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**Constraining Cosmological Parameters with CosmoMC and CAMB: Dark Energy and the Accelerated Expansion of the Universe** LOGAN FOX, Univ of Texas, Dallas — The Lambda-CDM model provides a simple, yet elegant, description of our universe. It can give us answers to questions such as: What is the energy density of the universe? Of this total density, how much is in the form of baryonic matter? What are the other components? When did large scale structures begin to form? In recent decades advances in computational and observational power have enabled us to answer these questions accurately in the form of constraints on the parameters of the Lambda-CDM model, and led us to an era of precision cosmology. Bayesian statistics, specifically maximum likelihood estimation, is used to translate the observed data into estimates of cosmological parameter values. CosmoMC, a Markov-Chain Monte-Carlo code, is used to produce marginalized posterior plots of the cosmological parameters, as well as 2D plots that give both quantitative and qualitative descriptions of parameter degeneracies and constraining power. CAMB is a Boltzmann solver code. The results of these constraints imply that dark energy is responsible for the accelerated expansion of the universe and that it is the dominant component of the energy density in the universe. It is extremely satisfying to be able to learn so much about our universe despite being such a small part of it.

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