



The Bandol Summer School on Liquid Crystals,
 25 September – 1 October 2022
 —*Lecture schedule*

SUNDAY 25.09

19:00 - 20:00	Welcome reception (buffet dinner).	
20:00 - 20:30	Welcome lecture: The liquid crystalline state of matter and key concepts to describe it. Overview of the summer school schedule.	Jan Lagerwall
20:30 - 22:00	Welcome reception (continued).	

MONDAY 26.09

9:00-9:45	Nematics and smectics: order, symmetry and elasticity.		Frank Giesselmann
10:00 - 10:45	Optical and dielectric properties, birefringence.		Per Rudquist
11:00 - 11:45	Polarized light microscopy basics		Jan Lagerwall
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	Giusy Scalia, Per Rudquist
16:30 - 18:00		Groups 3-4	
18:15 - 19:15	Scattering studies of liquid crystals		Frank Giesselmann
19:15 - 19:45	Questions / Discussion.		All teachers

TUESDAY 27.09

9:00-9:45	Phase transitions: symmetry, order parameters and theories		Frank Giesselmann
10:00 - 10:45	Singularities in nematics and smectics: From hedgehogs to focal conics. The Volterra Process.		Stefan Jagiella
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		

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	Computer simulation of liquid crystals 1		Stefan Jagiella
19:05 - 19:35	Questions / Discussion.		All teachers

WEDNESDAY 28.09

9:00-9:45	Mixtures and phase diagrams.		Jan Lagerwall
10:00 - 10:45	Lyotropic liquid crystals from amphiphiles.		Johanna Bruckner
11:00 - 11:45	Liquid crystals containing micro- and nanoparticles: from Onsager theory to colloidal stability.		Giusy Scalia
12:00 - 12:45	Synthesis and molecular design of liquid crystals 1		Johanna Bruckner

Afternoon free

THURSDAY 29.09

9:00-9:45	The Poincaré Sphere and Mauguin's analysis of the optics of twisted nematics.		Giusy Scalia
10:00 - 10:45	Synthesis and molecular design of liquid crystals 2		Johanna Bruckner
11:00 - 11:45	Cholesterics 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 1/2	Johanna Bruckner Frank Giesselmann
16:30 - 18:00		Groups 3/4	
18:15 - 19:00	Computer simulation of liquid crystals 2.		Stefan Jagiella
19:05 - 19:35	Questions / Discussion		All teachers

FRIDAY 30.09

9:00-9:45	Field effects in nematics.		Giusy Scalia
10:00 - 10:45	Neumann's and Curie's principles. Ferro- and antiferroelectricity in smectics.		Per Rudquist
11:00 - 11:45	The zoo of new nematic phases		Frank Giesselmann
13.00 - 14:15	Lunch at Golf Hotel.		

14:30 - 16:00	Practical work: (1) computer modeling of mesogen structure and comparison with x-ray diffraction data; (2) The Frederiks transition + 'smart windows' from PDLCs.	Groups 3/4	Stefan Jagiella, Johanna Bruckner/ Per Rudquist Giusy Scalia
16:30 - 18:00		Groups 1/2	
18:15 - 19:00	Liquid crystals in motion: from anisotropic viscosities to active nematics.		Jan Lagerwall
19:05 - 19:35	Questions / Discussion.		All teachers

SATURDAY 01.10

9:00-10:00	Overview of LCDs on the market.		Per Rudquist
10:15 - 10:45	Discotic thermotropics: self-assembled structures and applications.		Giusy Scalia
11:00 - 11:45	Liquid crystal polymers and 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	Per Rudquist
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.		Johanna Bruckner
22:00 - 23:00	Farewell buffet (continued).		