



## Study of the Comets C/2012 S1 (Ison) and C/2013 A1 (Siding Spring)

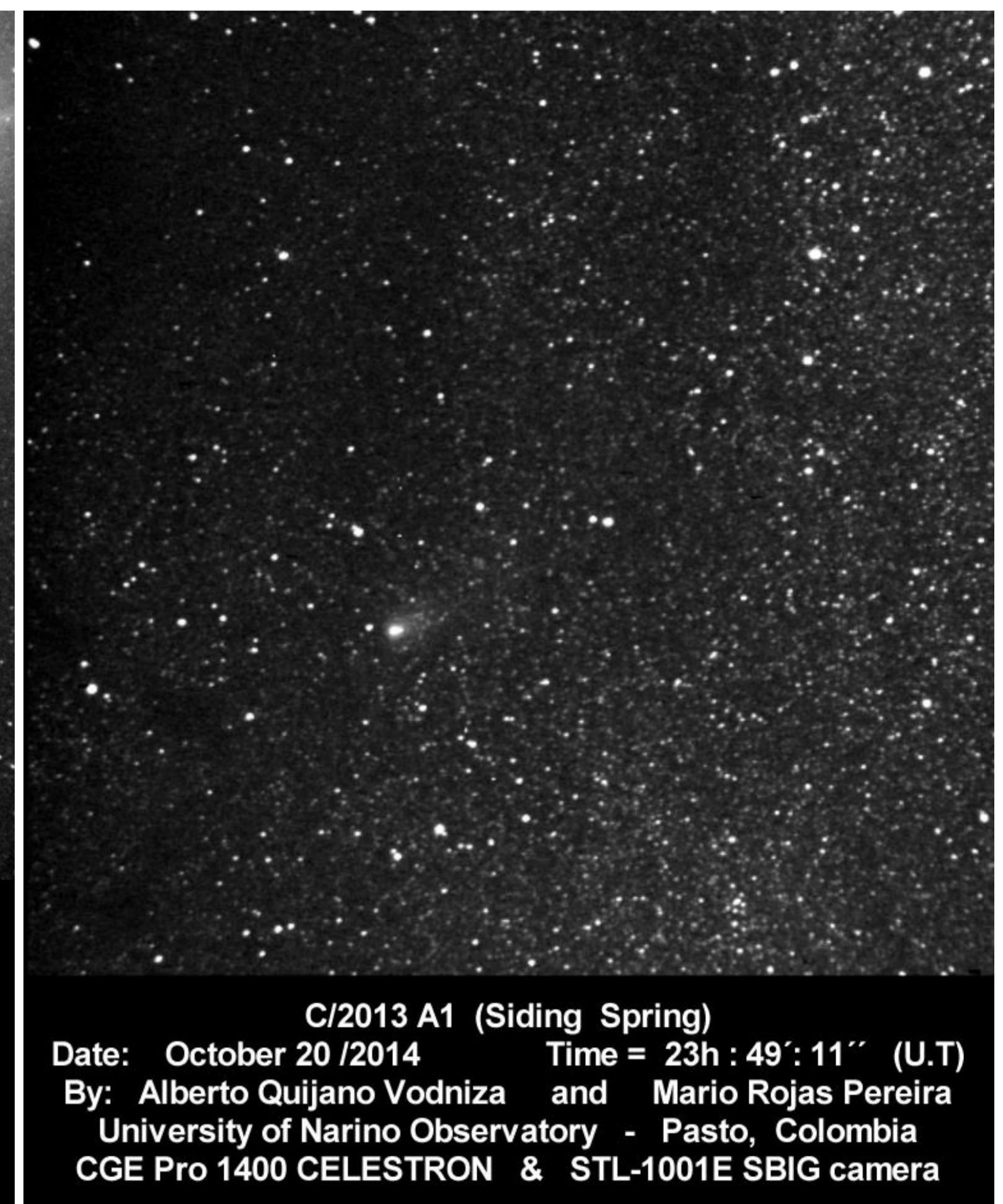
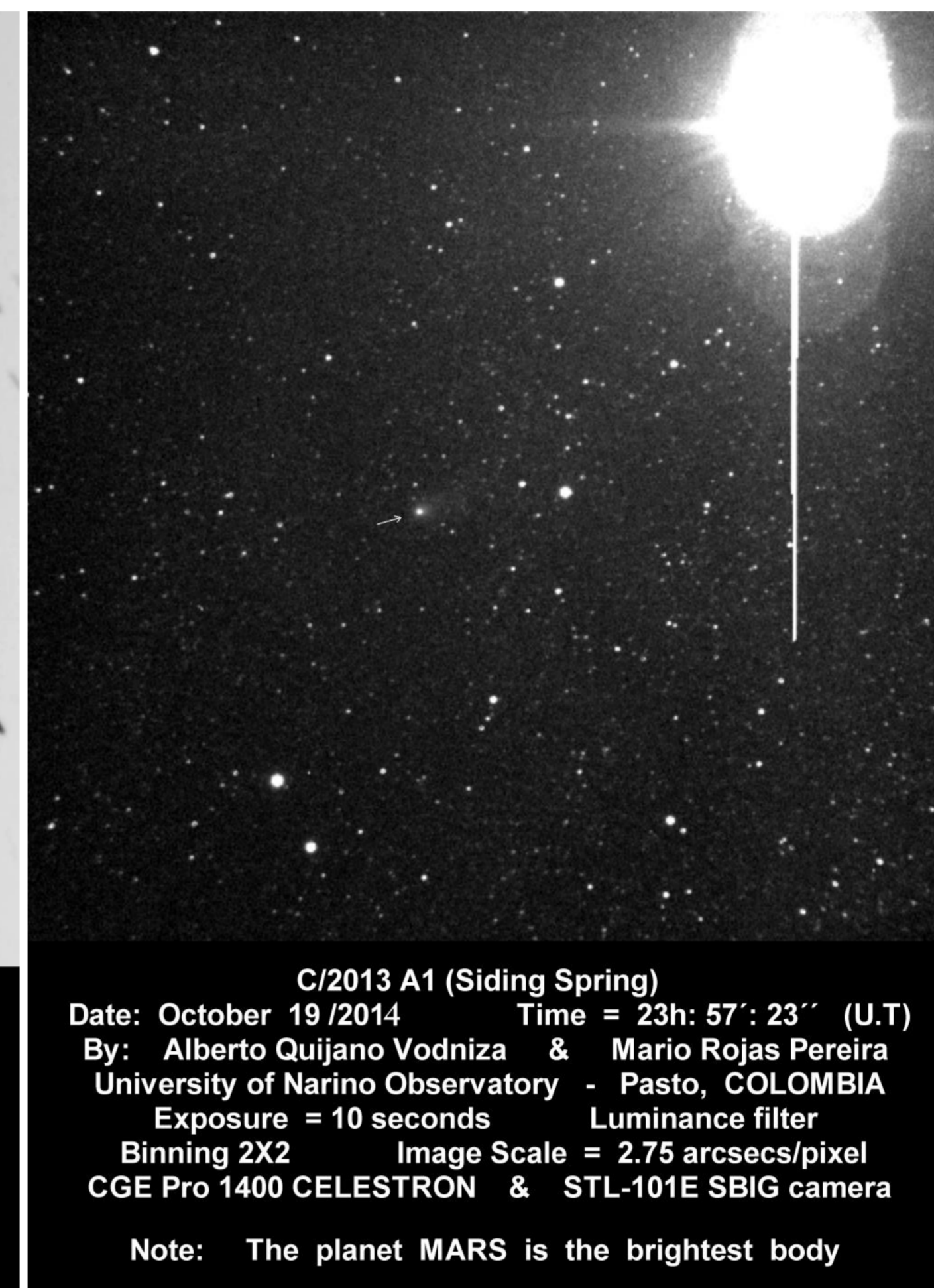
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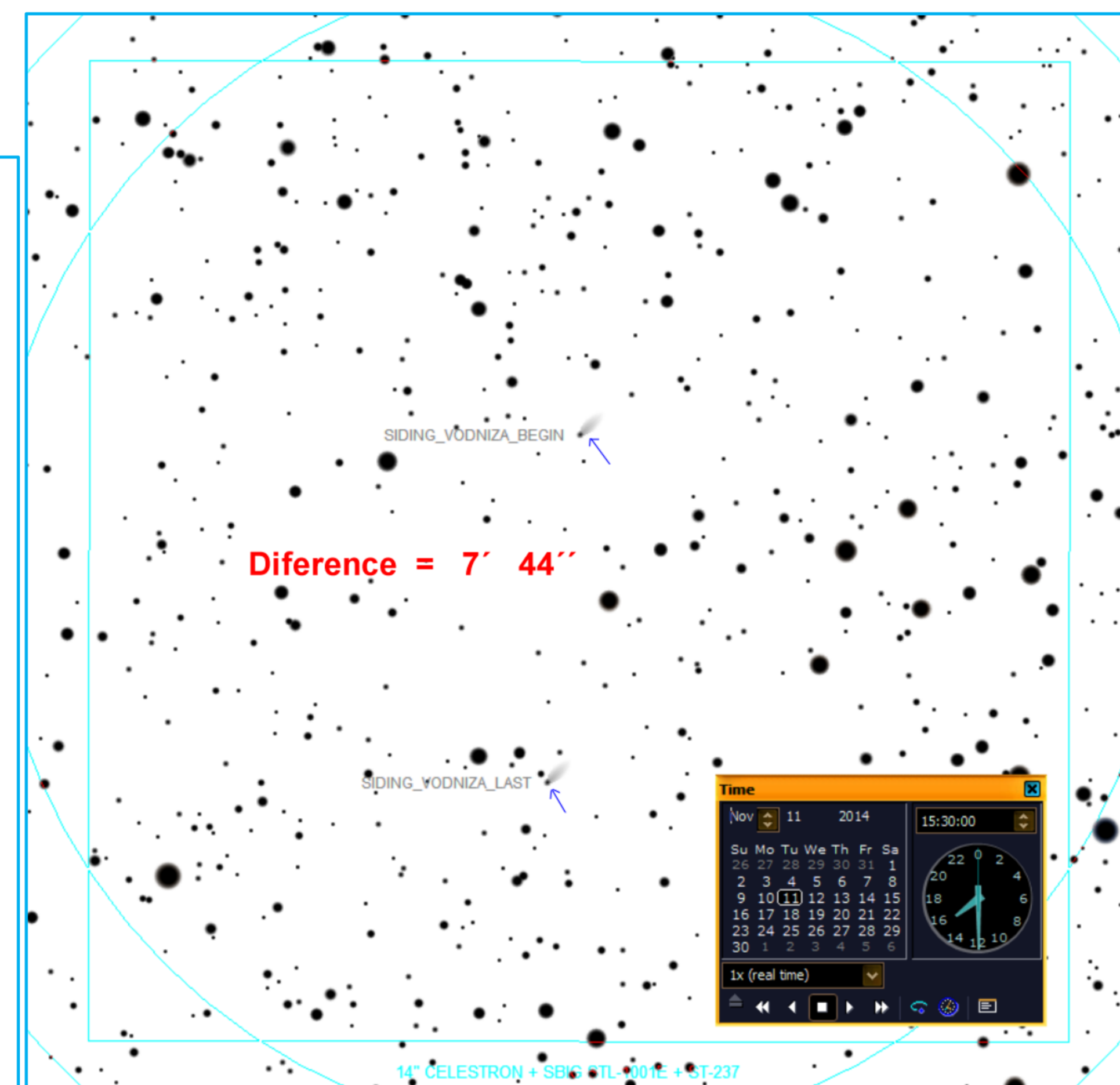
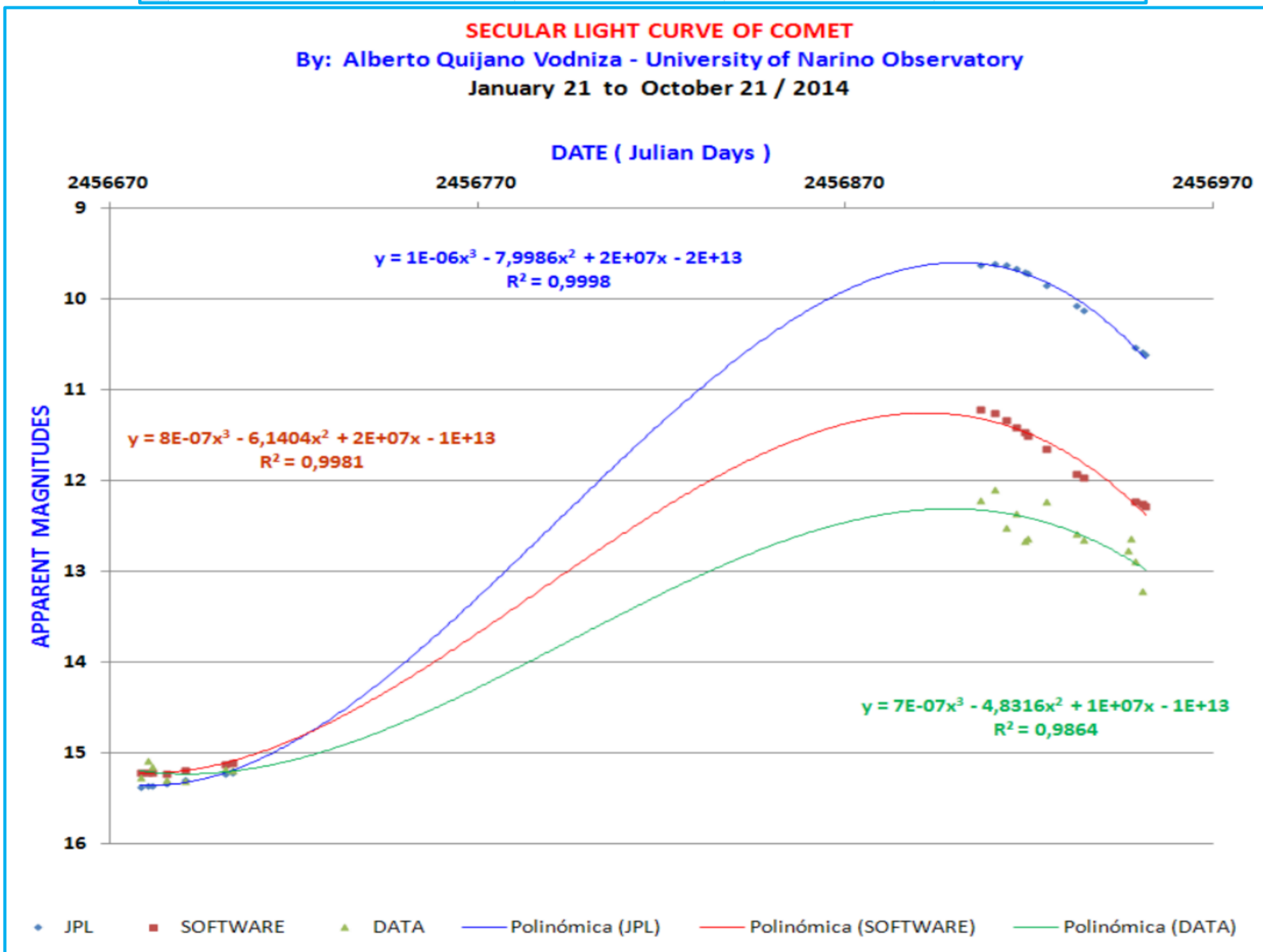
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### COMET C/2013 A1 (SIDING SPRING)

The comet called C/2013 A1 (SIDING SPRING) was discovered on January 3/2013 in Australia. In January 28/2014, NASA announced that is preparing for the close encounter that will happen between the comet C/2013 A1 and Mars on October 19-2014. The Mission, called "MAVEN", was inserted in Mars orbit on september 21/2014. The comet passed just 138,000 kilometers far from the surface of Mars. The probability that the comet collided with Mars was small but the dust particles emitted by the comet could cause damage to spacecrafts and probes that are in orbit around that planet. NASA made preparations to take all precautions. We captured images and astrometry data during several days. The pictures of the asteroid were captured with the following equipment: CGE PRO 1400 CELESTRON (f/11 Schmidt-Cassegrain Telescope) and STL-1001 SBIG camera. We obtained the light curve of the body. We calculated the orbital elements and obtained the following orbital parameters (Jan 21 to October 29): Eccentricity = 1.0005849, orbital inclination = 129.04413 deg, longitude of the ascending node = 300.97593 deg, argument of perihelion = 2.42011 deg, perihelion distance = 1.39876996 A.U. The parameters were calculated based on 32 observations with mean residual = 0.309 arcseconds. We also obtained the light curve of the body with our data (January to November/2014). The orbit had a perturbation of 7 minutes, 44 seconds.



	JAN 21 to APRIL 02	JAN 21 to OCT 29	PERTURBATION (%)
16			
17	1,0003983	1,0005849	0,0187
18	129,0307800	129,04413	0,0103
19	300,9953800	300,97593	-0,0065
20	2,4231000	2,42011	-0,1234
21	1,4002320	1,39876996	-0,1044
22	20	32	
23	0,334	0,309	



### C/2012 S1(ISON)

The comet C/2012 S1(ISON) was discovered on September 24/2012 by Vitali Nevski and Artyom Novichonok (Rusia), and though it was expected to be very bright at the end of 2013 and the beginning of 2014, the close encounter with the Sun (November 28th /2013) was devastating; the comet couldn't survive this event. In this work the comet's light curve and the orbital parameters are obtained. We have photographed and studied the comet from the University of Nariño's Observatory (Pasto-Colombia) since January 31st /2013. The brightness' variation of a comet with respect to the heliocentric distance is given by the following equation:

$$m = m_0 + 2.5 n \log ( r ) + 5 \log ( \Delta )$$

$m$  = magnitude as observed from the Earth;

$m_0$  = absolute magnitude;

$r$  = distance of the comet to the Sun;

$\Delta$  = distance of the comet to the Earth;

$n$  = index of cometary activity.

We also obtained the following orbital parameters: eccentricity = 1.000009, orbital inclination = 61.92926 deg, longitude of the ascending node = 295.72536 deg, argument of perihelion = 345.51426 deg, perihelion distance = 0.01249335 A.U. The parameters were calculated based on 22 observations (2013 Jan 31-May 17) with mean residual = 0.387 arcseconds.

