Dear Soft Matter Colleagues,

Greetings from the International Liquid Crystal Conference in Dublin, Ireland (ILCC 2014)! To celebrate this important biennial event we present you with two fascinating Liquid crystals articles. We also have special features on a 2 year post-doctoral position and upcoming Autumn 2014 conferences.

Liquid Crystal Conic Flowers

Focal conic domains (FCDs) in smectic-A liquid crystals have the ability to direct the assembly of micro- and nanomaterials. FCDs can arrange themselves in a fan-like texture comprised of focal curve pairs, the hyperbolae of which intersect at a single point, and can be used to form things like microlens arrays. In contrast to the fan-like texture, the patterns studied by the authors take on a flower-like appearance, created by using curved interfaces to confine smectic LCs into the desired pattern.

The researchers, working at the University of Pennsylvania, present two systems exhibiting this flower-like pattern. In system A, a large colloidal inclusion was placed in the LC, causing the FCDs to arrange themselves radially around the particle (Fig 1). In system B, patches of SiO2 nanoparticles on the surface were used to promote degenerate planar anchoring of the smectic layers, causing the layers to bend (Fig 2). In both systems, the flower texture was observed, with thickness decreasing as distance from the center increased. In system A, the researchers show that it’s not the LC anchoring to the colloid that causes the flower texture, but the colloid’s wetting chemistry that deforms the LC-air interface. In system B, the flower texture was produced by the same geometry present in system A, but due to the bend of the LC layers, the geometry is upside down. The researchers found the flower texture in both systems to be the result of the outward tilt of the normal vector of the homeotropic interface.

These patterns of self-organization could be controlled by manipulating the eccentricity of the FCDs, which varied with the curvature of the homeotropic interface. The resulting orientation mismatch between the hybrid aligning surfaces of a smectic thin film produced changes in the overall texture of the system. The authors suggest future research can focus on self assembly and using arrangements of smectic-a liquid crystals to guide the assembly of other materials, including colloids and nanoparticles.

Read the full article at APS Physical Review X

- Michael Lane
**INDUCTION OF DEFECT LOOPS IN NEMATIC FIELDS**

Rigid particles were obtained by using a two-photon photopolymerization with spatially patterned pulsed femtosecond laser light. This method allowed the team to construct particles with the topology of colloidal knots. Consisting of polymeric tubes, the particles are looped $p$ times with $q$ revolutions, $T(p,q)$, about the colloidal rotational symmetry axis. Examples of colloidal knots can be seen in Fig. 2. Various configurations of knots even became mutually tangled when constructed in large quantities. The particles’ molecular orientations and points of incompatibility with the nematic liquid crystal resulted in point defects called “boojums”.

The team found that boojums around different knots could be specifically characterized both by the number of times the director rotates as one circumnavigates the defect core and by the bulk topological charge. The overall interplay of these particle topologies with the liquid crystal was controlled by the varying surface boundary conditions. This approach to a predictable way of experimenting with knotted colloids can lead to uses involving self-assembly of metal and semiconductor nanoparticles possibly applied to information displays, metamaterials and data storage.

The full article can be found at the [Nature Materials website](#).

-Marcus Rice

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**POST-DOCTORAL POSITION AT INRA: CELLULOSE NANOCRYSTALS STABILIZING PICKERING EMULSIONS**

The Institute of National Research of Agriculture (INRA) is a French public research body dedicated to producing scientific knowledge for economic and social innovation in the areas of food, agriculture and the environment. There is strong motivation within this context to replace petroleum-based polymers with polymers from renewable resources. Emulsions, present in large application domains, usually use surfactants issued from the petro-chemical industry.

Recent studies have shown that it was possible to obtain highly stable oil-in-water Pickering emulsions stabilized only by unmodified Cellulose NanoCrystals (CNC). The aim of this 24 month post-doctoral position is to study the adsorption process and wetting properties of cellulose nanoparticles at the interface. Different interfaces will be selected in order to better constrain and identify the physicochemical interactions driving the adsorption and diffusion of the particles at the interface. They will be characterized with various techniques involving scattering techniques, confocal microscopy and rheology notably. To read more, visit the posting on the Noticeboard or download this informational PDF.
CAI-STEM is being held August 23-29, 2014, in Cancun, Mexico. This conference is a follow up to the highly successful Workshop on Bridging Nanoscale Forces and Interfacial Phenomena to the Macroscopic World which was held in Cancun in 2006. A special issue of Langmuir will be published in conjunction with the conference.

This meeting, which will take place at the Fiestamericana Condesa Hotel, will bring together experimental and computational scientists to explore various aspects of biomolecular surface interactions.

Submission of Featured Articles / Historical Reviews / Articles / Letters or Instructional Reviews is strongly encouraged.

The main topics include:
- Interactions in colloidal and nanoparticle systems
- Colloidal and Adhesion Forces in Liquids
- Forces in Biological Systems
- Multi-scale Modeling Related to Surface Forces
- Single-Molecule Forces Single-Molecule Force Measurements
- Capillary and Related Surface and Interfacial Tension Forces
- Tribological Phenomena
- Dynamics and non-equilibrium interactions and phenomena
- Instrumental Developments

Any further questions can be answered by contacting the conference organizers at SFA2014@usf.edu.


The 14th Annual Jülich Soft Matter Days will be held November 11th through November 14th at the Seminaris Hotel, Bad Honnef, Germany. Forschungszentrum Jülich, a member of the German Helmholtz Research Network, is one of the largest interdisciplinary research centres in Europe. The Institute of Complex Systems (ICS) proudly presents its annual international workshop which aims to bring together scientists from condensed matter physics, macromolecular and physical chemistry, and molecular and cell biology.

This year’s workshop will focus on the physics and chemistry of mesoscopically structured systems. The topics of focus are:
- Biopolymers
- Biosystems
- Colloids
- Functional Polymers
- Polymer Nanocomposites
- Microswimmers

The programme will consist of 24 invited lecturers, with contributed talks and posters. The Deadline for final registration is September 12 2014.

To read more visit the website or download the First Poster and Flyer at the fz-juelich website.

Thank you for reading
Linda Hirst, Adam Ossowski & the Softmatterworld Team