Identification of X-Ray Sources and Discovering New Variable Stars

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The purpose of our project is identification of x-ray sources and discovering new variable stars. We use 2 original methods. First is used for searching variable stars in optical range in the vicinity of X-ray sources. In this case the probability of finding new stars is much higher because objects which are emitting x-rays usually are binary systems with white dwarfs, neutron stars or black holes. Second method is detection of new variable stars in real images which we took from telescopes located in Australia and controlled over the internet. For searching in optical range was chosen Serpent and Telescope area in South hemisphere of the sky. The method of searching of variability consisted in comparing scatter of observed value with average errors of measure. To determine a period, we used archived Catalina Survey data of 2005-2014 years. As a result, we discovered four new variable stars Identified x-ray source in constellation of Dragon (Karachurin 3). According to preliminary information type of this star is CV+E (cataclysmic variable with eclipses). This star is very important because it can become supernova. Also, we discover 3 variable stars in optical range. First (Karachurin 1) is variable star of type EW (eclipsing variable star of type W of Ursa Major). Second (Karachurin 2) is variable star of type of RRAB/BL (RR Lyrae with Blazhko effect). Third (Timofeev 1) is ultra-periodic pulsation variable of type Delta Scuti with big amplitude (HADS). Also, we created 3D models for Karachurin 1 and Karachurin 3 and determined a distance to our stars. Discoveries received recognition by the international astronomical community. Our stars were registered in international register of variable stars AAVSO VSX.

Awards Won: