Molecular Bands in High-Resolution Spectra of Kapteyn's Star (M1.5 VI) Across a Broad Spectral Range from 3800 to 10,400 Å

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The primary aim of this talk is to demonstrate how recent updates in the lists of molecular lines for oxides (TiO, ScO) and hydrides (AlH, SiH, MgH, CaH, FeH) from the ExoMol database contribute to a more precise understanding of the spectra of late-type stars across the visual spectral range (3800–10,400 Å). Using MARCS atmospheric models, I synthesize the spectrum of an M1.5 red subdwarf and compare it with archival spectra of Kapteyn's Star. The choice of this star was motivated by several factors: its spectral type, where chemical abundances have been determined from atomic lines, but molecular bands are already prominent; the availability of flux-calibrated spectra (XShooter); and high-resolution spectra (HARPS, UVES) with a signal-to-noise ratio above 100. I highlight the need to introduce an enhancement of continuous opacities starting below 5600 Å, increasing towards shorter wavelengths, to match the observed flux. Modifications to the intensities of molecular bands are suggested in order to reconcile with the chemical abundances derived from atomic lines.