Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Electronic structure, interactions, and spin-orbit coupling at the CoO_2-terminated surfaces of delafossite oxide metals P.D.C. KING, Univ. of St Andrews, UK, V. SUNKO, Univ. of St Andrews, UK & Max Planck Institute for Chemical Physics of Solids, Dresden, H. ROSNER, P. KUSHWAHA, MPI-CPfS, Dresden, L. BAWDEN, O.J. CLARK, J.M. RILEY, Univ. of St Andrews, UK, M.W. HAVERKORT, D. KASINATHAN, MPI-CPfS, Dresden, A.P. MACKENZIE, MPI-CPfS, Dresden & Univ. of St Andrews, UK — The ABO_2 family of delafossite oxide metals has recently found renewed prominence due to their remarkable transport properties. The Pd- and Pt-based cobaltates are the most conductive oxides known, with room-temperature resistivities lower per carrier even than copper metal [1,2]. This is underpinned by extremely broad bandwidths of the bulk electronic structure around the Fermi level, dominated by Pd/Pt-derived carriers that behave remarkably like free electrons [2]. Here, we will discuss how the polar CoO_2-terminated surface of $PtCoO_2$ hosts a markedly different electronic structure to that of the bulk. From angle-resolved photoemission spectroscopy, we will demonstrate that this transition-metal oxide surface layer supports massive Co-derived surface states. We will show how these exhibit a pronounced interplay of many-body interactions and spin-orbit coupling, and will discuss how these together shape the low-energy surface electronic structure of this compound. [1] Hicks et al., Phys. Rev. Lett. 109 (2012) 116401; [2] Kushwaha et al., Science Adv. 1 (2015) e1500692.

Philip King
Univ. of St Andrews, UK

Date submitted: 11 Nov 2016 Electronic form version 1.4