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**Holographic Equivalence Principal (HEP).** PAUL OBRIEN, No Company Provided — HEP is a bijection between quantum information, (I), and mass, (M), and energy, (E). (M) is 2-D, and (I) is invariant. (I) is physical and irreducible, and not reduceable to a point function. (I) is a Planck area which contains a quantum of (M) and a quantum of (E). (I) is a dual state function with real and imaginary, (i), components. The (i) part represents (E) because it can be local and nonlocal. A dual state function equates with a metric tensor having a dual basis. BH's convert all local thermal (E) into entropy, (S). (S) is always nonlocal. HEP describes the exact location of (M), (E), (S) and (I). Thermodynamics does not allow BH's to store the thermal (E) used to increase its size. It must radiate that thermal (E) as (S) into the vacuum causing the accelerated expansion of our universe. This principal defines the conservation of (I) as a dual state function. (S) from large BH's have extremely long wavelengths, therefore it is the darkest (E) imaginable. All BH's have a constant amount of thermal coupling (E) that couples BH's to the vacuum (E). This local thermal (E) is not included in the calculation of (M). My proof is the ratio of a Planck mass vs a Planck area is a scalar value because a Planck area contains a quantum of (M). This is the HEP. BH thermodynamics shows that this density ratio is a duality defining a limit on both (M) density and (I) density, which is equaled to the thermal density limit. It defines Boltzmann's constant and is equal to Bekenstein bound.

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