Abstract Submitted
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55 Tesla coercive magnetic field in frustrated Sr_3NiIrO_6[1] JOHN SINGLETON, Los Alamos Natl Lab, JAE-WOOK KIM, Rutgers University, CRAIG TOPPING, Oxford University, ANDERS HANSEN, Los Alamos Natl Lab, EUN-DEOK MUN, Simon Fraser University, SAMAN GHANNADZADEH, Oxford University, PAUL GODDARD, Warwick University, XUAN LUO, YOON SEOK OH, SANG-WOOK CHEONG, Rutgers University, VIVIEN ZAPF, Los Alamos Natl Lab — We have measured extremely large coercive magnetic fields of up to 55 T in Sr_3NiIrO_6, with a switched magnetic moment $\approx 0.8\ \mu_B$ per formula unit. As far as we are aware, this is the largest coercive field observed thus far. This extraordinarily hard magnetism has a completely different origin from that found in conventional ferromagnets. Instead, it is due to the evolution of a frustrated antiferromagnetic state in the presence of strong magnetocrystalline anisotropy due to the overlap of spatially-extended Ir^{4+} $5d$ orbitals with oxygen $2p$ and Ni^{2+} $3d$ orbitals. This work highlights the unusual physics that can result from combining the extended $5d$ orbitals in Ir^{4+} with the frustrated behaviour of triangular lattice antiferromagnets.

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