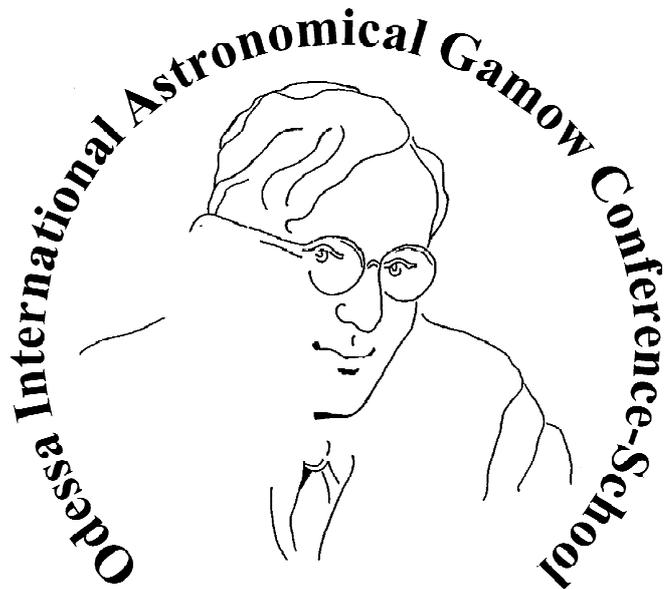


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"ASTRONOMY AND BEYOND: ASTROPHYSICS,
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ASTROPARTICLE PHYSICS, RADIOASTRONOMY
AND ASTROBIOLOGY"**



ABSTRACTS

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For the exoplanets TrES-3b, Kepler-17b, WASP-3b and Qatar-1b, the obtained results of the center-transit time, depth and length of transit agree with the ephemeris data, while for two observations of the Qatar-2 system for the planet Qatar-2b there is a clear decreasing trend of the value of the O-C parameter. Additionally, using the method of time variation (TTV), we found a possible gravitational effect on the orbit of the exoplanet Qatar-2b of another massive body. This suggests that the assumption of the existence of the planet Qatar-2c conjectured in the article Bryan (2011) is true.

HIGH-RESOLUTION SPECTROSCOPY OF THE B[E] STAR MWC 645

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Optical high-resolution spectroscopic observations of the emission-line star MWC 645 are presented. The spectrum exhibits strong variable double-peaked Balmer emission lines as well as low-excitation emission lines of Fe II, [Fe II], and [O I] which are signatures of the B[e] phenomenon, while lines of helium have not been found.

In addition to the emission lines, for the first time we identified absorption lines of neutral metals (e.g., Li I 6708 Å, Ca I 6717 Å, and a number of Fe I and Ti I lines) that indicate the presence of a cool component in the system. The heliocentric radial velocity measured in our best spectrum was found to be -65.1 ± 1.0 km/s for the emission lines and -23.2 ± 0.4 km/s for the absorption lines. Using a combination of photometric and spectroscopic data as well as the Gaia EDR3 distance ($D=6.5 \pm 0.9$ kpc), we disentangled the components' contributions and estimated their temperatures and luminosities (~ 15000 K and ~ 4000 K, $\log L/L_{\odot} \sim 3.7$ and $\log L/L_{\odot} \sim 3.3$ for the hot and cool component, respectively).

SPECTROSCOPIC INVESTIGATIONS OF GALACTIC OPEN CLUSTER *Collinder 394* – NEW RESULTS

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We present the results of a spectroscopic investigation of 11 objects from the open cluster *Collinder 394*, which contains the Cepheid BB Sgr. We used the spectroscopic data obtained by SALT (South Africa) and TCO (North Carolina, USA) telescopes. Besides the Cepheid, we studied 10 confident cluster members, including 9 main sequence stars and one post-MSTO object. These confident clusters' members have been found by the using of radial velocities (RV), T_{eff} , $\log g$, obtained spectroscopically, and proper motions and distances from GAIA DR2 catalogue. We have derived the color-excesses, reddenings, intrinsic colors and absolute magnitudes for these stars to compare with ones, obtained from photometry. Moreover, we made an attempt to resolve the inverse problem – using the $T_{\text{eff}} - R - M_v$ relations for main sequence stars to check the distances, obtained by GAIA telescope.

THREE REMARKABLE OBJECTS IN GALACTIC OPEN CLUSTER *Collinder 394* – HD 174403 (V4088 Sgr, HD 174652 and BB Sgr)

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We present the results of a spectroscopic investigation of 3 remarkable objects from the open cluster *Collinder 394*: post-MSTO object HD 174403 that is an eclipsing binary V4088 Sgr, Be-star HD 174652 and Cepheid BB Sgr. Till recently these objects were researched spectroscopically very poorly, but we have fill up the gap using the spectroscopic data obtained by SALT (South Africa) and TCO (North Carolina, USA) telescopes.