Rotation Rates of Near-Earth Asteroids. Y. Rodríguez-DelValle[1], A. López-Oquendo[1], G. Espinosa-Rodríguez[1] and D. Cotto-Figueroa[1], [1]Dept. of Physics and Electronics, University of Puerto Rico at Humacao, Call Box 860, Humacao, PR 00792, USA.

Introduction: It is widely accepted that Near-Earth Asteroids (NEAs) represent a global hazard for human civilization [1]. They have impacted many bodies in the Solar System, including the Earth. More notorious was the NEA with an estimated diameter of 17 meters that exploded over Chelyabinsk in Russia with an energy of about 470 kilotons in 2013 and injured over 1,500 people [2].

Due to the possible devastating consequences of such impacts, Congress has assigned NASA the task of finding 90% of all of the asteroids with sizes greater than 140 meters by 2020. While is of vital importance and priority to detect these objects, it is also of vital importance to characterize them in order to develop a correct deflection strategy in case of an imminent impact. An asteroid photometry campaign has been initiated with the intent of obtaining lightcurves of NEAs in order to determine their rotation periods and lower limits. The rotation rate distribution of NEAs can give us important information about their material strength and composition.

Observations: NASAcam, a 2K x 2K thermoelectrically cooled CCD camera, is used on the 31-inch National Undergraduate Research Observatory (NURO) telescope at the Lowell Observatory in Flagstaff, Arizona to obtain the photometric data. To date fourteen NEAs have been observed. Table 1 shows the date and the estimated absolute magnitude (H) for each observed NEA. Each object was observed using an R-band or V-band filter for no more than four hours in one night. The exposure time is typically 30 seconds and random time delays are inserted in order to avoid problems with aliasing.

Methods and Preliminary Results: The data reduction and analysis of the data is conducted using the Minor Planet Observer (MPO) Canopus program, the Image Reduction and Analysis Facility (IRAF) program, and a suite of Interactive Data Language (IDL) routines. Rotation periods have been previously reported for six of the observed NEAs in Table 1 [3-7]. Our results will be compared to the published values and new rotation periods and lower limits will be obtained for the remaining eight observed NEAs.

Table 1. NEAs observed.

Name	Date	H
2016 HD19	05/27/2016	18.9
2016 GN221	05/27/2016	20.5
2016 JC6	05/28/2016	21.3
2016 HM	05/29/2016	20.1
2016 PN1	09/05/2016	20.1
1999 TR14	09/06/2016	15.7
2016 LX48	09/06/2016	19.3
2015 JF11	09/06/2016	20.8
2000 HA24	04/21/2017	19.1
2017 GB8	04/23/2017	19.8
2014 JO25	04/21/2017	18.1
2017 GT5	04/23/2017	21.3
2016 WO1	04/23/2017	19.9
2017 FH101	04/22/2017	22.5

References: [1] Sagan, C. and Ostro, S.J. (1994), *Nature*, 368, 501. [2] Popova et al. (2013), *Science*, 342, 1069-1073. [3] Warner, B.D. (2016) *Minor Planet Bul.* 43, 311-319. [4] Warner, B.D. (2017) *Minor Planet Bul.* 44, 22-36. [5] Warner, B.D. (2017) *Minor Planet Bul.* 44, 335-344. [6] Hayes-Gehrke et al. (2017)) *Minor Planet Bul.* 44, 310. [7] Brozovic et al. (2017) American Astronomical Society, DPS meeting #49, id.204.01.

Acknowledgements: This research is funded by NASA Puerto Rico Space Grant Consortium (PRSGC).