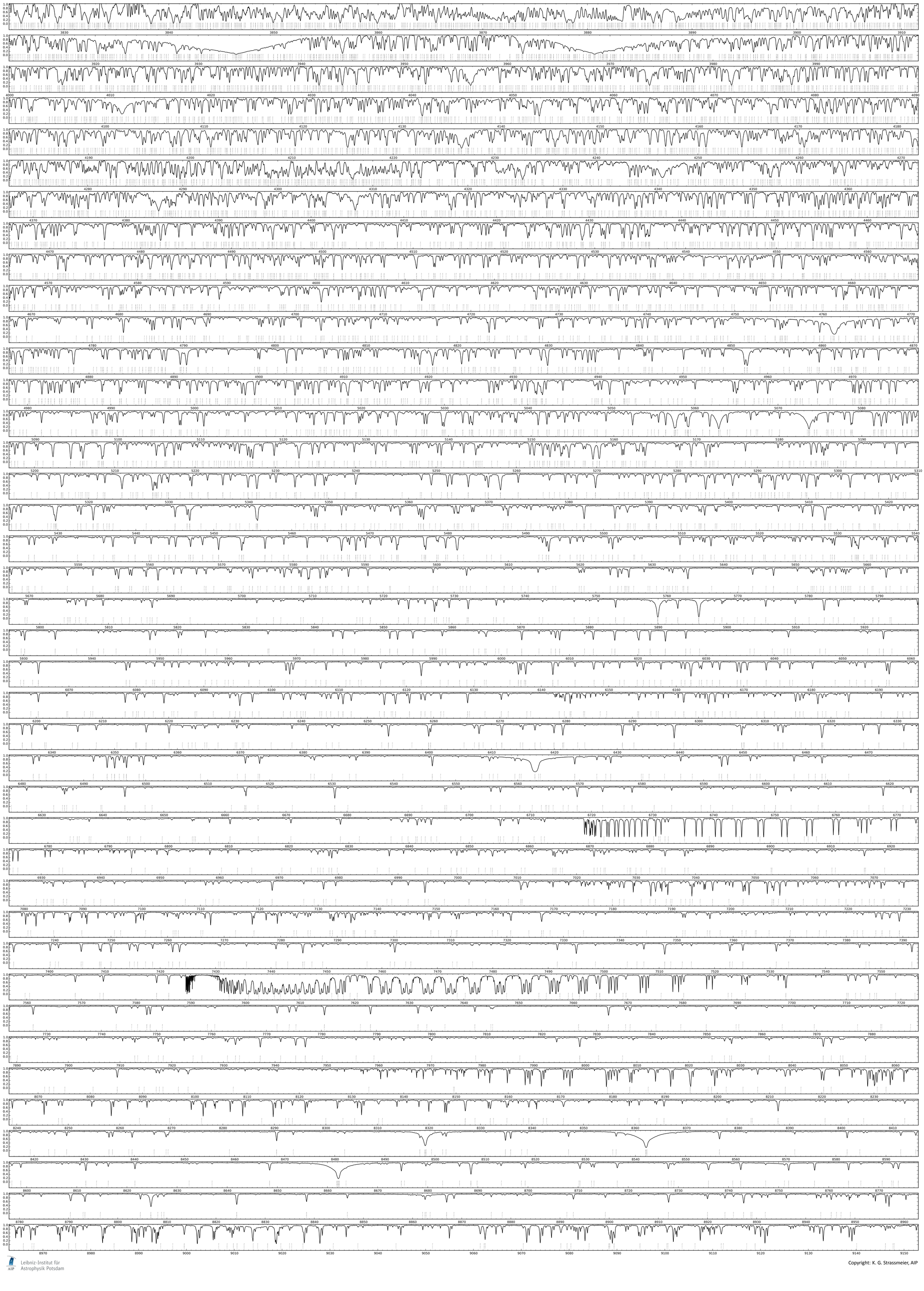
The fingerprint of a star: ζ Her

ζ Herculis (40 Her = HD 150680) is a G0 subgiant in a multiple star system. The primary member is a subgiant star that is somewhat larger than the Sun and has just begun to evolve away from the main sequence as the supply of hydrogen at its core becomes exhausted. It is orbited by a smaller companion star at a mean angular separation of 1.5 arcseconds (or about 15 AUs). The stars orbit each other over a period of 34.45 years. Parallax measurements put it at a distance of about 35.0 light-years from the Sun. Component A has a stellar classification of G0 IV. It has about 2.6 times the radius of the Sun and 1.45 times the Sun's mass. This star is radiating more than six times the luminosity of the Sun at an effective temperature of 5,820 K. The secondary component (Component B) is about the same size and mass as the Sun, with an effective temperature of 5,300 K. Both stars are rotating slowly. There may be a faint third member of this system, although little is known about it. This poster shows the optical spectrum of ζ Her 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 1 min, and 30 min with the VATT, and involve between 2-14 exposures in all six cross dispersers. The signal-to-noise ratio (S/N) of the spectrum peaks at 2040:1 at 8250 Å and has a low of 240:1 at 4500 Å . The exposures were obtained on April 2-10, 2016 with the VATT and on June 3, 2016 with the LBT. 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/).



Leibniz-Institut für
Astrophysik Potsdam