

# Symposium Optics and Light-Matter Interaction with Excitons in 2D Materials (SYLM)

jointly organized by  
 the Semiconductor Physics Division (HL),  
 the Thin Films Division (DS),  
 the Surface Science Division (O), and  
 the Low Temperature Physics Division (TT)

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Atomically thin two-dimensional materials have advanced to the point where they are becoming highly appealing for the study of novel quantum physics and for constructing emergent photonic, electronic and photochemical devices using tailored 2D-heterostructures. The most prominent monolayer 2D material, graphene, has a bandstructure in its pristine form without an electronic bandgap. In contrast, monolayers of transition metal dichalcogenides (TMDCs) tend to be direct gap semiconductors with a bandgap in the visible to near-infrared spectral range. Moreover, the two-dimensional nature of these monolayered semiconductors give rise to very strong excitonic effects, even at ambient conditions and their strong light-matter interactions and spin-valley properties make them highly interesting for e.g. opto-valleytronics and novel coherent light sources. Intriguingly, TMDC crystals can host strongly localized excitons, which result in the possibility to emit quantum light. In this symposium the current status and prospects of the very rapidly evolving field of TMDC research will be summarised including materials properties and synthesis and the exploration of phenomena such as quantum light emission, coherent laser action, spinor excitonics and cavity quantum electrodynamics.

## Overview of Invited Talks and Sessions

(Lecture room HSZ 02)

### Invited Talks

SYLM 1.1	Thu	15:00–15:30	HSZ 02	<b>Light matter interaction in TMDs and their heterostructures</b> — •URSULA WURSTBAUER
SYLM 1.2	Thu	15:30–16:00	HSZ 02	<b>Quantum optics with deterministically positioned quantum emitters in a two-dimensional semiconductor</b> — •BRIAN GERARDOT
SYLM 1.3	Thu	16:00–16:30	HSZ 02	<b>Light-matter coupling with atomic monolayers in microcavities</b> — •CHRISTIAN SCHNEIDER
SYLM 1.4	Thu	17:00–17:30	HSZ 02	<b>Properties of Synthetic 2D Materials and Heterostructures</b> — •JOSHUA ROBINSON
SYLM 1.5	Thu	17:30–18:00	HSZ 02	<b>Exciton spectroscopy in transition metal dichalcogenide monolayers and van der Waals heterostructures</b> — •BERNHARD URBASZEK
SYLM 1.6	Thu	18:00–18:30	HSZ 02	<b>Strain-induced single-photon emitters in layered semiconductors</b> — •RUDOLF BRATSCHITSCH

### Sessions

SYLM 1.1–1.6	Thu	15:00–18:30	HSZ 02	<b>Optics and Light-Matter Interaction with Excitons in 2D Materials (SYLM)</b>
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