Simulation of Light Emitted from a Test Mass Orbiting an Extreme Black Hole BENJAMIN BROWN, Grand Valley State University — One of the most famous results from Einsteins theory of general relativity is the bending of light by massive objects. In this undergraduate thesis, we seek to simulate what a distant observer would see from a luminous object orbiting a black hole. To do this, we have developed a general program which calculates null geodesics emitted from a test mass orbiting a central mass, taking relativistic beaming into account. We will show results for the cases of Schwarzschild, Reissner-Nordstrom, and Kerr black holes with an emphasis on black holes that have extreme charge-mass and angular momentum-mass ratios.

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