Supersymmetric Casimir energy
The vacuum energy $E_0$ of a four-dimensional quantum field theory placed on a curved manifold is in general a scheme-dependent quantity, subject to ambiguities. However, in the presence of supersymmetry one can show that the ambiguities disappear and $E_0$ becomes a physical observable. I will discuss the computation of $E_0$ for any $\mathcal{N} = 1$ theory (with an $R$-symmetry) on a deformed three-sphere using various approaches, including supersymmetric localization and holography.