

Conference booklet



Nordic Rheology Conference
May 29-31, 2024



University of Stavanger

Final program

Contents

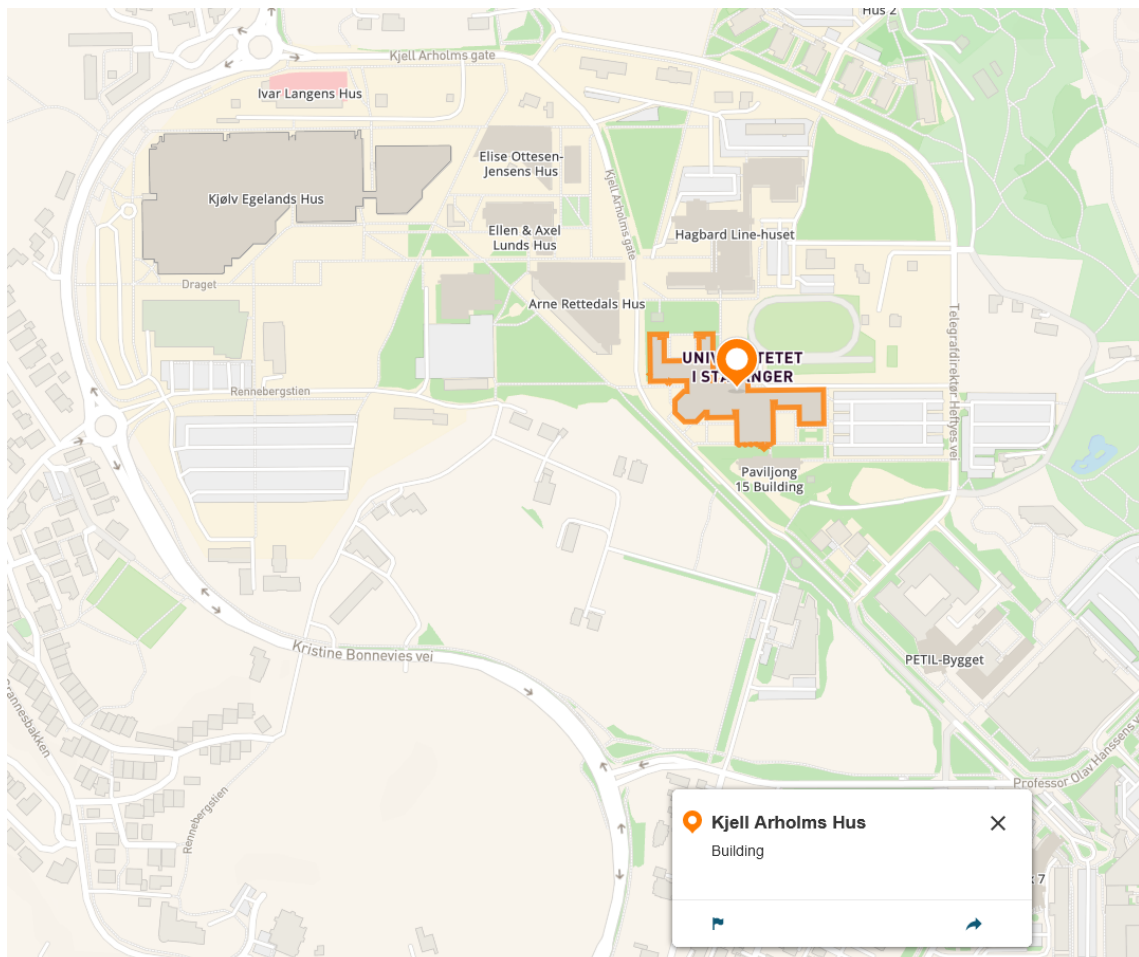
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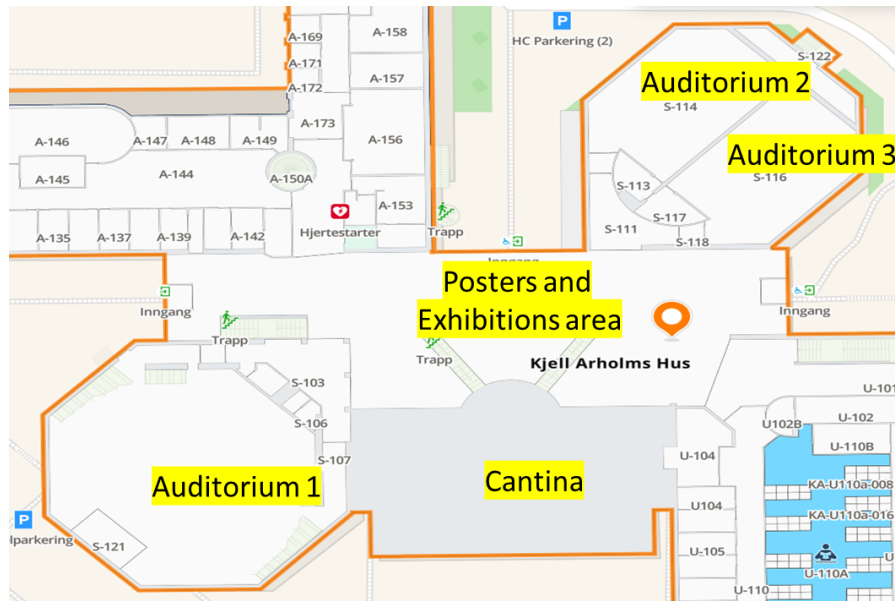
Welcome to the NRC2024

The 33rd Nordic Rheology Conference (NRC2024) will take place at the University of Stavanger Norway UiS on May 29-31, 2024. The conference will cover subjects ranging from food rheology to rheology within civil engineering. It will be physically hosted and arranged by the Department of Energy and Petr. Engineering at the Faculty of Science and Technology at UiS.

Conference venue

The conference venue is at the University of Stavanger, Kjell Arholms building.





Objective

The conference objective is meant to promote and propagate rheology at all levels by building a broad forum where academia and industry, in their application and theoretical guises could meet, share, and discuss ideas to their mutual benefit.

Scope and theme

The scope and theme for the NRC2024 is Rheology for Science and Technology. As usual, contributions from experimental and theoretical contributions from all areas of rheology, industrial case studies, and all kinds of contributions are welcomed. The goal of the conference is to create a gathering of people interested in the scientific, technical, and industrial applications within the science of rheology.

Rheology course

On Wednesday the 29th, a rheology course for registered participants will be held at the University of Stavanger. The course, which will be held by Annika Sahlström at Rekonsa AB, gives a good basic knowledge of the fundamentals of rheology to make it easier to understand more complicated topics discussed during the conference.

Organizers

The local organizing committee consists of A. H. Rabenjafimanantsoa and Arild Saasen, both from the Department of Energy and Petroleum, and Vanessa Grace Ochon Booc, Linda Natalie Borho, Guro Mette Viker Bråthen and Kjetil Tjåland from the Faculty of Science and Technology at University of Stavanger.

Sponsors and exhibitors



Proven Excellence.

Sponsor for best poster



*colloids
and interfaces*

an Open Access Journal by MDPI

WIFI-connections

Eduroam is available at the University of Stavanger campus.

Following is the **UiS-Guest** network:

- Guest Username: *rheology*
- Guest Password: *8245*
- Account activation: Wednesday, 29 May 2024, 6:00 AM
- Account Expiration: Account will expire at Friday, 31 May 2024, 8:00 PM

Transportation

The campus of the University from the city centre is easy to reach by bus. You might use Google maps or Mazemap. Taxi is also an option, but it is very expensive. For the public bus, find your travel planner here. Your destination bus stop at the University for the venue is: *UiS ved Kjell Arholms hus (Stavanger)*.

From the Airport Sola to Stavanger, the easiest way is to take a bus from Flybuss or Taxi.

Flybuss:

Flybuss departure is every 20 min and the time of travel to Stavanger is 20-30 min. You can buy the cheapest tickets online here, or on board with Visa, Mastercard with an extra fee.

Ticket with QR code must be provided throughout the trip. The ticket must be presented in paper print or PDF on your mobile/tablet.

Taxi:

Taxi is always available right outside the terminal building at the Airport.

For booking online:

- Stavanger Taxi: Tlf. +47 51 90 90 90
- Siddis Taxi Stavanger: Tlf. +47 47 51 58 66 66
- Norges Taxi: Tlf. +47 08 000

Estimated price between NOK 450 – 600, one trip from the Airport to Stavanger city.

How to buy the bus ticket?

- In the ticket Kolumbus billett app.
- In Entur's, Vy's and Go-Ahead's ticket apps.
- On ticket machine (one at campus, one at Stavanger train station).
- At Stavanger train station, Kolumbus customer service.
- Onboard the bus or train with cash. (This option is not recommended due to the extra fee, and no acceptance of visa or master credit card).

Plenary speakers

Professor Pier Luca Maffettone

Pier Luca Maffettone, PhD, is Full Professor in Chemical Engineering at University of Naples “Federico II” where he was [2013-18] Chairman of the Department of Chemical-Materials-and-Production Engineering and is [2020-] Member of the University Board. He graduated in 1988 in Chemical Engineering under the supervision of Prof. G. Marrucci, and received the Ph.D. in Chemical Engineering at the University of Naples “Federico II” in 1993 under the supervision of Prof. G. Astarita. Pier Luca Maffettone became Assistant Professor in Chemical Engineering at the University of Naples “Federico II” in 1994. In 1998 he became Associate Professor of Chemical Engineering at Politecnico di Torino, and then became Full Professor of Chemical Engineering at the University of Naples “Federico II” in 2005. He was visiting scientist at the University of Delaware, at Katholieke Universiteit Leuven, at the Stanford University, and at Okinawa Institute of Science and Technology. His main research activity is focused on modeling and simulation of the flow behavior of soft matter. In early stage of career, working in the group of Pino Marrucci he analyzed the rheology of liquid crystalline polymers within the framework of the rigid rod model of Doi and Hess both in bulk [Macromolecules, 1989, J. Rheol., 34, 1217-1230, 1990] and as monolayers in collaboration with the group of Gerry Fuller at Stanford [Macromolecules, 1996]. Later, he showed the occurrence of “Rheo-Chaos” in shear flows [PRL, 2001; PRL, 2003].

He proposed in collaboration with Mario Minale a simple but effective toy model for the deformation of a drop in linear flows with Newtonian [JNNFM, 2000] and/or viscoelastic liquids [JRheol, 2004]. The predictions of this model have been used as a rheological guide in several polymer blends and emulsion applications.

The work on cross-flow migration of particles suspended in viscoelastic liquids, started as a joint effort together with the group of Jan Vermant in Leuven and with Martien Hulsen in Eindhoven [J Rheol, 2008, [J Comp. Phys, 2007; JNNFM 2008]. The cross-streamline migration of a spherical particle in a viscoelastic fluid flowing in a wide slit microdevice was investigated through 3D finite element simulations. It was discovered a multiplicity of stable positions whereby the particle is driven towards the channel centerplane or the closest wall depending on its initial position through the gap, thus leading to the existence of an unstable separatrix. This phenomenon was considered a viscoelastic reversal of the well-known Segré-Silberberg effect, which is, instead, driven by inertia [JNNFM, 2009;

2010; 2011, LOC, 2012; ARFM 2017]. The results had then brought to the development of Rheo-Engineered microfluidics for Lab-on-a-chip applications. The cross-flow particle migration was also used to build a microrheometer to estimate the relaxation time of viscoelastic fluids, down to milliseconds [LOC, 2015; J Rheol, 2017]. He recently addressed in collaboration with Gerry Fuller the phenomena related to film rupture dynamics with viscoelastic interfaces showing the existence of a novel breakage scenario [PNAS 2021].

He is presently member of the Editorial Boards of *Rheologica Acta* and *Journal Non-Newtonian Fluid Mechanics*.

He is 2023 recipient of the Weissenberg award bestowed by the European Society of Rheology.

Professor Helen Wilson

Helen Wilson has a PhD in applied mathematics from the University of Cambridge, where she worked on instabilities in viscoelastic fluids. Moving to Chemical Engineering for postdoctoral research at the University of Colorado at Boulder, she became interested in suspension mechanics. These two themes have continued through her career, first as a lecturer at the University of Leeds, and later at UCL in London where she has recently completed a 5-year term as Head of the Department of Mathematics. She was President of the British Society of Rheology from 2015-2017.

Professor John Hinch

John Hinch received his education at Cambridge University, graduating with a B.A. in mathematics in 1968 and a Ph.D. in 1972 supervised by George Batchelor on the "Mechanics of suspensions of particles in fluids, with an additional section on the convection due to a moving heat source". After a post-doc at Caltech under the then young Gary Leal, he returned to a faculty position at Cambridge University and since 1998 has been there a Professor of Fluid Mechanics, becoming Professor Emeritus in 2014. He has benefited greatly from many collaborations, first with Andreas Acrivos and his students, and later with experimental groups in France following introductions by Etienne Guyon. His research interests include suspensions of particles and other mobile particulate systems, the flow of non-Newtonian fluids, and applications of mathematics to industrial problems. He is a Fellow of the Royal Society, APS, Academia Europaea, NAE and NASI, holds an honorary doctorate from Toulouse, and an honorary professorship from Brasilia, and was awarded the Fluid Dynamics prizes of the APS and the European Mechanics Society, and the gold medal of the British Society of Rheology.

Additional plenary speakers

- Advanced combined rheometer setups: Rheo-NMR, Rheo-dielectric, and Rheo-IR
*Prof. Dr. **Manfred Wilhelm**, KIT, Institute fuer Technische und Polymerchemie*
- Combining Rheology and Raman Spectroscopy: Monitoring crystallization
*CEO **Jan Schäffer**, Dipl.Ing. Houn*

Program

May, 29th

Time	Program	Auditorium
08:00	Coffee, tea, water available whole day	
08:30 - 11:30	Rheology course by Reokonsa	Aud 2
11:30 - 12:00	Registration of conference participants	Lobby
12:00 - 13:00	Lunch	Lobby
13:00 - 13:15	Conference opening by Faculty Dean Øystein Lund Bø (15 min)	Aud 1
13:15 - 14:00	Plenary Speaker (40 min + 5 min Q&A)	Aud 1
14:05 - 15:15	<p>Two parallel sessions (15 min + 5 min Q&A)</p> <p>General Rheology Experimental Method</p> <p>14:05 - 14:25 GR1 EM1</p> <p>14:30 - 14:55 GR2 EM2</p> <p>14:55 - 15:15 GR3 EM3</p>	Aud 2 and Aud 3
15:15 - 15:45	Refreshment break	Lobby
15:45 - 16:55	<p>Two parallel sessions (15 min + 5 min Q&A)</p> <p>General Rheology Experimental Method</p> <p>15:45 - 16:05 GR4 EM4</p> <p>16:10 - 16:30 GR5 EM5</p> <p>16:35 - 16:55 GR6 PM1</p>	Aud 2 and Aud 3
17:00 - 17:30	Advanced combined rheometer setups: Rheo-NMR, Rheo-dielectric, and Rheo-IR (30 min + 10 min Q&A)	Aud 1
18:30 - 20:30	Welcome reception by Head of Dept. Øystein Arild	Cafeteria

- GR1 Controlling Well Leakage: Rheological and Operational Effects, by **Ian Frigaard**
- GR2 Effect of Additives on Rheological Properties and Fluid Loss of Oil Based Drilling Fluids, by **Blandine Feneuil**
- GR3 Thixotropy as a Purely Viscous Phenomenon and How the Dynamic Moduli can Mislead us, by **Eric M. Burgesson**
- GR4 Viscoelastic Characterization of Wood Fiber Foams, by **Olli-Ville Laukkanen**
- GR5 Effect of Lubricants on the Lubricity of an Intervention Base-Oil, by **Mesfin Belayneh**
- GR6 Effect of Titanium Nitride Nanoparticles on the Lubricity and Viscous Properties of KCL-Water-Based Drilling Fluid, by **Mesfin Belayneh**

Program

- EM1 Advanced Extensional Rheometry on a Rotational Rheometer Platform,
by **Jörg Läger**
- EM2 Cross-Scale Material Properties Analysis Using an Innovative Rheology,
Temperature, and Moisture-Controlled SAXS/WAXS Setup,
by **Marko Bek**
- EM3 High-Speed Synchrotron x-Ray Analysis of Non-Contact Jetting Process,
by **Gustaf Mårtensson**
- EM4 Rheomicroscopy of Starch Gelatinisation, by **Mats Stading**
- EM5 Scaling Laws for Micro-Scale Flow of Thixo-Elasto-Viscoplastic Fluids,
by **Ases Akas Mishra**
- PM1 A Cost-Effective Determination of Pressure- and Temperature-Dependent
Viscosity of Polymers by Linking Conventional Viscosity Data to pvT-Data,
by **Felix FH Hanselle**

May, 30th

Time	Program	Auditorium
08:00 -	Coffee, tea	Cafeteria
08:00 - 08:30	Registration of conference participants	Entrance area
08:30 - 09:15	Plenary Speaker (40 min + 5 min Q&A)	Aud 1
09:20 - 10:30	Two parallel sessions (15 min + 5 min Q&A) General Rheology Polymer	Aud 1 and Aud 2
	09:20 - 09:40 GR7 PM2	
	09:45 - 10:05 GR8 PM3	
	10:10 - 10:30 GR9 PM4	
10:30 - 11:00	Refreshment break	Lobby
11:00 - 12:10	Two parallel sessions (15 min + 5 min Q&A) General Rheology Non-Newtonian	Aud 1 and Aud 2
	11:00 - 11:20 GR10 NN1	
	11:25 - 11:45 GR11 NN2	
	11:50 - 12:10 GR12 NN3	
12:10 - 13:00	Lunch	Lobby
13:00 - 13:45	Annual Business Meeting and election	Big Aud
13:50 - 15:00	Poster session and Exhibition (stands)	Lobby
15:05 - 15:50	Plenary Speaker (40 min + 5 min Q&A)	Aud 1
15:50 - 16:10	Refreshment break	Lobby
16:10 - 16:50	Combining Rheology and Raman Spectroscopy: Monitoring crystallization (30 min + 10 min Q&A)	Aud 1
Buss departure 17:15 - 17:45	Taking buss to Flor & Fjære, Bekhuskaien	Parking at Arne Rettedals hus
Boat deaprture 18:00 - 22:30	Conference dinner at Flor & Fjære incl. guided tour Please note: drinks bought separately!	

- GR10 High Definition 2-Dimensional Numerical Model of Particle Sedimentation on Newtonian and Shear-Thinning Fluids, by **Lucas Volpi**
- GR11 Hydrophobic Modification of Bentonite: Unraveling the Impacts of Aluminum Cation on Silica-Water Interface, by **Hazzaz B. Yousuf**
- GR12 Characterizing Cellulose Nanocrystals-Graphene Oxide Synergies in Taylor Couette Flow, by **Kesavan Sekar**

- PM2 Impact and Interaction of Polymers, NACL and Cellulose Particles on the Rheological Properties of Drilling Fluids under Conditions of Thermal and Mechanical Wear, by **Karl Ronny Klungtvedt**
- PM4 Role of Rheology For Magnetic Field Alignment of Graphene in Polymers: A Path towards Tailored Functional Materials by **Viney Ghai**
- NN1 An Experiment of Taylor, Couette, Maxwell and Kolmogorov, by **Roland Kádár**
- NN2 Dynamic Flocculation in Fiber Suspensions Studied by Rheo-OCT, by **Olli-Ville Laukkanen**
- NN3 Formation and Stability of Particle Pairs in Inertial Microfluidics - Effect of Relative Size and Softness, by **Timm Krueger**

May, 31st

Time	Program	Auditorium
08:00 - 08:30	Coffee, tea	
08:30 - 10:05	Two parallel sessions (15 min + 5 min Q&A) Food and Bio Non-Newtonian 08:30 - 08:50 GR13 NN4 08:55 - 09:15 FB1 NN5 09:20 - 09:40 FB2 NN6 09:45 - 10:05 FB3 NN7	Aud 2 and Aud 3
10:05 - 10:30	Refreshment break	Lobby
10:30 - 12:05	Two parallel sessions (15 min + 5 min Q&A) Food and Bio Non-Newtonian 10:30 - 10:50 FB4 NN8 10:55 - 11:15 FB5 NN9 11:20 - 11:40 FB6 SG1 11:45 - 12:05 SG3 GR14	Aud 2 + Aud 3
12:10 - 12:30	Awards and prizes: student travel grants rheology award, best poster award	Aud 1
12:30 - 12:45	Conference is closing: Family photo and announcement for next conference	Aud 1
13:00 - 13:45	Guided tour to Iron Age farm	
14:00 -	Lunch	Cafeteria

GR13 Overview of how the Calculation of Dynamic Temperature of Drilling Fluids is Closely Linked with Rheology, by **Knut Bjørkevoll**

GR14 Establishing Direct Relationships between Soft Material Perception and Rheology, by **Eric M. Burgeson**

FB1 Influence of non-Newtonian Blood Dynamics on Pulsatile Wall Shear Stress in Vascular Anomalies, by **Hamed Vaseghnia**

FB2 New Insights into Stringiness from Extensional Rheology, by **Florian Nettesheim**

FB3 pH- and Temperature-Dependent Strain Hardening of Sodium Caseinate Gels, by **Norbert Raak**

FB4 The Rise and Fall of Miscible Drops, by **Joachim Mossige**

FB5 Hydrogel-Based Artificial Blood as a Lubricant in Bio-Tribological Model System Testing, by **Florian Rummel**

FB6 Developing Rheological Characterization Methods for Porcine Blood and Hydrogel-Based Artificial Blood, by **Florian Rummel**

- NN4 Electro-Rheology of GnP-reinforced IPN Nanocomposites,
by **Matheus Mendes de Oliveira**
- NN5 Mixing in Heterogeneous Fluids: An Examination of Fluid Property Variations,
by **Ida Karimfazli**
- NN6 Numerical Modelling of Particle Separation in Heterogeneous Suspensions
using Inertial Microfluidics, by **Benjamin Owen**
- NN7 Predicting Orientation in Extruded Wood Polymer Composites,
by **Sajjad Pashazadeh**
- NN8 Sloping Flows: Understanding Fluid Dynamics in Heavy Viscoplastic
Injection into Newtonian Channels, by **Ida Karimfazli**
- NN9 The Co-moving Velocity, a New Concept in Immiscible Two-Phase Flow in
Porous Media, by **Alex Hansen**

- SG1 Additive Manufacturing by Gel in Gel Printing, by **Yaman Boluk**
- SG3 Self-Assembling Simple Building Blocks to Generate Mechanically
Tuneable Supramolecular Gels, by **Krishna K. Damodaran**

List of posters

- Anion-induced Mechanical Properties of Stimuli-Responsive Supramolecular Gels based on N-oxide amides.
B. Kristinsson and K. Damodaran
- Glass Transition in Powders Determined by Compressional Dynamic Mechanical Analysis.
M. Stading
- Influence of the Hydroxy Functional Group on the Mechanical Strength of Amino Acid Based C3-Symmetric Gelators.
I. Volkova and K. Damodaran
- Rheological and Textural Properties of Protein Enriched Salmon Products Containing Different Texture Modifiers, Intended for Dysphagia Patients.
G. Drobac, A. V. Skuland and F. I. Tanji
- Non-Standard Powder Rheology with Standard Rheometer Equipment.
K. Oldörp
- Changes in Red Blood Cell Deformability at the Beginning of the Winter Swimming Season in Females and Males: Preliminary Reports.
A. Teleglów, M. Frankiewicz and J. Marchewka
- Fabrication of Graphene Oxide Nanofiltration Membrane for Water Purification: A Study of Antibacterial Activity.
M. O. Usman, V. Ghai and R. Kádár
- The Mathematics of Oscillatory Recovery Rheology with Applications to Experiments, the Cox-Merz Rules, and the Nonlinear Modeling of Common Amplitude Sweep Behaviors.
E. M. Burgeson