Discovery and Study of a New Cataclysmic Variable Star

Panov, Danil (School: Lyceum "Erudite")

There is a special class of objects in our Galaxy - cataclysmic variable stars. These are binary systems consisting of a white dwarf and a red dwarf on the compact orbit smaller than the Moon-Earth distance. White dwarf is stealing the matter from the red companion and growing with time. If the white dwarf is getting enough mass to exceed the Chandrasekhar limit, it explodes as a type Ia Supernova. That is why the cataclysmic binary systems are very important to discover, to characterize and to study. The topic of my research is the new cataclysmic variable star in Sagittarius I have discovered. The raw material for searching a variable star were pictures of the sky in constellation Sagittarius. I have the pictures taken by a telescope T31 in Siding Springs Observatory, Australia. The careful study of the blinking pictures allowed to discover the star with coordinates 19:21:27.38, -31:13:49.5, which showed brightness changing visible to the eye, on the pictures of the 15th August 2017. The light curve identified an eclipse for about 1.5 stellar magnitudes (17.8-19.4m). The period was defined in a program WinEffect. I used archive data from the NEAT survey in 2001-2002, and my own extra observation of the pictures taken with Australian telescope T31 in observatory Siding Springs to confirm the calculation of the period. The star which I have discovered belongs to two variability types: cataclysmic and eclipsing binary star. The stars of this type of variability are only 1% from all variable stars opened nowadays. The period of eclipse equals to 2.2626 hours. So, the star has a period of cataclysmic variable stars and it is a very rare object. My discovery of this is registered in an International Association of Variable Star Observers (AAVSO VSX) entitled as Dan V1.