

Probing the Fermi Surface topology of NdAgSb₂ through Large Linear Magnetoresistance and Quantum Oscillations

A. Gautam,¹ H. Singh,¹ P. Kant Mishra,¹ R. Y. Umetsu,² and A. K. Ganguli^{1,3}

¹*Indian Institute of Technology Delhi, New Delhi 110016, India*

²*Institute for Materials Research,
Tohoku University, 2-1-1 Katahira,
Aoba-ku, Sendai 980-8577, Japan*

³*Indian Institute of Science Education and Research,
Berhampur, Odisha 760003, India*

We present a comprehensive study of the magnetic, transport, and magnetotransport properties of single-crystalline NdAgSb₂. The compound exhibits pronounced magnetic anisotropy, with an antiferromagnetic ground state for magnetic fields applied in the *ab* plane, while clear de Haas–van Alphen oscillations are observed for fields along the *c* axis. Magnetotransport measurements reveal a large linear magnetoresistance ($\sim 450\%$ at 2K under 9 T), indicative of a clean-limit electronic structure with suppressed scattering. Notably, both de Haas van Alphen and Shubnikov de Haas quantum oscillations are observed simultaneously, enabling a detailed reconstruction of the Fermi surface. Analysis of the oscillation frequencies, effective masses, and Berry phases provides insight into the low-energy electronic states associated with the two-dimensional Sb square-net topology, establishing NdAgSb₂ as a model system to investigate the interplay of anisotropic magnetism, high-mobility charge carriers, and quantum oscillations in layered rare-earth pnictides.