THE COMET C/2013 A1 (SIDING SPRING) AND MARS

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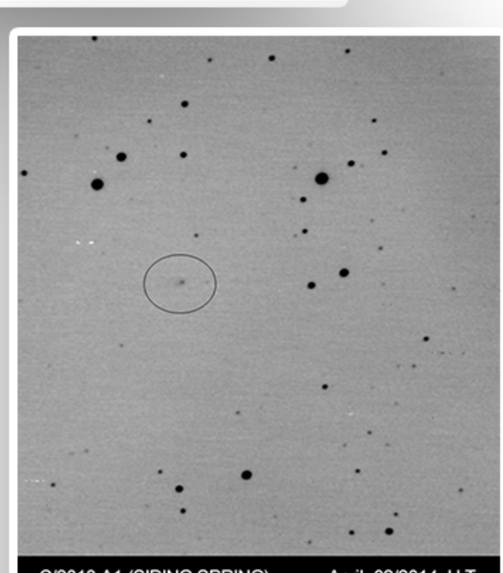
C/2013 A1 (SIDING SPRING) Jan 21/2014
By: Alberto Quijano Vodniza & Mario Rojas P
University of Narino Observatory - Colombia
CGE Pro 1400 CELESTRON 14" telescope &
STL-1001E SBIG camera Luminance filter
Image Scale = 2.75 arcsecs / pixel


C/2013 A1 (SIDING SPRING) Date: January 24/2014 U.T
By: Alberto Quijano Vodniza & Mario Rojas Pereira
University of Narino Observatory - Colombia
Exposure: 47X50 seconds Luminance filter
CGE Pro 1400 CELESTRON 14" & STL-1001E SBIG camera
Image Scale = 2.75 arcsecs/pixel
Image center: R.A = 02h:58´:49´´ DEC = -36º: 24´: 16´´


C/2013 A1 (SIDING SPRING) April 02/2014 U.T
By: Alberto Quijano Vodniza & Mario Rojas Pereira
University of Narino Observatory - Colombia
Exposure: (14X50 + 1X45) seconds
R.A = 02h: 39´: 37.45´´ DEC = -26º: 23´: 35.3´´
Image Scale = 2.75 arcsec/pixel
CGE Pro 1400 CELESTRON & STL-1001E SBIG camera

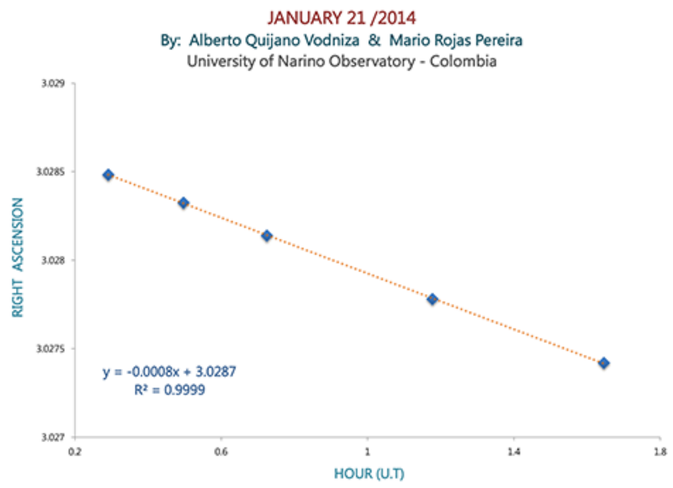
ABSTRACT

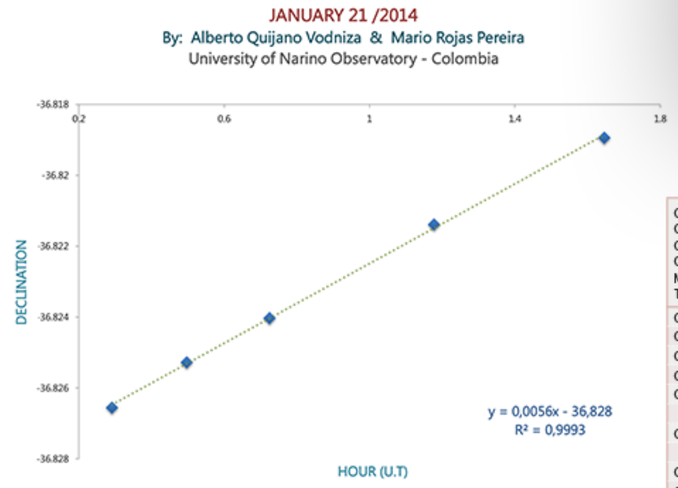
The comet called C/2013 A1 (SIDING SPRING) was discovered on January 3, 2013 in Australia. In January 28/2014, NASA announced that is preparing for the close encounter that will happen between the comet C/2013 A1 and Mars on October 19-2014. The Mission called "MAVEN" will insert in Mars orbit on september 21—2014. The comet will pass just 138,000 kilometers far from the surface of Mars. The probability that the comet collides with Mars is small but the dust particles emitted by the comet can cause damage to spacecrafts and probes that are in orbit around that planet. NASA is making preparations to take all precautions. During the months of April and May the ice will begin to sublimate and thus let loose dust. If the comet is quite active, there will be almost no time to take security measures with Mars orbiters. For that reason NASA is already ahead of the facts. According to scientists of the "JET PROPULSION LABORATORY-JPL", dust particles spewing from the comet may be traveling at 56 km / sec in relation to the orbiters, fifty times faster than the speed of a bullet.

From our Observatory, located in Pasto-Colombia, we captured several pictures, videos 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. Astrometry was carried out, and we calculated the orbital elements.

INTRODUCTION

After having processed adequately all the photographies (bias reduction, dark frames correction and correction of flat frames), we employed the software "The Sky6" and the "CcdSoft-Version 5" in order to identify the stars appearing on the images, so we could have the coordinates of any standard star. It is necessary to use many reference stars so we can have a higher precision on determining the comet's coordinates. The comet is identified superposing the photos and designing a small video to appreciate clearly enough its movement with regard to the fixed stars.





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TEL 0.36m f/10 Cassegrain Meade+ CCD

CK13A010	C2014	01	21.012	03	01	42.54	-36	49	35.6
CK13A010	C2014	01	21.021	03	01	41.97	-36	49	31.0
CK13A010	C2014	01	21.030	03	01	41.30	-36	49	26.5
CK13A010	C2014	01	21.049	03	01	40.01	-36	49	17.0
CK13A010	C2014	01	21.069	03	01	38.71	-36	49	08.2
CK13A010	C2014	01	23.012	02	59	33.30	-36	33	06.0
CK13A010	C2014	01	24.010	02	58	31.37	-36	24	40.5
CK13A010	C2014	01	24.016	02	58	30.95	-36	24	37.0
CK13A010	C2014	01	24.022	02	58	30.53	-36	24	34.3
CK13A010	C2014	01	24.028	02	58	30.18	-36	24	30.8
CK13A010	C2014	02	2.0530	02	50	22.78	-35	03	55.9
CK13A010	C2014	02	2.0560	02	50	22.56	-35	03	54.4
CK13A010	C2014	02	2.0640	02	50	22.24	-35	03	50.0
CK13A010	C2014	02	2.0680	02	50	22.09	-35	03	47.6
CK13A010	C2014	02	13.009	02	43	19.87	-33	19	50.2
CK13A010	C2014	02	13.013	02	43	19.75	-33	19	48.3
CK13A010	C2014	02	13.016	02	43	19.63	-33	19	46.3
CK13A010	C2014	02	13.018	02	43	19.57	-33	19	45.5
CK13A010	C2014	02	15.049	02	42	19.88	-33	00	12.3
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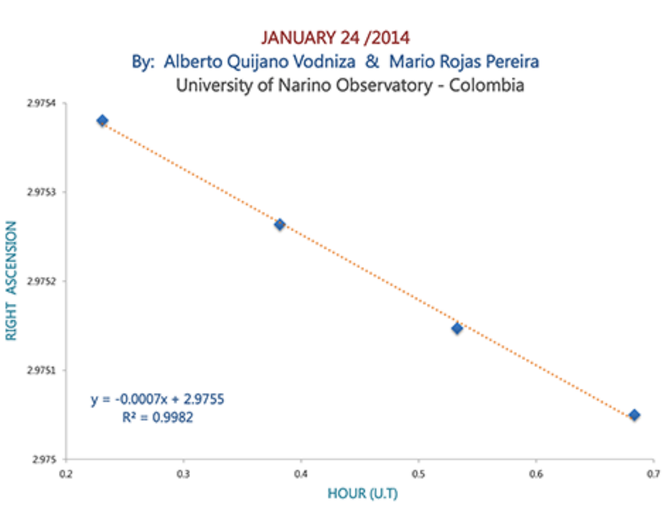

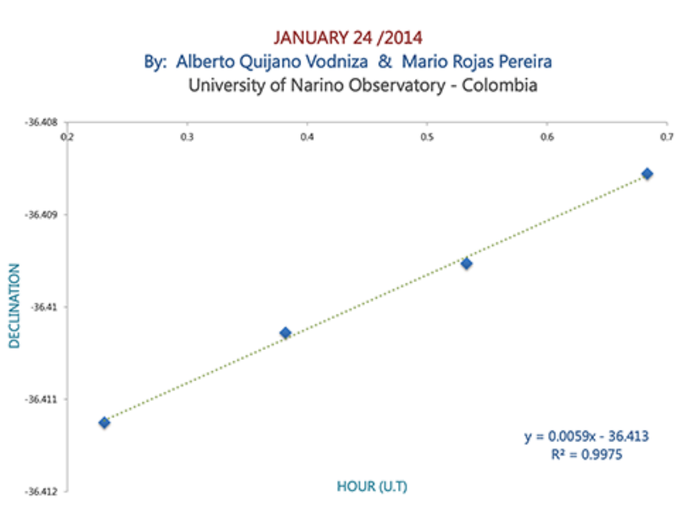

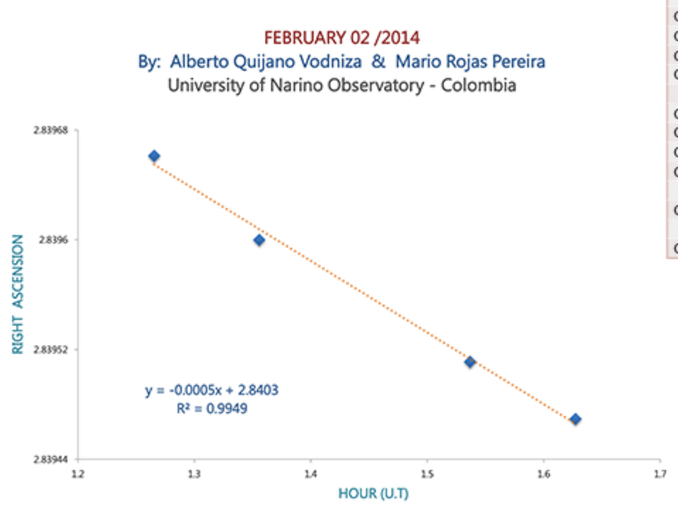

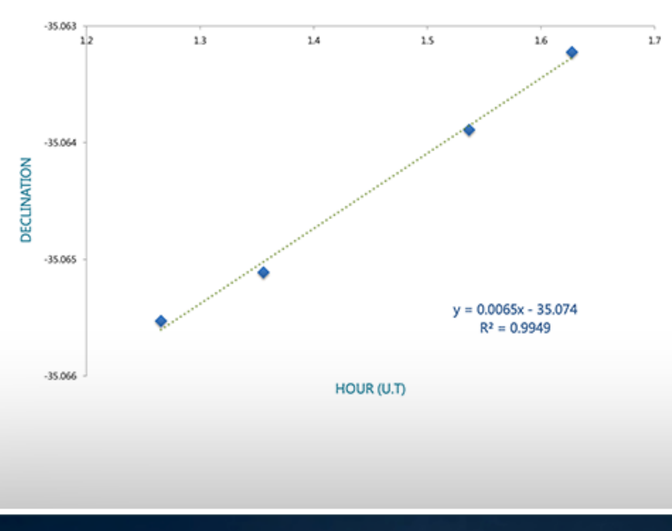

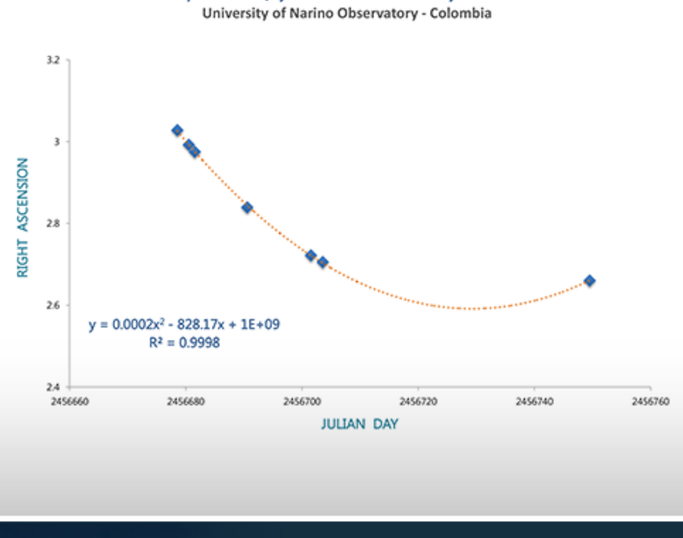

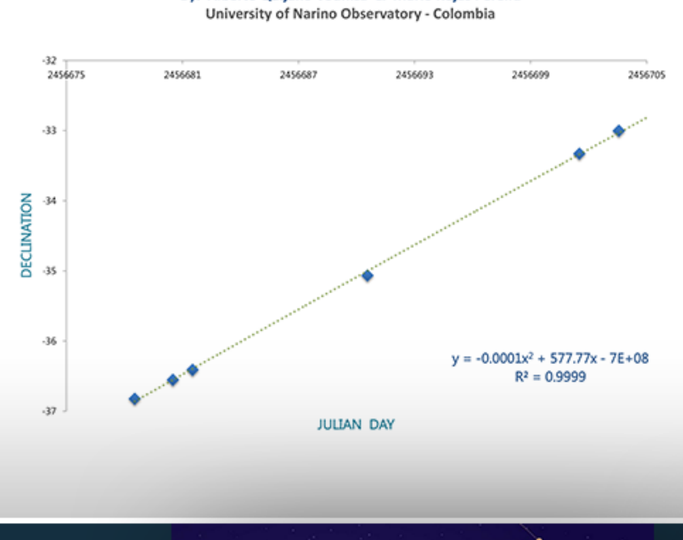

SUMMARY & CONCLUSIONS

We obtained the following orbital parameters: eccentricity = 1.0003983, orbital inclination = 129.03078 deg, longitude of the ascending node = 300.99538 deg, argument of perihelion = 2.42310 deg, perihelion distance = 1.40023196 A.U. The parameters were calculated based on 20 observations (Jan 21 to April 02) with mean residual = 0.334 arcseconds.

ACKNOWLEDGEMENTS

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