

Abstract Submitted
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Balancing Newtonian gravity and spin to create localized structures MICHAEL BUSH, JOHN LINDNER, The College of Wooster — Using geometry and Newtonian physics, we design localized structures that do not require electromagnetic or other forces to resist implosion or explosion. In two-dimensional Euclidean space, we find an equilibrium configuration of a rotating ring of massive dust whose inward gravity is the centripetal force that spins it. We find similar solutions in three-dimensional Euclidean and hyperbolic spaces, but only in the limit of vanishing mass. Finally, in three-dimensional Euclidean space, we generalize the two-dimensional result by finding an equilibrium configuration of a spherical shell of massive dust that supports itself against gravitational collapse by spinning isoclinically in four dimensions so its three-dimensional acceleration is everywhere inward. These Newtonian “atoms” illuminate classical physics and geometry.

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