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Orbital selective gap opening in $Ca_3Ru_2O_7$ observed by ARPES FELIX BAUMBERGER, Stanford University, NAOKI KIKUGAWA, University of St. Andrews, NICHOLAS INGLE, University of British Columbia, WORAWAT MEEVASANA, KYLE SHEN, DONGHUI LU, Stanford University, SUMAN HUSSAIN, ANDREA DAMASCELI, University of British Columbia, ANDREW MACKENZIE, University of St. Andrews, YOSHITERU MAENO, Kyoto University, ZHI-XUN SHEN, Stanford University — We present a high-resolution photoemission study of the bilayered ruthenate $Ca_3Ru_2O_7$, which is right on the verge of a Mott-Hubbard metal-insulator transition. The low carrier density, inferred from transport measurements is manifested in a very small quasiparticle weight, and a characteristic broadening of the valence band states. Coincident with the first order structural phase transition at 48 K, we observe the orbital selective opening of a weak, mean-field like gap. This sheds new light on the mysterious low-temperature metallic state of $Ca_3Ru_2O_7$, and on the interplay of charge, lattice, and orbital degrees of freedom.

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