Abstract:

This thesis contains spectroscopic analyses of two unusual binaries with circumstellar disks – β Lyr and ϵ Aur. Several hundred optical spectra were processed and analyzed for both binaries which led to several original findings. For β Lyr, it was a discovery of a weak shell spectrum originating in a disk pseudophotosphere and a hidden satellite spectrum, present only during eclipses, which arise from additional absorption of the primary light passing through the gaseous envelope around the secondary. For ϵ Aur, it led to the discovery of the apparent multiperiodic line variability occuring during the current eclipse with a dominant and common period of $66\overset{\mathrm{d}}{.}21$ and to an explanation of complex Hα line profiles during the eclipse which is again caused by an additional absorption of a primary light in an atmosphere of a dark disk around a secondary. Also rich series of radial velocity measurements and photometric observations were collected and used to determine a new precise orbital solution for ϵ Aur. Further, a hydrodynamical and a radiative modeling of a discontinuous mass transfer in a close binary system was carried out which resulted in a formation of an elongated disk with a slow prograde revolution, demonstrated itself by double emission Hα line profiles that exhibit V/R variations.