



# Anomalous spin-relaxation properties in the mother of all semimetals

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Graphite has been known to mankind since ancient times and has been intensively studied for more than 80 years. It is also the archetype of semimetals (metals with a small Fermi surface) and the mother compound of graphene and other two-dimensional van der Waals heterostructures. Albeit we have a vast knowledge about this material, it turns out that its spin-relaxation properties are poorly understood and a recent revision of the system [1] yielded the surprisingly long 100 ns spin-lifetime in this material. This is an order of magnitude longer than the world-record holding bilayer graphene. It turns out that previous spin-relaxation studies were in fact not interpreted with the correct description and also that graphite has a hitherto unexplored symmetry which inevitably leads to this long spin-relaxation time. We believe that this enables bulk graphite to become a viable candidate for using the electron spins as information carrier units in future spintronics devices.

[1] B. G. Márkus et al. "Ultralong 100 ns spin relaxation time in graphite at room temperature", Nat. Comm. 14, 2831 (2023)

<https://www.nature.com/articles/s41467-023-38288-w>