



The Bandol Summer School on Liquid Crystals,
22 – 28 September 2024
—*Lecture schedule*

SUNDAY 22.09

19:00 - 20:00	Welcome reception (buffet dinner).	
20:00 - 20:45	Welcome lecture: The liquid crystalline state of matter and key concepts to describe it. Overview of the summer school schedule.	Jan Lagerwall
20:45 - 22:00	Welcome reception (continued).	

MONDAY 23.09

9:00-9:45	Nematics and smectics: order, symmetry and elasticity.		Sven Lagerwall
10:00 - 10:45	Optical properties, birefringence.		Per Rudquist
11:00 - 11:45	Polarized light microscopy basics		Daniel Krüerke
13.00 - 14:15	Lunch at Golf Hotel.		
14:30 - 16:00	Practical work: polarizing microscopy and “macroscopy”, birefringence and the use of phase plates, nematic textures.	Groups 1-2	Daniel Krüerke, Per Rudquist
16:30 - 18:00		Groups 3-4	
18:15 - 19:15	Phase transitions: symmetry, order parameters and theories		Frank Giesselmann
19:15 - 19:45	Questions / Discussion.		All teachers

TUESDAY 24.09

9:00-9:45	Scattering studies of liquid crystals		Frank Giesselmann
10:00 - 10:45	Synthesis and molecular design of liquid crystals 1		Stefan Jagiella (Johanna Bruckner)*
11:00 - 11:45	Identifying liquid crystal phases; polarizing microscopy textures due to birefringence and to selective reflection.		Per Rudquist
13.00 - 14:15	Lunch at Golf Hotel		

*Johanna Bruckner had a conflicting engagement, so her lectures are given by other teachers.

14:30 - 16:00	Practical work: smectic textures, phase transitions and thermotropic contact samples.	Groups 3-4	Per Rudquist, Jan Lagerwall
16:30 - 18:00	Free-standing smectic films.	Groups 1-2	
18:15 - 19:00	Field effects in nematics.		Giusy Scalia
19:05 - 19:35	Questions / Discussion.		All teachers

WEDNESDAY 25.09

9:00-9:45	Neumann's and Curie's principles. Ferro- and antiferroelectricity in smectics.		Per Rudquist
10:00 - 10:45	Computer simulation of liquid crystals 1		Stefan Jagiella
11:00 - 12:00	Overview of LCDs on the market		Per Rudquist Daniel Krüerke
13.00 - 14:15	Lunch at Golf Hotel		
14:30 - 16:00	Practical work: (1) computer modeling of meso-gen structure and comparison with x-ray diffraction data; (2) The Frederiks transition + 'smart windows' from PDLCs.	Groups 1-2	Stefan Jagiella & Frank Giesselmann; Giusy Scalia, Daniel Krüerke
16:30 - 18:00		Groups 3-4	
18:15 - 19:00	Singularities in nematics and smectics: From hedgehogs to focal conics. The Volterra Process.		Sven Lagerwall
19:05 - 19:35	Questions / Discussion.		All teachers

THURSDAY 26.09

9:00-9:45	Mixtures and phase diagrams.		Jan Lagerwall
10:00 - 10:45	Lyotropic liquid crystals from amphiphiles.		Frank Giesselmann (Johanna Bruckner)*
11:00 - 11:45	Liquid crystals containing micro- and nanoparticles: from Onsager theory to colloidal stability.		Giusy Scalia
12:00 - 12:45	Liquid crystals in motion: from anisotropic viscosities to active nematics.		Jan Lagerwall

Afternoon free

FRIDAY 27.09

9:00-9:45	The Poincaré Sphere and Mauguin's analysis of the optics of twisted nematics.		Sven Lagerwall
10:00 - 10:45	Synthesis and molecular design of liquid crystals 2		Daniel Krüerke (Johanna Bruckner)*

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11:00 - 11:45	Cholesterics, blue phases and their applications: the optics of helicoidally modulated birefringence.		Jan Lagerwall
13.00 - 14:15	Lunch at Golf Hotel.		
14:30 - 16:00	Practical work: particle and surfactant lyotropics and surfactant+solvent+cosurfactant phase diagrams. Lyotropic contact samples.	Groups 3-4	Giusy Scalia Frank
16:30 - 18:00		Groups 1-2	Giesselmann
18:15 - 18:45	Computer simulation of liquid crystals 2.		Stefan Jagiella
18:45 - 19:00	Introduction to tensor formalism		Sven Lagerwall
19:05 - 19:35	Questions / Discussion		All teachers

SATURDAY 28.09

9:00-10:00	The zoo of new nematic phases		Frank Giesselmann
10:15 - 10:45	Discotic thermotropics: self-assembled structures and applications.		Giusy Scalia
11:00 - 11:45	Liquid crystal polymers, including elastomers.		Jan Lagerwall
13.00 - 14:15	Lunch at Golf Hotel.		
14:30 - 16:00	Practical work: cholesteric textures (selective reflection and fingerprint) and field-induced helix unwinding. Comparison with cholesteric structures in biology.	Groups 1-2	Daniel Krüerke
16:30 - 18:00		Groups 3-4	Jan Lagerwall
20:30 - 21:30	Farewell buffet.		
21:30 - 22:00	Farewell lecture: Liquid crystals and life.		Daniel Krüerke
22:00 - 23:00	Farewell buffet (continued).		

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