

Abstract Submitted
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Special relativity and the speed of matter DENNIS CROSSLEY,
University of Wisconsin-Sheboygan — Why is there a cosmic speed limit? Why is the speed limit for *matter* the same as the speed of *light*? This suggests an intimate connection between light and matter that has not been fully understood. We present here a model of both matter and light as wave modes in the geometry of space. This model offers new insight into the foundations of quantum mechanics and the wave nature of matter, but the emphasis in this talk is on the implications for the relativistic behavior of matter. In particular, this model gives an intuitive explanation for time dilation and length contraction as real physical phenomena. This in turn has profound implications for the question of the existence of absolute space. Special relativity does not require absolute space (in fact it denies its existence on philosophical grounds) but the wave model presented here *does* require absolute space since it is the “medium” that carries light and matter waves. We emphasize that the wave model presented here is fully consistent with the mathematical formalism of special relativity and, in fact, supplies an underlying physical explanation for relativistic behavior. We conclude by reviewing experimental evidence in support of the existence of absolute space.

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