NEWSLETTER

Issue No 16 – 2020

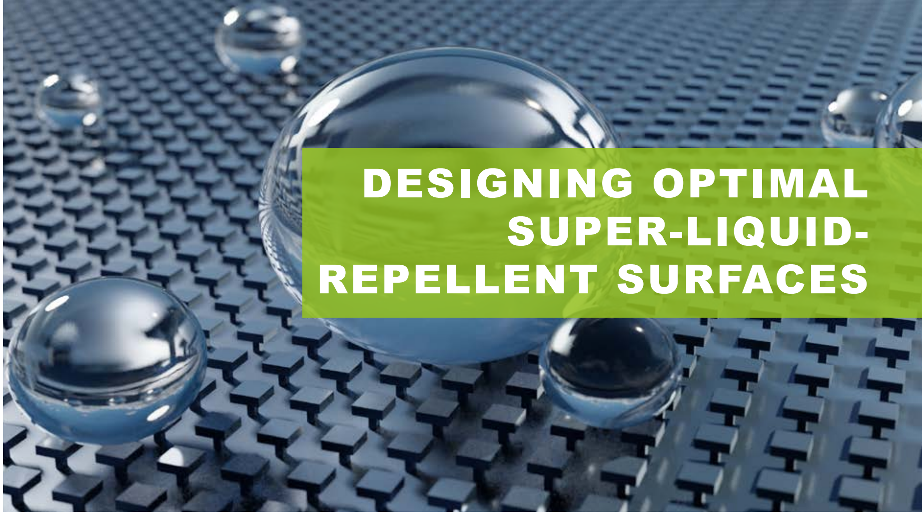
SoftComp
SOFT MATTER COMPOSITES

In this issue

Editorial

Scientific Communication in Times of Corona and Beyond

The corona pandemic is affecting all aspects of our everyday lives, to a greater or lesser extent. Fortunately, science as a whole has only been moderately impacted – with scientific communication in the form of talks, workshops and conferences being the main casualty. The scientific community has reacted very quickly to fill this gap, at least in part, by the organization of virtual online conferences. And virtual conferences are here to stay! Such conferences have their limitations; in particular, the informal personal contact between scientists, which is important at the start of new collaborations, is lost. However, their advantages are not to be underestimated, e.g. in terms of economy of time, outreach, and energy conservation. Indeed, this last aspect is extremely important. We are in fact already in the middle of the next crisis, the climate crisis. The resolution of this crisis will require much more time and resources than the resolution of the corona crisis. Thus, the corona pandemic provides a great opportunity to speed up and enhance the development of online conferencing and communication, enabling the science community to contribute to the prevention of further global warming. Let's use this opportunity!



DESIGNING OPTIMAL SUPER-LIQUID-REPELLENT SURFACES

Superomniphobic surfaces efficiently shed all liquids. This makes them universal antifouling coatings with transformative potential in the food, packaging, and medical industries, as well as in lab-on-a-chip and water purification technologies. However, the complex surface structures required have posed considerable challenges to both experimental and theoretical analyses of their wetting properties, slowing the development of optimal designs for practical applications. In our article [1], we develop computational techniques to comprehensively survey three key wetting properties required for high operational performance, before simultaneously optimizing these properties to produce application-specific designs. We demonstrate this methodology by designing ideal surface textures for droplet microfluidics and sustainable water purification membranes.

Close up of water droplets on a doubly reentrant surface designed for optimal water repellence (symbolic image).
Copyright: Durham University.


by Jack R. Panter (left), j.r.panter@durham.ac.uk,
and Halim Kusumaatmaja (right), halim.kusumaatmaja@durham.ac.uk, both Durham University, UK

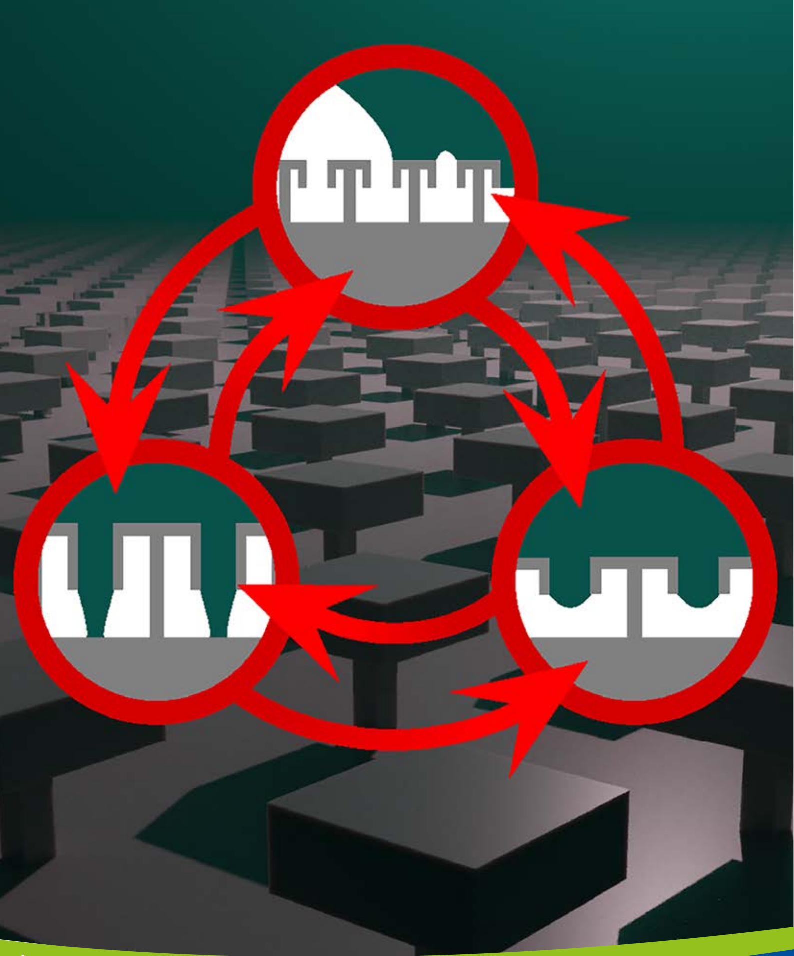
The so-called "doubly reentrant geometry" is at the frontier of superomniphobic design. This mushroom-shaped surface protrusion can suspend liquids on top of the structure over an air layer.

This minimises interactions between the liquid and solid, so that liquids can be shed very easily from the surface. The overhanging cap means that even highly pressurised, highly wetting liquids can be suspended in this way. In order to manufacture such complex surface structures (the overhanging cap geometry is particularly challenging to achieve), a range of innovative fabrication techniques are beginning to be deployed, such as multi-step lithography, the fluidization of polymer micropillars, and 3D printing [2-5].

Despite recent advances in fabrication techniques, optimizing the surface design for real-world use remains a substantial challenge. In many applications, three wetting properties must be optimized: the contact angle hysteresis, a measure of liquid mobility; the minimum energy breakdown barrier, the ease in which liquid displaces the air layer and when superomniphobic properties are lost; and the critical pressure, the maximum maintainable liquid pressure on the surface. Each individual wetting property has a complex dependence on the structural design. It is not possible to design a surface texture which optimizes each property individually, as they are coupled antagonistically by structural parameters. Therefore, an optimal design is produced by considering all three properties simultaneously.

We overcome these challenges by first performing large-scale, systematic surveys of each wetting property across the structural parameter range, finding multiple competing mechanisms. We then develop new analytical models to describe these mechanisms, and test previously proposed models. From the critical pressure survey, we find that previous models grossly overestimate the distance the liquid sags underneath the cap, meaning previously fabricated surface structures were substantially taller (and mechanically weaker) than necessary. From the minimum energy barrier survey, we find doubly reentrant geometries are prone to failure through condensation, but also show how to counteract this.

Second, we combine the individual surveys to simultaneously optimize the surface texture. This optimization is also performed using a genetic algorithm, a method of evolutionary design, speeding up this process by up to 10,000×. We demonstrate the power of this strategy by designing structures which overcome the challenges faced by two emerging applications: surfaces enabling versatile digital microfluidics, and energy-efficient water purification via membrane distillation. Strikingly, the optimized doubly reentrant structure for water purification closely matches the natural



occurrence of this surface on the skin of the springtail arthropod. Like the purification membrane, the springtail's skin has adapted to allow gaseous exchange while resisting fouling by liquid contaminants.

Overall, the designs we produce are able to meet multiple wetting property requirements simultaneously, for optimum application performance. Looking to the future, we believe this versatile and efficient simulation strategy will be a powerful tool for the practical realization of structured surfaces with special wettability.

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The doubly reentrant surface geometry couples the three key wetting properties antagonistically. These properties are: the contact angle hysteresis (top), minimum energy pathway to failure (left), and critical breakdown pressure (right). Optimal design can only be achieved through a simultaneous balance between all three. Copyright: Durham University

by Preeti Sharma, preeti.sharma@wur.nl,
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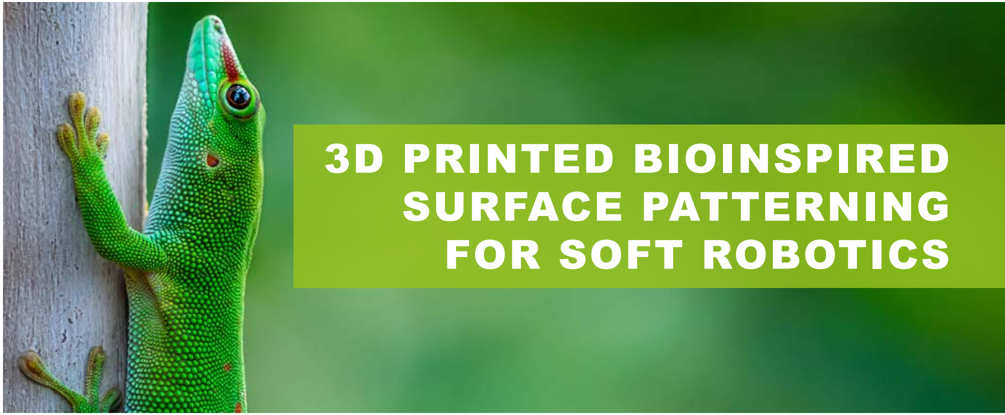


3D PRINTED BIOINSPIRED SURFACE PATTERNING FOR SOFT ROBOTICS

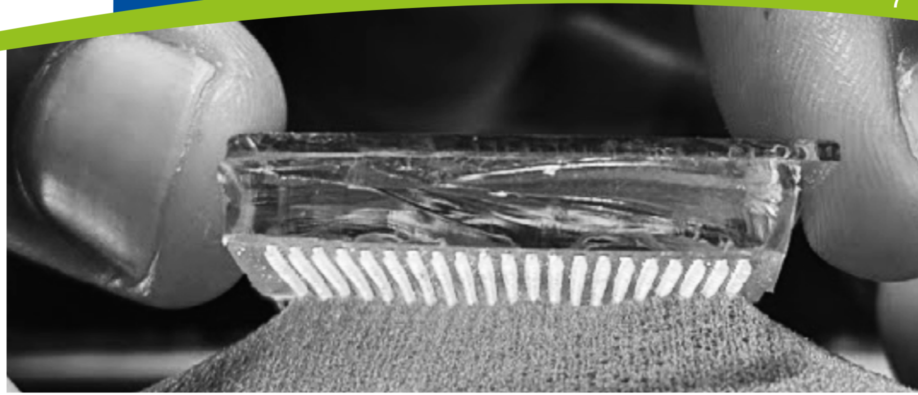
Patterned surfaces and interfaces are of paramount importance for various animal species to perform tasks for their survival. One such example can be found in the gecko, which demonstrates an exceptional ability to stick to and run on any vertical or inverted surface due to the presence of micron-to-nanometre-size features on their toes [1]. Also, in the plant world, 3D patterned surfaces with hooks can be found on the leaves of Galium aparine, commonly called catchweed, that can adhere to many surfaces [2, 3]. To understand the fundamental physical mechanisms that govern such adhesive behaviour, recreating bioinspired patterned surfaces is essential. Indeed, such studies can also inspire new, innovative designs of interfacial mechanics for new applications in robotics. However, it is still challenging to develop a simple, scalable methodology that allows a 3D structure to be realized, with overhanging features such as “mushroom” or “hook” shapes, essential for the “interlocking” mechanics so often observed in Nature.

Currently, 3D printers are the easiest and most economic tool for the direct realization of complex 3D features. While submicron resolution 3D printing can be achieved by high-end technology, scientific work involving 3D printing in many labs is regularly done with normal stereolithography printers. These stereolithography or SLA 3D printers are a subset of 3D printers which use UV or visible light-curable resins as a 3D printing material. The liquid resin is cured layer by layer, exposing the resin selectively to light from a laser (laser-SLA), a beamer (digital light processing DLP) or a liquid crystal display (LCD). Among these, laser-SLA can fabricate the smallest of features, even those of 100 microns or less, as the minimum feature size is equal to the size of the laser beam at the focal point. It is no surprise then, that we show that this kind of simple 3D printing method can be used for patterning surfaces with small and complex features such as 3D mushroom features (Figure on this page). We also print catchweed-like hooks and an array of sharp pillars standing at a 60 degree angle. The printed features show the desired mechanical functionality, for instance, the mushroom features adhere to rough substrates such as textiles via the mechanical interlocking of the micro-mushrooms into fabric asperities. Mechanical adhesives based on interlocking can induce damage and wear and tear on surfaces.

We therefore extended our 3D printing method to create complex 3D surface patterns in polydimethylsiloxane elastomer (PDMS) using a double moulding process [4]. The methodology can be easily applied: first, the positive 3D printed structure was replicated as negative in a highly stretchable elastomer Ecoflex 0030. Then standard PDMS Sylgard 184 was cast on the Ecoflex layer and cured in the negative Ecoflex for making the 3D printed replica. Note that an important aspect to take into account is the chemical composition of the different materials and the chemical reaction involved in the process. In fact, 3D printer resins are usually composed of methacrylates, which are reactive with the vinyl-terminated siloxane presented both in the Ecoflex and PDMS. This means that if the 3D printed structure is not completely cured, it will react with the uncured Ecoflex and will chemically bond to it, making it impossible to peel off. Similar considerations are relevant when casting PDMS on Ecoflex. If the latter is not properly cured, the two silicone-based elastomers will react and seal together. We solved these issues using a chemical surface modification of the 3D printed and Ecoflex mould. Both surfaces were first activated by a plasma oven followed by a reaction with perfluorodecyltrichlorosilane (PFOTS) using a chemical vapour deposition (CVD) approach.

3D printed pattern with mushroom features on it.

Surface pattered with 3D soft mushroom features showing adhesion via mechanical interlocking of mushroom features onto a textile fabric.



Our work, which has been done in collaboration with Vittorio Saggiomo from the Bio-NanoTechnology group at Wageningen University, and Marleen Kamperman from Groningen University, shows that samples having 3D mushroom-shaped features have desirable mechanical functionality to adhere to soft and rough surfaces such as fabrics (Figure on this page) via mechanical interlocking. Although mechanical interlocking sounds like a simple process, and can occur annoyingly easily as a brief exposure to catchweed will surely confirm, there is a surprising level of microscopic dynamics occurring in the adhesion process itself. We have shown that attachment–detachment dynamics taking place at the interfaces can be experimentally accessed in great detail, revealing novel key handles for tuning the adhesive properties of soft patterned interfaces. The main target of our work is indeed to reveal the fundamentals of patterned adhesion, with the overall aim of improving the adhesive strength of these interlocking-based adhesives. A fundamental understanding of mechanical adhesion and its scaling behaviour will perhaps allow us to understand other types of dry adhesives such as gecko adhesives, where the dynamics of an individual feature is hard to visualize due to the nanometric size of the features. Our work will certainly open up new routes towards active control and thus robotic optimization of mechanical adhesion, for example by embedding microfluidics or electromagnetic control features in the patterned adhesives. This work therefore naturally fits in the framework of the 4TU Soft Robotics initiative (https://dutchsoftrobotics.nl/), a collaborative Dutch research effort from the four technical universities in the Netherlands to develop enhanced soft robotics technology.

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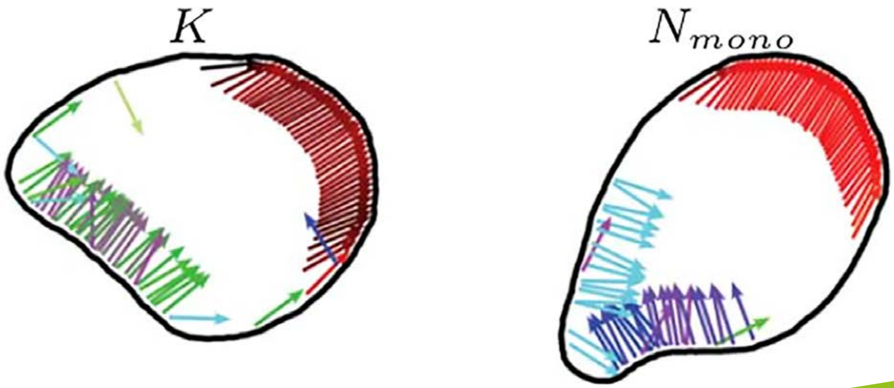
ARTIFICIAL CELLS AND SOFT MICROROBOTS: CONTROLLING SHAPE, MOTILITY, AND SENSING

Self-propulsion and navigation due to the sensing of environmental conditions – such as durotaxis and chemotaxis – are remarkable properties of biological cells that cannot be modelled by single-component self-propelled particles (such as active Brownian particles). Therefore, we introduce and study “flexocytes”, deformable vesicles with enclosed, attached, self-propelled pushing and pulling filaments that align due to steric and membrane-mediated interactions. These filaments mimic the action of actin filaments in cells, which display a treadmilling motion or are displaced relative to each other by myosin motors.

Using computer simulations in two dimensions, we show that the membrane deforms under the propulsion forces and forms shapes mimicking motile biological cells, such as keratocytes (K) and neutrophils (N).

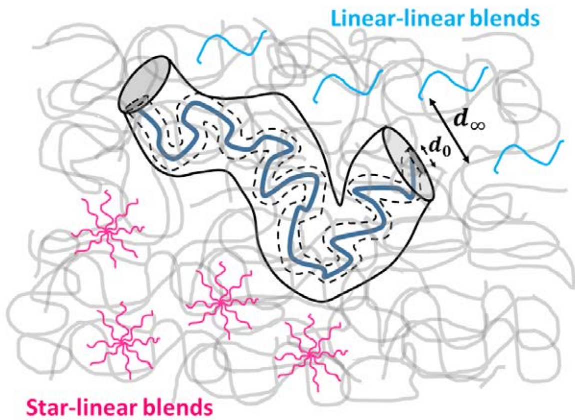
When interacting with walls or with interfaces between different substrates, the internal structure of a flexocyte reorganizes, resulting in a preferred angle of reflection or deflection, respectively. We predict a correlation between motility patterns, shapes, characteristics of internal forces, and the response to micropatterned substrates and external stimuli. We propose that engineered flexocytes with desired mechanosensitive capabilities enable the construction of soft-matter microrobots.

Read more: Abaurrea-Velasco C. et al., New J. Phys. 21, 123024 (2019)
SoftComp partner: Forschungszentrum Jülich – Theoretical Physics of Living Matter



A flexible membrane ring is pulled or pushed (indicated by arrows) by internal self-propelled filaments. Filaments mutually interact repulsively via membrane deformation, and thereby align parallel to each other in clusters.

Schematic representation of the tube dilation in linear-linear and star-linear blends. The undilated tube has a diameter and increases with time as a consequence of constraint release (CR) – relaxation of a given chain driven by the motions of surrounding chains.



DIRECT OBSERVATION OF TUBE DILATION IN POLYMER BLENDS

The viscoelastic properties of high molecular weight polymer melts are controlled by entanglements: topological constraints imposed by mutually interpenetrating and uncrossable chains. In the tube model for entangled chains, these constraints are represented by a fictitious tube that restricts the lateral motion of a chain within its diameter leading to creep motion – reptation – along the tube. However, this model fails to explain the behaviour of polymeric materials with increased compositional complexity. In particular, an open question is how the topological constraints are released by mobile neighbouring chains or, in other words, how the constraining 'tube' is dilated.

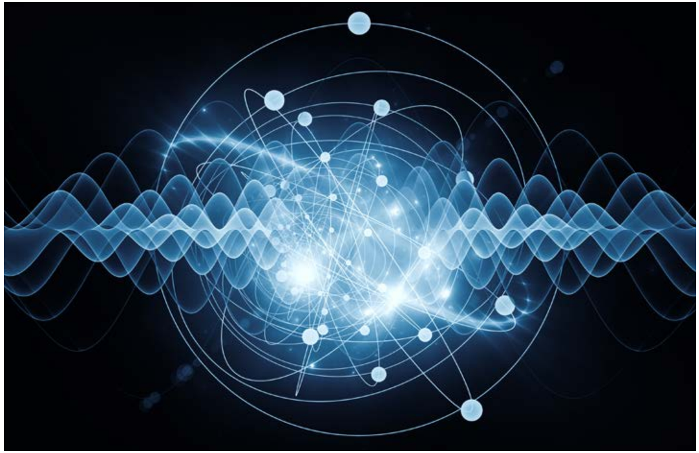
The effective tube dilation of long chains in blends with shorter chains can be determined by measuring the terminal chain relaxation time with macroscopic techniques such as dielectric spectroscopy (DS) and rheology. However, these techniques cannot resolve the time evolution of the tube diameter. In a recent collaboration between the University of the Basque Country and Forschungszentrum Jülich, we exploit the spatial and time resolution of neutron spin echo (NSE) to directly probe the time-dependent tube dilation in blends of entangled polymers blended with small polymers of different topologies: linear and stars. By combining NSE with rheology and DS, the characteristic time that governs tube dilation is identified as the terminal time of the short component. This finding will help elucidate the mechanism for constraint release, and thus will facilitate the design of polymeric materials with optimal rheological properties.

Read more: P. Malo de Molina et al., Phys. Rev. Lett. 123, 187802 (2019)

SoftComp partners: University of the Basque Country and Forschungszentrum Jülich – Neutron Scattering and Biological Matter

ACHIEVING LONG SPIN DIFFUSION LENGTHS IN CARBON-BASED SEMICONDUCTORS

Carbon-based semiconductors such as conjugated organic polymers are of potential use in the development of spintronic devices and spin-based information processing. In particular, these materials offer a low spin–orbit coupling strength due to their relatively light constituent chemical elements, which should, in principle, favour long spin diffusion lengths.



However, organic polymers are relatively disordered materials and typically have a carrier mobility that is orders of magnitude lower than crystalline inorganic materials. As a result, small spin diffusion lengths of around 50 nm have typically been measured using vertical organic spin valves. Here, we report measuring spin diffusion lengths in doped conjugated polymers using a lateral spin transport device architecture, which is based on spin pumping injection and inverse spin Hall detection. The approach suggests that long spin diffusion lengths of more than 1 µm and fast spin transit times of around 10 ns are possible in conjugated polymer systems when they have a sufficiently high spin density (around $10^{20}\,cm^{-3}$). We explain these results in terms of an exchange-based spin diffusion regime in which the exchange interactions decouple spin and charge transport.

Read more: Wang S.-J. et al., Nat. Electr. 2, 98 (2019)

SoftComp partner: University of Mainz

Atom (symbolic image)

ISMC2019 plenary talks were held in the impressive McEwan Hall.

ISMC 2019: Spectacular settings in Edinburgh

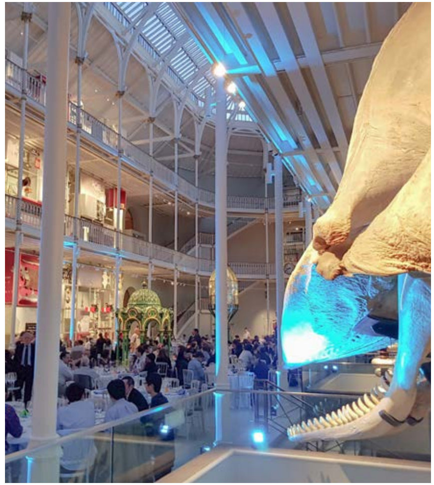
The fifth International Soft Matter Conference took place in Edinburgh from 03-07 June in 2019. It attracted 500 delegates from all over the world, although the majority were from Europe. We heard from eight outstanding plenary speakers in the iconic setting of McEwan Hall, (shown above), which was presented to the University of Edinburgh in 1897 by the brewer William McEwan as a ceremonial space for graduations and other functions.

Lydéric Bocquet from Paris told us about flow and rheology at small scales, Montpellier's Luca Cipelletti introduced us to his work on the failure of soft solids, Stephen L. Craig from Duke explained how macromolecules can sense mechanical stress, while Marileen Dogterom of Delft opened up the ambitious topic of building synthetic cells. Kohzo Ito from Tokyo showed us how his work on tough polymers led to the construction of the first all-polymer car body, Edinburgh local Cait MacPhee bravely battled tonsillitis to introduce us to the soft matter physics of bacterial biofilms, while Susan Perkin from Oxford used the metaphor of a 'cabinet of curiosities' to tell a number of intriguing stories about electrostatics in soft matter. The list of plenary speakers was completed by Bangalore's Sriram Ramaswamy, who offered us a number of cameos from theoretical active matter physics.

Tim White from Colorado, the 2019 Royal Society of Chemistry Soft Matter Prize winner, received his award at the conference, and gave a lecture on 'Pixelated Polymers: Programming Function into Liquid Crystalline Polymer Networks and Elastomers'.

The 32 parallel sessions were organized around nine topics with 18 keynote speakers. Two poster sessions enabled 400 presenters to showcase their work. Catering throughout the conference, including drinks at the poster sessions and a memorable banquet in the magnificent hall of the National Museum of Scotland, (shown below), was sponsored by 13 organizations and companies.

by W. Poon



The National Museum of Scotland gave the conference banquet a truly exceptional setting.

SoftComp supports dissemination

One of the roles of the SoftComp consortium is to support the dissemination of scientific and technological knowledge among partners and others, and to provide the means to support the training and education of research students. As a result, a stimulating programme of conferences, workshops, laboratory courses, schools, and inter-institute visits is organized by SoftComp members and supported by SoftComp year on year. The yearly Annual Meeting organized by SoftComp was attended by 120 soft matter scientists in 2019.

SoftComp furthermore agreed to support the following events in 2019:

- Conference: Granular matter across scales, 18.-22.03.2019, Leiden, the Netherlands
- SoftComp Topical Workshop: Edible soft matter, 17.-19.04.2019, Le Mans, France: https://ediblesoftmat.sciencesconf.org/
- International Soft Matter Conference 2019, 03.-07.06.2019, Edinburgh, UK, see report on page 11 and www.ismc2019.ed.ac.uk/
- Ampere School 2019, 23.-29.06.2019, Zakopane, Poland
- SoftComp Topical Workshop: Polymers in fast flows, 28-31.07.19, Capri, Italy: www.dodynet.eu/workshop-july-2019/
- European Rheology School 2019, 01.-06.09.19, Leuven, Belgium: https://cit.kuleuven.be/smart/rheoschool
- JCNS Laboratory Course Neutron Scattering 2019, 02.-13.09.19, Jülich/Garching, Germany: www.fz-juelich.de/jcns/LabCourse/

Motile Active Matter

26 – 29 October 2020
(New date due to Corona)

Jülich, Germany

International Conference, organized by the DFG Priority Programme SPP 1726: Microswimmers – From Single Particle Motion to Collective Behaviour. Active matter is a novel class of nonequilibrium materials composed of a large number of agents, which consume energy and generate directed motion. Topics of this conference include:

- Cells and Microorganisms
- Artificial and Biological Microswimmers
- Collective Behaviour
- Steering and Navigation
- Confinement and External Fields
- Statistical Mechanics of Active Matter

spp-microswimmers@fz-juelich.de
www.fz-juelich.de/ics/Microswimmers-International-Conference-2020

Group photo taken during the 2019 Joint Annual Meeting of SoftComp and EUSMI.

Annual European Rheology Conference (AERC) 2021

7 – 9 April 2021

Seville, Spain

Rheologists from all scientific fields, from academia to industry, are invited to submit contributions.

http://rheology-esr.org/aerc-2021/

SoftComp Annual Meeting 2021

Probably late May/early June 2021

Ischia, Italy

The SoftComp Annual Meeting represents a forum for all SoftComp participants to discuss scientific work accomplished and the implementation of future goals. Due to the Coronavirus, no meeting will take place in 2020. More information on the 2021 meeting will be announced in due course.

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https://eu-softcomp.net/news/meetings/

JCNS Laboratory Course - Neutron Scattering 2021

30 August – 10 September 2021

Jülich and Garching, Germany

Lectures on neutron scattering, instruments, and their applications at Forschungszentrum Jülich. Hands-on experience with the instruments at the Heinz Maier-Leibnitz Zentrum MLZ in Garching. The course is open to students with a BSc or equivalent in physics, chemistry, material science, or biology. Organized by Forschungszentrum Jülich, in cooperation with RWTH Aachen University.

neutronlab@fz-juelich.de

www.neutronlab.de

European Rheology School

Probably in early September 2021

Leuven, Belgium

The European School on Rheology is an intensive short course designed to give practicing engineers and scientists an understanding of the fundamentals of rheology, its principles of measurement and its application to problem-solving. The up-coming course will be the 18th School on Rheology organized at the University of Leuven.

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https://cit.kuleuven.be/smart/rheoschool

34th Conference of the European Colloid and Interface Society (ECIS) 2021

5 – 10 September 2021

(New date due to Corona)

Athens, Greece

ECIS is a voluntary, non-profit organization of scientists. Its objective is to advance colloid and interface science and to promote cooperation between European scientists. Particular emphasis is placed on the support of early-career researchers. ECIS seeks to cooperate with existing national Societies in European countries as well as with other international organizations. ECIS Annual Conferences cover fundamental and applied advances in the field of colloids and interfaces.

info@ecis2020.org

https://www.ecis2020.org/

Universitat Rovira i Virgili (URV), Spain, has been accepted as a new SoftComp partner; we are now waiting for the final documents to formalize its access to the Consortium. URV is located in the Catalan cities of Tarragona and Reus.

SoftComp hired a **Social Media Officer** in 2020. **Dr. Roksana Markiewicz** (Adam Mickiewicz University) is a chemist at the NanoBioMedical Centre in Poznań, Poland. She will promote and connect SoftComp initially via two newly created SoftComp social media profiles: @SoftCompNetwork on Twitter and SoftComp Consortium on LinkedIn.

Two new **Innovative Training Networks** have been granted funding from the European Union, each of them for 15 PhD positions from 2020 – 2024:
The scientific objective of the EU-ITN **PHYMOT** is to understand the physics of cell motility, from single cells to collective behaviour. The network is expected to have a significant impact on the rapidly growing fields of microbial motility, parasite infections, and environmental microbiology. **PHYMOT** comprises eleven academic and three private partners at the interface of physics, biology, and engineering and is administered by **Forschungszentrum Jülich**.

The EU-ITN **SuperCol** plans to get a closer look at colloidal surfaces both visually and with receptor chemistry in order to aid the development of these particle systems. The project will combine super-resolution microscopy, colloidal sciences, and advanced modelling to control, visualize and quantify, and rationally design surface-functionality to advance particle-based biomedical applications. SuperCol comprises six academic and two private core partners as well as nine associate partners and is coordinated at **Eindhoven University of Technology**.

Dr. Alexandra Bayles (ETH Zurich) will join the Department of Chemical and Biomolecular Engineering at the University of Delaware as an assistant professor in 2021. The Department is consistently ranked as one of the top Chemical Engineering departments in the US, with a strong tradition in transport phenomena and soft matter research and good relations with SoftComp.

Dr. Christian Lang (Forschungszentrum Jülich) received an “Enzo Ferroni Award for a Young Scientist” at the 33rd Conference of the European Colloid and Interface Society (ECIS 2019). The physicist received the prize for his investigations into the flow behaviour of rod-shaped colloids in suspensions and its quantitative predictions.

Prof. Dr. Luis Liz-Marzán (University of Vigo, the CIC biomaGUNE, the Basque Foundation for Science Ikerbasque, and the Centro de Investigación Biomédica en Red Bioingeniería, Biomateriales y Nanomedicina (CIBER-BBN)) has been awarded the Spanish National Research Award "Enrique Moles" in Chemical Science and Technology and the Spanish-German "Elhuyar-Goldschmidt Award". Furthermore, he was elected Corresponding Member of the Galician Royal Academy of Sciences, Full Member of the Spanish Royal Academy of Sciences, and Member of Academia Europaea.

Dr. Doreen Niether (Forschungszentrum Jülich) received a 2019 Jülich Excellence prize for her thesis work. She investigated the relation between thermophoresis and the formation of hydrogen bonds, in order to develop models to solve the 'origin of life' puzzle and to gain information about protein-ligand binding.

Prof. Wilson Poon (University of Edinburgh) was awarded the 2019 Institute of Physics Sam Edward Medal for "his outstanding contributions to the fundamental study of condensed matter physics, statistical physics and biophysics using model colloidal systems". He was also awarded the 2019 Thomas Graham Lectureship by the Joint Colloid and Surface Science Group of the Royal Society of Chemistry and the Society of Chemical Industry.

Dr. Felix Roosen-Runge (Lund University) has received the Wolfram-Prandl-Prize 2018 from the "Komitee für Forschung mit Neutronen" for "his outstanding contributions to neutron scattering studies of the phase behaviour and dynamics of protein solutions. His original work has advanced the quantitative understanding of these complex systems both experimentally and theoretically".

Dr. Benedikt Sabass (Forschungszentrum Jülich) has been awarded a Starting Grant by the European Research Council (ERC). Over five years, the physicist will receive a total of approximately € 1.5 million in funding for his research project "Quantifying minute forces: How mechanoregulation determines the behaviour of pathogenic bacteria" from the European Union's research funding programme Horizon 2020.

Dr. Kislon Voitchovsky (Durham University) has been awarded a five-year Fellowship from the Engineering and Physical Sciences Research Council (EPSRC) worth £1.17 million. The award supports the development of a novel type of microscope that will be able to track in-situ and locally the dynamics of single ions at the surface of immersed solids with a resolution exceeding 1 nanometre and 50 nanoseconds. The microscope will subsequently be used to uncover the molecular mechanisms enabling certain ions and charged molecules to migrate efficiently through composite materials while preventing others. It will also enable direct comparisons with molecular dynamics simulations.

SoftComp
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About SoftComp

SoftComp first emerged in 2004 as a Network of Excellence – a tool developed within the 6th Framework Programme of the European Commission – and continued as a self-sustaining Consortium in December 2009, when EU funding came to an end. SoftComp deals with the integration of European research, seeking to strengthen scientific and technological excellence in soft matter. In particular, it aims to establish a knowledge base for the intelligent design of functional and nanoscale soft matter composites, by overcoming the present fragmentation of this important field involved in the development of new materials at the interface of non-living and living matter, where the delicate principles of self-assembly in polymeric, surfactant and colloidal matter prevail. SoftComp has created an integrated team that is able to mobilize European potential in soft matter composite materials and thus disseminate excellence through extensive training and knowledge transfer schemes. SoftComp now consists of 39 research groups in 35 different institutions spread over 12 European countries.

For more information, please visit www.eu-softcomp.net and subscribe to our email newsletter. Or get connected with us on Twitter: @SoftCompNetwork, and LinkedIn: SoftComp Consortium.