Strain control of magnetic structure in Sr$_3$Ir$_2$O$_7$ CHOONG H. KIM, IBS-CCES & Seoul Nat’l Univ. — We have studied from first principles the structural, electronic, and magnetic properties of the layered-perovskite iridates Sr$_3$Ir$_2$O$_7$ as a function of epitaxial strain. In Sr$_3$Ir$_2$O$_7$, bilayer iridates, an easy c-axis collinear antiferromagnetic structure have been reported, a significant constrast to single layer Sr$_2$IrO$_4$ with in-plane canted moments. This behavior is understood by competition among intra- and interlayer bond-directional pseudodipolar interactions. From our first-principles calculations, we show that these two energy scales are controllable via strain to drive spin-flop transition.