

2023 IBS-CALDES Seminar

- ✓ **Date & Time** 10:30AM, November 8 (Wed), 2023
- ✓ **Venue:** Room #104 (Auditorium), IBS POSTECH campus bldg.
- ✓ **Speaker & Title**
10:30AM~ Prof. Shiwei Wu (Fudan University)
“Second harmonic generation: a symmetry probe for 2D materials”

Organized by: Dr. Ungdon HAM (uham@ibs.re.kr, 054-260-9015)



■ 10:30AM~

Second harmonic generation: A symmetry probe for 2D materials

Shiwei Wu

Department of Physics,
Fudan University, Shanghai, China

Atomically thin two-dimensional materials such as graphene, transition metal dichalcogenide and chromium trihalide monolayers have recently spurred a great of interests due to their unique mechanic, electronic, optical and magnetic properties. And often these properties could be greatly tuned by external stimuli such as electric, magnetic and force field. Individual member in this class of 2D materials is also characteristic in term of different symmetries. Moreover, the symmetries could also be tuned, depending on how monolayers are stacked on one another. These variations in symmetry have given rise to even richer properties among different 2D materials and their homo-/hetero-structures. Therefore, they provide a new playground for nonlinear optics, namely second harmonic generation, because of its sensitivity to symmetries. Vice versa, second harmonic generation becomes a powerful technique to study 2D materials. In this talk, I will present some of our recent results on 2D materials [1-3].

References:

- [1] Zeyuan Sun et al., Giant nonreciprocal second harmonic generation from antiferromagnetic bilayer CrI₃. *Nature* 572, 497 (2019).
- [2] Yu Zhang et al., Doping-induced second harmonic generation in centrosymmetric graphene from quadrupole response. *Physical Review Letters* 122, 047401 (2019).
- [3] Yuwei Shan et al., Stacking-symmetry governed second harmonic generation in graphene trilayers. *Science Advances* 4, eaat0074 (2018).