

## Mining the HST Treasury: The ASTRAL Reference Spectra for Evolved M Stars

*K.G. Carpenter, (NASA-GSFC), T. Ayres (CU/Boulder), G. Harper (TCD),  
G. Kober (NASA-GSFC/CUA), and G.M. Wahlgren (NASA-HQ/CUA)*

The "Advanced Spectral Library (ASTRAL) Project: Cool Stars" (PI = T. Ayres) is an HST Cycle 18 Treasury Program designed to collect a definitive set of representative, high-resolution ( $R > 100,000$ ) and high signal/noise ( $S/N > 100$ ) UV spectra of eight F-M evolved cool stars. These extremely high-quality STIS UV echelle spectra are available from the HST archive and through the University of Colorado (<http://casa.colorado.edu/~ayres/ASTRAL/>) portal and will enable investigations of a broad range of problems -- stellar, interstellar, and beyond -- for many years. In this current paper, we concentrate on producing a roadmap to the very rich spectra of the two evolved M stars in the sample, the M3.4 giant Gamma Crucis (GaCrux) and the M2Iab supergiant Alpha Orionis (Betelgeuse) and illustrate the huge increase in coverage and quality that these spectra provide over that previously available from IUE and earlier HST observations. These roadmaps will facilitate the study of the spectra, outer atmospheres, and winds of not only these stars, but also numerous other cool, low-gravity stars and make a very interesting comparison to the already-available atlases of the K2III giant Arcturus.