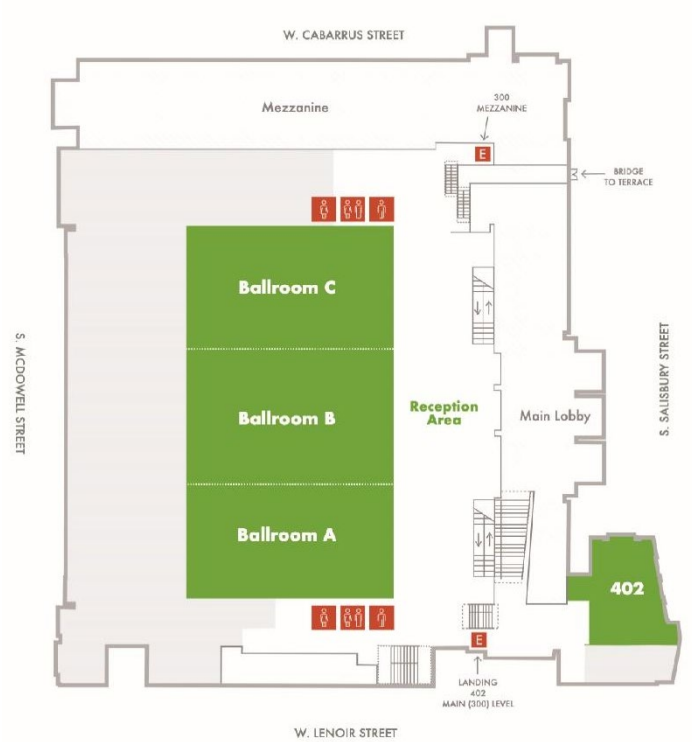


# Program of the International Soft Matter Conference 2024, Raleigh, NC

The ISMC2024 will take place in the [Raleigh Convention Center](#) in Raleigh, NC, between July 29, 2024, and August 2, 2024.

## Conference Abstract Sorting Categories:

A	Active
B	Biological
C	Colloidal
F	Fluid Dynamics & Rheology
G	Glasses, Granular & Jamming
I	Interfaces, Surfaces & Membranes
L	Liquid Crystals
M	Measurement & Characterization
N	Networks & Gels
P	Polymers
S	Self-Assembly



-  Women
-  Men
-  All-gender/Family
-  Elevator
-  Open to Below
-  Back of House

## Monday, July 29, 2024

5:00 PM – 8:00 PM – Registration (see Registration area on the map on the previous page)

6:30 PM – 8:00 PM – Conference Reception (see Reception area on the map on the previous page)

## Tuesday, July 30, 2024

7:30 AM – Registration Opens (see Registration area on the map on the previous page)

8:45 AM – Conference Opening Ceremony, Ballroom B

Opening Remarks by:

Dr. Penny Gordon-Larsen, Vice Chancellor for Research, University of North Carolina at Chapel Hill

Dr. Chris Clemens, Provost and Chief Academic Officer, University of North Carolina at Chapel Hill

Dr. Jennifer Lodge, Vice President for Research and Innovation, Duke University

Dr. Peter Fedkiw, Interim Associate Dean for Research and Infrastructure, College of Engineering at NC State University

Dr. Genevieve Garland, Senior Associate Vice Chancellor of Research, Development and Operations, NC State University

Senator Paul Newton, North Carolina State Senate

Ribbon Cutting

Conference Background and Week Review:

Michael Rubenstein, Distinguished Professor, Duke University

Aleksandar S. Vesic, Distinguished Professor, Duke University

9:15 AM – 10:00 AM - Plenary Session F, Chair: Fyl Pincus, Ballroom B

**Howard A. Stone** “Physicochemical hydrodynamics and soft matter: From thin films to molecular biology to swimming cells”

10:00 AM – 10:30 AM - Coffee Break

Session	A1 (Room 306 BC)	B1 (Room 305 AB)	P1 (Room 302 BC)	G1 (Room 301 AB)
Chair	Fred MacKintosh	Paul Janmey	Timothy Fornes	Srikanth Sastry
10:30 AM	<b>A1.1: Steve Granick</b> A skeptic's guide to active matter	<b>B1.1: Dennis Discher</b> Rigidity percolation predicts tissue viscoelasticity scaling with fibrillar collagen based on collagenase kinetics imaged by SHG	<b>P1.1: Sanat Kumar</b> Mechanism of micro and nanoplastics	<b>G1.1: Zahra Fakhraai</b> Controlling Glass Equilibration Using Soft Substrates
10:45 AM		<b>B1.2: Kinjal Dasbiswas</b> Modeling active contractility in fibrous living matter		

11:00 AM	<b>A1.2: Carles Calero</b> Self-propulsion at the nanoscale	<b>B1.3: Gijsje Koenderink</b> Living soft matter: bridging cell-free and live-cell perspectives	<b>P1.2: Daniel Rau</b> Multi-material additive manufacturing of polymeric composites with seamless soft - hard interface integration from molecular bonding	<b>G1.2: Francesco Zamponi</b> Creating equilibrium glassy states via random particle bonding
11:15 AM	<b>A1.3: Suzanne Ahmed</b> Tunability and switchability of nanomotor modes of motion utilizing biocompatible actuation methods		<b>P1.3: Alina Kirillova</b> 3D Printing of polymeric and composite porous scaffolds for biomedical applications	
11:30 AM	<b>A1.4: Clemens Bechinger</b> Brownian particles in non-equilibrium baths	<b>B1.4: Sam Safran</b> Novel mesoscale properties of protein condensates: Non-equilibrium activity and conformational freedom	<b>P1.4: Mark Ediger</b> Surface-directed assembly of structured glasses	<b>G1.3: Cacey Bester</b> Force signatures of creep in a photoelastic granular medium
11:45 AM				<b>G1.4: Kai Huang</b> Role of gravity on granular drag: From impacting on to digging into sand
12:00 PM	Sessions end			

12:00 PM - Lunch

12:15 PM – 1:00 PM - Panel Discussion 1, Ballroom B

2:15 PM – 3:00 PM - Plenary Session B, Chair: Patricia Bassereau, Ballroom B  
**Kinneret Keren** “Topological defects and their role in Hydra morphogenesis”

3:00 PM – 3:30 PM Coffee Break

Session	I1 (Room 306 BC)	B2 (Room 305 AB)	C1 (Room 302 BC)	N1 (Room 301 AB)
Chair	Beverly Asoo Stonas	José R Alvarado	Jacinta Conrad	Aniket Bhattacharya
3:30 PM	<b>I1.1: Eric Dufresne</b> Controlling interfacial tension without surfactants in biomolecular condensates	<b>B2.1: Brent Hoffman</b> Coupling during collective cell migration	<b>C1.1: Jasna Brujic</b> Colloidal protein analogs	<b>N1.1: Eric Weeks</b> Highly polydisperse colloidal gels
3:45 PM		<b>B2.2: Alexander Alexeev</b> Collective behavior of platelets in fibrin fiber clots		<b>N1.2: Liheng Cai</b> A universal strategy for decoupling stiffness and extensibility of polymer networks

4:00 PM	<b>I1.2: Yohko Yano</b> Investigating viscoelastic behavior of lipid monolayers in spontaneous oscillation of surface tension induced by the Marangoni effect	<b>B2.3: Lakshminarayanan Mahadevan</b> Endless forms most beautiful: geometry, physics and biology	<b>C1.2: Prema Sharma</b> Folding of colloidal membranes into non-Euclidian geometries	<b>N1.3: Kohzo Ito</b> Slide-ring materials for circular economy
4:15 PM	<b>I1.3: William Ducker</b> Porous thin films facilitate rapid evaporation of water droplets			
4:30 PM	<b>I1.4: Jacob Klein</b> Lipid bilayers under transmembrane fields: cell-inspired, massive electromodulation of friction	<b>B2.4: Sharon Lubkin</b> Cell packing in the notochord	<b>C1.3: Amir Pahlavan</b> Diffusiophoretic transport of colloids in disordered media	<b>N1.4: Olga Kuksenok</b> Characterizing dynamic heterogeneities and properties of degrading polymer networks
4:45 PM		<b>B2.5: Julio Belmonte</b> Connectivity and Contraction in Cytoskeletal Networks	<b>C1.4: Jeffrey Richards</b> Engineering the electrical response of conductive suspensions	<b>N1.5: C. Nadir Kaplan</b> Rapid, non-linear diffusio-phoretic swelling of chemically responsive hydrogels
5:00 PM	<b>I1.5: Di Jin</b> Thin films under an electric field	<b>B2.6: Toshiyuki Nakagaki</b> Adaptable network of veins to environmental complexity in an huge amoeboid organism of Physarum plasmodium	<b>C1.5: Ning Wu</b> Assembly of particles under orthogonally applied electric and magnetic field	<b>N1.6: Costantino Creton</b> Ionically conducting elastomers: balancing strength, reversible elasticity and conductivity
5:15 PM	<b>I1.6: Jacopo Vialetto</b> Deposition of complex colloidal assemblies from drop evaporation		<b>C1.6: Gaurav Arya</b> Machine-assisted design of effective potentials for colloidal self-assembly	
5:30 PM	Sessions end			

6:00 PM – 8:00 PM - Poster Session 1, Exhibit Hall A

### Wednesday, July 31, 2024

9:15 AM – 10:00 AM – Plenary Session A, Chair: Jean-François Joanny, Ballroom B  
**Ramin Golestanian** “Non-reciprocal active matter across the scales”

10:00 AM – 10:30 AM - Coffee Break

Session	A2 (Room 306 BC)	L1 (Room 305 AB)	F1 (Room 302 BC)	S1 (Room 301 AB)
Chair	Orlin Velev	Timothy Bunning	Charles Schroeder	Dean DeLongchamp

10:30 AM	<b>A2.1: Ludovic Berthier</b> Collective motion in very dense active matter	<b>L1.1: Chinedum Osuji</b> Polymer self-assembly and liquid demixing in the presence of liquid crystals	<b>F1.1: Véronique Trappe</b> Memory of shear flow in soft jammed materials	<b>S1.1: Madhavi Krishnan</b> A charge dependent long-ranged force drives tailored assembly of matter in solution
10:45 AM			<b>F1.2: Vanessa Ward</b> Shear Banding as a cause of Non Monotonic Stress Relaxation	
11:00 AM	<b>A2.2: Menachem Stern</b> Physical networks become what they learn	<b>L1.2: Slobodan Žumer</b> Topological soft matter: Some examples from photonics to active and biosystems	<b>F1.3: Itai Cohen</b> Viscosity Metamaterials	<b>S1.2: Erika Eiser</b> Using multivalency and superselectivity of DNA-coated colloids for whole genome detection
11:15 AM	<b>A2.3: Shengkai Li</b> Memory-induced spontaneous symmetry breaking			
11:30 AM	<b>A2.4: Julia Yeomans</b> Active nematics: A new approach to mechanobiology?	<b>L1.3: Xinyu Wang</b> Moiré effect enables versatile design of topological defects in nematic liquid crystals	<b>F1.4: Ralph Colby</b> Determination of molecular weights using a polydisperse Rouse model for semidilute unentangled polyelectrolyte and neutral polymer solutions	<b>S1.3: Thi Vo</b> Rational design of nanoparticle surface patterning for directed self-assembly
11:45 AM		<b>L1.4: Kushal Bagchi</b> Functional soft materials from the directed self-assembly of liquid crystals		<b>S1.4: Andraž Gnidovec</b> Towards controlled self-assembly of curved surfaces
12:00 PM	Sessions end			

12:00 PM - Lunch

12:15 PM – 1:00 PM - Panel Discussion 2, Ballroom B

2:15 PM – 3:00 PM – Plenary Session L, Chair: Seth Fraden, Ballroom B  
**Shu Yang** “Responsive liquid crystalline elastomeric droplets and particles”

3:00 PM – 3:30 PM Coffee Break

Session	I2 (Room 306 BC)	B3 (Room 305 AB)	P2 (Room 302 BC)	S2 (Room 301 AB)
Chair	Ryan Fuijter	James Harden	Matthew Becker	Ramón Castañeda-Priego
3:30 PM	<b>I2.1: Vivek Narsimhan</b> Pearling, buckling, and wrinkling instabilities of multicomponent vesicle threads	<b>B3.1: Oded Farago</b> Multiscale lattice modeling and simulations of heterogeneous membranes	<b>P2.1: Matthew Tirrell</b> Molecular arrangement in polyelectrolyte complex coacervates	<b>S2.1: Greg Grason</b> Misfits unite: Understanding & engineering self-limitation in geometrically frustrated

3:45 PM	<b>I2.2: Dean DeLongchamp</b> Polarized resonant soft X-ray scattering measurements in polymer-grafted nanoparticles	<b>B3.2: Valeria Milam</b> Competition -based selection of universal DNA ligands for antibody fragments		assembly
4:00 PM	<b>I2.3: Yendry Corrales Urena</b> Functionalized carbon nanocones performance in water harvesting	<b>B3.3: Ankur Jain</b> Sequence programmable nucleic acid condensates	<b>P2.2: Jacinta Conrad</b> Phage probes couple to DNA relaxation dynamics across scales and regimes	<b>S2.2: Dwaipayan Chakrabarti</b> Programming self-assembly of colloidal gyroids for advanced materials
4:15 PM	<b>I2.3.1: Penger Tong</b> AFM force clamping and extension spectroscopy studies of velvet worm slime proteins at different pH and buffer conditions	<b>B3.4: Atanu Chatterjee</b> Adapt to bend: An cooperative transport of soft rods	<b>P2.3: Thomas Schroeder</b> Triggering inorganic crystal deposition from polymer -induced liquid precursors	<b>S2.3: Edward Van Keuren</b> Multicomponent liquid -core nanocapsules synthesized with flash nanoprecipitation
4:30 PM	<b>I2.4: Abdelhamid Maali</b> Direct measurement of the hydro-capillary lift force acting on sphere moving along liquid interfaces	<b>B3.5: Cesar Rodriguez Emmenegger</b> Phagocytic synthetic cells: non-living predators to fight bacteria	<b>P2.4: Zhen-Gang Wang</b> Origin of the entropic driving force in polyelectrolyte complex coacervation	<b>S2.4: Xiaoming Mao</b> Frustrated assemblies as incompatible graphs
4:45 PM	<b>I2.5: David Cheung</b> Effect of surface chemistry on conformation and aggregation of amyloid peptides	<b>B3.6: Jay Tang</b> Gastric mucin Promotes the spread of growing bacterial swarm on agar surface		
5:00 PM	<b>I2.6: Ko Okumura</b> A hydrodynamic analog of critical phenomena: an uncountably infinite number of universality classes	<b>B3.7: Andela Šarić</b> Shape-shifting soft matter across evolution "2023 <i>Soft Matter</i> Lectureship Award"	<b>P2.5: Panayotis Benetatos</b> Stretching bistable linear polymers and loops	<b>S2.5: Yulia Shmidov</b> Self-Assembly of Recombinant Elastin-like Polypeptide
5:15 PM			<b>P2.6: Geoffrey Geise</b> Microwave dielectric relaxation spectroscopy: A technique to inform ion transport in hydrated polymer membranes	<b>S2.6: Maggie Daly</b> Design of Peptide-DNA Architectures to Build Functional Artificial Cells
5:30 PM	Sessions end			

7:00 PM – 9:00 PM - Conference Banquet, Ballroom A

### Thursday, August 1, 2024

9:15 AM – 10:00 AM – Plenary Session N, Chair: Jian Ping Gong, Ballroom B

**Zhigang Suo** "Mechanical behavior of a tanglemer – a polymer network in which entanglements greatly outnumber crosslinks"

10:00 AM – 10:30 AM Coffee Break

Session	A3 (Room 306 BC)	L2 (Room 305 AB)	P3 (Room 302 BC)	S3 (Room 301 AB)
Chair	Daphne Klotsa	Edward Samulski	Thomas Halsey	Leah Johnson
10:30 AM	<b>A3.1: Cecile Cottin-Bizonne</b> Active colloids climbing up a wall	<b>L2.1: Christopher Quinones</b> Interparticle friction in sheared, dense suspensions of rod-like particles: Simulations	<b>P3.1: Gary Grest</b> Dynamics of ring polymers	<b>S3.1: Oleg Gang</b> Programming self-assembly and transformations of nanoscale systems
10:45 AM		<b>L2.2: Thomas Parton</b> Chiral doping of a colloidal liquid crystal phase in cellulose nanocrystal suspensions		
11:00 AM	<b>A3.2: Hartmut Löwen</b> Active matter: self-propelled colloids and beyond	<b>L2.3: Ivan Smalyukh</b> Knotted chiral meta matter	<b>P3.2: Ting Ge</b> Elastomer mechanics of cross-linked ring-linear polymer blends	<b>S3.2: Timothy Lodge</b> Equilibration of block copolymer micelles: How difficult can it be?
11:15 AM			<b>P3.3: Myoem Kim</b> Dynamics of polymers with controlled distribution and density of associative groups	
11:30 AM	<b>A3.3: Orlin Velev</b> New mechanisms of active particle propulsion powered by temporally asymmetric AC fields	<b>L2.4: Timothy Atherton</b> Catching the wave: particle transport by a moving phase boundary	<b>P3.4: Kurt Kremer</b> Playing with entanglements to structure polymer materials	<b>S3.3: Kateri DuBay</b> Dissipative self-assembly within an oscillating energy landscape
11:45 AM	<b>A3.4: Nitesh Arora</b> Light-driven transformations in entangled active matter			<b>S3.4: Rae Robertson-Anderson</b> Timed material self-assembly controlled by circadian clock proteins
12:00 PM	Sessions end			

12:00 PM - Lunch

12:15 PM – 1:00 PM - Panel Discussion 3, Ballroom B

2:15 PM – 3:00 PM - Plenary Session C, Chair: Hajime Tanaka, Ballroom B  
**Emanuela Del Gado** “Soft particulate networks and their hidden hierarchical nature”

3:00 PM – 3:30 PM Coffee Break

Session	A4 (Room 306 BC)	B4 (Room 305 AB)	F2 (Room 302 BC)	G2 (Room 301 AB)
Chair	James Harden	Rae Anderson	Bavand Keshavarz	Daniel Blair



3:30 PM	<b>A4.1: Alexander Grosberg</b> Active hydrodynamics in the nucleus of a living cell	<b>B4.1: Megan Valentine</b> New approaches to designing and deploying hydrogels for force sensing and control	<b>F2.1: Yoav Tsori</b> Electrolubrication in flowing liquid mixtures	<b>G2.1: Connie Roth</b> Impact of chain connectivity and covalent bonding on the local glass transition temperature of polymers
3:45 PM			<b>F2.2: Saad Khan</b> Nanodiamond-stabilized Pickering emulsions: Microstructure and rheology	<b>G2.2: Gregory McKenna</b> Anomalous behavior of ultrastable glasses and the implications for the glass "transition"
4:00 PM	<b>A4.2: Rony Granek</b> Active fractal networks with stochastic force monopoles and force dipoles unravel subdiffusion of chromosomal loci	<b>B4.2: Peter Olmstead</b> Coupling during collective cell migration Diffusion in a multiscale model for the Stratum Corneum	<b>F2.3: Dimitris Vlassopoulos</b> Rheological challenges with polymeric gels	<b>G2.3: Annie Colin</b> Flow of non Brownian suspensions
4:15 PM	<b>A4.3: Ram Adar</b> Environment-stored memory in active matter: a framework for extra-cellular matrix remodeling	<b>B4.3: Xianting Lei</b> De-novo ATP independent contractile protein network		
4:30 PM	<b>A4.4: Rodrigo Soto</b> Kinetic theory for active Brownian particles	<b>B4.4: Ioana Illie</b> Computational engineering of responsive metaparticles	<b>F2.4: Victor Steinberg</b> Amplification of vorticity fluctuations and stochastic resonance in inertia-less viscoelastic channel flow	<b>G2.4: Sarika Maitra Bhattacharyya</b> Exploring the structural contribution to dynamics in supercooled liquids
4:45 PM		<b>B4.5: William Polacheck</b> Cell-derived matrix hydrogels with tunable mechanics for donor-derived microphysiological systems	<b>F2.5: Sara Hashmi</b> Complex fluids in confined flows	
5:00 PM	<b>A4.5: Stewart Mallory</b> Phase behavior and transport of active colloids under extreme confinement	<b>B4.6: Jérémie Palacci</b> Bacteria as blacksmiths	<b>F2.6: Anette Hosoi</b> Bio-inspired filtration: Fluid mechanics of the Manta Ray	<b>G2.5: Shima Parsa</b> Emergence of preferential flow paths in transport of emulsions in porous media
5:15 PM	<b>A4.6: Paarth Gulati</b> Asymmetry in active-passive phase separation			<b>G2.6: Vinutha H. A.</b> Stress relaxation in soft jammed materials
5:30 PM	Sessions end			

6:00 PM – 8:00 PM - Poster Session 2, Exhibit Hall A

## Friday, August 2, 2024

9:15 AM – 10:00 AM - Plenary Session M, Chair: Eugenia Kumacheva, Ballroom B  
**Roberto Cerbino** "Multiscale dynamics in inert and living soft matter"

10:00 AM – 10:30 AM - Coffee Break

Session	A5 (Room 306 BC)	B5 (Room 305 AB)	C2 (Room 302 BC)	N2 (Room 301 AB)
Chair	Andrea Liu	Liheng Cai	Preeta Datta	Stephen L. Craig
10:30 AM	<b>A5.1: Sriram Ramaswamy</b> Bulk condensation by an active interface	<b>B5.1: David Hill</b> Neutrophil Extracellular Traps (NETs) in MucO-Obstructive Pulmonary Disease.	<b>C2.1: Paul Chaikin</b> Random to ordered packings: From candies to monster crystals from space	<b>N2.1: Barbara Ruzicka</b> Dynamical and structural behaviour of PNIPAM based microgels
10:45 AM				<b>N2.2: Krassimir Velikov</b> Cellulose microfibrils: Properties and application in complex fluids and soft materials
11:00 AM	<b>A5.2: Luca Giomi</b> Phase transitions in confluent epithelia	<b>B5.3: Meera Ramaswamy</b> Morphodynamics of bacterial communities proliferating in three dimensions	<b>C2.2: Nicolas Fares</b> Confined Brownian motion of soft colloid	<b>N2.3: Monica Olvera de la Cruz</b> Controlling the structure and function of confined electrolytes
11:15 AM		<b>B5.3: Danielle German</b> Bacterial dynamics at the swarm front	<b>C2.3: Steven van Kesteren</b> Light-controlled colloidal crystallization	
11:30 AM	<b>A5.3: Gwynn Elfring</b> The hydrodynamics of active matter in inhomogeneous environments	<b>B5.4: Rebecca Schulman</b> Programmed spatiotemporal dynamics and pattern recognition in soft materials with synthetic biochemical signaling networks	<b>C2.4: Delia Milliron</b> Interactions and assemblies of colloidal nanocrystals	<b>N2.4: Michael Dickey</b> Ultra tough ionogels
11:45 AM	<b>A5.4: Mickaël Bourgoïn</b> Magnetic Janssen effect			<b>N2.5: Avisek Das</b> Correlated orientational disorder in crystalline assemblies of hard convex polyhedral
12:00 PM	Sessions end			

12:15 PM – 1:00 PM – Ballroom B Business Meeting of Soft Matter Association of the Americas and ISMC 2024 Closing Ceremony