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Weyl nodes assisted conductivity contrast in the interfacial phase change memory[1] JINWOONG KIM, California State University, Northridge, JEONGWOO KIM, University of California, Irvine, YOUNG-SUN SONG, Pohang University of Science and Technology, RUQUIAN WU, University of California, Irvine, SEUNG-HOON JHI, Pohang University of Science and Technology, NICHOLAS KIOUSSIS, California State University, Northridge — The interfacial phase-change memory (iPCM) GeTe/Sb_2Te_3 continues to attract a great deal of interest not only because they are promising candidates for the next generation non-volatile random-access memories but also for their fascinating topological properties. Depending on the atomic-layer-stacking sequence of the GeTe block the iPCM can be either in the "SET" (Ge-Te-Ge-Te) or "RESET" (Te-Ge-Ge-Te) states where the former exhibits a ferroelectric polarization and an electric conductivity which is two orders of magnitude higher than that of the RESET state. The presence of ferroelectric polarization which breaks the inversion symmetry and the fact that the system is close to the topological phase boundary raises the intriguing question of the emergence of a Weyl semimetal phase in the "SET" state between the topological and trivial insulator phases as proposed by Murakami. *Ab initio* electronic structure calculations reveal the emergence of a Weyl semimetal phase for the SET phase associated with a large electric conductivity due to the gapless Weyl nodes.

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