Graphene is the most famous two-dimensional material. However, there are many layered crystal structures which can be exfoliated to single-layer thickness. Among them, the dichalcogenide MoS$_2$ is a very promising material, as it becomes a direct-gap semiconductor when thinned to a single layer, and emits strong photoluminescence.

I will give an overview of the current research activities on two-dimensional dichalcogenides and present our recent results on optical spectroscopy of this new material system.