

# APOGEE NET: AN EXPANDED SPECTRAL MODEL OF BOTH LOW MASS AND HIGH MASS STARS

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We train a convolutional neural network, APOGEE Net, to predict  $T_{\text{eff}}$ ,  $\log g$ , and, for some stars,  $[\text{Fe}/\text{H}]$ , based on the APOGEE spectra. This is the first pipeline adapted for these data that is capable of estimating these parameters in a self-consistent manner not only for low mass stars, (such as main sequence dwarfs, pre-main sequence stars, and red giants), but also high mass stars with  $T_{\text{eff}}$  in excess of 50,000 K, including hot dwarfs and blue supergiants. The catalog of  $\sim 650,000$  stars created in this work allows for a detailed investigation of the star forming history of not just the Milky Way, but also of the Magellanic clouds, as different type of objects tracing different parts of these galaxies can be more cleanly selected through their distinct placement in  $T_{\text{eff}}-\log g$  parameter space than in previous APOGEE catalogs produced through different pipelines.