

Abstract Submitted  
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**Dark Energy and Dark Matter as  $w = -1$  Virtual Particles and the World Hologram Model** JACK SARFATTI, Internet Science Education Project — The elementary physics battle-tested principles of Lorentz invariance, Einstein equivalence principle and the boson commutation and fermion anti-commutation rules of quantum field theory explain gravitationally repulsive dark energy as virtual bosons and gravitationally attractive dark matter as virtual fermion-antifermion pairs. The small dark energy density in our past light cone is the reciprocal entropy-area of our future light cone's 2D future event horizon in a Novikov consistent loop in time in our accelerating universe. Yakir Aharonov's "back-from-the-future" post-selected final boundary condition is set at our observer-dependent future horizon that also explains why the irreversible thermodynamic arrow of time is aligned with the accelerating dark energy expansion of the bulk 3D space interior to our future 2D horizon surrounding it as the hologram screen. Seth Lloyd has argued that all 2D horizon surrounding surfaces are pixelated quantum computers projecting interior bulk 3D quanta of volume  $(\text{Planck area})\sqrt{(\text{area of future horizon})}$  as their hologram images in 1-1 correspondence.

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