

Abstract Submitted  
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**The Interaction of Nuclei in the Gravitational Fields of Mini Black Holes**<sup>1</sup> LAUREN GREENSPAN, New York University, Texas A&M Cyclotron REU — The goal of this research was to find solutions to the Schrodinger equation that describe particle scattering around mini black holes (on the order of a fermi). Black holes of this kind could have formed in density irregularities in primordial space just after the big bang and can answer cosmological questions as well as provide a setting for research in quantum-gravity. Black holes go along with the theory of general relativity, but since mini black holes can be comparable in size to nucleons, the project also considers the limit at which the black hole must obey Quantum Mechanical law. A large emphasis was placed on the choice of a coordinate system and its implications on general relativity and the curvature of space-time. We derived the potentials for the black hole and used them to calculate the absorption cross-section in the non-relativistic limit. As an additional exercise, we calculated the possible bound states of a particle with the black hole and the amount of mass it could gain based on the expected cross-section.

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