



# Innsbruck Physics Colloquium

## Single-photon emitters in atomically thin materials

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Graphene is known as a prototypical two-dimensional material with unique physical properties. However, the difficulty of creating an optical band gap stimulated the search for other monolayer materials.

Atomically thin transition metal dichalcogenides serve as a promising new material class for opto-electronics. In contrast to thicker crystals, monolayers of  $\text{MoS}_2$ ,  $\text{WS}_2$ ,  $\text{MoSe}_2$ , and  $\text{WSe}_2$  exhibit prominent photoluminescence at room temperature. Recently, we have discovered bright and stable single-photon emitters in single layers of  $\text{WSe}_2$ , which renders atomically thin semiconductors also interesting for quantum optics. In my talk, I will show that these quantum light sources are strain-induced and demonstrate deterministic positioning of the emitters on the nanoscale. Furthermore, I will present single-photon emission from the layered monochalcogenide semiconductor GaSe and provide evidence that the incorporated non-classical light sources are also strain-induced. Finally, I will demonstrate that single-photons from GaSe emitters can be routed in waveguides on a photonic chip.

**Colloquium: Tuesday, 17.04.2018**  
**17:15 h in lecture hall C**

**DK-ALM Pre-Talk: 16:30 h**

Maximilian Prilmüller

**Quantum Dots as sources of nonclassical light**

Snacks will be provided in between the pre-talk and the colloquium.

