

SNAP Instrument
Space and Astrophysics Applications
Chris Bebek (LBNL)

The SNAP space mission concept is designed to explore dark energy with Type Ia supernova distance-luminosity measurements and with weak lensing angular distance correlation power spectrum. The supernova program uses photometric discovery and detailed follow-up observations of at least 2000 Type Ia supernovae with redshifts ranging from 0.3 to 1.7. The weak lensing program uses a deep small field survey and a shallower large field survey with photometry, position and shape measurement of several million galaxies. The instrument sits at the focus of a 2-m diameter three mirror anastigmat telescope with a 1.4 square degree FOV. It consists of an imager that instruments 0.7 square degree of the FOV, and a low resolution spectrograph. Both the photometer and spectrograph use visible and near infrared detectors to span the wavelength range 350 nm to 1700 nm. Wavelength is covered with two detector materials implemented with different readout architectures – CCDs for the visible and HgCdTe hybrid pixel detectors for the near infrared. While these detector technologies are familiar in HEP experiments, they used in a very different manner, namely photon counting. The physics, architecture and characteristics of these detectors and how they are used will be presented.