Graphene-based integrated optoelectronic devices

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With unique possibilities for controlling light in nanoscale devices, graphene has opened new perspectives to the nanophotonics community with potential applications in metamaterials, modulators, photodetectors, and sensors. In this talk, I will present our recent results on how we utilize two-dimensional materials to demonstrate novel integrated optoelectronic devices, e.g., graphene based silicon ring-resonator modulators [1], graphene plasmonic waveguide modulators [2], graphene plasmonic waveguide photodetector [3], and high-energy-efficiency graphene microheats [4].

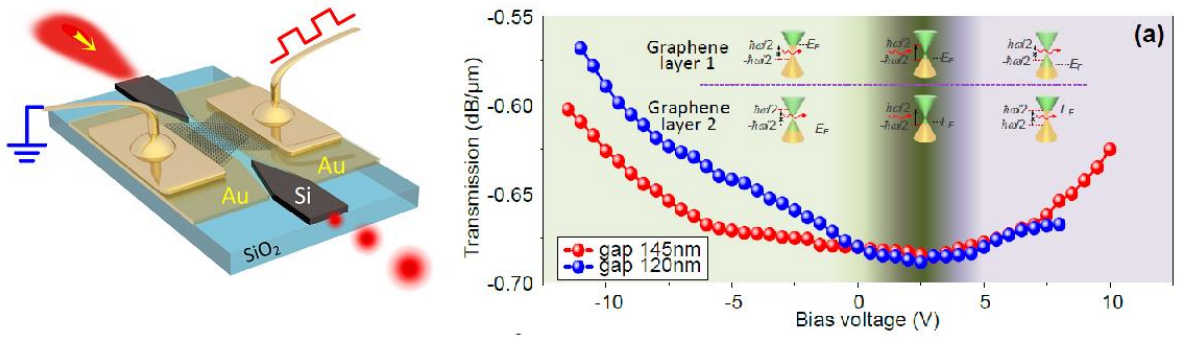

Fig. 1. (a) 3D schematic of the graphene plasmonic waveguide modulator; (b) Modulated transmission for 20um-long graphene plasmonic hybrid slot waveguides

1. F. Bonaccorso, et.al., *Nature Photon*., **4**, 611 (2010).
2. Y. Ding, et.al., *Nanoscale*, **9**, 15576 (2017).
3. Y. Ding, et. al., *Nano. Lett*., **15**, 4393 (2015).
4. Y. Ding, et.al., in preparation (2018).
5. S. Yan, et. al., *Nature Communications*, **8**, 14411 (2017).

Presentation Method (Poster/ Invited Oral 15/20/25/30minutes): Invited