SES16-2016-000262

Abstract for an Invited Paper
for the SES16 Meeting of
the American Physical Society

APOGEE: A New Look at the Structure, Dynamics and Evolution of the Milky Way[1]

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The Apache Point Observatory Galactic Evolution Experiment (APOGEE) is a large-scale, systematic and homogeneous spectroscopic census of the the stellar populations of the Milky Way. Because it samples stellar spectra at infrared wavelengths (from 1.51-1.68 m), APOGEE is able to peer through the veils of dust that obscure and hinder traditional optical wavelength surveys to create the most comprehensive spectroscopic probe of all parts of our home Galaxy. Moreover, because the APOGEE spectra are of high resolution ($\lambda/\Delta\lambda \sim 22,500$) with high S/N and include time series information via repeat visits to stars, this database is being applied to numerous, wide-ranging problems in Galactic astronomy, stellar populations, stellar astrophysics and even the study of exoplanets. Operating from 2011-2014 as part of the Sloan Digital Sky Survey III (SDSS-III), and now continuing as "APOGEE-2 in SDSS-IV, the APOGEE project has already amassed over a million spectra from its northern spectrograph attached to the Sloan 2.5-m Telescope at APO in New Mexico, and will soon begin collecting data for stars in the Southern Hemisphere with a twin spectrograph attached to the du Pont 2.5-m Telescope in Chile. I will summarize some science highlights from the APOGEE project, including measurements of Galactic dynamics, age and multi-element atomic composition maps for stars across the Galaxy, and the discovery and characterization of substellar mass companions and rare species of stars.

[1]for the APOGEE Team and Sloan Digital Sky Survey Collaboration.