

# Symposium New Trends in Nonequilibrium Physics: Conservation Laws and Nonreciprocal Interactions (SYNP)

jointly organized by  
the Dynamics and Statistical Physics Division (DY),  
the Biological Physics Division (BP),  
the Chemical and Polymer Physics Division (CPP), and  
the Physics of Socio-economic Systems Division (SOE)

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Nonequilibrium phase transitions and pattern formation are known from numerous examples of open systems, where external reservoirs and gradients prevent relaxation to thermodynamic equilibrium. In recent years, related research in biology and soft matter systems in physics and chemistry has increasingly focused on active matter, where energy is injected locally. This often involves mass conservation constraints and, in many cases, in addition non-reciprocal interactions of the involved entities, such as macromolecules or cells. Both have far reaching consequences on the universal dynamical behavior of a wide range of nonequilibrium systems and require classical concepts of non-linear and statistical physics, such as phase transitions, to be reconsidered and developed further. For example, well-known approaches to nonequilibrium pattern formation require substantial extensions to address conserved systems. Thus, recent theoretical studies in this field have revealed many novel phenomena, such as arrested coarsening, odd elasticity, oscillatory phase separation, persistent wave dynamics, and active turbulence. Many of these aspects have by now been confirmed by experimental findings, for example, in intracellular pattern formation or collective dynamics in colloidal systems. This symposium will provide a well-balanced overview of experimental and theoretical progress in this new, exciting area.

## Overview of Invited Talks and Sessions

(Lecture hall H 0105)

### Invited Talks

SYNP 1.1	Thu	15:00–15:30	H 0105	<b>Universality classes of nonequilibrium phase transitions with conservation constraints</b> — ●WALTER ZIMMERMANN
SYNP 1.2	Thu	15:30–16:00	H 0105	<b>The many faces of living chiral crystals</b> — ●NIKTA FAKHRI
SYNP 1.3	Thu	16:00–16:30	H 0105	<b>Non-reciprocal pattern formation of conserved fields</b> — ●FRIDTJOF BRAUNS, M CRISTINA MARCHETTI
SYNP 1.4	Thu	16:45–17:15	H 0105	<b>Phase transitions and fluctuations of nonreciprocal systems</b> — ●SARAH A.M. LOOS
SYNP 1.5	Thu	17:15–17:45	H 0105	<b>Chiral matters</b> — ●WILLIAM IRVINE

### Sessions

SYNP 1.1–1.5	Thu	15:00–17:45	H 0105	<b>New Trends in Nonequilibrium Physics: Conservation Laws and Nonreciprocal Interactions</b>
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