

Abstract Submitted
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Quantum Stabilization of the Collapse of a Stellar Black Hole

MARK P. SILVERMAN, Trinity College — In contrast to prevailing models based on classical general relativity theory, in which a degenerate star, having exhausted its nuclear fuel, will, if sufficiently massive, unavoidably collapse to a singularity in space (unless the contraction is prevented by hitherto unrealized processes of quantum gravity acting at the scale of the Planck length), I present a heuristic argument, based on known quantum processes, for the existence of stable equilibrium states of neutron stars and quark stars with macroscopic radii and masses unconstrained by the Chandrasekhar and Oppenheimer-Volkoff limits. The processes [1] that stabilize the star against gravitational contraction involve strong magnetic coupling of the constituent fermions and fermionic pair production at the expense of gravitational potential energy.

[1] M. P. Silverman, “Quantum Stabilization of a Relativistic Degenerate Star Beyond the Chandrasekhar Mass Limit,” *International Journal of Modern Physics D* 13 (2004) 2281.

Mark P. Silverman
Trinity College

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