

Soft Matter World Newsletter

February | 2011 | Issue 26

Dear Soft Matter Colleagues,

Attached to this month's newsletter is the 2011 Conference Listing - over 30 conferences for 2011. Be sure to browse through it as many deadlines are approaching rapidly. It will be updated periodically as more conferences arrive. Next month we will be attaching a similar listing for the Noticeboard so email the editor if you have any positions you would like advertised.

Complex Fluids and Molecular Biophysics Lab, University of Milan



This month we are featuring the [Complex Fluids and Molecular Biophysics Lab](#) from the University of Milan. Led by Prof Tommaso Bellini, the lab focuses on induced organization of fundamental self-structuring systems, most notably liquid crystals, colloidal suspensions and proteins. The final goal of the research being to

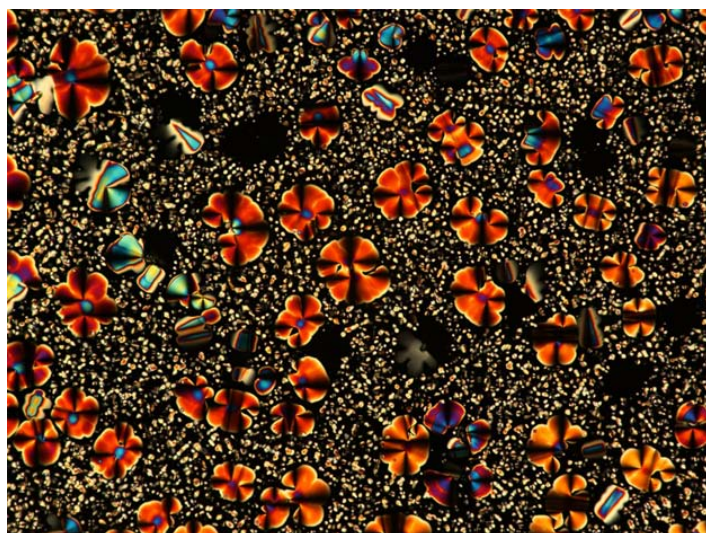
“probe and understand the unknown relationship between the well known isolated elements and the self-structured assemblies.”

Research interests extend from fundamental physics to technological applications, from discovery of novel materials and phenomena to new solutions for specific technological problems. The techniques used include light scattering, laser spectroscopy, electric birefringence and optical microscopy.

Some of their current projects include:

- Suspensions of Nanowires, Nanotubes and Viruses
- Protein Folding Kinetics
- Supramolecular Structures in Nucleotides and Peptides
- Optical Detection of Ligand-Receptor Interactions
- Topological Defects in Liquid Crystals

Their research has far reaching applications in biophysical processes, particularly [unfolded protein states](#) and [protein aggregates](#). The latter of which is

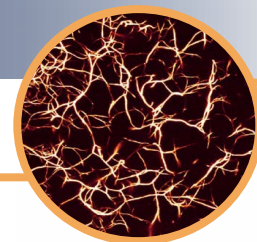


▲ Columnar LC domains growing upon slow cooling in a concentrated aqueous solution of small fragments of double-stranded DNA. Taken in polarized transmitted optical microscopy on a TE200 Nikon Microscope, with a Nikon DS-5M camera. The sample is between two glass slides spaced by 10-30 micrometers film. Giuliano Zanchetta, University of Milan, Italy

vital in understanding some of the mechanisms behind alzheimers disease.

This is not the first time Prof. Bellini's group has been on the pages of the SMW Newsletter; in October of 2010 “Exploring soft matter with x-rays” was featured as highlighted research as well as a handful of stunning images of liquid crystal DNA in our Gallery taken by Giuliano Zanchetta, a post-doc working in the group.

To read more visit the group [website](#).



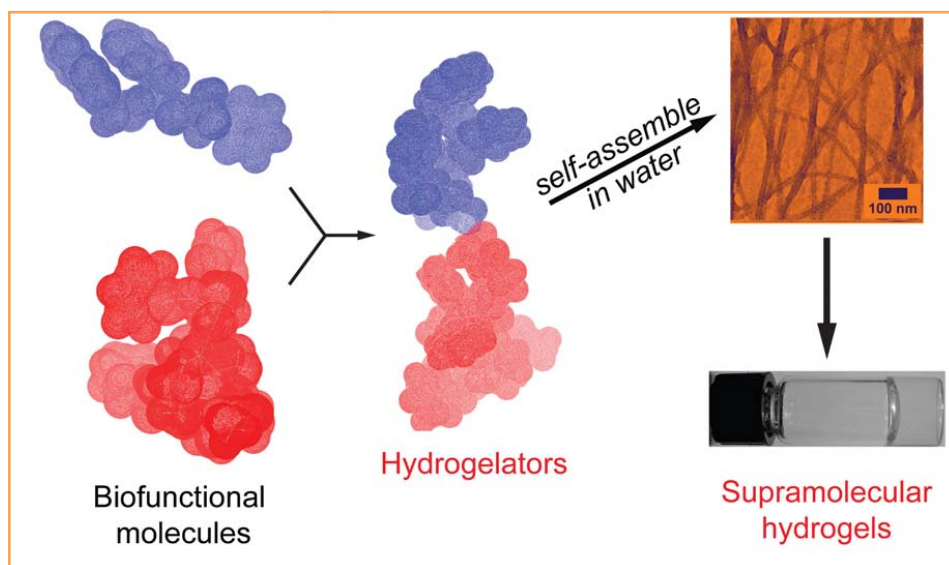
Self-Assembly of Small Molecules Leads to Biofunctional Hydrogels

Y.Zhang, Y.Kuang, Y.Gao, B.Xu. *Langmuir* 2011, 27(2), 529–537. DOI: 10.1021/la1020324

Bing Xu and colleagues, researchers from Brandeis University, present a series of structural motifs (referred to as “samogen”) that possess a high propensity to self-assemble in water and serve as the building blocks of hydrogelators to generate a variety of supramolecular hydrogels. These motifs would help overcome the challenges connected to predicting whether a small molecule can act as a hydrogelator.

Using a compound that consists of two phenylalanine residues and a naphthyl group as an example of the samogens, they demonstrate the ability of the samogens to convert bioactive molecules into molecular hydrogelators that self-assemble in water to result in nanofibers.

The molecular hydrogelators show potential applications in



▲ A diagram illustrating the steps behind structural motifs, 'samogens', and how they can convert bioactive molecules into hydrogelators, which subsequently self-assemble in water and become biofunctional hydrogels. This diagram was featured in the January 18th issue of *Langmuir*. Illustration by corresponding author, Bing Xu.

chemistry, materials science, and biomedicine (e.g., wound healing, drug delivery, controlling cell fate,

typing bacteria, and catalysis).

For more information visit [Langmuir at ACS publishing](http://Langmuir.at.ACS.publishing).

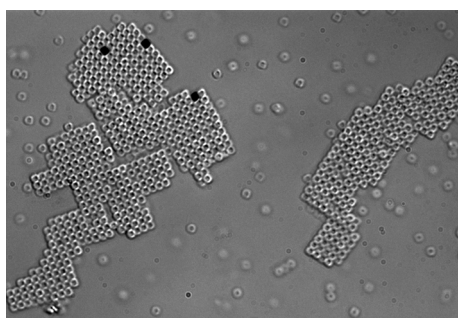
Cubic Crystals from Cubic Colloids

L. Rossi, S. Sacanna, W.T.M. Irvine, P.M. Chaikin, D.J. Pine and A.P. Philpse. *Soft Matter*. RSC Publishing. December 9th 2010. doi:10.1039/C0SM01246G

Researchers from Utrecht and New York Universities investigate the crystallization behavior of colloidal cubes by means of tunable depletion interactions.

The colloidal system consists of micron-sized cubic silica particles which are prepared by silica deposition on iron oxide templates. In subsequent steps the templates are dissolved and diffuse through the porous silica shell, leaving a hollow silica cube.

The cubic colloid system is dispersed in various non-adsorbing water soluble polymers as deple-



▲ Typical snapshots of optical microscopy movies of hollow silica cubes readily crystallizing into close packed, simple cubic (SC) arrays. The cubes diffuse in an aqueous solution of salt and the depletant poly-ethyleneoxide.

tion agents. Under these conditions it is found that the cubic crystals nu-

merate then subsequently grow via coalescence with other nuclei ultimately forming cubic mosaics. The depletion effect of the polymers is responsible for driving the cube faces together.

The system provides a new tool for space-and time resolved studies of simple cubic structures. In addition, the cubes offer unique possibilities to study the mechanism of formation and melting of simple cubic (SC) crystals in two dimensions, which is not possible for cubic crystals from (magnetic) nanocubes.

To read more visit [RSC publishing](http://RSC.publishing).

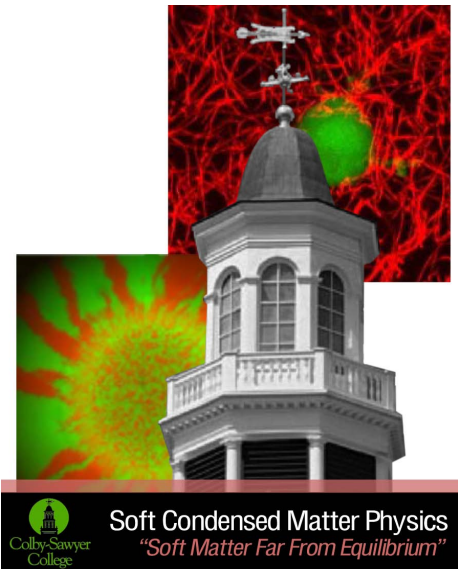


Gordon Research Conferences Presents: Soft Matter Far From Equilibrium

The 2011 Gordon Conference on "Soft Condensed Matter Physics: Soft Matter Far from Equilibrium" will be taking place on August 14th through 19th, at Colby Sawyer College. The conference will highlight a wide range of phenomena at the forefront of soft materials research where traditional concepts, based on equilibrium physics, fail to provide an accurate description. Potential topics include fluids and solids undergoing catastrophic deformations, active and self-propelled systems, new developments in and applications of turbulence, dynamics and flow in confined and driven systems, jamming and glassy systems, and the interplay of geometry and topology in soft materials. Invited speakers will represent

a variety of scientific disciplines, ranging from soft condensed matter physics to chemical engineering to geophysics. As a means to stimulate further exchange of ideas we plan to select by jury 3-4 junior presenters of particularly outstanding posters to give short talks. The collegial atmosphere of this Conference will provide an avenue for scientists from different disciplines to brainstorm and promotes cross-disciplinary collaborations in the various research areas represented.

The conference will be preceded by a two-day Gordon-Kenan Research Seminar on August 13th and 14th. The focus of this seminar is to foster scientific exchange among young scientists in the field with a special emphasis on the latest chal-



lenges in soft condensed matter physics. In addition, a panel consisting of scientists in various career stages will discuss career advancement and transitions.

To read more visit the [GRC conferences website](#).

www.grc.org

Sigma-Phi International Conference on Statistical Physics

The International Conference on Statistical Physics will be held July 11th through the 15th in Ayia Napa, Cyprus. The conference will be organized in sessions dealing with general aspects and applications of statistical physics. Furthermore, workshops and symposia will clus-

ter talks dedicated to special topics.

The conference will include poster sessions covering all the topics of statistical physics.

The Annual Meeting of the EPS-SNP (European Physical Society - Statistical and Nonlinear Physics

Division) will be held during the Conference. The 2nd call for abstracts is February 20th. Visit the [conference website](#) to read more.

www.sigmaphi2011.org/

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



Linda S. Hirst and Adam Ossowski

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