

Dark Energy with a Little Help from its Friends

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We analyse theories that do not have a de Sitter vacuum and cannot lead to slow-roll quintessence, but which nevertheless support a transient era of accelerated cosmological expansion due to interactions between a scalar and either a hidden sector thermal bath, which evolves as Dark Radiation, or an extremely-light component of Dark Matter. We show that simple models can explain the present-day Dark Energy of the Universe consistently with current observations. This is possible both when the scalar's potential has a hilltop form and when it has a steep exponential run-away, as might naturally arise from string theory. We also discuss a related theory of multi-field quintessence, in which the scalar is coupled to a sector that sources a subdominant component of Dark Energy, which overcomes many of the challenges of slow-roll quintessence.

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