Precision Studies of Dark Energy with the LSST[1] DAVID BURKE, SLAC, LSST COLLABORATION — The proposed Large Synoptic Survey Telescope (LSST) will confront "dark energy" and "dark matter" with multiple precision probes of space and time, evolution of energy and matter, and the relation between cosmological kinematics and dynamics in a single deep survey of half the astronomical sky. The LSST optical throughput will be 100 times that of any existing facility. In the ten-year LSST mission the 2-D shapes and 3-D positions of over 3 billion galaxies will be measured ($z \leq 3$), and each year 250,000 Type Ia supernovae detected ($z \leq 1$). The LSST will enable studies of tomographic projections of shear correlations of weakly lensed galaxies, distributions of galaxies and clusters, and baryon acoustic oscillations. With LSST studies of supernova "standard candles" and "synchronized clocks" (time delays of multiply-lensed supernovae), these will precisely determine cosmological parameters. Six eigenmodes of the DE equation of state will be mapped by LSST data, and combined with CMB data, the lowest eigenvalues determined with percent-level accuracy.

David Burke
SLAC

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