STUDY OF THE ASTEROID "2009 DL46"

Poster # 119.01

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INTRODUCTION

2009 DL46 was discovered by the Catalina Sky Survey on 2009-February 28. This asteroid has a diameter of about 194 meters (119 to 268 meters) [1], and Brian Warner has obtained a rotation period of at least 10 hours [2]. The asteroid 2009 DL46 flew past Earth on May 24/2016 at a distance of about 6.2 lunar distances (0.0158293668567628 A.U) [3]. The NEOWISE mission had a great likelihood to observing this asteroid in early May. Radiotelescopes of Goldstone and Arecibo had planned to make observations of 2009 DL46. "Using the Goldstone facility, we had planned to make radar observations of 2009 DL46" said Landis, Rob R. (HQ-DG000). This asteroid is on list for possible human mission targets.

METODOLOGY

From our Observatory, located in Pasto-Colombia, we captured several pictures, videos and astrometry data during several hours during three days. Our data was published by the Minor Planet Center (MPC) and also appears at the web page of NEODyS [4]. The pictures and data of the asteroid were captured with the following equipment: CGE PRO 1400 CELESTRON (f/11 Schmidt-Cassegrain Telescope) and STL-1001 SBIG camera.. Astrometry was carried out, and we calculated the orbital elements.
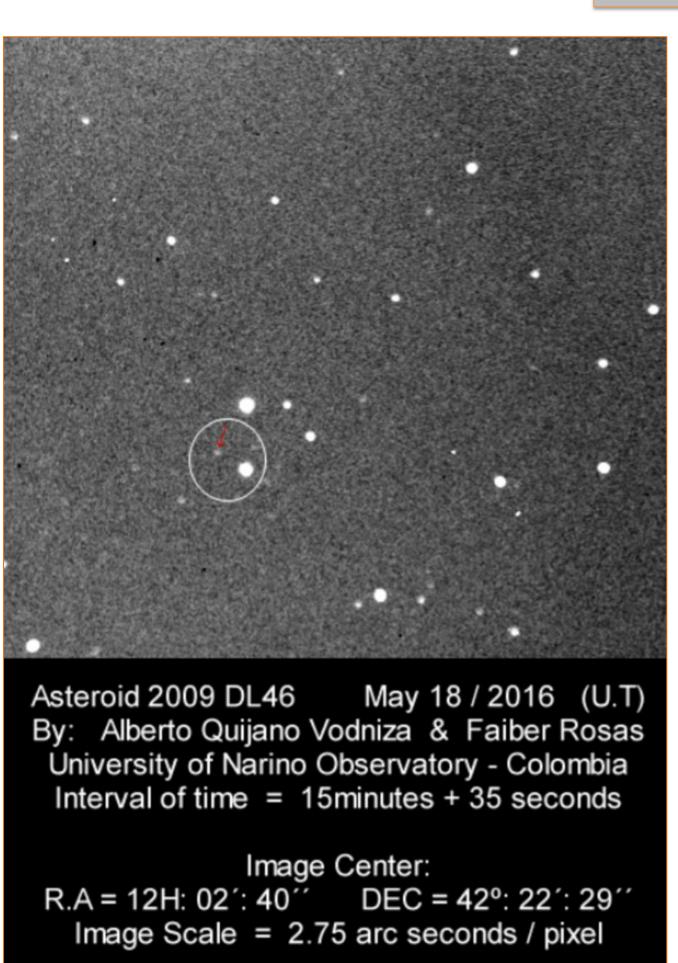
SUMMARY AND CONCLUSIONS

We obtained the following orbital parameters:
eccentricity = 0.30731 +/- 0.00025,
semi-major axis = 1.460279 +/- 0.000532 A.U,
orbital inclination = 7.9503 +/- 0.0048 deg,
longitude of the ascending node = 63.45053 +/- 0.00034 deg,
argument of perihelion = 159.8804 +/- 0.0024 deg,
mean motion = 0.558535 +/- 0.000305 deg/d,
perihelion distance = 1.01151363 +/- 3.39e-6 A.U,
aphelion distance = 1.90904 +/- 0.00106 A.U,
absolute magnitude = 22.5.
The parameters were calculated based on 83 observations.
Dates: 2016 May: 18 to 21 with mean residual = 0.29 arcseconds. The asteroid has an orbital period of 1.76 years (644.53 days).

REFERENCES

[1] http://newton.dm.unipi.it/neodys/index.php?pc=1.1.9&n=2009DL46.
[2] http://echo.jpl.nasa.gov/asteroids/2009DL46/2009DL46_planning.html
[3] http://ssd.jpl.nasa.gov/sbdb.cgi?sstr=2009%20DL46;orb=1;old=0;cov=0;log=0;cad=1#cad
[4] http://newton.dm.unipi.it/neodys/index.php?pc=2.1.2&o=H78&ab=7

Diagram of orbital elements: MAJOR AXIS, Longitude of Ascending Node, Argument of Perihelion, PLANE OF ECLIPTIC, Orbital Inclination, ORBITAL PLANE, ASCENDING NODE, VERNAL EQUINOX

ASTEROID 2009 DL46 - MAY 19 / 2016
By: ALBERTO QUIJANO VODNIZA
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DECLINATION (DEGREES) vs HOUR (U.T)
y = -0.169x + 38.73
R² = 0.999

ASTEROID 2009 DL46 - MAY 19 / 2016
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RIGHT ASCENSION (HOURS) vs HOUR (U.T)
y = 0.006x + 12.22
R² = 0.999

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DECLINATION (DEGREES) vs HOUR (U.T)
y = -0.291x + 28.12
R² = 0.999

ASTEROID 2009 DL46 - MAY 21 / 2016
By: ALBERTO QUIJANO VODNIZA
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RIGHT ASCENSION (HOURS) vs HOUR (U.T)
y = 0.008x + 12.68
R² = 0.999

Asteroid 2009 DL46   May 18 / 2016 (U.T)
By: Alberto Quijano Vodniza & Faiber Rosas
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Interval of time = 15minutes + 35 seconds
Image Center:
R.A = 12H: 02´: 40´´   DEC = 42º: 22´: 29´´
Image Scale = 2.75 arc seconds / pixel
1400 CGE Pro CELESTRON telescope and STL-1001 SBIG canera

Asteroid 2009 DL46   May 19 / 2016 (U.T)
By: Alberto Quijano Vodniza, Faiber Rosas and Mario Rojas - University of Narino Observatory
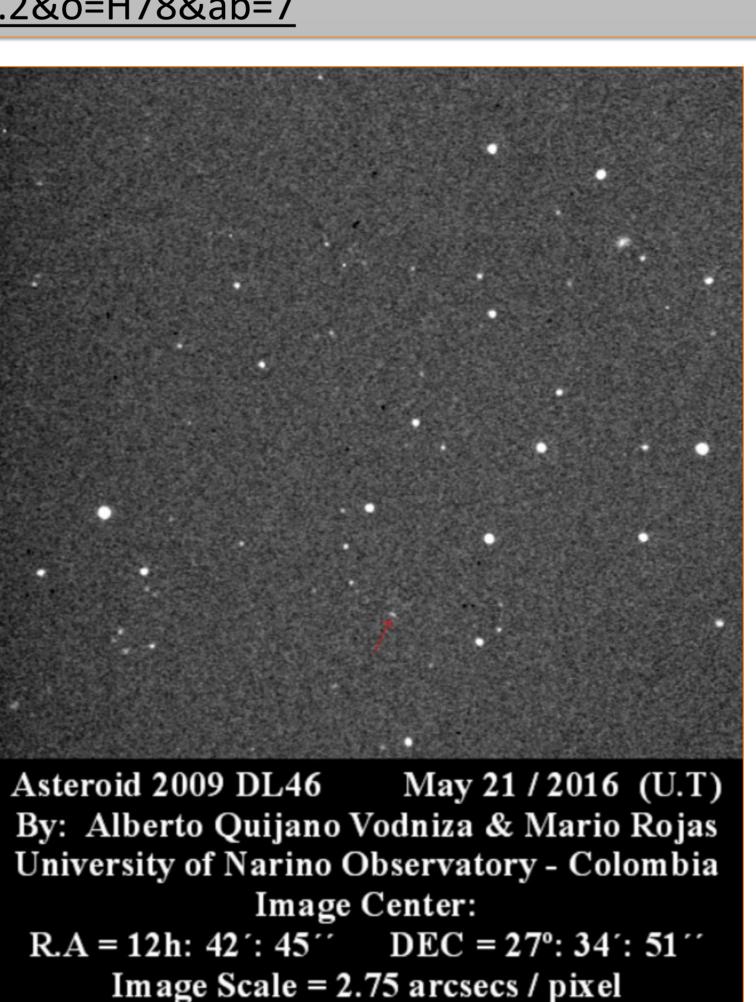Interval of time = 13 minutes + 48 seconds
Image Center:
R.A = 12h: 13´: 56´´   DEC = 38º: 44´: 20´´
Image Scale = 2.74 arcseconds/ pixel
1400CGE CELESTRON telescope and STL-1001 SBIG camera

Asteroid 2009 DL46   May 21 / 2016 (U.T)
By: Alberto Quijano Vodniza & Mario Rojas
University of Narino Observatory - Colombia
Image Center:
R.A = 12h: 42´: 45´´   DEC = 27º: 34´: 51´´
Image Scale = 2.75 arcsecs / pixel
Interval of time = 23 minutes+36 seconds
1400 CGE CELESTRON & STL-1001E SBIG