



The fingerprint of a star: μ UMa

μ Ursae Majoris (34 UMa = HD 89758), named Tania Australis, is a cool M0 III giant. Parallax measurements give an estimated distance of roughly 230 light-years from the Sun, with a margin of error of 4%. It has expanded to 75 times the radius of the Sun whilst the outer atmosphere has cooled to an effective temperature of 3,900 K. Estimates of the luminosity range from 977–1,200 times that of the Sun. It is classified as a suspected variable star with a brightness variation from magnitude 2.99m to 3.33m. It is a spectroscopic binary star system with a companion a mere 0.2 AU from the primary, assuming a distance of 71 parsecs, with an orbital period of 230 days.

This poster shows the optical spectrum of μ UMa obtained with the Potsdam Echelle Polarimetric and Spectroscopic Instrument (PEPSI) of the Large Binocular Telescope (LBT). It plots the normalized intensity as a function of wavelength λ in Angströms (1Å=0.1nm) from the top left corner to the bottom right corner. The PEPSI spectrum covers the wavelengths between 3820 Å (top left) and 9130 Å (bottom right) with an average spectral resolution of $R=\lambda/\Delta\lambda=220,000$ or approximately 1.4 km/s. Its average dispersion is 0.012 Å/pixel. Integration time with the LBT was 2 min, and 20 min with the VATT, and consists of 3-15 exposures in all six cross dispersers. The signal-to-

noise ratio (S/N) of the spectrum peaks at 2200:1 at 8250 Å and has a low of 190:1 near the blue cutoff. The LBT exposures were obtained on March 3, 2017 and April 9, 2015, the VATT exposures on April 4, 2015. A subset of spectral absorption lines is identified in the graphics and marked with dashes beneath the spectrum. The annotation indicates the chemical element (e.g., Fe for iron), the ionization state (I for a neutral line, II for an ionized line), and the wavelength in Angström. The original spectrum has been published in *Astronomy & Astrophysics* (Strassmeier, K. G., Ilyin, I., & Weber, M. 2018, A&A, **612**, A45; see <https://pepsi.aip.de/>).

