**Optical nonlinearity and exciton dynamics in van der Waals materials**

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The first part of this talk is optical nonlinearity of Group IV monochalcogenides (such as GeSe, GeS, SnSe, SnS), which have been predicted to be multiferroic materials with in-plane ferroelectricity and ferroelasticity in its monolayer form. I will report the giant second-order nonlinearity of SnS and SnSe with ferroelectric stacking. From theoretical and experimental results, the susceptibility of second harmonic generation (SHG) from SnS and SnSe with ferroelectric stacking is two to three orders of magnitude higher than the values of traditional nonlinear crystals such as BBO and KTP. The SHG anisotropy can be a tool to study ferroelastic transformation. The second part is exciton dynamics of InSe. we utilized obliquely incident and polarization-resolved light to investigate the IP and OP optical features of InSe. The energy difference of IP and OP exciton in InSe (0.5 meV) was experimentally resolved for the first time. The theoretical results confirmed that the contributions of IP and OP excitons originate from different k-points and splitting states. In the presence of photocarriers, the difference of IP and OP optical gap increased up to 8 meV. Such energy difference results from the anisotropic reduction of binding energies of IP and OP excitons.