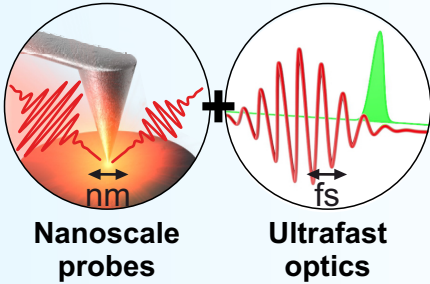




The Nanoworld in Motion

RUN. Regensburg Center for Ultrafast Nanoscopy

2 PhD POSITIONS IN ULTRAFAST NANO-OPTICS

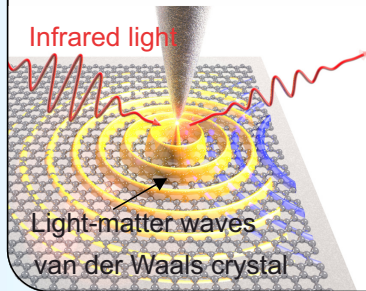


Modern microscopes readily capture still images of **van der Waals materials**. Yet, to realize the full potential of the material class for science and nanotechnologies, the processes that give rise to the exciting functionalities of quantum materials need to be captured on their intrinsic length and time scales.

Our newly established junior group “*Subcycle Nano-Optics*” at the RUN is eager to record **slow-motion movies** of the following phenomena with few-nanometer ($1 \text{ nm} = 10^{-9} \text{ m}$) and few-femtosecond ($1 \text{ fs} = 10^{-15} \text{ s}$) resolution:

TOPIC 1 - PROPAGATION DYNAMICS OF HYBRID LIGHT-MATTER WAVES

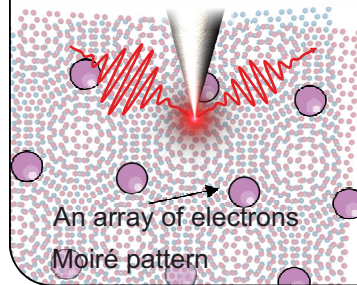
Light can oscillate in unison with the motions of charge carriers or the crystal lattice, leading to a propagation across the surface of a material with a strongly reduced wavelength.



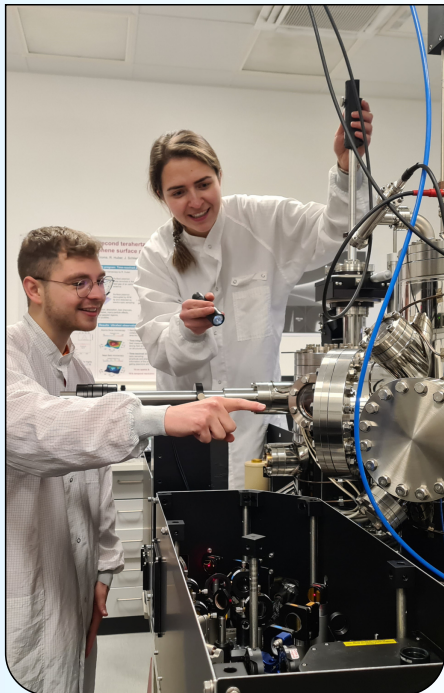
We want to control such nano-light on ultrafast time scales and thus reveal its potential as a future information carrier.

TOPIC 2 - ELECTRON-HOLE PAIRS IN TWISTED 2D MATERIALS

When two layers are stacked on top of each other with a slight twist, an interference (moiré) pattern emerges. This represents a potential landscape that affects the electron-hole pairs in the system.



We want to resolve the local effects on the ultrafast dynamics of electron-hole pairs and on their mutual influence on each other (correlations).



Your Job:

- contribute to the development of unique ultrafast nanoscopy setups
- investigate ultrafast quantum dynamics that nobody has seen before
- have fun working on these topics with your colleagues
- share your results in scientific publications and at conferences

Your profile:

- a Master's degree in physics, nanoscience, etc.
- a high level of motivation and a curiosity for ultrafast nanoscopy
- ideally: some experience with femtosecond lasers and/or atomic force, scanning tunnelling, near-field microscopy
- proficiency in written and spoken English
- basic programming skills, e.g. in MATLAB, Python, ...

Our offer:

- scientific mentoring in a small and dynamic research group
- an exciting work environment in the newly constructed RUN building
- the opportunity to participate in national and international conferences

The two positions are for fixed terms of 3 years each, starting in **April 2024**. Pay in line with 75% of pay group 13 of the Collective Agreement for the Public Service (TV-L E13).

Regensburg Center for Ultrafast Nanoscopy, Germany (<https://www.run-regensburg.com/>)

Interested? Then send an email to **Dr. Fabian Mooshammer** (fabian.mooshammer@ur.de).

I am happy to discuss further details in person or over the phone.

