

## **Phyllosilicates as functional dielectrics in two-dimensional materials-based electronics**

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Since the last decade, the number of isolated two-dimensional (2D) materials keeps growing exponentially, focusing on high-performance semiconducting and spontaneously polarized materials. However, the number of vdW insulators is extremely disproportional to both semiconductors and metals. Almost exclusively the entire field relies on hexagonal boron nitride. Surely, this cannot be the only technologically relevant system.

Inspired by naturally occurring van der Waals (vdW) crystals – 2D minerals – from the phyllosilicate family, our team works on establishing 2D phyllosilicates as a vdW dielectric platform. In this talk, we will focus first on the potential application of non-magnetic phyllosilicates – hBN alternatives – in 2D materials-based transistors, and opportunities for this material class to be used as charge-trap layers for computing in memory applications. Afterwards, we will look into intrinsic magnetism in phyllosilicates, magnetic domains, their layered antiferromagnetic ordering, and ion implementation as a potential pathway to engineer magnetic impurities.