# WOLF RAYE TYPE WR 134 STAR SHORT-TERM PHOTOMETRIC VARIABILITY

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# INTRODUCTION

40 cm telescope of Paris Observatory, discovered three stars (HD191765, HD192103, and HD192641) in Cygnus, with the unusual broad emission lines. The observed strongest lines belonged to nitrogen, carbon, oxygen and helium. In the spectrum of WR stars, on the other hand, the hydrogen lines are usually weak or completely missing Here we consider only the massive Population of I WR stars of our Galaxy, which are concentrated in Galactic plane.

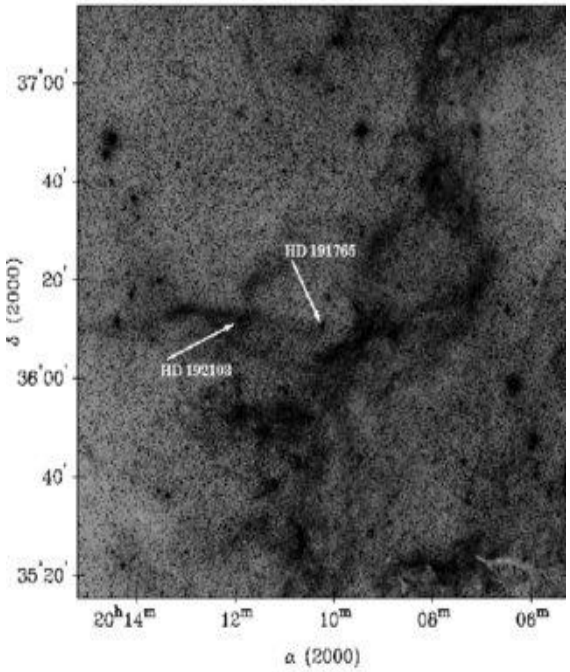
The spectral, photometric, etc. properties of WR stars are very different from the ordinary stars.

**1)** WR stars exhibit very intense and broad emission ines of helium, nitrogen, carbon, oxygen, etc. and weak continuous spectrum

**2)** the WR stars are mainly composed of helium and very little hydrogen. In ordinary olar type stars, the opposite contamination is observed, namely less helium and more hydrogen

**3)** the simultaneous presence in the spectra of these stars of the low-temperature continuous Spectrum and lines of atoms and ions corresponding to the very high (up to 130 eV) ionization potentials

**4.)** The simultaneous existence of the lines with very different excitation potentials (10-130 eV) in the spectra of these stars could be explained by the presence of strong temperature stratification in the envelopes of these stars



**5)** WR stars were classiffied into three types: nitrogen (WN), carbon (WC) and oxygen (WO) ones. The spectra of WN and WC stars mainly contain nitrogen and carbon lines correspondingly. The spectrum of the WO stars consists of lines of oxygen and carbon.

**6**) About half of the WR stars are components of the close binary systems.

**7)** Exploiting binary stars, the masses of WR stars were found to range from $10M_{\odot}$ to 83 $M_{\odot}$;

**8)** The spectral features of these stars indicate strong radial outflow of matter from WR stars. The widths of the emission lines correspond to velocities of ~ 1000−3000 km/s, which, within average characteristics of these stars, exceed the parabolic velocity. These stars mass loss which is 3-4 times larger than for the ordinary hot OB stars

**9)** In the (HR) diagram, the WR stars with the most confidently determined physical parameters (temperature and luminosity) lie in the region between the main sequence (MS) and the sequence of homogeneous helium stars.

**10)** Population I WR stars are very high luminosity $(\sim 10^5 \div 10^6)L_{\odot}$ hot stars. The absolute magnitudes of these stars are in the range from $-4^m$ to $-7^m$

# The first and second stage of the study of WR stars  in the ShAO

he study of WR stars in ShAO can be divided into two stages.

1) 1962-2005 - At this stage of investigation, a photographic plate or photo electronic amplifiers was used as a light detector
2) After 2005, at the second stage, spectral and photometric observations were carried out by using modern high sensitive light detectors – CCD matrices.

Dr.A.Huseynzade studied the possible variability of the parameters (equivalent width, half-width etc.) of the HeII4686 and HeII5411 emission lines in the spectra of WR type stars, V 444 Cyg, and CQ Cep. The equivalent width of emission line HeII4686 in the spectra of V 444 Cyg and CQ Cep stars changed 2.1 and 1.9 times

The second stage of spectral and photometric observations of WR stars begins from 2005 year by using of modern high sensitive light detectors - CCD matrices by Dr. J.N.Rustamov. The profiles of five strongest emission lines were studied: HeII 4859, HeII 5411, CIV 5808, HeI 5875, (HeII+H) 6560

# WR 134

Control star TYC 2683-1582-1 (V = 9.73)

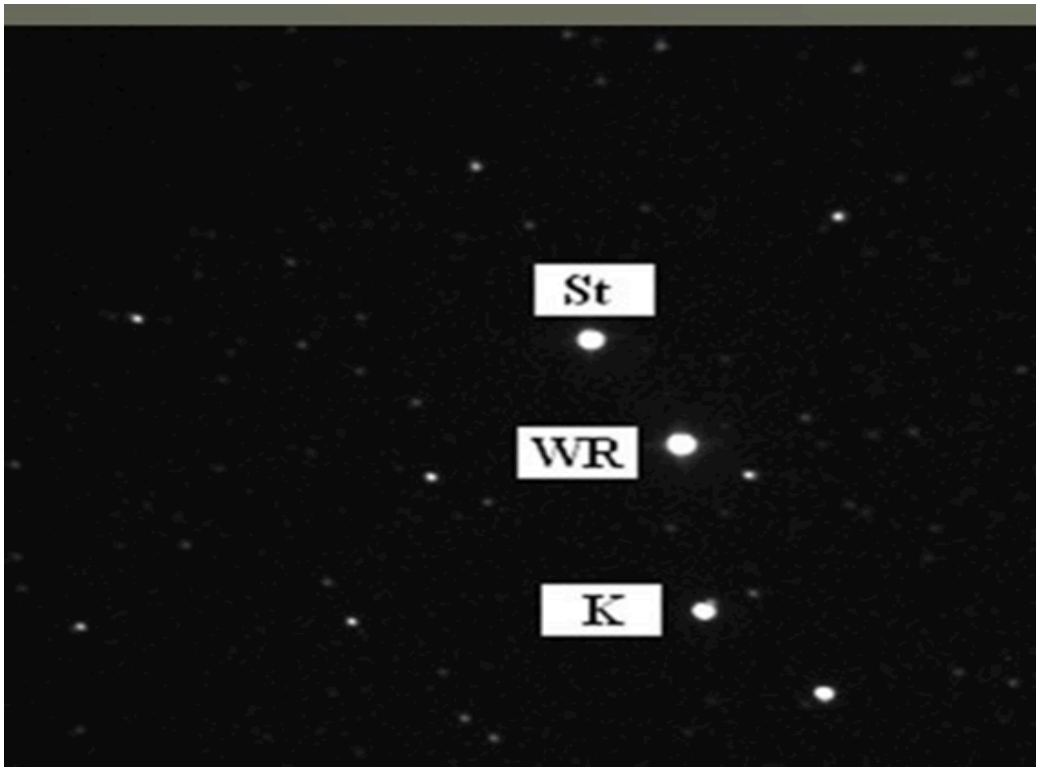
$a_{2000}$ = 20$^h$ 10$^m$ 14$^s$.34

$d_{2000}$ = +36$^0$ 09$^{¢}$ 12¢¢.9

Standart HD 228063 (Sp B8V, V = 8.60)

$a_{2000}$ = 20$^h$ 10$^m$ 11$^s$.67

$d_{2000}$ = +36$^0$ 11$^{¢}$ 28$^{¢¢}$.80



# WR 134

The results of the study of photometric observation material obtained in June 2021 with a CCD photometer in the 60-cm telescope of the Shamakhy Astrophysics Observatory named N.Tusi of Wolf 134 type WR 134 star are given. Observations of the star WR 134 were made in filter V of the international UBV photometric system and its short-term (approximately one hour) photometric variability was detected. The mean quadratic error assigned to the control star was 0.004. The MaxImDL software folder was used to process the photometric images of the star under study. Photometric studies of this star have been performed before, and its photometric variability with a periodicity of 1,887 days, as well as short-term (within a few minutes) was found . The periodic variability of 1,887 days is explained by the fact that this star is a binary star. Photometric observations and research method used. Photometric images of the star WR 134 were installed in June-November 2021 in the 60-cm telescope of ANAS named after N.Tusi, equipped with a modern CCD light receiver. This study presents the results of the development of 150 photometric images of the star WR 134 taken in approximately one hour on 01/02 June 2021. Processing of the obtained photometric material was observed with the MaxIM DL software folder. Standard (HD 228063, Sp B8V, V = 8.60) and control (HD 228062 V = 8.31) stars were used in the development of photometric images of the research star. The mean square error determined for the control star was found to be 0.004.

Picture 1 shows the processing of 150 photometric images (m) of the star WR 134 taken in the V filter. As can be seen from Figure 1, the stellar size of this star varies from about 8.07 to 8.03 in the form of a clock (from 20.3 to 21.1 with UT). Since this change interval (0.04) is much larger than the three sigmas (30.004 = 0.012), As noted, the photometric variability of this star has been discovered before. Therefore, active non-stationary processes take place in this star, and the observed variability is an indicator of non-stationary processes taking place in that star