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Near-Zero Modes in Superconducting Graphene POUYAN GHAEMI, FRANK WILCZEK, Massachusetts Institute of Technology — Vortices in the simplest superconducting state of graphene contain very low energy excitations, whose existence is connected to an index theorem that applies strictly to an approximate form of the relevant Bogoliubov-deGennes equations. When Zeeman interactions are taken into account, the zero modes required by the index theorem are (slightly) displaced. Thus the vortices acquire internal structure; the resulting "modicules" obey nonabelian quantum statistics.

Pouyan Ghaemi
Massachusetts Institute of Technology

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