

## Symposium Chirality meets ultrafast (SYCU)

jointly organized by  
the Molecular Physics Division (MO) and  
the Quantum Optics and Photonics Division (Q)

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Chiral molecules, including elementary building blocks of life such as amino acids, are molecules which are not superimposable on their mirror images. Their chiral structures, and the chiral complexes they form, facilitate molecular recognition. It is this chiral recognition which enables our senses of smell and taste. Chiral recognition is also crucial in pharmaceutical applications – it allows us to metabolize drugs. This is why understanding chiral interactions and distinguishing different enantiomers of a chiral molecule are such important problems with applications in physics, chemistry, biology, and medicine.

We are currently witnessing a revolution in our ability to use light to discriminate chiral molecules and to resolve the chiral electronic and nuclear dynamics underlying chiral functions. Since the times of Louis Pasteur in the XIX-th century, molecular chiral recognition with light relied on weak interaction between the molecule and the magnetic-field component of the light wave. This symposium will spotlight a disruptive step, the electric-dipole revolution, in chiral discrimination, which enabled the extremely efficient interaction between light and chiral matter. This opened the way not only to ultrafast imaging, but also to controlling such interactions in chiral molecules on various time scales, from electronic and vibronic to rotational, and eventually even to spatially separate enantiomers. Efficient control over chiral light-matter interactions requires a new type of light, i.e., a synthetic chiral electric field, which is fundamentally different from the circularly polarized light we are familiar with.

## Overview of Invited Talks and Sessions

(Lecture hall Audimax)

### Invited Talks

MO 3.1	Tue	10:45–11:15	H3	<b>Photoelectron circular dichroism in the light of resonance enhanced multi-photon ionization</b> — ●THOMAS BAUMERT
SYCU 1.1	Tue	14:00–14:30	Audimax	<b>Overview of the temporal dependencies of Photoelectron Circular Dichroism</b> — ●VALERIE BLANCHET
SYCU 1.2	Tue	14:30–14:45	Audimax	<b>Ultrafast, all-optical, and highly enantio-sensitive imaging of molecular chirality</b> — ●DAVID AYUSO
SYCU 1.3	Tue	14:45–15:00	Audimax	<b>Hyperfine interactions in rotational chiral states</b> — ●ANDREY YACHMENEV
SYCU 1.4	Tue	15:00–15:30	Audimax	<b>Chiral molecules in an optical centrifuge</b> — ●VALERY MILNER, ALEXANDER MILNER, ILIA TUTUNNIKOV, ILYA AVERBUKH
SYCU 1.5	Tue	15:30–16:00	Audimax	<b>Enantiomer-selective controllability of asymmetric top molecules</b> — ●MONIKA LEIBSCHER

### Sessions

SYCU 1.1–1.5 Tue 14:00–16:00 Audimax **Chirality meets ultrafast**

### Session about chirality within MO

MO 3.1–3.8 Tue 10:45–13:00 H3 **Chirality**