General Relativity and Quantum Cosmology

Wormholes or Gravastars?

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The one loop effective action in a Schwarzschild background is here used to compute the Zero Point Energy (ZPE) which is compared to the same one generated by a gravastar. We find that only when we set up a difference between ZPE in these different background we can have an indication on which configuration is favored. Such a ZPE difference represents the Casimir energy. It is shown that the expression of the ZPE is equivalent to the one computed by means of a variational approach. To handle with ZPE divergences, we use the zeta function regularization. A renormalization procedure to remove the infinities together with a renormalization group equation is introduced. We find that the final configuration is dependent on the ratio between the radius of the wormhole augmented by the "brick wall" and the radius of the gravastar.

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