

Abstract Submitted
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Incipient Ferroelectricity in Thermoelectric Lead Telluride¹ EMIL BOZIN, Brookhaven National Laboratory, CHRISTOS MALLIAKAS, Northwestern U, PETROS SOUVATZIS, THOMAS PROFFEN, Los Alamos National Laboratory, NICOLA SPALDIN, ETH Zurich, MERCOURI KANATZIDIS, Northwestern U, SIMON BILLINGE, Brookhaven National Laboratory, Columbia U — PbTe, is the parent compound of currently the most important thermoelectric (TE) materials in applications just above room temperature [1]. It has an anomalously low thermal conductivity resulting in a rather high TE figure of merit. Our neutron total scattering and atomic pair distribution function analysis shows the existence of a novel paraelectric state at and above room temperature. However, on cooling the structural dipoles do not order, but disappear resulting in an undistorted rock-salt ground-state. We suggest that new thermoelectrics should be sought among materials that, like PbTe [2], are close to a ferroelectric instability.

[1] Z.H. Dughaish, Physica B v.322, pp205 (2002).

[2] E.S. Bozin et al, Science (to be published).

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