1126-83-359   **Noah Benjamin** and **Iva Stavrov Allen***, Department of Mathematical Sciences, Lewis & Clark College, MSC 110, 0615 SW Palatine Hill Road, Portland, OR 97219. *Conceptualizing Point Particles as Limits of Matter Distributions.* Preliminary report.

Due to the linearity of the Poisson equation for the gravitational potential, a Newtonian point mass can be interpreted as a limit of a sequence of dust clouds whose matter densities approach the Dirac delta distribution. In general relativity this idea is much more difficult to implement because the Einstein equations are non-linear. In this talk we present a mathematically rigorous argument which shows that (on the level of time-symmetric initial data) simply letting the sequence of matter densities converge to the Dirac delta distribution does not in fact produce a Schwarzschild-like point particle. We conclude our talk with a brief survey of some expansions of this result. (Received January 17, 2017)

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