

Abstract Submitted
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Bound quantum system of electron or proton orbiting a small black hole DANIEL GRAY, ALEXANDER PANIN, Utah Valley University — Mini black holes (BH) of various mass could be left over in space from the early expansion Big Bang phase (so called primordial BHs). As a result of interaction of those BHs with interstellar hydrogen they could form a bound system with an electron or a proton (or both). What would such system look like? Would it be stable, metastable, or would BH quickly consume the orbiting particle? How much is life time of such “gravitational atom”? If such system is stable then what is the size of it; how much is the bonding energy of its ground state (= ionization potential energy) and how much are the energies of its excited states? Are those “gravitational atoms” observable? What other properties do they have? Based on known physics we try to analyze the behavior of such exotic system and answer the above questions for black holes of various masses.

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