SoftMatterWorld Newsletter

the web's foremost resource on soft condensed matter

July 2010, Issue 19

Latest Research

Dear Soft Matter Colleagues,

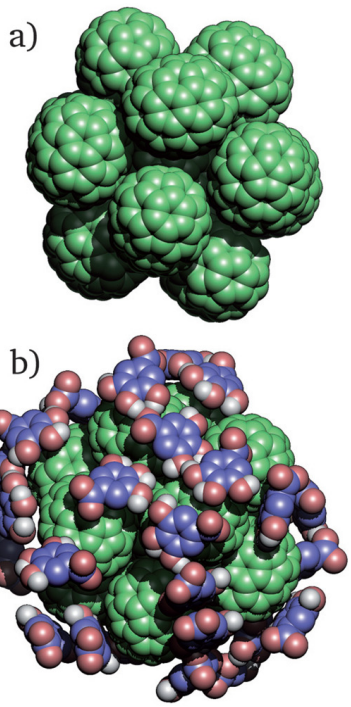
Summer continues with lots of great conferences and research. Check the Latest News section for updates - there are many conferences still open for registration.

Computational Soft Matter Research Group at the Helsinki University of Technology

This month we travel into the far North to the **Helsinki University of Technology** in Finland. The Computational Soft Matter Research group is led by Group Leader, Dr. Emppu Salonen. In 2006 Dr. Salonen was awarded a five year research fellow position at the Academy of Finland where he runs the group along with a team of other researchers; 1 senior, 1 doctoral and 6 undergraduate.

The group is primarily based on computational modeling of soft matter systems. At present, the focus of their work is in

1. Understanding the molecular-scale interactions between engineered carbon-based nanomaterials and biological matter;
2. Structural and dynamic properties of lipid membranes;
3. Development of novel methods for atomistic molecular simulations.



Cluster of fullerene C70 together with gallic acid molecules, highlighting the interaction of CNPs with natural organic matter. - Image credits: Soft Matter, 2009, 5, 4433–4445, DOI: 10.1039/b912310e

In order to link their computer simulations to reality, they are actively collaborating with leading experimental research groups in the field. Some of the group's current research topics include;

- Effects of small molecules on lipid membranes.
- Dielectrophoresis of nano- and bioparticles.
- Environmental and biological effects of nanomaterials.

The website has some stunning images of molecular simulations and even has some downloadable GROMACS topology and coordinate files. To read more about this group's simulation research and images visit the website **here.**

<http://tfy.tkk.fi/soft/>

Concerted Diffusion of Lipids in Raft-like Membranes

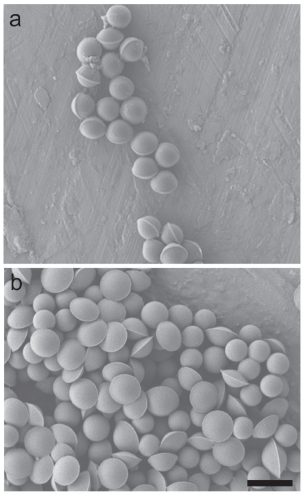
L. Monticelli, E. Salonen, P.C. Ke, I. Vattulainen, Faraday Discuss., 2010, 144, 411 - 430, DOI: 10.1039/b901487j

In this recent paper from the Salonen group researchers characterize diffusion phenomena. The data allows characterization of time scales for the concerted lipid motions and length scales associated with the correlated lipid diffusion patterns. Finally, the concerted nature of lipid motions is also found in dissipative particle dynamics simulations of lipid membranes, clarifying the role of hydrodynamics in membrane diffusion phenomena.

Fabrication of Unusual Asymmetric Colloids at an Oil–Water Interface

Bum Jun Park and Eric M. Furst, Langmuir, 2010, 26 (13), pp 10406–10410, DOI: 10.1021/la101030h

Researchers from the University of Delaware present a novel method for creating asymmetrical particles with unusual, flattened shapes from colloidal latex microspheres pinned at an oil−water interface. The shape and degree of asymmetry are controlled by incubating particles for minutes to tens of minutes at an elevated temperature. Estimates of the surface energy and work account for the shape-change mechanism in which heated particles deform as they spread at the oil−water interface to minimize the contact between these immiscible phases.

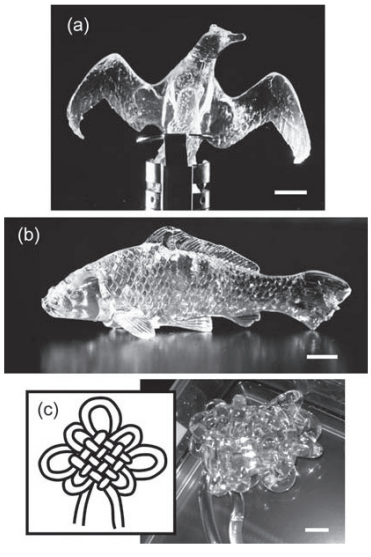


SEM images of the asymmetrical particles quenched (a) 1 and (b) 3min after incubating at 60 C. The original spherical particles are added to the 3 min sample to compare the shape and size directly. The scale bar is 5 μm.

A Facile Method for Synthesizing Free-shaped and Tough Double Network Hydrogels

Tasuku Nakajima et al., Polym. Chem., 2010, 1, 693 - 697, DOI: 10.1039/c0py00031k

The creation of double network hydrogels (DN gels), which show extremely high mechanical strength, enable hydrogels to be applied both in medical and industrial fields. However, one obstacle for various applications is the lack of formability of DN gels, owing to the brittleness of the first network poly(2-acrylamido-2-methylpropanesulfonic acid) (PAMPS) gels. In order to overcome this problem, researchers synthesized free-shaped DN gels (called PVA-DN gels) by using a physically cross-linked PVA gel as an internal mold. PVA-DN gels can form many complex shapes and their mechanical properties were comparable to those of conventional DN gels.



The pictures of the PVA-DN gels with the shape of (a) the bird, (b) the fish, and (c) the Chinese knot. Conventional PAMPS gels and DN gels cannot form such complicated shapes. The scale bars: 1 cm.

International Workshop Series: Passion for Knowledge

PASSION FOR KNOWLEDGE
The Workshops

The Donostia International Physics Center is celebrating its tenth year anniversary with a series of workshops entitled “Passion for Knowledge.” Each of the scientific workshops will focus into one of the main subjects of research in the DIPC. Of the four workshops presented one of them is “Passion for Soft Matter”: Presenting state-of-the-art experiments and theoretical advances in the fields of soft matter. The other three workshops will focus on Electrons, Interfaces and Photons. The 4 workshops will take place from September 28th to September 30th and all 4 workshops are integrated in the same event. Participants are free to attend any scientific talk from any of the workshops, independently on the particular one in which they initially register. To read more about the speakers, poster session and lecture programs visit the **website**.

<http://www.dipc10.eu/en/workshops/introduction>

82nd Annual Meeting of the Society of Rheology

The Society of Rheology 82nd Annual Meeting is being held from October 24 - 28, 2010 in Santa Fe, New Mexico. The conference will have ten thematic sessions and a poster session, which includes the annual student/post-doc poster competition. Some of the planned sessions are;

- Rheology and Flow of Glass-like Materials
- Nano- and Micro-Rheology: Indentation and Beyond
- Rheology of Natural Materials: Biorheology and Food Rheology
- Self-Assembling, Associative, and Gel-like Systems
- Suspensions, Colloids and Emulsions
- Complex Fluids: Nanocomposites and Phase Separated System
- Polymer Rheology: Melts, Solutions and Blends
- Micro- and Nano- Fluidics
- Computational Rheology: Behavior ‘in Silico’
- Surface and Interfacial Rheology

The Society of Rheology is one of the five founding members of the American Institute of Physics. The Society is also a member of the International Committee on Rheology, which organizes the International Congress on Rheology, held every four years. Registration for the poster session is open until August 13, 2010. Read more on the **website**.

<http://www.rheology.org/sor/annual_meeting/2010Oct/default.htm>

The Society of Rheology

We hope you enjoy browsing softmatterworld.org and come back soon,

Linda S. Hirst and Adam Ossowski

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