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Interfacial charge transfer and magnetism in 5d-3d oxide heterostructures JOHN NICHOLS, XIANG GAO, ERJIA GUO, CHANGHEE SOHN, Oak Ridge National Laboratory, JOHN W. FREELAND, YONGSEONG CHOI, DANIEL HASKEL, Argonne National Laboratory, SATOSHI OKAMOTO, TIMOTHY CHARLTON, MICHAEL. R. FITZSIMMONS, HO NYUNG LEE, Oak Ridge National Laboratory — The existence of strong spin-orbit coupling has brought the iridates to the forefront of materials research, whereas strong electronic correlation has proven to produce a plethora of novel properties within the manganites. Here, we investigate the physical properties of interfaces between such materials by synthesizing a series of artificial superlattices with 5d paramagnetic metal $SrIrO_3$ and 3d antiferromagnetic insulators $AMnO_3$, where A = Sr or La. Through our investigations by x-ray diffraction, magnetometry, dc-transport, x-ray circular dichroism, and polarized neutron reflectometry measurements, we observe both novel magnetic and transport properties, which drastically differ from those of the constituent materials and are highly sensitive to the degree of dimensional confinement within the superlattices. Here we will present these results and discuss the implications of these intriguing magnetic and electronic properties. This work was supported by the U.S. Department of Energy, Office of Science, Basic Energy Sciences, Materials Sciences and Engineering Division.

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