[ST05] Asteroseismology of enigmatic Przybylski's star

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The investigation of oscillation spectrum of the most chemically-peculiar star in the sky - the rapidly-oscillating magnetic (roAp) star HD101065 (Przybylski's star) is presented. High-precision radial velocity measurements spanning four consecutive nights on 3-6 March,2004 were obtained with HARPS echelle-spectrometer at the ESO 3.6-m telescope. The RVs were measured using all spectral lines in the wavelength range 4700-5000 A. The rich spectrum of 16 oscillation modes with general spacings of mode 64 μHz and amplitudes ranging from 217 m s^{-1} to 1.6 m s^{-1} were detected. Asteroseismic tuning of the parameters of the theoretical stellar model was done to fit oscillation spectra to observed one. A model with parameters 1.55 $M_{\odot}$, log $L/L_{\odot}$=0.827, log Te=3.827 and polar magnetic field strength of 7.8 kG well fit the observed oscillation frequency spectrum. The accurate posotion of Przybylski's star on HR diagram was found. This is a first accurate asteroseismic determination of magnetic field strength and accurate parameters for a roAp star.

[ST06] X-ray Spectral Study of Centaurus X-3 in Various Intensity States

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We report a detailed spectral analysis of the out of eclipse observations of Cen X-3 with ASCA, BeppoSAX, Chandra, XMM-Newton and RXTE in its different intensity states. We find that the high and the low states of Cen X-3 have separate domains of the value of photon index. From RXTE, we find that the column density has a ceiling in the high states. The equivalent width of the Fe-emission lines as measured with RXTE shows a decreasing trend with the increasing value of the (7-25) keV PCA flux. It goes up to almost ~800 eV for low values of PCA flux and then decreases to (50-100) eV. We compare our results with that of LMC X-4 and Her X-1. We then discuss the applicability of the "warped accretion disk model" in describing the high and low states of Cen X-3 vis-a-vis the other two pulsars.