

Abstract Submitted  
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**Phase Diagram of a Geometrically-Frustrated Triangular-Lattice Antiferromagnet in a Magnetic Field**<sup>1</sup> RANDY FISHMAN, Oak Ridge National Laboratory — The magnetic phase diagram of a geometrically-frustrated triangular-lattice antiferromagnet is evaluated as a function of magnetic field and anisotropy using a trial spin state built from harmonics of a fundamental ordering wavevector. A non-collinear incommensurate state, observed to be chiral and ferroelectric in  $\text{CuFeO}_2$ , appears above a collinear state with 4 sublattices (SLs). A previously unobserved collinear 5-SL phase may be accessible in a magnetic field for a non-stoichiometric compound with excess or deficient oxygen. The apparent absence of multiferroic behavior for predicted chiral, non-collinear 5-SL states poses a challenge to theories of the ferroelectric coupling in  $\text{CuFeO}_2$ .

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