Tnano 2020

International Workshop on Nanotechnology (Tnano20)
October 5 – 8, 2020, in Tbilisi, Georgia

STRONG LIGHT-MATTER COUPLING IN 2D ATOMIC CRYSTALS

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Two-dimensional (2D) van der Waals materials have emerged as a very attractive class of optoelectronic material due to the unprecedented strength in its interaction with light. In this talk I will first discuss the formation of exciton-polaritons [1] and their spin-optic control [2] in the 2D transition metal dichalcogenide (TMD) systems. Following this, I will discuss the formation of polaritons using excited states (Rydberg states) to enhance the nonlinear polariton interaction [3]. Recent results on electrical control and realization of a polariton LED based on 2D TMDs [4] will also be presented.

References

[1] X. Liu *et al.*, Nature Photonics 9, 30 (2015)
[2] Z. Sun *et al.*, Nature Photonics **11**, 491 (2017)
[3] J. Gu *et al.*, ArXiv 1912.12544 (2019)
[4] J. Gu *et al.* Nature Nanotech. **14**, 1024 (2019)