

## Discovery of Rare Highly-Magnetized B Stars in the APOGEE Survey

The Apache Point Observatory Galactic Evolution Experiment (APOGEE) - one of the Sloan Digital Sky Survey III programs -- is using near-infrared spectra of  $\sim 100,000$  red giant branch star candidates to study the structure of the Milky Way. In the course of the survey, APOGEE also acquires spectra of hot field stars to serve as telluric calibrators for the primary science targets. I will present the serendipitous discovery of two rare, fast-rotating, highly-magnetized B stars of the Sigma Ori E type among those blue field stars observed during the first year of APOGEE operations. Both of the discovered stars display the spectroscopic signatures of the rigidly rotating magnetospheres (RRM) common to this class of highly-magnetized ( $B \sim 10$  kiloGauss) stars, increasing the number of known RRM stars by  $\sim 10\%$ . One (HD 345439) is a main-sequence B star with unusually strong He absorption (similar to Sigma Ori E), while the other (HD 23478) fits a "He-normal" B3IV classification - the first known He-normal RRM star. We combine the APOGEE discovery spectra with other optical and near-infrared spectra of these two stars, and of Sigma Ori E itself, to show how near-infrared spectroscopy can be a uniquely powerful tool for discovering more of these rare objects, which may show little/no RRM signatures in their optical spectra. I will discuss the potential for further discovery of Sigma Ori E type stars, as well as the implications of these discoveries and future work with the upcoming MIRADAS spectrograph on GTC for the population of these objects and insights into their origin and evolution.

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Friday Nov 13, 2015  
4:00-5:00 PM  
OPS, Room 140

Light refreshments will be served