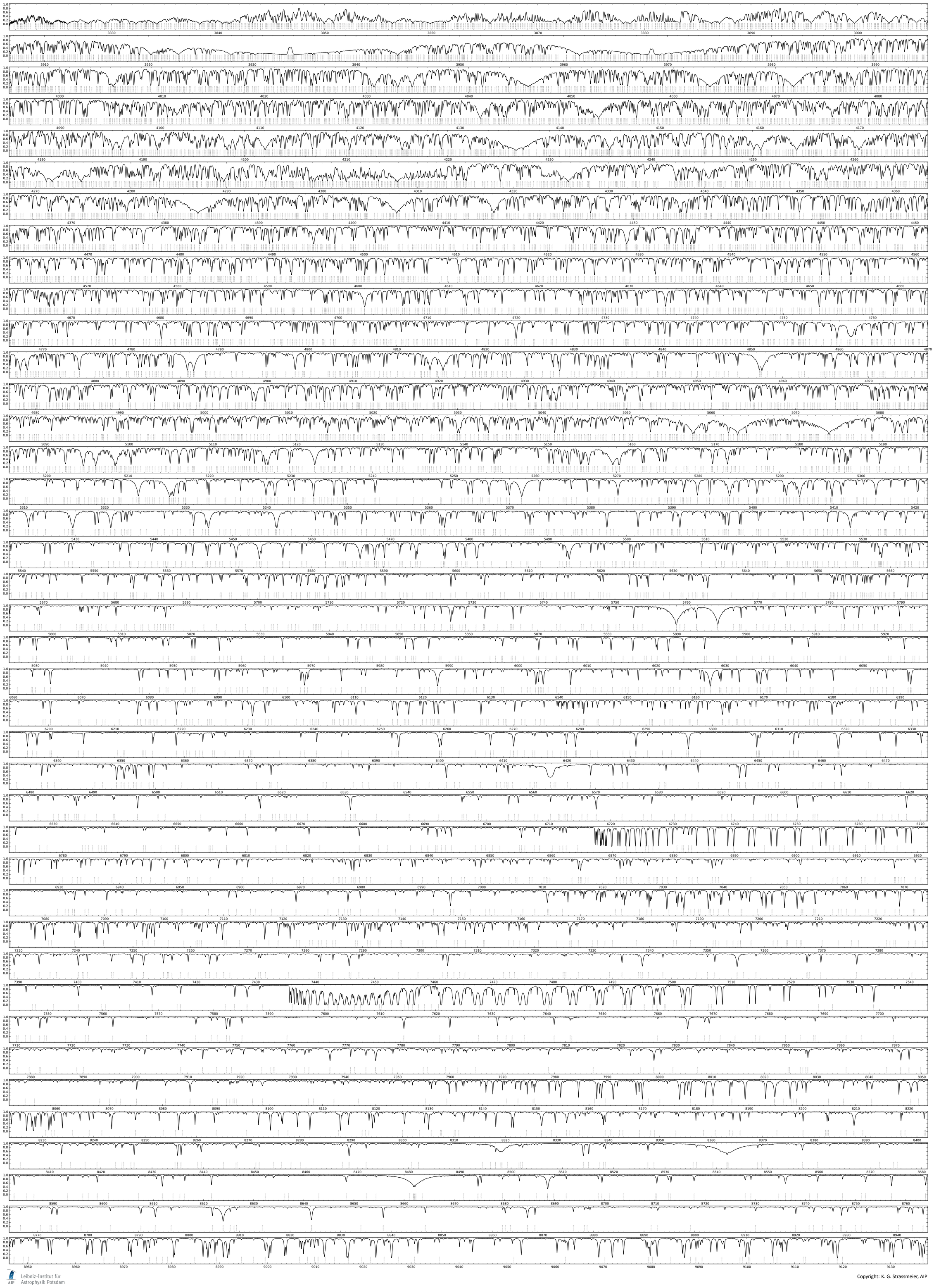
The fingerprint of a star: ϵ Eridani

Epsilon Eridani (ϵ Eri = 18 Eri = HD 22049), also named Ran, is a very nearby star just 3.2 pc away from the Sun with an apparent magnitude of 3.73 mag. The star is estimated to be less than a billion years old. Because of its relative youth, ϵ Eridani has a higher level of magnetic activity than the present-day Sun which is evident from the emission lines in the cores of the Ca II H&K resonance lines. It is a main-sequence star of spectral classification K2V, roughly 800 K cooler than the Sun. The ϵ Eridani system also includes two belts of rocky asteroids; at about 3 AU and 20 AU from the star. Periodic radial-velocity changes yielded evidence of a giant planet orbiting the star with a period of 7 years. The discovery of the planet has been controversial because of the amount of background noise in the radial velocity data, particularly in the early observation, but many astronomers now regard the planet as confirmed. This poster shows the optical spectrum of ϵ Eri 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 (1 Å = 0.1 nm) 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 0.007 Å/pixel. Exposure time with the LBT was 2 min and five consecutive exposures were co-added. The achieved signal-to-noise (S/N) ratio of the spectrum shown varies strongly with wavelength because the star appears very red and provides only little flux in the blue wavelengths. S/N ratio is peaking at 2,200:1 at 7000 Å with a low of 400:1 near Ca II H&K. The individual exposures took in total 35 minutes and were obtained on October 1, 2016. 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. Note that the annotation text appears darker the stronger the line. The line identifications and the wavelengths were taken from the Vienna Atomic Line Database. The original spectrum has been published in Astronomy & Astrophysics (Strassmeier, K. G., Ilyin, I., & Weber, M. 2017, A&A). For further details and for spectra of other stars see https://pepsi.aip.de/



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