

# Stable-fragile-delicate: new notions in topological band theory

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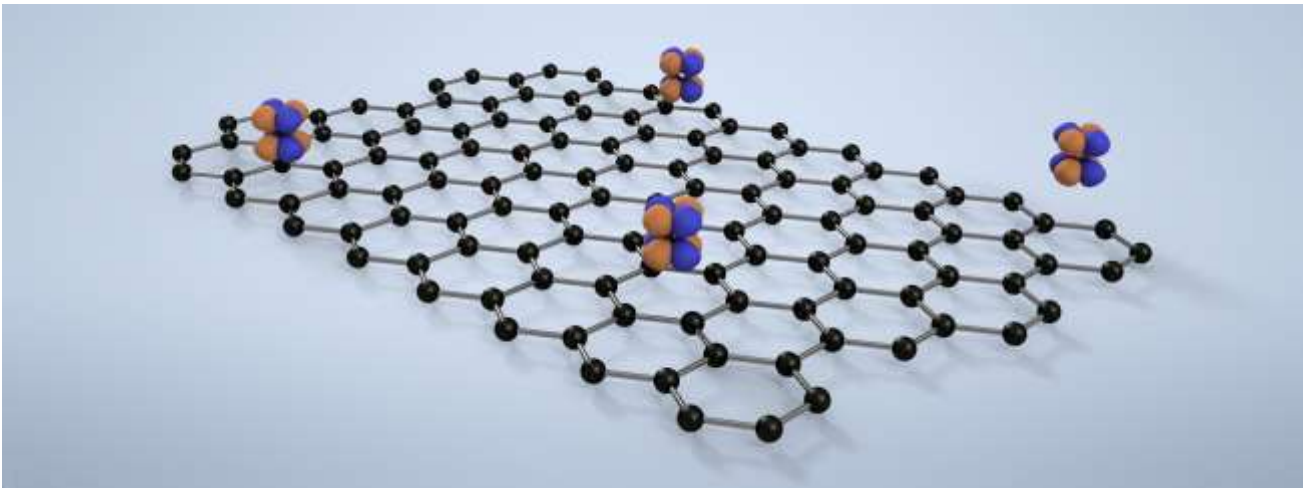
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Topological quantum matter is a very active research direction in condensed matter physics. Over the past two decades, many topological materials have been identified in a tight interplay between theory and experiments. In this process, the theoretical framework, in particular topological band theory, has been continuously refined. In this talk I will give an overview of our current understanding of topological classifications of electronic bands, with a focus on two-dimensional materials. In particular, I will discuss the differentiation between atomic insulators, so-called delicate topology [1] and fragile topology. As a concrete example, I will discuss how graphene, when decorated with adatoms, can host fragile topological flat bands [2]. I will contrast these bands with the ones arising in moiré heterostructures.

## REFERENCES

1. Nelson, A., Neupert, T., Bzdušek, T., and Alexandradinata, A., [arXiv:2009.01863](https://arxiv.org/abs/2009.01863)
2. Skurativska, A., Tsirkin, S.S., Natterer, F.D., Neupert, T., and Fischer, M.H., [arXiv:2101.08273](https://arxiv.org/abs/2101.08273)

## FIGURES



**Figure 1:** Schematic of graphene decorated with adatoms giving rise to a fragile topological flat band with d-orbital character.