Developing a Program to Identify Targets for Transit Followup for the Minerva Telescope Array

Fieldhouse, Kit

Minerva is a cutting-edge telescope array focused on the detection of exoplanets in the habitable zone of their stars. The first objective in the fledgling stages of this array is to perform transit followup on stars that have had radial velocity measurements taken. These telescopes will be robotically controlled and have an active queue system to make autonomous decisions on transits to observe, not requiring constant user input. In order to perform this task the scheduler needs a list of objects to work from. To achieve this goal, I developed software to 1) Solve for the total transit time of the exoplanet 2) Extract targets from a Google spreadsheet 3) Perform processing and conversion to format these data in a software-friendly manner 4) Filter these data by parameter based on user or software input. These data are then checked to make sure that the star will be visible during the complete transit, checking for variables such as; position in the sky relative to the horizon and location of the sun. After these steps, the processed data are then returned as a list of viable targets for observation that can be utilized by a scheduler to compose a queue of observations for the telescope array.

Awards Won:
Third Award of $1,000