

- **Dynamical apparent horizons in inhomogeneous Brans-Dicke universes**
Valerio Faraoni (Bishop's University)

We study the presence and evolution of apparent horizons in a two-parameter family of spherically symmetric and time-dependent solutions of Brans-Dicke gravity. These solutions were originally intended to represent central objects embedded in a spatially flat universe and to model space- and time-varying gravitational couplings. We find that the solutions possess multiple evolving apparent horizons, both black hole horizons covering a central singularity and cosmological ones. Sometimes two of these apparent horizons merge and annihilate, leaving behind a naked singularity covered only by a cosmological horizon. The limit in which the theory reduces to general relativity and the limit to static solutions are discussed.

[Based on V. Faraoni, V. Vitagliano, T.P. Sotiriou, and S. Liberati, *Phys. Rev. D* 86, 064040 (2012).]