

Abstract Submitted  
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**The Photon may have mass** RICHARD KRISKE, University of Minnesota — The argument for a particle having mass is now days predicated on a Quantum Mechanics. The argument involves the distance that a particular force can be felt, and in the case of the Photon that should be infinity, and if it is infinity then the mass of the Photon has to be zero. This author has some doubts about the distance the Electromagnetic Force can be felt. This author has previously stated that if the Universe has a Horizon wherein there is a three space embedded in four dimensions, where time is perpendicular to the three space dimensions, then if there is curvature, like the curvature of the Earth, then one should see time tilt backward away from the observer at the Horizon (just as a large tower would tilt away from the observer if it where on the other side of an ocean for instance-on the Earth's surface). If this tilting does take place (if Space-Time is not flat, but positively curved), then the Photon redshifts in every direction even if Space-Time is not expanding. This redshift limits the distance of the Electromagnetic Field, and therefore the Photon should have rest mass, as the Horizon acts as a boundary for each observer, but may not be the actual size of Infinity, the Universe may go on for a large distance beyond the Horizon.

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