Rd., Cambridge CB30EH UK. Tel. 44 1233 335981; Fax: 44 1233 330508.

May 27-31, 1996: Polymer Processing Society, 12th Annual Meeting, Sorrento, Italy. Contact: Prof. Jose Kenny, Dept. of Materials & Production Engrg., U. of Naples - P. Tecchio, 80125 Naples, Italy. Fax: 39 81 768-2404.

June 12-14, 1996: Symposium on Recent Developments in Elasticity, ASME summer AMD/MD meeting, Baltimore MD. Contact: Prof. R.C. Batra, Dept. of Engrg. Science & Mech., Virginia Tech., Blacksburg, VA 24061. Tel: (703) 231-6051; Fax: (703) 231-4574.

June 24-28, 1996: Royal Society - Unilever, Indo-UK Forum on Dynamics of Complex Fluids, Cambridge, UK. Contact Mrs. M.A. Staff, Polymers & Colloids Group, Cavendish Lab., Madingley Rd., Cambridge CB3 0HE, UK. Tel. 44 1223 337007; Fax: 44 1223 337000.

August 4-9, 1996: 36th IUPAC International Symposium on Macromolecules, Seoul, Korea. Contact: Dr. K.U. Kim, Division of Polymers, Korea Inst. of Science & Tech., P.O. Box 131, Cheongryang, Seoul 130-650, Korea. Tel: 82 2-957-6104; Fax: 82 2-957-6105.

September 9-11, 1996: Fourth International Conference on Flow Processes in Composite Materials, Aberystwyth, UK. Contact: Dr. R.S. Jones, Dept. of Math., U of Wales, Penglais, Aberystwyth, Dyfed SY23 3BZ, UK. Tel. 44 1970 622762; Fax: 44 1970 622777.

November 17-22, 1996: ASME Symposium on Rheology and Fluid Mechanics of Nonlinear Materials, Atlanta, GA. Contact: Prof. D. A. Siginer, Dept. of Mechanical Engrg, Auburn University, Auburn, AL 36849. Tel. (334) 844-3331; Fax: (334) 844-3307.

# **CHANGE OF ADDRESS**

If you are moving, please inform: Janis Bennett, (516) 576-2403, Fax: 576-2223, or Carolyn Gehlbach, (516) 576-2404 at

THE SOCIETY OF RHEOLOGY c/o American Institute of Physics 500 Sunnyside Boulevard Woodbury, NY 11797

# THE SOCIETY OF RHEOLOGY STATEMENTS OF REVENUE AND EXPENSE AS OF DECEMBER 1995

emin DET		1993 Actual		1994 Budget		1994 Actual		1995 Budget		1996 Budget
REVENUES										
Dues Interest Journal of Rheology Mailing List Sales Annual Meetings Short Courses	\$	48,207 14,096 216,871 434 7,726 9,551	\$	47,000 14,000 208,266 200 4,000 4,500	\$	51,675 16,305 218,477 565 2,902 12,863	\$	50,000 16,000 201,690 400 4,000 5,250	\$	56,000 16,500 220,250 400 -
TOTAL REVENUE		296,885		277,966		302,787		277,340		293,150
EXPENSES										
AIP Administrative Service AIP Member Society Dues AIP Financial Handling AIP Physics Olympiad Renewal Billing Journal of Rheology Bulletins & Abstracts Short Courses Bingham Award Executive Cmt. Meeting Pres. Discretionary Fund Trea. Discretionary Fund Program Chm. Discre. Fund Secretarial Services Mailing Office Expenses Banking Services Liability Insurance		6,000 3,612 4,000 2,000 1,461 168,481 9,791 5,418 5,000 5,373 500 494 - 575 1,734 1,286 10 182		7,000 4,800 4,000 1,000 1,500 207,274 6,500 4,500 3,000 6,500 1,500 2,000 1,000 5,000 1,500 25 182		7,000 5,076 3,600 1,000 920 249,998 11,344 4,592 2,500 4,780 - 802 - 198 1,408 26 169		7,000 5,000 4,500 1,000 1,500 201,625 7,000 5,000 3,500 6,500 1,500 2,000 1,000 5,000 1,500 1,500 1,500		7,000 5,600 4,000 1,000 1,500 222,135 3,000 - - 6,500 1,500 1,500 - 1,000 2,000 1,500 1,500 1,500
Membership Directory Membership Brochure Accountant Student Member Travel Grant Advance Deposit For Future Mtg. Miscellaneous		273 692 1,095 1,648 500		4,500 1,000 1,500 5,000 1,000 500		6,255 1,200 1,100 6,157 - 4,900	-	3,500 1,000 1,500 5,000 1,500 5,500	_	6,500 1,000 1,500 5,000 2,500 1,500
TOTAL EXPENSE		220,125	-	272,281	_	313,025	_	273,425	_	276,524
NET INCOME	\$_	76,760	\$_	5,685	\$_	(10,238)	\$_	3,915	\$_	16,626
NET ASSETS AT YEAR END	\$_	366,159			\$_	355,921				

# JOURNAL OF RHEOLOGY STATEMENTS OF REVENUE AND EXPENSE AS OF DECEMBER 1995

	1993 Actual	1994 Budget	1994 Actual	1995 Budget	1996 Budget
REVENUES	riotaar	Duaget	Howar	<u> </u>	Baagot
	\$ 201,615 \$	200,191 \$	199,468 \$	199,375 \$	218,550
Page Charges	7,678	-	995	-	-
Publication Award			1,300	1,000	1,000
Miscellaneous	7,578	8,075	16,714	1,315	700
TOTAL REVENUE	216,871	208,266	218,477	201,690	220,250
EXPENSES					
Advertising and Marketing	8,095	12,050	14,068	12,760	12,870
Single Copy and Reprints	7,457	8,825	10,830	3,240	9,850
AIP Editorial	29,368	35,280	47,815	36,770	33,750
SOR Editorial	29,483	33,000	30,052	37,000	40,000
Production Costs	48,191	57,309	79,443	56,830	56,250
Printing and Mailing	35,135	49,503	54,929	42,240	56,100
Subscription Fulfillment	10,752	11,307	11,861	11,785	12,315
Publication Award	-		1,000	1,000	1,000
TOTAL EXPENSE	168,481	207,274	249,998	201,625	222,135
NET INCOME	\$48,390\$	992 \$	(31,521) \$	65 \$	(1,885)

# Application for Membership in THE SOCIETY OF RHEOLOGY

I wish to apply for membership in THE SOCIETY OF R		
(Family Name)(Please print)	(Given Name)	
Mail Address		
Telephone Number	Fax Number	
E-Mail Address	- 100/19	
Please indicate in the boxes provided below the code letter from the list at the right, which best describes your areas of interest in order of decreasing importance.  PRIMARY  SECONDARY  TERTIARY  Professional Affiliation	INTEREST AREA  Biorheology Experimental Methods Foods Inks, Paints, Coatings Materials Science Petroleum Production Plastics Processing Polymer Dilute Solutions Polymer Melts and Conc. Solns. Theoretical and Applied Mechanics Rubbers and Elastomers Solid Polymers Suspensions	CODE A B C D E F G H I J K L M N P Q
Academic National Laboratory	Theory of Viscoelasticity Electrorheology Composite Materials	
Industrial Other  I understand that my regular member's subscription to the Journal	al of Rheology is for my personal use, and not fo	r library use
(Signature)  Enclose remittance in U.S. dollars (only) drawn on a U.S. c/o American Institute of Physics, 500 Sunnyside Boulev  \$40 for Regular Annual Dues  \$25 for	ard, Woodbury, NY 11797-2999, (516) 576	<b>EOLOGY</b> , -2403.
Complete if paying by credit card	EXP. DATE SIGNATURE	