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Charge Density Waves in Metal-Intercalated Topological Insulator Nanoribbons JEFFREY COMMONS, Brown University — Topological insulators are an exciting new form of matter in which the interior is insulating while the surface supports symmetry-protected conductive states. We report on charge density wave transitions in the two-dimensional layered topological insulator bismuth selenide (Bi2Se3) following intercalation with zero-valent metals. Using a previously reported intercalation method, Bi2Se3 nanoribbons were intercalated with either one or a combination of two metals. Disorder-order polytypic phase transitions were subsequently observed with in-situ transmission electron microcopy. In particular, nanoribbons intercalated with both copper and iron demonstrate a superlattice at room temperature indicative of a charge density wave stabilized by intercalant ordering; heating of these nanoribbons to $\sim$ 375 °C introduces several disorder-order phase transitions, which demonstrate varying degrees of reversibility on subsequent cooling.

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