Nonlinear Optics with Low-dimensional Materials

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In this talk, I will discuss our recent results on nonlinear optics with one-dimensional (e.g., carbon nanotubes [1]) and two-dimensional layered (e.g., graphene [2-3], transition metal dichalcogenides [3-5], and black phosphorus [6-7]) materials. These results show advantages of utilizing low-dimensional nanomaterials for various photonic and optoelectronic applications, such as high-purity quantum emitters [1], wavelength converters [2-5], and ultrafast lasers [2,6,7]. Further, I will present our recent advances employing hybrid structures, such as two-dimensional heterostructures [2], plasmonic structures [8-10], and silicon/fibre waveguides integrated structures [8-10].

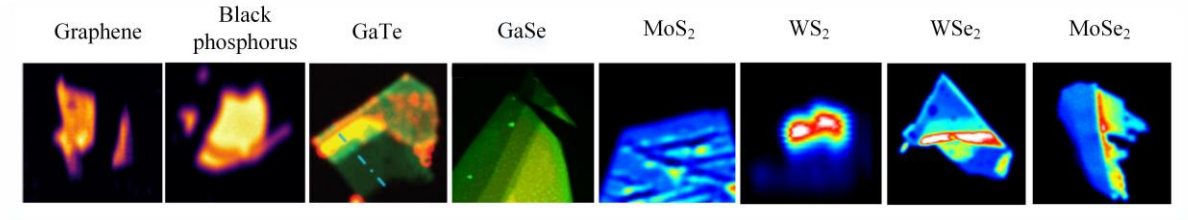

Figure 1. Nonlinear optical images of different two-dimensional layered materials [10]

References

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