



The Bandol Summer School on Liquid Crystals,  
23 - 29 September 2018  
—*Lecture schedule*

SUNDAY 23.09

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 24.09

9:00-9:45	Nematics, cholesterics and the basic smectic phases: order, symmetry and elasticity.	Sven Lagerwall	
10:00 - 10:45	Optical and dielectric properties, birefringence.	Per Rudquist	
11:00 - 11:45	Polarized light microscopy.	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	Jan Lagerwall, Giusy Scalia, Per Rudquist
16:30 - 18:00		Groups 3-4	
18:15 - 19:00	Chemistry 1: designing thermotropic mesogens.	Stefan Jagiella	
19:05 - 19:35	Questions / Discussion.		

## TUESDAY 25.09

9:00-9:45	Phase transitions: symmetry, order parameters and appearance in the polarizing microscopy.		Frank Giesselmann
10:00 - 10:45	Singularities in nematics and smectics: From hedgehogs to focal conics. The Volterra Process.		Sven Lagerwall
11:00 - 11:45	Identifying liquid crystal phases and understanding selective reflection and polarizing microscopy textures.		Daniel Krüerke
13.00 - 14:15	Lunch at Golf Hotel		
14:30 - 16:00	Practical work: (1) smectic and cholesteric textures, phase transitions. Free-standing smectic films; (2) Selective reflection from cholesterics and from beetles with cholesteric-like chitin exoskeletons, contact samples.	Groups 3/4	Daniel Krüerke Per Rudquist Giusy Scalia Jan Lagerwall
16:30 - 18:00		Groups 1/2	
18:15 - 19:00	Chemistry 2: Amphiphiles and chromonics; design and function.		Stefan Jagiella
19:05 - 19:35	Questions / Discussion.		

## WEDNESDAY 26.09

9:00-9:45	Liquid crystals containing micro- and nanoparticles: from Onsager theory to colloidal stability.		Giusy Scalia
10:00 - 10:45	Mixtures and phase diagrams.		Jan Lagerwall
11:00 - 11:45	Lyotropic liquid crystals from amphiphiles.		Frank Giesselmann
12:00 - 12:45	Computer simulation of liquid crystals 1		Stefan Jagiella

*Afternoon free*

## THURSDAY 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	X-ray structural studies 1: short and long range order.		Frank Giesselmann
11:00 - 11:45	Liquid crystals in motion: from anisotropic viscosities to active nematics.		Jan Lagerwall Giusy Scalia
13.00 - 14:15	Lunch at Golf Hotel.		
14:30 - 16:00	Practical work: particle and surfactant lyotropic liquid crystals and surfactant+solvent+cosurfactant phase diagrams.	Groups 3-4	Jan Lagerwall Frank Giesselmann Giusy Scalia
18:15 - 19:00			
19:05 - 19:35	Questions / Discussion		

## FRIDAY 28.09

9:00-9:45	X-ray structural studies 2: nematics and smectics.		Frank Giesselmann
10:00 - 10:45	Field effects in nematics.		Per Rudquist
11:00 - 11:45	Neumann's Principle and Hermann's Theorem. Ferroelectric and antiferroelectric liquid crystals.		Sven Lagerwall
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) Frederiks transition & field-induced helix unwinding.	Groups 1/2	Per Rudquist Daniel Krüerke Stefan Jagiella, Frank Giesselmann
16:30 - 18:00		Groups 3/4	
18:15 - 19:00	Flexoelectricity, polar effects in chiral smectics (from chiral or non-chiral mesogens).		Per Rudquist
19:05 - 19:35	Questions / Discussion.		

## SATURDAY 29.09

9:00-9:45	Overview of LCDs on the market.		Per Rudquist Daniel Krüerke
10:00 - 10:45	Discotic thermotropics: structure, design 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	Students' choice; reviews or new issues (examples: conoscopy, discotic textures, ferroelectric/antiferroelectric switching, tactoid and droplet analysis, PDLCs, ...).		All teachers
16:30 - 18:00			
18:15 - 19:00	Blue phases, the Kerr effect, and displays based on the Kerr effect (e.g. the Blue Phase Display).		Sven 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).		