Circularly Polarized Lasers using Intrinsically Chiral Hybrid Perovskite Crystals (CLIP)

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Project Summary: Chiral hybrid organic inorganic perovskites are an exciting new class of materials with intrinsic chirality (lack of mirror/rotational symmetry). These materials possess a unique combination of semiconducting electronic properties and a chiral optical response that may enable the direct generation of coherent circularly polarized light (CPL). In this project we will systematically explore the structure-property relationships that govern both spontaneous and stimulated emission of CPL in chiral perovskites. We will develop processes to obtain high quality crystalline thin films, and we will systematically study the energetics and dynamics of photo-excited states as they relate to the absorption and emission of circularly polarized light.