

THE ASTEROID 2012 QG42. A. Q. Vodniza¹ and M. R. Pereira², ¹University of Narino Observatory, Narino, Colombia, aquijanov@gmail.com, ²University of Narino Observatory, Narino, Colombia, mariojaspereira@yahoo.com.

Abstract: The potentially hazardous asteroid (PHA) 2012 QG42 was discovered on 26 August 2012. The Minor Planet Center-MPC reported [1] the discovery of the asteroid (discovery magnitude 16.8) by Catalina Sky Survey on images taken on August 26.3 with a 0.68-m Schmidt. The Virtual Telescope in Italy contributed to confirm its nature within few hours after the first report [2]. The asteroid 2012 QG42 had an estimated size of 190 - 440 meters ($H=90.4$) and it had a close approach with Earth at 0.0190906 A.U on 14.21795 september-2012 [3]. The asteroid was just lately observed by the observatories around the world, in spite of its size, a clear indication of the latent danger that surrounds us. Bob Berman, an editor and Astronomy Magazine columnist, said: "Near Earth Objects have been whizzing past us lately, undetected until they have been practically on top of us. This illustrates the need for continued and improved monitoring for our own future safety" [4]. The 2012 QG42 was studied by radar, by the radiotelescopes of Arecibo- Puerto Rico and Goldstone, which allowed a more in detail visualization of its structure and rotation movement. Brian Warner presented the lightcurve obtained using data provided by different amateur astronomers all around the world and it reveals this asteroid rotates once every 24.278 hours [5]. From our Observatory, located in Pasto-Narino-Colombia, we captured several pictures, videos and astrometry data during four days. The picture of the asteroid was published on the web of Spaceweather on september 08-2012 [6] and our data was published by the Minor Planet Center (MPC) and also appears at the web page of NEODyS [7]. Our observatory's code at the MPC is "H78". Pictures of the asteroid were captured with the following equipment: 14" LX200 GPS MEADE (f/10 Schmidt-Cassegrain Telescope) and STL-1001 SBIG camera. Astrometry was carried out, and we calculated the orbital elements.

Introduction: After having processed adequately all the photographs (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 asteroid's coordinates. The asteroid is identified superposing the photos and designing a small video to appreciate clearly enough its movement with regard to the fixed stars.

Summary And Conclusions: We obtained the following orbital parameters: eccentricity = 0.3730367, semi-major axis = 1.02417462 A.U, orbital inclination = 6.81529 deg, longitude of the ascending node = 344.98058 deg, argument of perihelion = 116.19654 deg, orbital period = 1.04 years (378.57 days), mean motion = 0.95091797 deg/d, perihelion distance = 0.64211988 A.U, aphelion distance = 1.40622936 A.U. The parameters were calculated based on 125 observations (2012 Sept. 6-11) with mean residual = 0.186 arcseconds.

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References:

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- [4] <http://www.space.com/17572-asteroid-flies-by-earth-this-week-how-to-watch-online.html>
- [5] Guido, et al 2012 <http://remanzacco.blogspot.com/2012/09/close-approach-of-pha-asteroid-2012-qg42.html>
- [6] http://spaceweather.com/submissions/large_image_popup.php?image_name=ALBERTO-QUIJANO-VODNIZA-2012-QG42_SEPT-8_2012_1347206684.jpg
- [7] <http://newton.dm.unipi.it/neodys/index.php?pc=2.1.2&o=H78&ab=2>