



### Seminar

## The Colorful Palette of 2D-Materials: Defects, Shapes, and Growth

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**Time: 3:30pm, May 6, 2019 (Monday)**

**时间: 2019年5月6日 (周一) 下午3:30**

**Venue: Room W563, Physics building, Peking University**

**地点: 北京大学物理楼, 西563会议室**

### Abstract

The diverse basic optics (transmission, absorption, reflection) of numerous 2D materials [1], as well as functionality of their defects [2] as single photon emitters (SPE), and their other compelling properties motivate the synthetic efforts, both in breadth (different compositions) and in quality (monocrystal wafers). We will discuss theories and mechanisms behind the recent advances in salt-assisted massive synthesis of a “library” of 2D-materials and alloys [3], in the evolutionary selection mechanisms of growth of  $\sim 1$  m monocrystal graphene [4], and in vicinal-surface complementarity guiding the growth of low-symmetry material [5]. If time permits, we will discuss developments in 2D boron, from our 2007 prediction of pure-boron fullerene to recent successes in synthesis of borophene, its intriguing structures and properties [6].

### Reference

- [1] “In pursuit of 2D materials for maximum optical response”, S. Gupta et al., **ACS Nano**, **12**, 10880 (2018).
- [2] “2-level quantum systems in 2-D materials for single photon emission”, idem, **Nano Lett.** **19**, 408 (2019).
- [3] “A library of atomically-thin metal chalcogenides”, J. Zhou et al., **Nature**, **556**, 355 (2018).
- [4] “Evolutionary selection growth of two-dimensional materials on polycrystalline substrates”, I. Vlassioux et al., **Nature Mater.** **17**, 318 (2018).
- [5] “How the complementarity at vicinal steps enables growth of 2D monocrystals”, K. Bets et al., **Nano Lett.** **19**, 2027 (2019).
- [6] “Intermixing and periodic self-assembly of borophene line defects”, X. Liu et al., **Nature Mater.**, **17**, 783 (2018) || “Polyphony in B flat”, Z. Zhang et al., **Nature Chemistry**, **8**, 525 (2016).