Discovery of superconductivity in Bi$_2$Te: evidence of universal behavior in an infinitely adaptive series under compression[1] RYAN STILLWELL, JASON JEFFRIES, SCOTT MCCALL, ZSOLT JENEI, SAM WEIR, Lawrence Livermore National Laboratory, YOGESH VOHRA, University of Alabama at Birmingham — The end members of the infinitely adaptive $(Bi_2)_n(Bi_2Te_3)_m$ series, Bi and Bi$_2$Te$_3$, can be experimentally tuned to display topological surface states or superconductivity under appropriate conditions. An intermediate member of the series, Bi$_2$Te has been found to superconduct under similar conditions, transitioning from a semiconductor at ambient conditions to a metallic superconductor with a maximum $T_c = 9.1$ K at 14.5 GPa. This represents a move towards universal behavior in the infinitely adaptive $(Bi_2)_n(Bi_2Te_3)_m$ series in which all of the superstructures converge into a metallic, superconducting state at high pressure. Lawrence Livermore National Laboratory is operated by Lawrence Livermore National Security, LLC, for the U.S. Department of Energy, National Nuclear Security Administration under contract DE-AC52-07NA27344.

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