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Approaching the Intrinsic Bandgap in Suspended High-Mobility Graphene Nanoribbons MING-WEI LIN, CHENG LING, Wayne State University, LUIS AGAPITO, NICHOLAS KIOUSSIS, California State University, YIYANG ZHANG, MARK MING-CHENG CHENG, Wayne State University, WEILI WANG, EFTHIMIOS KAXIRAS, Harvard University, ZHIXIAN ZHOU, Wayne State University, WAYNE STATE UNIVERSITY COLLABORATION, CALIFORNIA STATE UNIVERSITY COLLABORATION, HARVARD UNIVERSITY COLLABORATION, WAYNE STATE UNIVERSITY COLLABORATION
— We report electrical transport measurements on a suspended ultra-low-disorder graphene nanoribbon (GNR) with nearly atomically smooth edges that reveal a high mobility exceeding 3000 $cm^2\ V^{-1}\ s^{-1}$ and an intrinsic bandgap. The experimentally derived bandgap is in *quantitative* agreement with the results of our electronic-structure calculations on chiral GNRs with comparable width taking into account the electron-electron interactions, indicating that the origin of the bandgap in non-armchair GNRs is partially due to the magnetic zigzag edges.

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