Planet Hunting at UNG

Developing a Data Reduction Pipeline for UNG's Échelle Spectrograph

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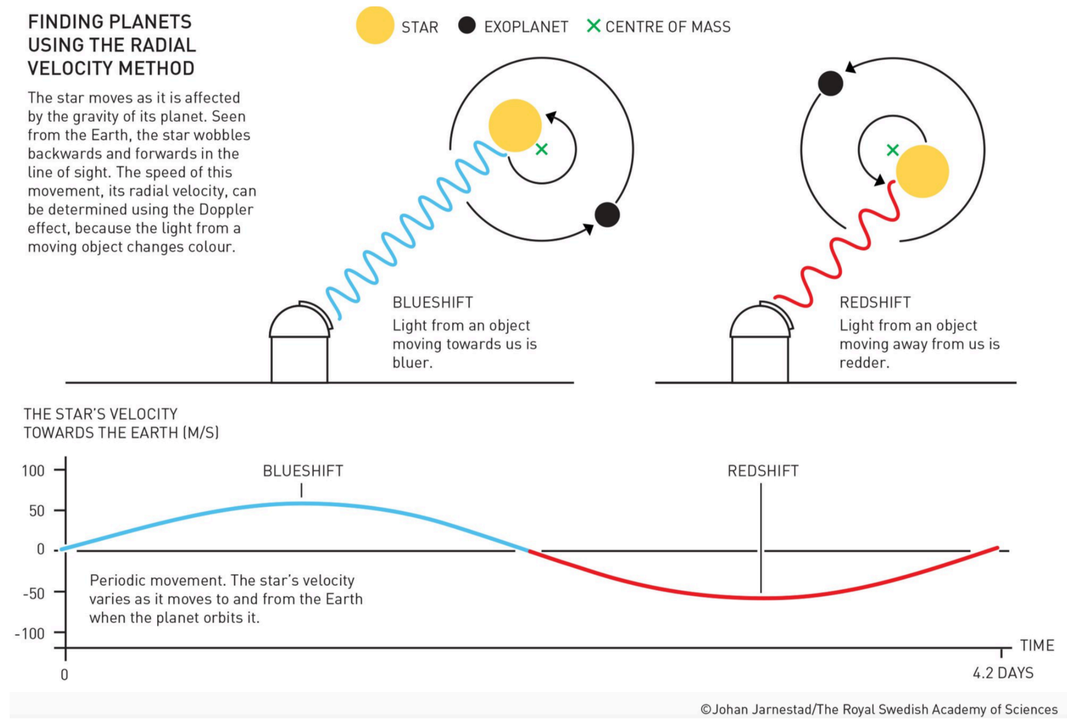
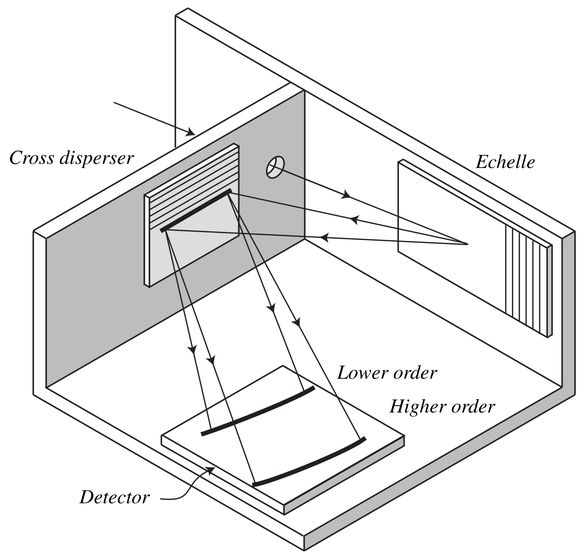
Motivation

A transiting exoplanet is a planet outside of our solar system whose orbital motion is oriented in such a way that Earth-based observers will see the planet periodically pass in front of the parent star, blocking a small fraction of the light from the star.



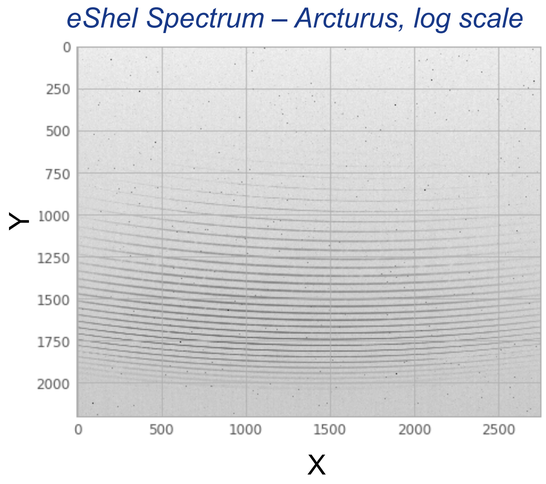
Échelle Spectrograph



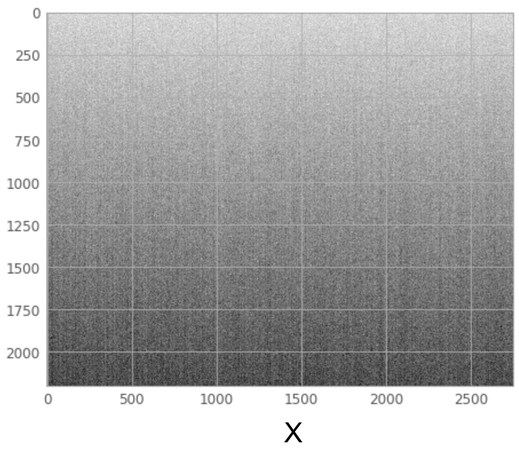
A spectrograph is an instrument used to obtain and and record astronomical spectrum by splitting or dispersing light from an object into its component wavelengths.

Reduction Pipeline

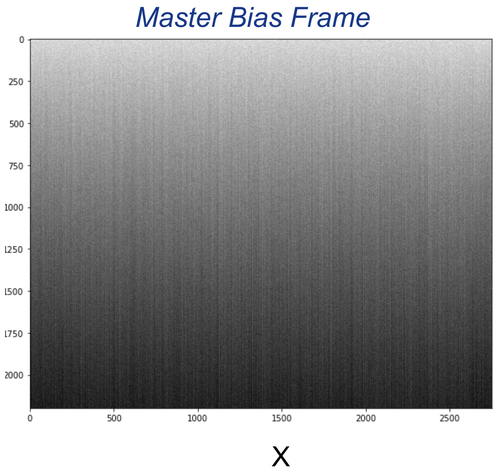
eShel Spectrum – Arcturus, log scale



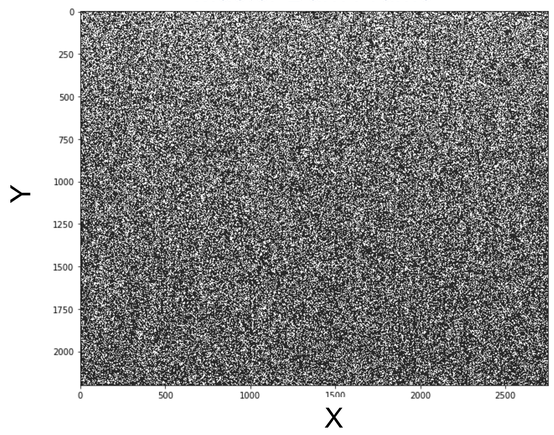
Bias Frame



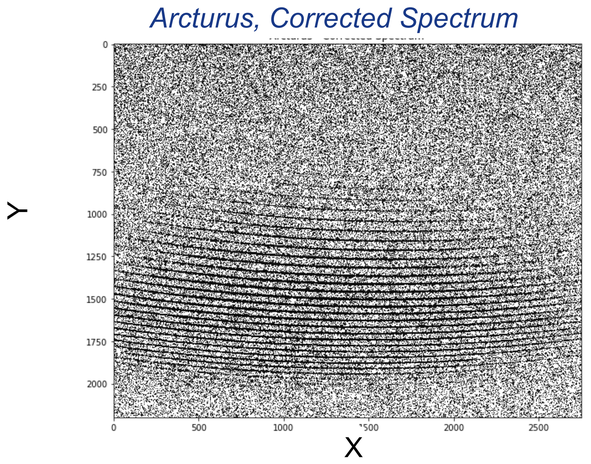
Master Bias Frame



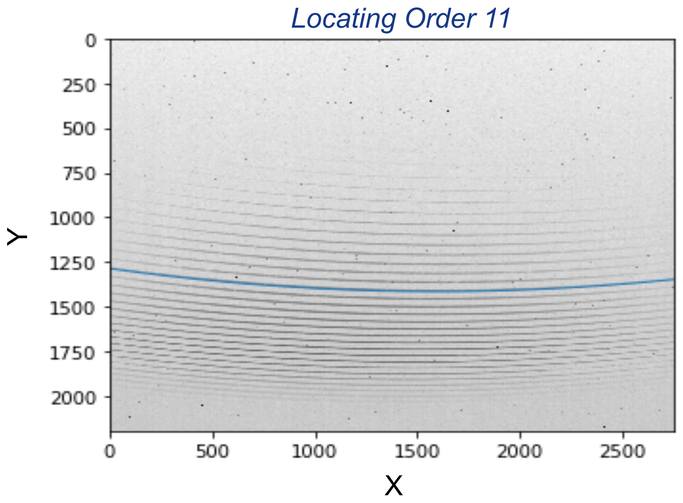
Master Dark Frame



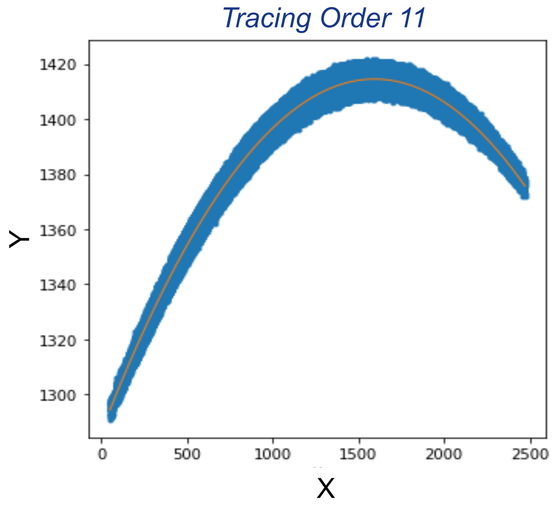
Arcturus, Corrected Spectrum



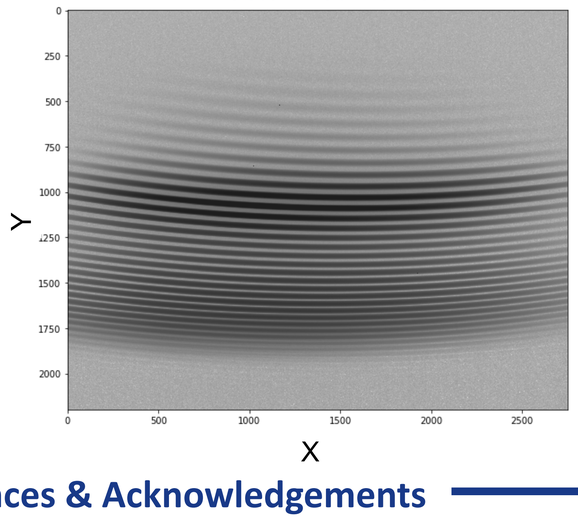
Locating Order 11



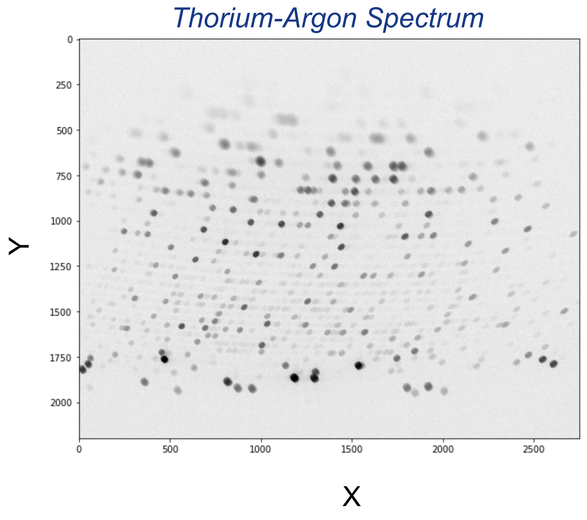
Tracing Order 11



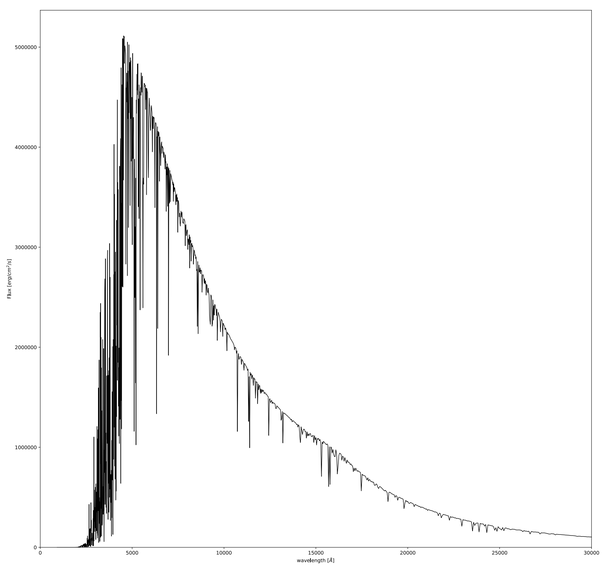
Master Flat Frame



Thorium-Argon Spectrum



Future Work



- Flat Field subtraction
- Wavelength calibration
- Radial velocity follow-up
- The data reduction pipeline will also be made publicly available to benefit the astronomy community for reuse and repurpose

References & Acknowledgements

FUSE Program and their support on this project

Chromey, Frederick R. *To Measure the Sky: an Introduction to Observational Astronomy*. Cambridge University Press, 2017.