

ABSTRACT

GIRARDI, Leo

INAF-Osservatorio Astronomico di Padova

The Apache Point Observatory Galactic Evolution Experiment (APOGEE)

Authors: S. Majewski et al.

The Apache Point Observatory Galactic Evolution Experiment (APOGEE) in SDSS-III is a large-scale, near-infrared, high-resolution ($R=22,500$) spectroscopic survey of the Milky Way (MW) using a newly-constructed, 300-fiber, cryogenic spectrograph operating over 1.51-1.70 micron (i.e., a large fraction of the H-band). Because of the lower H band dust extinction compared to that at optical wavelengths ($A_H/A_V=0.16$), APOGEE effectively pierces through dust obscuration and will provide a vast, uniform database of chemical abundances and radial velocities for stars across all Galactic populations (bulge, thin and thick disks, halo). APOGEE started observations in May 2011 and is using the remaining 3 years of SDSS-III bright time to observe of order 100,000 giant star candidates selected from the Two Micron All-Sky Survey (2MASS) across hundreds of sight lines with field limits ranging over $H=11-13.5$. With its high resolution and S/N (>100 per Nyquist-limit-sized pixel), APOGEE will determine precision radial velocities (presently at 100 m/s absolute accuracy and 30 m/s relative precision) and accurate abundances for numerous chemical species, including C, N, O and Fe, as well as other alpha, odd-Z, and iron-peak elements. About 5% of the APOGEE targeting is dedicated to a number of ancillary science programs that are already yielding interesting results. To date the APOGEE survey has collected more than 125,000 spectra of $S/N>60$ each on over 58,000 distinct stars. Some initial APOGEE findings will be illustrated.