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## Advances and prospects of 2D ferromagnetic semiconductors

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### Abstract

The intrinsic ferromagnetism in two-dimensional (2D) materials has been a long-term concern and pursuit. Only few years ago it has been realized, after thinning CrGeTe<sub>3</sub> and CrX<sub>3</sub> (X = Cl, Br, I) from bulk down to a monolayer. These materials were not only ferromagnetic, but also semiconducting - which stimulated intensive research on novel emergent phenomena and creative concepts. In this talk I will summarize the recent progress of 2D ferromagnetic semiconductors and discuss ongoing (theoretical) strategies proposed to enhance ferromagnetism, tailoring the very mechanisms of magnetic exchange interaction and magnetic anisotropy. Moreover, I will discuss the multifunctionality of such materials and their promise towards advanced van de Waals heterostructures in magnetoelectric, multiferroic, and nondissipative electronic technology – tailored practically at will.