

# 2D systems post-graphene: Single-layers of di- and tri-chalcogenides

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Some transition metal chalcogenides are layered materials which have been studied for longtime and even some of them,  $2H\text{-NbSe}_2$ ,  $1T\text{-TiSe}_2$ , etc, are at the origin of the physics of low-dimensional metals. The possibility to prepare systems with one, two, three,..., n-layers of these materials in a controlled way opens the way to the study of a new 2D physics because of the controlled suppression of the electronic screening effects due to neighboring layers. In this presentation we will discuss some recent results concerning: (i) the microscopic structure of the low-temperature  $3 \times 3$  modulated phase of  $2H\text{-NbSe}_2$ , (ii) the mechanism of the  $2 \times 2$  modulation in  $1T\text{-TiSe}_2$  and the possible occurrence of incommensurate phases under doping, and (iii) how strain tuning of the band anisotropy in  $\text{TiS}_3$  can be exploited to focus plasmons in the desired direction, a feature with potential applications for optoelectronic devices.