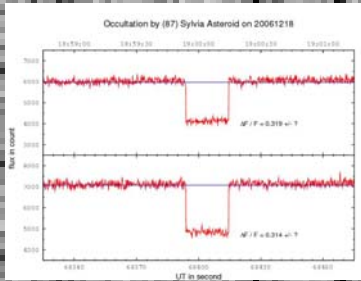
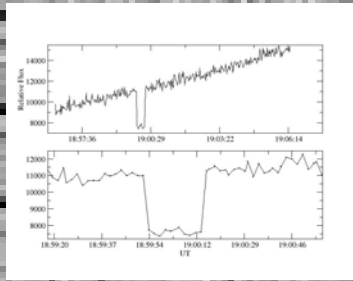


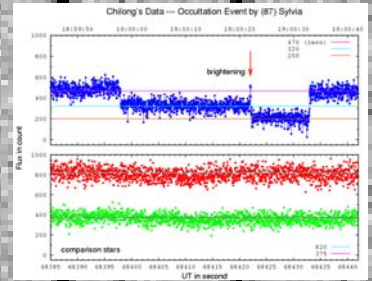
TAOS telescopes found a previously unknown binary in a predicted asteroid event : The catalogued star **TYC 1947-00293-1** ($V = 10.0$) was occulted by the asteroid **(87) Sylvia** ($V = 12.6$, size = $192 \times 132 \times 116$ km) at around 19:00 UT, 2006 December 18. This event was predicted with a maximal occultation duration around 23.4 seconds. Its shadow was expected to pass through the northern half of Taiwan where the TAOS site (Lulin) is near the southern edge. The asteroid (87) Sylvia is known as a triple asteroidal system, that is very special (other than the Pluto and Charon quartet) in our Solar System. Using a special zipper mode operation, two working TAOS telescopes (TAOS A and TAOS B) are able to identify this event clearly while running in synchronous mode (bottom left). A 40-cm telescope at Lulin (running by Hung-Chin Lin, middle) and a 10-inch telescope (F/4, with WATEC-902H CCD & was recorded by SHARP-Z5U DV) in Taichung City (running by Dr. Chilong Lin, bottom right) observed this event at the same time. There was no satellite occultation event detected. However, both the TAOS telescopes and the 40-cm telescope observed a $\sim 32\%$ flux drop (nearly 0.4 magnitudes) lasted for about 20.5 seconds. The Taichung team saw two (32% and 57%) flux drops separated by two or three video frames. The duration of these two flux drops are about 23.9 seconds and 10.8 seconds respectively. All flux drops measured are consistent with the picture that the background star is really a binary system. The brightness ratio between the primary and its companion is about 1.8. The spectrum of this binary system shows that the primary should be an F-type star. This is a previous unknown binary system that was first resolved by this observation.



TAOS A & TAOS B



Lulin One-meter Telescope



Dr. Lin in Taichung City

2006 TAOS STATUS 2007

TAOS A/B/D are running since 2004: A/B/D work in synchronous mode automatically through remote control. These are monitored in a routine observation.



(Left) TAOS D telescope (Right) Webcam image of A(ul), B(ur), C(ill), D(lr) (26 Oct. 2004)

TAOS C and a New Frame-transfer CCD: A new baffle was designed and was first tested at TAOS C in March, 2007. A new frame-transfer CCD was installed for test at the same time. This new camera has a smaller field of view (1K by 1K, the smaller picture below). Though, a faster read-out in zipper mode is possible. A comparison to the current field of view from SI-800 is shown in the bigger picture (same field F054). (FTCCD data by A-Chim)

TAOS A B C D and SLT: The four TAOS sites A/B/C/D (from lower right to upper left) can be seen in this picture. Four telescopes were installed as shown in the webcam image above. The Korean primary (in C) was re-polished and re-installed by summer 2005. Though, there is still some imperfection at the edge. The old SLT building is our control center. (Picture taken by H. C. Lin in December 2004.)

TAOS Observation (2005–2006): Here is a quick summary of the TAOS observation time in 2005 and 2006. Usually, a zipper run lasts for one and half hours since summer 2005 when TAOS has better zipper guiding capability. The zipper frequency was 4 Hz instead of the current 5 Hz in early 2005. Some other parameters are also different in the test run. The total observation time is 661.3 hours for at least one telescope data and 343.8 hours for three telescope data. A preliminary result of the first year data is shown below. We have been working on improving the photometric algorithm and archiving system so that the more stable second year data can be well analyzed. (Statistics & plot prepared by Andrew Wang)

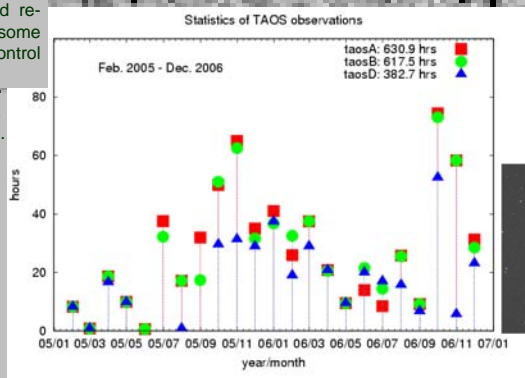


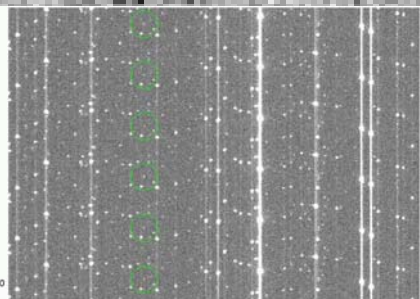
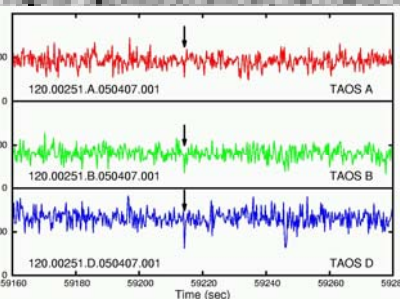
Image by SI-800

Image of frame-transfer CCD

Number of row blocks (4 or 5 Hz)				Time span near the ecliptic (hr)			
3 telescope	2 telescope	1 telescope	Total	3 telescope	2 telescope	1 telescope	Total
2,504,256	1,311,136	273,056	4,088,448	157.49	87.76	16.73	261.97

Number of row blocks (4 or 5 Hz)				Time span off the plane (hr) (more than 10° away)			
3 telescope	2 telescope	1 telescope	Total	3 telescope	2 telescope	1 telescope	Total
474,624	1,046,784	264,640	1,786,048	32.77	72.40	18.31	123.47

Statistics of the First Year Data (2005 February to 2006 February): These two tables show the TAOS observation on a field near the ecliptic (within 10°, top panel) and the observation away from the plane (bottom) during this 13 months. System parameters, such as zipper frequency, was changing. (prepared by Kiwi Zhang.)



Occultation Candidate in the First Year Data (2005 February to 2006 February): Using a specific adaptive aperture photometric algorithm and the rank statistics developed within the TAOS team, the most likely candidate event in this set of data is shown above. See Chen et al. 2006 (astro-ph/0611527) for more detail. (The original analysis was done by Kiwi Zhang.)