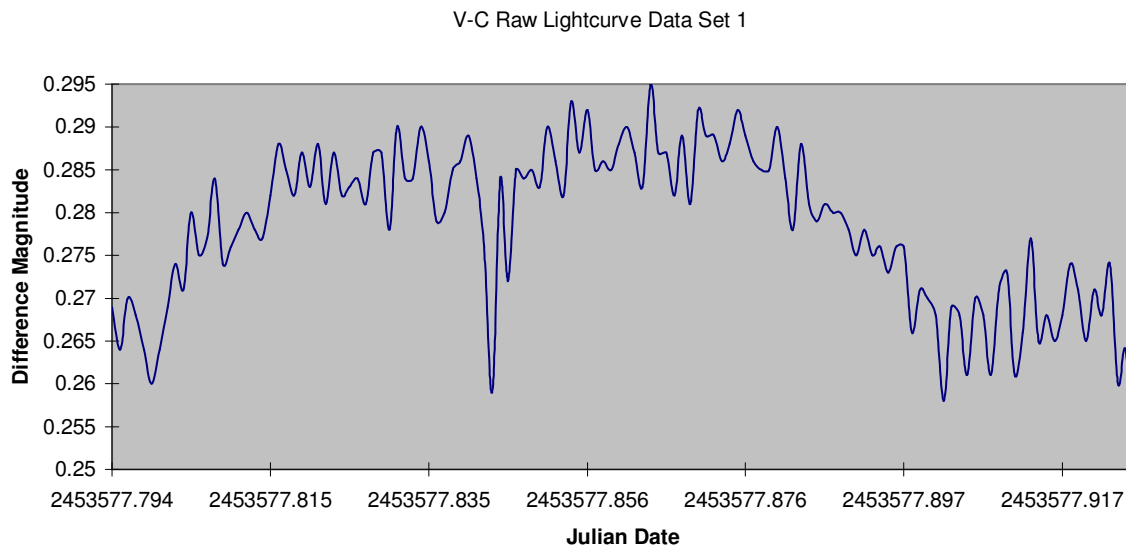


Stephen Riley Measures the Transit of Transiting Exoplanet TrES-1

The orbits of some exoplanets (planets around stars far from the Solar system) are aligned such that the planet appears to pass in front of (and behind) its star as observed from Earth. These are termed “transiting exoplanets”, and the planet is said to transit its star as it passes in front.

On the night of July 26, 2005 recent New Milford High School graduate Stephen Riley and his mentor, Mark Pernerewski (advisor to the NMHS Astronomy Club), were able to measure the transit of exoplanet TrES-1 using precision differential photometry. This method compares the light from the exoplanet’s star to that of a nearby star known to have constant light output, thereby minimizing the effects atmospheric variations during the night. TrES-1 was discovered in 2004, and was known to have a period around the star of 3.03 days, and a transit time of about 145.45 minutes. Steve and Mark started taking photometric data about 4 minutes before the transit started, and had to stop taking data about 33 minutes after the transit was predicted to end.

As their light-curve below shows, the light from the TrES-1 star dims a very small amount (about 2%) during the transit of the planet and this effect is well discerned despite the fairly large noise in the measurements. [Higher values on the astronomers magnitude scale corresponds to less light, or dimmer stars.]



[“Julian Date” is an absolute system of time measurement used by astronomers so that data taken over the centuries can be compared and understood without the complications of leap years, different calendars, etc.. The Julian day goes from noon to noon (since most astronomy is done at night.) So the chart above shows about 3.2 hours of observation.]