

PDC2017  
Tokyo, Japan

IAA-PDC-17-02-P10

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## HIGH-PRECISION FOLLOW-UP OBSERVATIONS OF NEAR-EARTH OBJECTS

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**Keywords:** NEO, Follow-up, Orbit refinement

### ABSTRACT

We present the latest results of ongoing high-precision astrometric follow-up observations of Near-Earth Objects (NEOs) using the University of Hawaii 2.24 metre telescope (currently 7.5 arcmin FOV), the Canada-France-Hawaii Telescope (CFHT; 1 degree FOV) with MegaPrime, and the Subaru Hyper Suprime-Cam (1.5 degree FOV) [See Table 1].

The combination of excellent observing conditions at Maunakea, and the use of no filter to maximise our throughput efficiency, allows us to recover targets having  $V < 24$ , and sometimes  $V < 25$  under ideal conditions. We frequently achieve astrometric accuracy limited by the reference catalog and plan to improve on this capability with the recent implementation of the GAIA catalog [1].

We will also tackle challenges encountered during follow-up observations by highlighting the importance of coordinated, rapid and efficient NEOCP observations and reporting to minimise duplication of effort and inefficient use of resources amongst the larger class of telescopes. We will present an uncommon scenario where observations of asteroids that are temporally and spatially isolated lead to incorrect identification of the asteroid and propagation of its orbit ephemeris. The target was followed-up over a month after its discovery. A second night confirmation, after a long period of no visual confirmation, would have reduced the amount of telescope time required to reacquire this asteroid. Our second follow-up attempt

failed to initially recover the target due to an incorrect ephemeris prediction.

<b>Magnitude</b>	<b>N</b>
< 19	245
19 - 20	401
20 - 21	655
21 - 22	873
22 - 23	528
23 - 24	423
> 24	101

**Table 1.** Follow-up observations undertaken between Sep 2015 and Oct 2016.

**Acknowledgments:** This work is funded by NASA grant NXX13AI64G (PI: D. J. Tholen) and NASA ROSES 2013 grant NNX14AN83G (PI: C. Aspin).

**References:**

[1] Gaia Collaboration et al. (2016a) A&A special Gaia volume, Gaia Data Release 1