GeTe Ferroelectric Rashba semiconductor: from growth to electronic properties

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Spintronics aims at changing the concepts of data storage and processing by addressing the intrinsic angular momentum of charge carriers. In this context, the emergent ferroelectric Rashba semiconductors, and in particular GeTe, stands out as a promising material for the realization of all-electric controlled spintronic devices [1,2]. In this perspective GeTe thin films grown on silicon in a controlled polarization state have been achieved [3-5]. The electronic band structure exhibits a giant spin splitting down to 1 nm film thickness.

[1] C. Rinaldi et al., Nano Lett. 2018, 18, 5 2751.
[2] M. Liebmann et al., Adv. Mater. 2016, 28, 3 560.
[3] B. Croes et al. Phys. Rev. Mater. 2023, 7, 014409
[4] B. Croes et al. Phys. Rev. Mater. 2022, 6, 064407
[5] B. Croes et al. Phys. Rev. Mater. 2021, 124415