A scalar field is a favorite candidate for the particle responsible for dark energy. However, few (three) theoretical means exist that can simultaneously explain the observed acceleration of the Universe and evade tests of gravity. The chameleon mechanism, whereby the properties of a particle depend upon the local environment, is one possible avenue. I present the results of the GammeV experiment, the first experiment to probe for chameleon dark energy in the laboratory. I also present the design of the Chameleon Afterglow Search (CHASE) experiment. CHASE marks a significant improvement over its predecessor both in terms of its sensitivity to the photon/chameleon coupling as well as its sensitivity to the broader class of chameleon dark energy models and standard power-law models (e.g. $\phi^4$). Since chameleon dark energy is virtually indistinguishable from a cosmological constant, CHASE will constrain dark energy in a manner not accessible to astronomical surveys.