

ICR2012

Rheology Bulletin



ICR 2012
XVth International Congress on Rheology



Inside:

Report on Lisbon/Come to Pasadena
International Committee on Rheology
Investigating "Old Viscosity"
New Cover Art coming to JOR, and more!

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On the Cover:

The Belém Cultural Centre in Lisbon was all decked out with ICR banners during the International Congress on Rheology ICR2012. The Congress report begins on page 4.

To the Left:

Your *Bulletin* editor could not resist this sculpture on Princeton University's campus. The piece, "Public Table" by Scott Burton, was installed in 1998. A similar piece is installed at the General Mills headquarters in Golden Valley, MN USA; youtube/xzhimS3gUIE.

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and is also available through the *iRheology* app for iPhone.

Obrigados! That's the word on the minds of the 970 rheologists who convened in Lisbon, Portugal 5-10 August 2012 to attend the XVIth International Congress on Rheology, hosted jointly by the Portuguese, Spanish and Slovenian Rheology Societies. Our hosts in Lisbon were João Maia, Case Western Reserve University, Local Organizer; Crispulo Gallegos, University of Huelva, Technical Program Organizer; and Igor Emri, University of Ljubljana, Technical Program Organizer.

The ICR2012 meeting was held at the modern Belém Cultural Centre (inaugurated in 1992) located by the estuary of the Tagus river, across from the sixteenth century Jerónimos Monastery, a short distance from the iconic Belém Tower. A stroll from the Cultural Center brought attendees to the bakery Pastéis de Belém, easily identified by the long line of visitors who come daily to sample the best of these Portuguese delicacies. The Congress also brought Pastéis de Belém directly to the conferees, as they were featured, along with the famous porto wine, at many of the social occasions of the Congress. Conferees stayed at hotels throughout Lisbon and were transported to the Cultural Center by comfortable



motor coach.

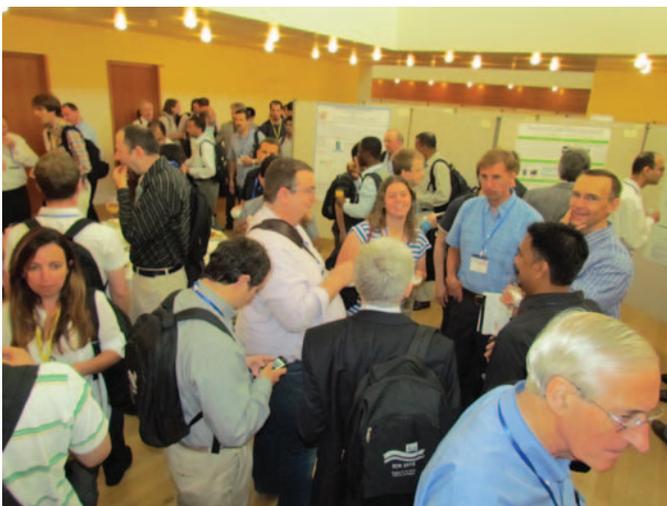


From top: the Bélem Tower; Congress Chair João Maia; plenary speaker Paula Moldenaers; two views of the poster session.

Lisboa!

Chairman João Maia welcomed delegates to the technical program of ICR2012

and chaired the opening plenary delivered by Paula Moldenaers of KU Leuven, Belgium. Over the five days of technical talks, 902 papers were presented, including five additional plenaries: Masao Doi (University of Tokyo, Japan), Gareth McKinley (Massachusetts Institute of Technology, USA), Gerald Fuller (Stanford University, USA), Han Meijer (University of Technology, Eindhoven, The Netherlands), and Wolfgang Knauss (California Institute of Technology, USA). The technical program also included 59 keynote lectures (40 minutes), which anchored the technical sessions by providing an opportunity for additional depth in the sessions' topics. The talks took place throughout the conference center, with audience members guided to their desired



talks by a scheme of colored arrows placed strategically on the paths.

Two optional short courses were offered as part of ICR2012 on Saturday and Sunday, 4-5 August (total enrollment 52): *Colloidal Suspension Rheology* (Instructors: Norman Wagner and Jan Mewis), and *IRIS: Synergy of Rheological Data Analysis and Modeling* (Instructors: Henning Winter and Manfred Wagner).

The highlights of the social program of ICR2012 included the Wednesday excursions (bicycling, golf, touring) and the Beach Party held at Praia da Torre beach, a short coach ride from the Cultural Center. There, the brave went for a swim in the chilly Atlantic, and everyone relaxed with feet in the sand as the sun set over the ocean. Once satiated with Portuguese barbeque specialties, conferees warmed up by moving to the beat supplied by a local DJ. The beach party event was a welcome way to feed the body after a week of feeding the mind. The Thursday Congress banquet was held at yet another spectacular venue, the historic Convento do Beato. The cocktail hour before the banquet took place in several rooms throughout the facility,

while the dinner was a sit-down affair in the courtyard of the 16th-century building. During dinner delegates were treated to a performance of the famous Portuguese Fado music.

The success of the Congress goes to the hard work of the conference organizers, especially Congress Chair João Maia. Equally important to the success of the Congress were the financial sponsors of the event, which included: (Diamond) TA Instruments; (Gold) MedImmune, Anton Paar, and Malvern; (Silver) Thermo Scientific, Xpansion Instruments, Fresenius Kabi, TAP Portugal, IOP Publishing, Caixa Geral de Depositos, EPI, RheoSense, Inc., and Turismo de Lisboa. The next opportunity to enjoy this level of international rheology fellowship will occur in 2016 in Kyoto, Japan, where the community will be hosted by a committee led by Hiroshi Watanabe (Kyoto University). Again, Obrigados! Obrigados! Ja, Kyoto de ne? (We'll see you in Kyoto?).

The Beach Party speaks for itself! Look for more photos from Portugal later in the *Bulletin*.



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Come to Pasadena

**84th Annual Meeting of The Society of Rheology:
10-14 February 2013 Pasadena, CA USA**

Presentation? Check.
Poster? Check.
Appropriate attire? Check.
Sunglasses? Yes!
Hiking shoes? ;-)
Art Guide? Ahh, yes.

We are ready for Pasadena. The 84th Annual Meeting of The Society of Rheology will be held in Pasadena, California 10-14 February 2013. Attendees will be treated to good science, camaraderie, and an enviable climate that, for most of us, will be a welcome break from winter's fury.

Our California hosts are John Brady, Andy Kraynik, Julie Kornfield, and Maryam Sepehr. They're responsible for this fabulous venue and for the weather (provided it's as expected!). The technical program chairs are Shelley Anna and Carlos Rinaldi, and they've put together a jam-packed technical program that will unfold in the Pasadena Convention Center/Conference Building, adjacent to the Paseo Colorado, a short walk from Old Town Pasadena and 1.5 miles away from the California Institute of Technology. The optional associated short course

on *Microfluidics and its Applications* (a two-day course) will be offered on 9 and 10 February by instructors

Anubhav Tripathi (Brown University), Annie Colin (Université Bordeaux 1 and Institut Universitaire de France), and Charles Schroeder (University of Illinois at Urbana-Champaign).

All the details of the meeting – how to get there, how to register, the technical program – are available on the website www.rheology.org/sor/annual_meeting/2013Feb/.

See you in Cal-i-for-ni-a!



PASADENA
Convention & Visitors Bureau
VisitPasadena.com

Report from the International Committee on Rheology (ICR)

www.icr.tu-berlin.de

The Secretary's Report
August, 2012
Manfred H. Wagner, Secretary

At each International Congress, the Secretary of the International Committee on Rheology (ICR) presents a summary on the status of rheological activity world-wide. The ICR was founded in 1953 on the occasion of the International Congress on Rheology in Oxford, UK. The members of the ICR are the National or Transnational Rheology Groups represented by delegates. The officers of the ICR are the Chairman and the Secretary. By tradition, the Chairman is one of the key organizers of the most recent International Congress on Rheology, who serves from the conclusion of that Congress until the conclusion of the next succeeding Congress. The outgoing Chairman is Gerald (Gerry) G. Fuller, Stanford, USA, co-chair of the XVth International Congress on Rheology (Monterey, USA, 2008). The incoming Chairman is Igor Emri, Ljubljana, Slovenia, co-chair of the XVIth International Congress on Rheology (Lisbon, Portugal, 2012).

According to its by-laws, the purpose of the ICR is to represent the interests of organized groups of rheologists and of individual rheologists throughout the world with respect to the international aspects of exchange of information, dissemination of knowledge, and the development of the science of rheology. In pursuit of these goals it decides on the location and approximate time for the quadrennial International Congresses on Rheology and special international meetings between such Congresses, assists the host group in the planning and organization of such Congresses or meetings by providing information, assistance on publicity, encourages the activities of national societies or groups concerned with rheology by providing interested individuals with information and contacts, and undertakes to establish and maintain contact with other international bodies as needed to further the interests of rheologists and the science of rheology.

The science of rheology is well-represented throughout the world. The major rheology meetings in North America, Europe, and Asia continue to attract greater



numbers of registrants. The 2008 Congress at Monterey attracted more than 1000 participants from around the globe, making it the largest such Congress on record, and with 962 participants from 39 countries, the 2012 Congress at Lisbon attracted similar numbers. This healthy growth in the rheological community reflects the vital position of our science in addressing world-wide technological challenges in energy, the environment, and manufacturing.

As developing countries grow their economies, opportunities to establish societies of rheology and rheology user groups emerge. A principal purpose of the International Committee on Rheology is to offer support to such activities. By a donation of the Korean Society of Rheology, a permanent website of the ICR with important information and direct links to all member society could be established at *www.icr.tu-berlin.de*. The Society of Rheology has also responded to this charge, and offered support for funding outreach activities that show the promise of establishing viable societies and groups of rheology throughout the world.

In this respect, the past four years have seen several important developments. The Southern African Society of Rheology, established in 2006 and having organized a number of important meetings, was voted into ICR membership in 2008. In 2009, the Romanian Society of Rheology was established and after its successful inaugural meeting organized by Corneliu Balan of Bucharest, was voted into ICR membership. Recent expansion of the Brazilian economy has led to a subsequent increased need for rheological research and development. On the initiative of Paulo Mendes of Rio de Janeiro, and helped by the enthusiastic support of the ICR chairman Gerry Fuller, a Brazilian Society of Rheology was established in 2010, and became a member of the ICR. Most recently, at the Complex Fluids Symposium at IIT-Guwahati, India, in January 2012, the Indian Society of Rheology, which was inactive for several years, was re-initiated. President is Ashish Lele. Presently, there are close to 130 members of the complex fluids community in India, and the Society intends to work towards im-

proving the industry-academia connection in India in the area of rheology and complex fluids. This will be partly done by organizing at least two training programs every year on the principles and applications of rheology to several focus segments of Indian industry such as plastics, paints, food, personal care products and mining.

The current roster of active member societies of the ICR is given in the accompanying table, together with foundation date and the number of memberships according to the latest figures at hand. With 27 active member societies organized by honorary members of boards and officers, with a total of more than 6000 individual members, with important international journals dedicated to the science of rheology, the field can be considered to be in a healthy state.

Member Societies of the International Committee on Rheology (2012)

1. The Society of Rheology (USA) (1929)	1268
2. The British Society of Rheology (1940)	372
3. Nederlandse Reologische Vereniging (1950)	25
4. Deutsche Rheologische Gesellschaft (1951)	205
5. Nordic (formerly Swedish) Society of Rheology (1956)	119
6. Australian Society of Rheology (1959)	72
7. Arbeitsgruppe Rheologische Gesellschaft Österreich.Chemiker (1959)	47
8. Groupe Français de Rhéologie (1964)	300
9. Rheology Group of the Czechoslovak Chemical Society (1970)	45
10. Societa Italiana de Reologia (1971)	100
11. The Society of Rheology, Japan (1973)	843
12. Belgian Group of Rheology (1974)	56
13. Sociedad Mexicana de Reologia (1975)	80
14. Israël Society of Rheology (1980)	220*
15. Grupo Espanol de Reologia (1981)	79
16. Canadian Rheology Group/Groupe Canadien de Rhéologie (1982)	120
17. Indian Society of Rheology (1983)	130
18. Chinese Society of Rheology (1985)	1200
19. Slovene Society of Rheology (1987)	30
20. Korean Society of Rheology (1989)	605
21. Swiss Group of Rheology (1990)	94
22. Vinogradov Society of Rheology (1991)	180
23. Hellenic Society of Rheology (1998)	40
24. Portuguese Society of Rheology (1998)	31
25. Southern African Society of Rheology (2006)	32
26. Romanian Society of Rheology (2009)	71
27. Brazilian Society of Rheology (2010)	130

* The number refers to the Israel Polymer and Plastics Society



Viscometric Comparison of "Old Viscosity" Ale and SAE 30 Motor Oil

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1. Objective

Two dark ales fermented by the Port Brewing Company (San Marcos, California, www.portbrewing.com) are branded as "Old Viscosity" and "Older Viscosity". Both carry the tagline "Not Your Dad's 30 Weight" (Figure 1). The purpose of this research is to verify if indeed these beverages are distinct from the 30-weight motor oil used by the author's father.

2. Experimental

Samples of the ales (Old Viscosity, 10.5% ABV, Older Viscosity 12% ABV) were obtained from Binney's Liquor Depot in Chicago Illinois, as they were unavailable locally. Samples were stored at 55 °F until just before the viscometric measurements could be made, at which point the bottles of ale were allowed to equilibrate to room temperature over a period of 6 hours. An unopened 1-quart bottle of SpectrumPlus SAE 30 motor oil was obtained from the author's father [2] and also allowed to equilibrate to room temperature prior to testing.

Viscometric measurements were made with a Brookfield DV-II+ Pro viscometer. The viscometer had been calibrated within 30 days prior to making the measurements.

3. Results and Discussion

The names of the beverages – "Old Viscosity" and "Older Viscosity," the artwork on the bottle, as well as the tagline clearly imply that the ethanolic beverages will differ from the processed petroleum product on a viscometric basis. Other points of differentiation may be possible, but a lack of difference in viscosity would clearly overshadow any other differences and make clear that the tagline was false. As such, the greatest emphasis in this report will be placed on the viscometric results.

Table 1 shows the measured viscosities for the indicated fluids as well as the spindles used and the rotational speed.

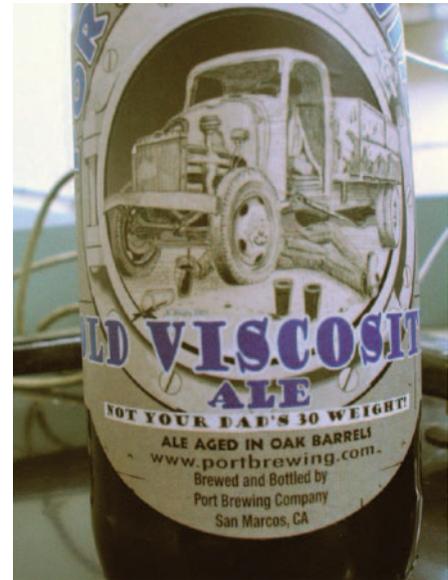


Figure 1: Label on the bottle of Old Viscosity Ale.

Upon starting the rotation of the viscometer, the readings for the motor oil reached a steady value very quickly. For the ales however, the readings were initially quite variable for a period of approximately 30 seconds before settling into a steady value. It is thought that the measurement variability might be a result of the carbon dioxide bubbles inherent in the libation being released upon agitation. This hypothesis is supported by the observation that after a steady state was reached, stopping and then restarting the viscometer allowed for the same final value to be reached almost as quickly as occurred in the fossil oil.

It is readily apparent from the tabulated data that the viscosities of the two classes of fluids are quite different, with the viscosity of the ales being approximately 33% that of the motor oil. This is a most significant finding since as was stated above, viscometric results are of primary importance in this testing. However, visual observation of the two sets of fluids did identify a number of other easily observed differences. Figure 2 shows the visual appearance of the fluids under study when first poured into beakers. Most obvious is that the

Table 1: Brookfield Viscometer Conditions and Viscosities

Sample	Spindle #	Rotation Speed (RPM)	Viscosity (cp)
Old Viscosity	1	60	57
Older Viscosity	1	60	56
SAE 30 Motor Oil	2	60	168

fermented potation generated a large amount of foam ("head") that subsequently subsided whereas the lubricating oil did not generate any such two-phase complex. The ale in Figure 2 is "Old Viscosity" – similar results were observed for "Older Viscosity." Further, the color differences between the two classes of fluids are also impossible to overlook. No effort was made to quantify the color differences at this time.

Lastly, an organoleptic analysis of the fluids was undertaken. For the ales, this analysis was undertaken to the fullest extent possible, both in detecting the aroma over the fluids as well as the gustatory sensations during their imbibition. The author is grateful that a panel of colleagues, one being an amateur zymurgist, was able to assist in this matter [3,4]. As for the motor oil, the organoleptic analysis was less extensive, being limited to olfaction only, this being sufficient to put off any quaffing of the fluid. The conclusion of the panel and the author is that from an organoleptic view, the two classes of fluids are also clearly different.

Additional testing (density, FTIR...) was planned to attempt to further differentiate the potable from the unpotable liquid, but the aforementioned organoleptic panel had consumed the balance of the test samples thus preventing this. As this intake did lead to a lively discussion of rheology tales from days past and a few attempts at melodic expression, the attitude of the author was enlivened despite these shortcomings in the planned research.

4. Conclusion

Based on all the evidence – viscometric, visual and organoleptic – it can be concluded that the tagline "Not Your Dad's 30 Weight" is correct and does not need to be modified.

5. Future Efforts

A close parsing of the semantics of the tagline reveals that the results presented here are actually only valid for the author and his four siblings as these are the only people that can claim that the motor oil tested herein was that of their father. Upon realizing this, it is readily apparent that further research will need to be undertaken by additional researchers everywhere with each researcher acquiring SAE 30 motor oil from their fathers, testing its viscosity and then doing the same for "Old Viscosity" and "Older Viscosity" ales. It is further recognized that the fermented beverage are based on natural feedstocks which are prone to annual variation in quality, and also that these products have fewer production and quality standards in place than exist for the SAE 30 motor oil.

As such, it would also be advisable to repeat the testing on a regular basis to ensure that the claimed difference is still valid at all points in the future.

6. Acknowledgements

The author thanks fellow SOR member Eric F. Brown for making the existence of these beers known to the author and also Yohannes Melekin, of Aspen Research for technical assistance with the viscometer.

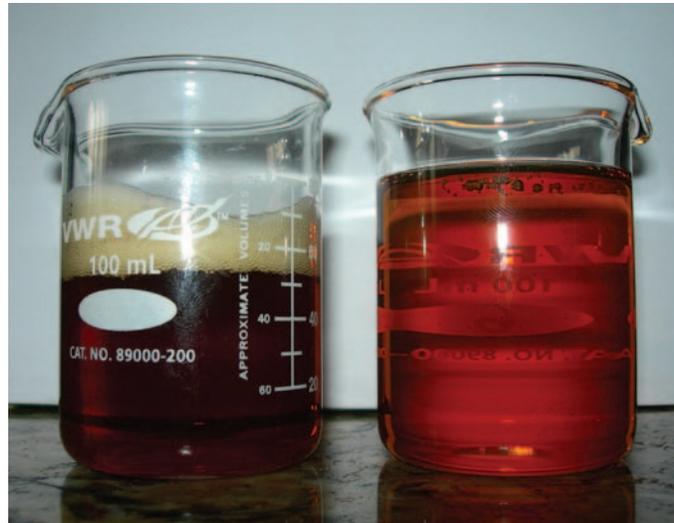


Figure 2: Visual appearance of Old Viscosity Ale (left) and SAE 30 motor oil (right).

Endnotes

1. The author also publishes the blog "It's the Rheo Thing," www.rheothing.com.
2. The author's father uses this oil in his propelled lawn mower, a modern convenience that the author sorely notes was not purchased until the author and all of his siblings had left the house. The author's father is noted as saying, "I always had a propelled lawnmower – you kids propelled it!"
3. That these colleagues were so willing to partake in this matter and show such dedication to the advancement of rheology on a Friday afternoon is not lost on the author, and he is quite grateful.
4. Limited tasting notes: Old Viscosity - A nice roasted flavor with sweet-anise after tones that surprise you - an excellent brew. Older Viscosity – Definitely darker and oak-barrel aged - not as well received by the tasters.

News Flash: Starting with 2013 issue 1, the *Journal of Rheology* will have full color images on the cover of each issue. Authors submitting new papers are encouraged to suggest full color images from their paper for the Editor to consider for the *Journal* cover.



The cover for volume 57 issue 1 is shown here, with an image from a paper by D. M. Hoyle, et al. comparing flow-induced birefringence (on left) with 2D simulations (on right) for cross-slot flows of long-chain branched polyethylenes.

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The 6th International Symposium on Food Rheology and Structure (ISFRS 2012)

Peter Fischer

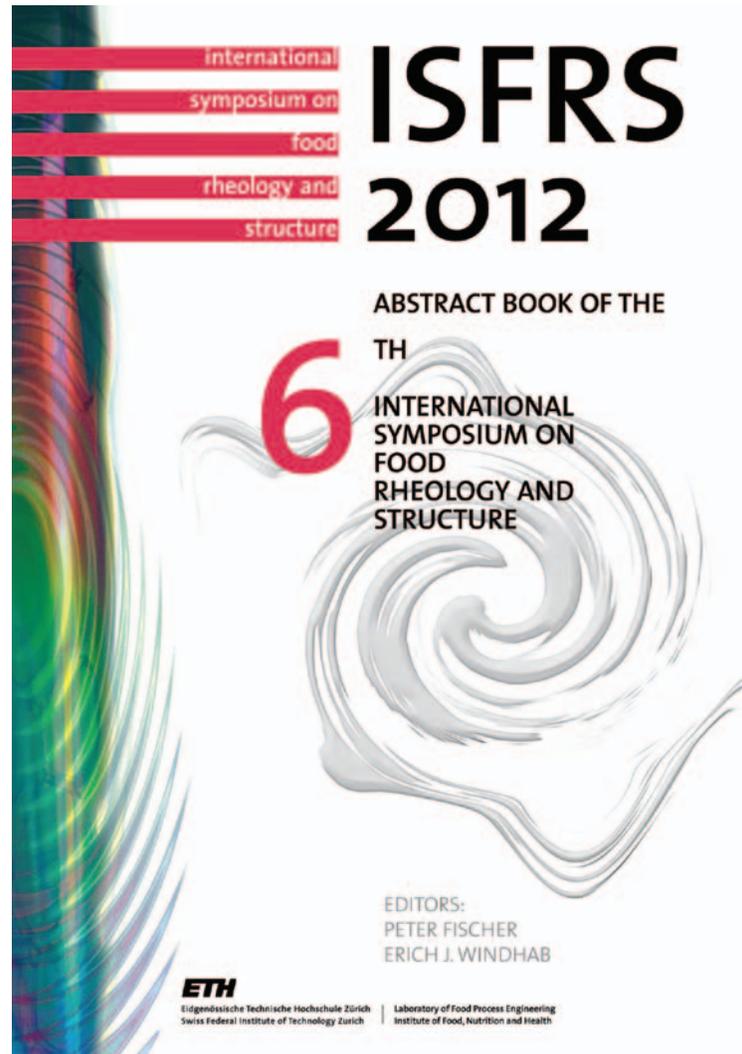
Zurich, Switzerland
10-13 April 2012

The sixth edition of the International Symposium on Food Rheology and Structure took place at ETH Zurich during 10-13 April 2012. During three and a half days, four plenary lectures, six keynote lectures, 90 oral talks and 110 posters were presented. One of the conference's goals is to provide the participants with an overview of the state of the art in food rheology, food morphology, and food processing. In recent years, the area is enriched with nutritional aspects and investigations into how food is digested. The latter aspects are becoming more and more important since food science has to address worldwide problems in malnutrition (deficiencies), weight management problems (obesity or anorexia), and changing nutritional patterns. It is of course not the task of a rheologist to directly tackle nutritional problems, but humans' evaluation of food properties, e.g. healthy food versus non-healthy food, is tremendously influenced by the food's texture and rheology. So, food structures with e.g. tailored breakdown, lubrication between tongue and palate, swallowing behavior – properties, which can be measured by rheology – are considered a contribution to nutritional aspects. Of course, rheological properties are not only of importance while eating and digestion but also during food processing and manufacturing, where the structure we will later associate with good and tasty food is generated. Besides reflecting recent developments and trends in food science, ISFRS also aims to expose food rheologists to new research areas and new techniques that can be of importance to their research.

Within this framework the first day

of the meeting saw a grand opening lecture by Robert Prud'homme (Princeton University) speaking on "Polysaccharide biopolymers: Lessons from nature on tuning molecular interaction." Two parallel sessions on *Emulsions and Foams* and on *Rheological Methods* completed the morning program. Highlights were the talks on the structuring of oils and interfacial rheology as well as online rheometry and advanced analytical methods (FT-Rheology, DLS). Two keynote lectures on "The effect of rheology on the dispensing of complex fluids" by Christian Clasen (K.U. Leuven) and "The fluid mechanics of mastication, swallowing and digestion" by Jan Engmann (Nestlé Research Center, Switzerland) started the afternoon session, which were devoted to *Semi-Solid Foods* with focus on protein structures in cheese and bread and *Rheological Modelling & Numerical Methods*.

The second day started with a plenary lecture on "Mucus microstructure and barrier properties" delivered by



Justin Hanes from The Johns Hopkins University in Baltimore/USA. The topic, more well known in the medical community, links directly into recent food-related discussions on digestion and food uptake in the intestine. Sessions on *Biopolymer Solutions* and *Gels and Colloidal Systems* followed the plenary talk and focused on protein fiber systems, acid gelation, and diffusion in complex structures. After the lunch break, Raffaele Mezzenga (ETH Zurich, Switzerland) reported on "Bridging length scales and properties in food protein fibrils," while Hans Tromp (NIZO & University of Utrecht, The Netherlands) opened the *Rheo-SALS, SANS, SAXS* session with his contribution entitled "Neutron scattering on food ingredients." This session was dominated by scattering method development and structural investigation on ice cream and protein adsorption layers. The third main ingredient of ISFRS, the half-day poster session in conjunction with the exhibition of scientific equipment, took place during the afternoon and was fueled by, beside scientific interest, beer and pretzels with Peter Bigler (ETH Zurich, Switzerland) being the barman.

The third day started with Gareth McKinley's (Massachusetts Institute of Technology, USA) plenary lecture "Rheological fingerprinting of complex fluids and soft solids" focusing on large amplitude oscillatory shear (LAOS) and its detailed analysis; techniques also recognized and utilized in food rheology. After the plenary lecture, the largest session of the entire conference, *Influence of Processing on Structure & Rheology* with 22 oral contributions started in parallel with the *Encapsulation* session. The main focus of the session, which continued in the afternoon and on Friday morning was on processing of cheese, heat-induced food structuring, membrane technology, fibers

for food structuring, and advanced milling techniques and dough rheology. In the *Encapsulation* session, the properties of proteins and biopolymer capsules and well as manufacturing techniques were discussed. The keynote lectures starting the afternoon sessions were delivered by Anne-Marie Hermansson (SIK, Sweden) reporting on "Structure design of soft biomaterials" and by Serafim Bakalis (University Birmingham, UK) focusing on "Model eating." The latter contribution also opened the sessions on *Macromolecular Assemblies and Structure* and *Nutrition and Health*, focusing on the relationship between food structure, perception, and digestion. Friday morning saw the plenary lecture by Erich Windhab (ETH Zurich, Switzerland) on "Rheology and functional structure processing in a reverse gastrointestinal engineering approach for personalized food" and the continuation of the *Influence of Processing on Structure & Rheology* session before the conference was ended at around midday.

ISFRS 2012 attracted more than 320 participants from academia and industry and was sponsored by Anton Paar, Emmi, Felchlin, Jowa, Lindt & Sprüngli, Nestlé, TA Instruments, and ThermoFisher. Scientific equipment was presented by Anton Paar, Brookfield, Chopin, Fritsch, Kinematica, LUM, Malvern, Perten, Stable Micro Systems, TA Instruments, and ThermoFisher.

The Book of Abstracts (ISFRS 2012) as well as all proceeding contributions of the previous conferences (ISFRS 2000, 2003, 2006, and 2009) are available for free at www.isfrs.ethz.ch.

A web-based issue of *Food & Function* and *Soft Matter* as well as a special issue of *Applied Rheology* devoted to ISFRS 2012 will be available in late 2012 (for more details please visit www.isfrs.ethz.ch).

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Technical Program

85th Annual Meeting of The Society of Rheology

Montréal, Québec, Canada

October 13-17, 2013

Local Arrangments Chair: **Marie-Claude Heuzey**, École Polytechnique de Montréal

Technical Program Co-Chairs:

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Technical Sessions:

1. Suspensions & Colloids
2. Polymer Solutions
3. Polymer Melts & Blends
4. Non-Newtonian Flows
5. Interfacial Phenomena
6. Rheology at the Microscopic Scale
7. Gels and Self-Assembled Systems
8. Solids, Glasses & Composites
9. Experimental Methods
10. Rheology & Processing of
Bio-Based Materials
11. Poster Session

Abstract submission for the Montreal meeting will
open after the conclusion of the Pasadena meeting.
Watch the Society website for details.



In Memoriam

Alan N. Gent 1927-2012

Rheological pioneer Alan Gent died on 20 September 2012. Gent was a native of Leicester, England and was educated at the University of London where he earned degrees in physics and math before receiving his Ph.D. in 1955 on the mechanics of deformation and fracture of rubber and plastics. Gent served on the faculty at the University of Akron, Ohio USA from 1961 until retirement in 1994, serving in emeritus capacity until his death. Gent was an expert on fracture mechanics of rubber and plastics, and he made significant contributions to the understanding of the physics of adhesion and the fracture of rubbery, crystalline and glassy polymers. At Akron, Gent served as Assistant Director of the Institute of Polymer Science from 1963 until 1978, when he assumed the post of Dean of Graduate Studies and Research, a role he filled for 8 years.

Gent published more than 200 papers as well as book chapters on the mechanical properties of rubber and plastics and edited a book titled *Engineering with Rubber*. Gent was President of the Society of Rheology from 1982-1983 and also presided over the High-Polymer Physics Division of the American Physical Society and the Adhesion Society. Gent served on the 11-member National Research Council panel that oversaw the redesign of the U.S. space shuttle's solid-fuel rockets in the aftermath of the Challenger explosion. In 1991 he was elected to the U.S. National Academy of Engineering.

Gent's extraordinary teaching and research career was recognized with numerous honors and awards, including:

- Mobay Award, SPI's Cellular Plastics Division (1964)
- Bingham Medal, Society of Rheology (1975)
- Colwyn Medal of the Plastics and Rubber Institute (1978)
- American Society for Testing and Materials International, Adhesives Award (1979)
- Society of Plastic Engineers International Research Award (1980)
- 3M Award for Excellence in Adhesion Science for the Adhesion Society (1987)
- George Stafford Whitby Distinguished Teaching Award (1987)



- Charles Goodyear Medal of the Rubber Division (1990)
- Medal of the Collège de France (1990)
- Polymer Physics Prize, American Physical Society (1996)
- NASA Public Service Medal (1988)
- Honorary degrees from Université de Haute-Alsace, France (1997) and De Montfort University, U.K. (1998)
- Tan Sri Dr. B.C. Sekhar Gold Medal (2011)
- Inaugural Tire Technology International Lifetime Achievement Award (2012)

In honor of his international recognition and his service to the University of Akron, the Board of Trustees of the University voted unanimously to change the name of the Ohio Research Scholar Professor at The University of Akron to the "Alan N. Gent Ohio Research Scholar Professor of Polymers." Gent is survived by his extended family, including his wife, Ginger Lee; former wife, Jean Gent; three sons, Martin, Michael and Andrew; 15 grandchildren and several great-grandchildren. Donations in his memory may be made to the Boy Scout Great Trail Council at 1601 South Main St., Akron 44301, for use at Camp Manatoc, or the Red Cross of Summit and Portage Counties, 501 West Market St., Akron 44303.

IUPAC MACRO World Polymer Congress 2012 Report

Submitted by the Organizers

Virginia Tech and the Macromolecules and Interfaces Institute hosted the 44th IUPAC World Polymer Congress in Blacksburg, USA, 24-29 June 2012. Timothy E. Long, S. Richard Turner, and Robert B. Moore organized the conference, which attracted more than 1400 attendees from 51 countries with 60% international attendees. The Congress provided an international forum for scientific discovery, professional networking, research collaboration, interdisciplinary education, and dissemination of the most recent scientific advances in polymers. More than 1200 presentations (766 oral and 475 poster presentations) ensured a diverse technical program, and 12 plenary speakers provided some key focal points.

The themes of the conference focused on “Enabling Technologies for a Safe, Sustainable, Healthy World.” Polymers continue to enable many emerging technologies, including topics such as tissue regeneration, multilayer structures, processing, drug delivery, water purification, security, biomedical technologies, alternate energy, sustainable resources, smart surfaces and interfaces, high performance engineering, polymers, energy storage and generation, sensors, and electro-active devices. In most instances, these technologies require functional nanoscale polymers, and polymer design for intelligent response to external stimuli represents an exciting frontier. In addition, there is an over-arching need for these technological solutions of the future to also adhere to the principles of earth sustainability. Recent advances in ionic liquids and agricultural-based feed stocks are extending performance and decreasing our dependence on petroleum-based monomers. The IUPAC MACRO World Polymer Congress 2012 assembled an international community for the presentation of recent advances in polymer synthesis, physical characterization, engineering, and performance in several complementary emerging technologies.



IUPAC MACRO 2012 organizers, from left to right: Robert Moore, S. Richard Turner, and Timothy E. Long. Photo courtesy of David Elmore.



Plenary lectures at Burruss Auditorium. Photo courtesy of Virginia Tech / Logan Wallace.



NEWS

Student Travel Grants Available

The SOR is supporting student travel to the Pasadena and Montreal SOR annual meetings through its *Student Meeting Travel Grant Program*, administered this year by SOR ExCom member-at-large Norm Wagner. Rules for the program and submission instructions are available on the web at www.rheology.org/sor/annual_meeting/2013Feb/student.htm. The award is open to student members whose advisor is also an SOR member. Prior recipients of SOR travel awards are not eligible. See the web for details.

Bingham Award 2013 Nominations Sought

Nominations are invited for the 2013 Bingham Award of The Society of Rheology. Prior award winners are listed on the web: www.rheology.org/sor/awards/bingham/.

The Bingham Award is presented annually to an individual who is a resident of North America or a member of the Society who has made outstanding contributions to the field of rheology. The award consists of a medal, a certificate, and a \$10,000 honorarium. Additional information and guidelines for preparing a nomination can be found on the SOR website at www.rheology.org/sor/awards/Bingham/nom2013.htm.

Nomination materials should be submitted electronically as pdf files by 15 February 2013 to the chair of the Bingham Award Committee, Michael Graham:

Michael D. Graham
University of Wisconsin, Madison
email: graham@engr.wisc.edu

Award announcement will precede the 85th Annual Meeting of the Society of Rheology in Montreal, Quebec, Canada (13-17 October 2013), and the medal will be presented at that meeting.

Nominations Sought for Fifth Metzner Early Career Award

Nominations are invited for the Metzner Award of The Society of Rheology. Prior award winners are listed on the web: www.rheology.org/sor/awards/Metzner/.

The Metzner Early Career Award is given, at most annually, to a member of the Society who is younger than 35 (on January 15th of the year the award is to be given) and has distinguished him/herself in rheological research, rheological practice, or service to rheology. The award consists of a plaque and a \$7,500 honorarium. Additional information and guidelines for preparing a nomination can be found on the SOR website at www.rheology.org/sor/awards/Metzner/nom2013.htm.

Nomination materials should be submitted electronically as pdf files by 15 February 2013 to the chair of the Metzner Award Committee, Eric Shaqfeh:

Eric S. G. Shaqfeh
Stanford University
email: esgs@stanford.edu

All nomination packages must be accompanied by a letter of support from a nominator. Award announcement will precede the 85th Annual Meeting of the Society of Rheology in Montreal, Quebec, Canada (13-17 October 2013).

SOR Officer Elections 2013

Officer elections will be held in 2013. The election process is that the SOR president appoints a 3-person nominating committee and a nominating committee chair. The Nominating Committee reports a slate to the membership by at least one hundred forty-five (145)

days prior to the date of the Annual Meeting at which the results of an election are to be announced. For the October Montreal meeting this date is 21 May 2013. Members interested in being nominated or interested in nominating candidates for office are encouraged to contact members of the Nominating Committee (see page 3 of this *Bulletin* for a list of committee members).

European Rheology: AERC2013

The Annual European Rheology Conference AERC2013 will take place from 2-5 April 2013 in Leuven, Belgium. The chairs of the meeting are Peter Van Puyvelde and Patrick Anderson.

The plenary lectures will be given by:

Mike E. Cates (The University of Edinburgh, UK)
Michael D. Graham (Univ. of Wisconsin–Madison)
Justin Cooper-White (Univ. of Queensland, Australia)
Fourth Plenary speaker: 2013 Weissenberg Awardee

For more information, please visit the conference website www.aerc2013.tue.nl. Abstracts for presentations were due 15 December 2012.

2012 TA Distinguished Young Rheologist Award recipients Announced

TA Instruments has presented its *Distinguished Young Rheologist* (DYR) Award to two scientists: Anson W. K. Ma, of the University of Connecticut USA and Ali Mohraz, of the University of California, Irvine USA.

The DYR Award cited Ma's work on interfacial rheology of nanoparticle-laden interfaces for stabilizing emulsions and flow dynamics of nanoparticles in simulated blood flows for cancer treatment. Ma is also a recent recipient of an NSF EAGER award, given for those projects that explore potentially "transformative" ideas or approaches." Mohraz was recognized for his outstanding contributions regarding the rheology of colloidal dispersions, including the flow behavior of anisometric particles, the non-linear rheology of colloidal gels, and the structure and dynamics of polymer/colloid gels.

The TA *Distinguished Young Rheologist Award* recognizes young faculty members that show exceptional promise in the field of rheology and is

designed to accelerate their research through equipment grants. Recipients are nominated by a group of established and respected academic researchers in the field of rheology. "The *Distinguished Young Rheologist Award* program has been a success in support of our vision to maintain our leading market position through strong partnerships with the academic community," comments Terry Kelly, President of TA Instruments.

Minutes of the ExCom Meeting

Lisbon, Portugal

The fall 2012 meeting of the Executive Committee of The Society Rheology will be held in Pasadena in conjunction with the upcoming February 2013 meeting.



Treasurer's Report

To the Membership,

Presented here are the usual tables describing the financial position of The Society of Rheology as of the end of August, 2012. With no meetings, 2012 looks like a good year with anticipated expenses only slightly above budget and anticipated income 18% above budget. Note that this is a projection using extrapolation factors based on past experience, and variances may well occur.

Of key importance is the 2013 Budget with a deficit of \$51,000. In 2013 we have two meetings with the associated expenses of awards, and student and plenary speaker travel. The situation was similar in 2005; but, thanks to rising interest rates, two successful meetings and expanding JOR consortia fees, the anticipated loss disappeared. The differences between then and now include a larger expense for awards (\$20,500 vs. \$6,200 per meeting) and little chance of higher interest rates. While such a deficit can be covered from reserves, we have disturbing trends in costs and journal subscriptions that must be considered. These trends will be presented in more detail at the Pasadena meeting, where the 2013-budget must be approved by the members.



Respectfully submitted,

Montgomery T. Shaw, Treasurer

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

(all amounts, USD)	2012 August	2011 Year End	2011 August	2010 Year End	2010 August
Assets					
Cash in checking account(s)	1,162	41,084	77,396	13,257	87,882
Securities	0	0	0	0	0
Balance in AIP account	1,585,355	1,545,020	1,513,618	1,435,019	1,427,891
Total Assets	1,586,517	1,586,104	1,591,014	1,448,276	1,515,773
Liabilities and Net Assets					
Liabilities					
Deferred subscription revenue					
Deferred member dues					
Deferred revenue	0	111,633	0	89,283	0
Total Liabilities	0	111,633	0	89,283	0
Net Assets					
Publication reserve	450,000	450,000	450,000	450,000	450,000
Student travel grant reserve	30,000	30,000	30,000	30,000	30,000
Annual Meeting reserve	300,000	300,000	300,000	300,000	300,000
Operating reserve	150,000	150,000	150,000	150,000	150,000
Unrestricted	656,517	544,471	661,014	428,994	585,773
Total Net Assets	1,586,517	1,474,471	1,591,014	1,358,994	1,515,773
Total liabilities and net assets	1,586,517	1,586,104	1,591,014	1,448,276	1,515,773

**Journal of Rheology
Receipts and Disbursements
(all amounts, USD)**

	2012 Budget	2012 Projection	2012 August	2012 Budget	2011 Year End
RECEIPTS					
Subscriptions	145,000	143,901	143,901	150,000	150,980
Royalties & Reprint Sales	6,300	5,910	2,560	5,500	88,162
Ad Sales	49,000	40,792	28,152	45,000	51,856
JORO revenue	75,000	136,249	120,619	65,000	94,242
Miscellaneous	2,000	0	0	2,100	2,000
TOTAL RECEIPTS	277,300	326,851	295,231	267,600	387,240
DISBURSEMENTS					
Ads	14,000	10,314	7,011	12,000	13,033
Reprints, Single Copy	1,200	2,415	1,922	1,800	630
Paper, Printing	29,000	22,572	17,437	29,000	26,267
SOR Editorial	45,000	72,342	48,228	45,000	40,914
Production	38,000	44,044	29,363	35,000	38,250
Fulfillment	5,550	5,188	3,334	5,925	5,350
Distribution	19,900	19,108	12,894	22,650	20,026
Electronic publishing	50,000	47,098	32,180	41,000	47,830
Miscellaneous	8,200	7,010	3,389	7,000	8,849
TOTAL DISBURSEMENTS	210,850	230,091	155,758	199,375	201,148
Net	66,450	96,760	139,474	68,225	186,091

The Society of Rheology
Receipts and
Disbursements
(all amounts, USD)

	2013 Budget	2012 Projection	2012 August	2012 Budget	2011 Year End
RECEIPTS					
Dues	44,500	47,201	46,295	46,000	46,619
Interest	3,000	2,770	1,941	3,000	2,460
Journal of Rheology	277,300	326,851	295,231	267,600	387,240
Mailing List Sales	0	0	0	100	-15
Donations	0	0	0	0	0
Bulletin Advertising	10,000	9,743	6,100	10,000	11,500
Annual Meeting (net)	0	0	0	0	-6,874
Short Course (net)	0	0	0	0	2,929
TOTAL RECEIPTS	334,800	386,566	349,568	326,700	443,860
DISBURSEMENTS					
AIP Dues Bill & Collect.	11,500	11,552	7,092	11,500	11,104
AIP Adm. Services	10,000	9,218	5,000	8,000	9,218
AIP Mem. Soc. Dues	0	3,375	3,375	7,500	13,069
Contributions and Prizes	3,500	11,085	1,585	12,000	10,471
Early Career Award	9,000				
Journal of Rheology	210,850	230,091	155,758	199,375	201,148
Bulletin	18,000	18,225	18,225	22,000	13,406
Bingham Award	20,000	0	0	0	10,000
Executive Cmt. Meetings	20,000	21,640	15,640	13,000	20,370
Pres. Discretionary Fund	1,500	1,500	799	1,500	1,477
Treas. Discr. Fund	1,500	389	389	1,500	0
Bulletin Editor Discr. Fund	1,500	0	0	1,500	0
Progr. Chm. Discr. Fund	6,000	2,000	0	3,000	786
Webmaster Discr. Fund	3,000	3,500	3,500	3,000	2,246
International Activities Fund	5,000	1,769	1,769	5,000	2,000
Office Expenses	500	1,365	1,365	4,000	551
Banking Services	160	446	297	100	184
Liability Insurance	5,200	5,250	1,249	5,200	5,079
Membership Broch. & Appl.	0	0	0	2,000	0
Accountant	2,300	2,200	0	2,200	2,200
Student member travel	50,000	21,480	21,480	30,000	25,495
Annual meetings, future	6,000	500	0	6,000	0
Website	200	200	0	3,000	50
Miscellaneous	100	0	0	100	817
TOTAL DISBURSEMENTS	385,810	345,784	237,522	341,475	329,670
Net	-51,010	40,782	112,046	-14,775	114,190

end

Even a fabulous meeting is improved by a congenial break with friends, especially if the Portuguese coast is accessible.

This hardy band of rheologists chose a bike ride as their Wednesday afternoon ICR2012 excursion, and they were blessed with a gorgeous day for it.





Lisbon weather was ideal for ICR2012; the outdoor reception allowed attendees to enjoy Portugal's blue skies and pleasant temperatures.



They just keep getting younger, don't they? It's good to know that rheology is appealing to a new generation.



(Calendar, continued from page 24)

2016

1-5 August 2016
XVIIth International Congress on Rheology, Kyoto, Japan, Hiroshi Watanabe (every four years).

19-24 August 2016
International Congress of Theoretical and Applied Mechanics, ICTAM, Montreal, Quebec, Canada

2017

February 2017
88th Annual Meeting of The Society of Rheology, Tampa Bay, FL USA, Don Baird

October 2017

89th Annual Meeting of The Society of Rheology, Denver, CO USA, Matt Liberatore

2018

October 2018
90th Annual Meeting of The Society of Rheology, location TBA

For additional meeting notices, see:

- www.rheology.org/sor/info/Other_Meetings.htm
- www.rheology-esr.net/Meetings.php
- www.appliedrheology.org/ (click on conferences)
- ictam.org



The Society of Rheology
American Institute of Physics
Suite 1NO1
2 Huntington Quadrangle
Melville, NY 11747-4502 USA

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CALENDAR OF RHEOLOGY CONFERENCES AND COURSES

2013

9-10 February 2013

SOR Short Course "Microfluidics and Its Application," Pasadena, California, USA; Anubhav Tripathi, Charles Schroeder, and Annie Colin.

10-14 February 2013

84th Annual Meeting of The Society of Rheology, Pasadena, California, USA, John Brady

25-27 March 2013

INNFM Conference 2013, Ken Walters (www.innfm.org.uk)

2-5 April 2013

8th Annual European Rheology Conference (AERC2013), Leuven, Belgium, Peter Van Puyvelde and Patrick Anderson (www.rheology-esr.net/AERC/2013/)

7-11 October 2013

1st International Conference on Rheology and Modeling of Materials, Miskolc, Hungary, Laszlo A. Gomze (www.ic-rmm1.eu/)

12-13 October 2013

SOR Short Course on Rheology (topic TBA), Montreal, Quebec, Canada.

13-17 October 2013

85th Annual Meeting of The Society of Rheology, Montreal Quebec Canada, Marie-Claude Heuzey, Paula Wood-Adams.

2014

6-11 July 2014

IUPAC World Polymer Congress (MACRO 2014) Chiangmai, Thailand, Supawan Tantayanon (www.macro2014.com/).

4-5 October 2014

SOR Short Course on Rheology (topic TBA), Philadelphia, Pennsylvania USA

5-9 October 2014

86th Annual Meeting of The Society of Rheology, Philadelphia, PA USA, Michael Mackay

2015

15 June 2015

15th International Congress of Biorheology and 8th International Conference on Clinical Hemorheology, Seoul.

October 2015

SOR Short Course on Rheology (topic TBA), Baltimore, Maryland USA

October 2015

87th Annual Meeting of The Society of Rheology, Baltimore, Maryland USA, Kalman Migler and Jai Pathak.

(Continues, page 23)