

Summary of Current Worldwide NEO Survey, Orbit Computation and Follow-up Efforts

UN COPUOS STSC 'Roundtable Discussion'

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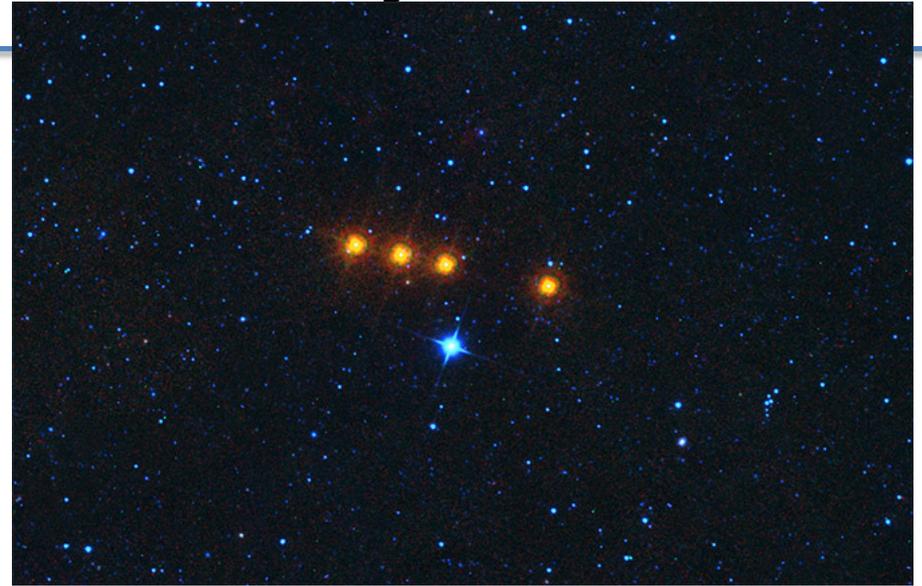
IAWN Functions

- (a) To discover, monitor, and physically characterize the potentially hazardous NEO population using optical and radar facilities and other assets based in both the northern and southern hemispheres and in space;
- (b) To provide and maintain an internationally recognized clearing house function for the receipt, acknowledgement and processing of all NEO observations;
- (c) To act as a global portal, serving as the international focal point for accurate and validated information on the NEO population;
- (d) To coordinate campaigns for the observation of potentially hazardous objects;
- (e) To recommend policies regarding criteria and thresholds for notification of an emerging impact threat;
- (f) To develop a database of potential impact consequences, depending on geography, geology, population distribution and other related factors;
- (g) To assess hazard analysis results and communicate them to entities that should be identified by Member States as being responsible for the receipt of notification of an impact threat in accordance with established policies;
- (h) To assist Governments in the analysis of impact consequences and in the planning of mitigation responses.

Worldwide NEO Survey Efforts

—around 1500 new NEOs discovered in 2015

—Most discoveries are made by large, professional observing stations in the United States and Chile

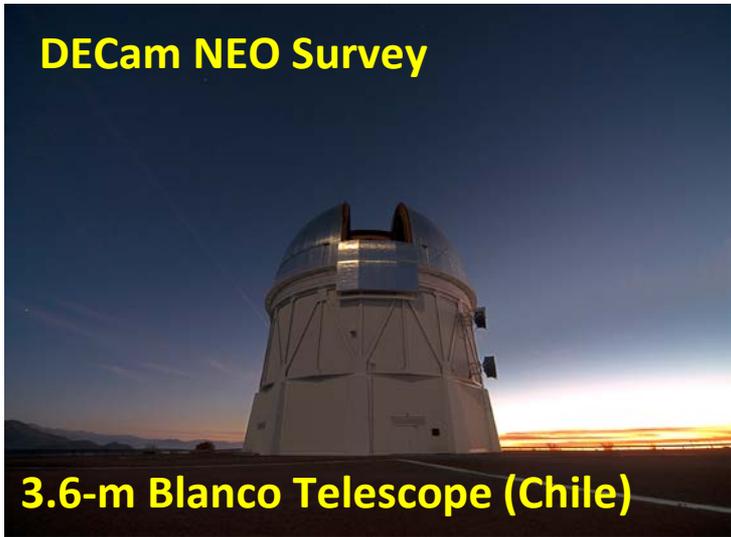


Michael Jaeger



NASA's NEO Search Program (Current Systems)

DECam NEO Survey



3.6-m Blanco Telescope (Chile)

Photo credit: T. Abbott and NOAO/AURA/NSF



Operations:
Jan 2010 –
Feb 2011

Re-activated:
Sept 2013



**Initial
Reactivation Image**
872 Holda (large Main Belt
asteroid, ~30 km, $H_{mag} = 9.9$)

SST (LINEAR)



New Mexico

Pan-STARRS



**University of Hawaii
Haleakalā, Maui**

**Catalina Sky
Survey**



**Univ of Ariz
Arizona & Australia**

Worldwide Orbit Computation Centers



The International Astronomical Union
Minor Planet Center
The nerve center of asteroid detection in the Solar System

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JPL's Center for NEO Studies



NEO BASICS	SEARCH PROGRAMS	DISCOVERY STATISTICS	ACCESSIBLE NEAs	NEWS	FAQ
ORBIT DIAGRAMS	ORBIT ELEMENTS	CLOSE APPROACHES	IMPACT RISK	IMAGES	RELATED LINKS



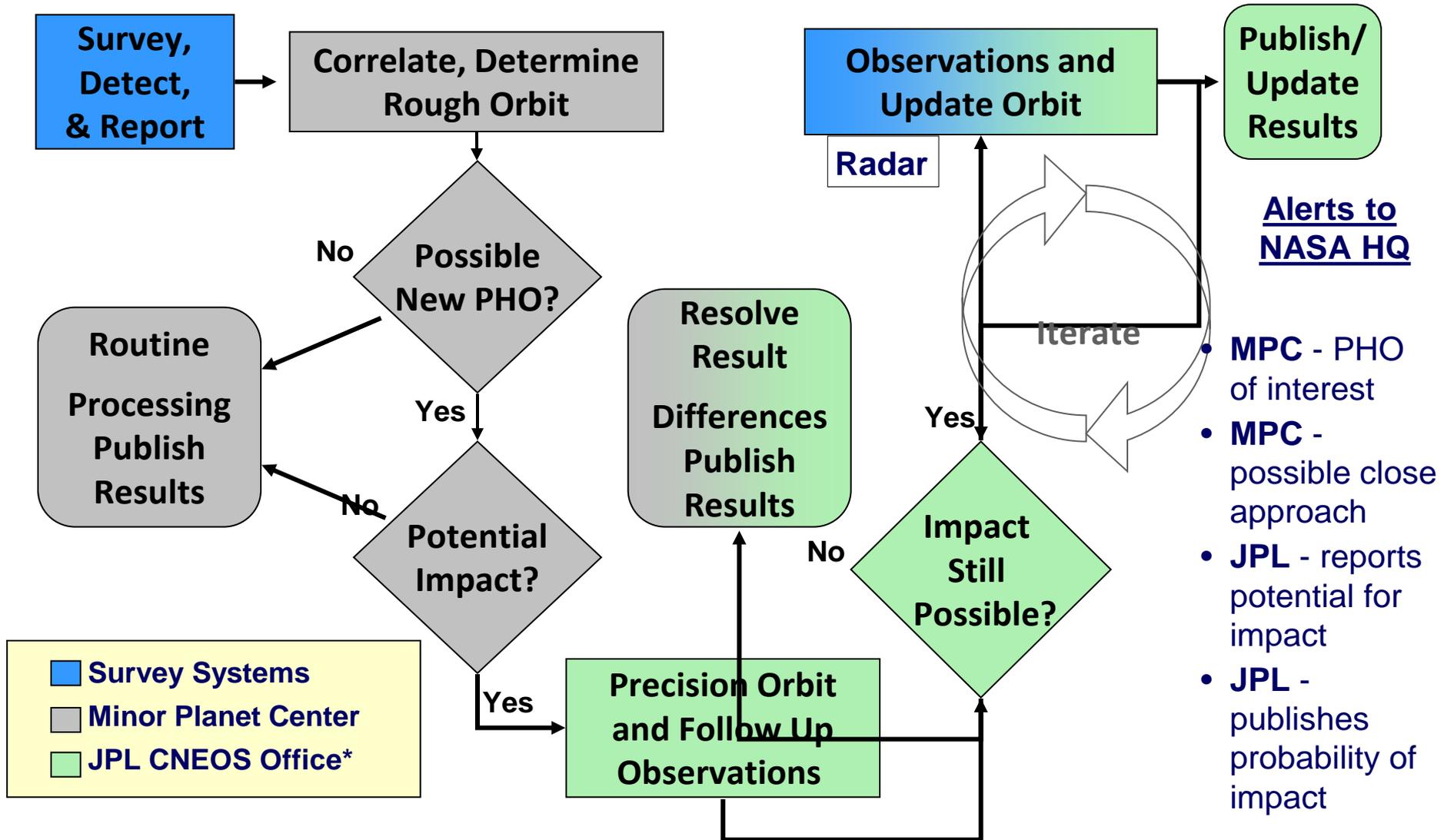
NEODyS-2
Near Earth Objects - Dynamic Site

Sponsored by

esa UNIVERSITÀ DI PISA SpaceDyS

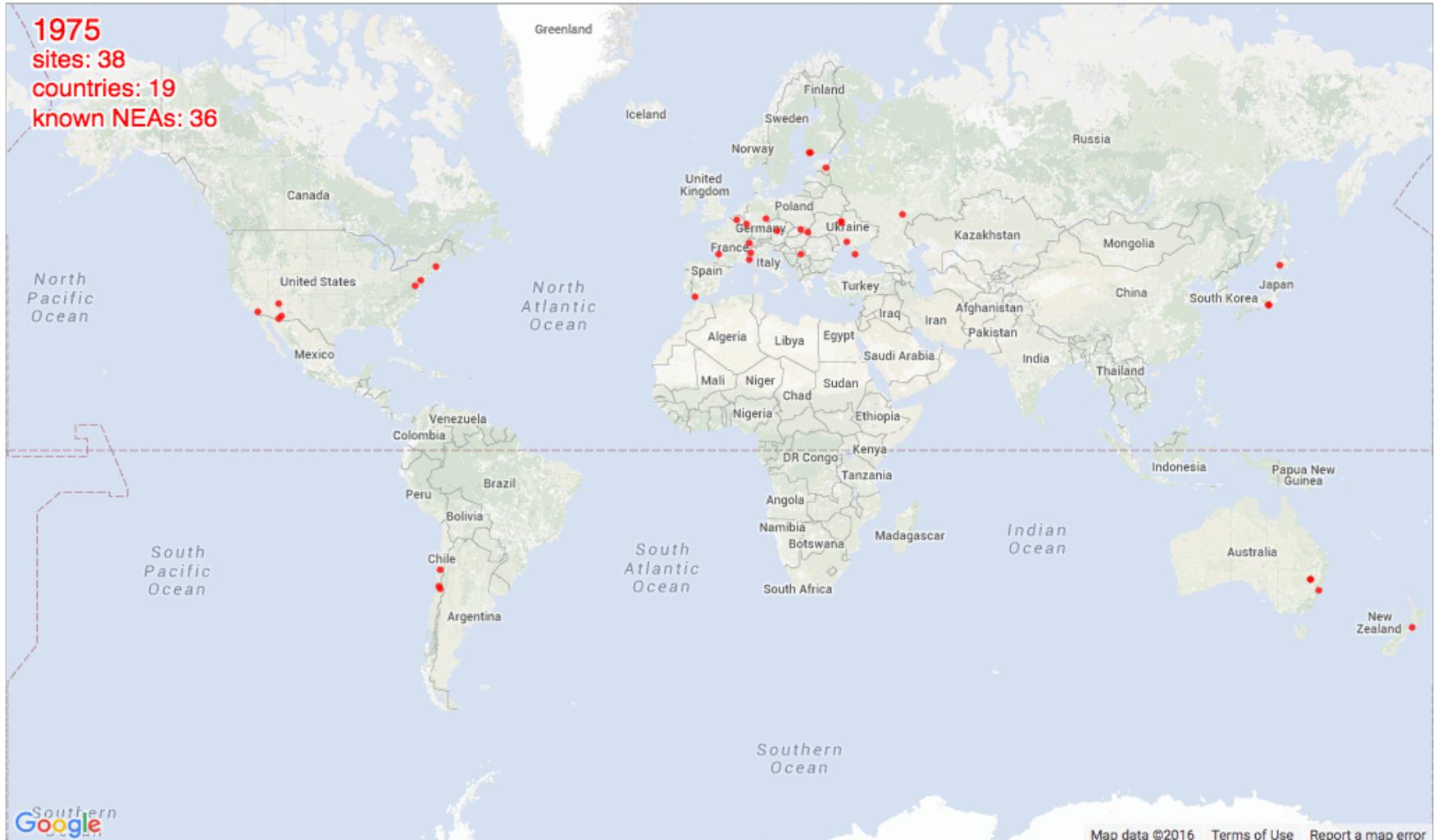
Spaceguard Survey Catalog Program

(current infrastructure & process)



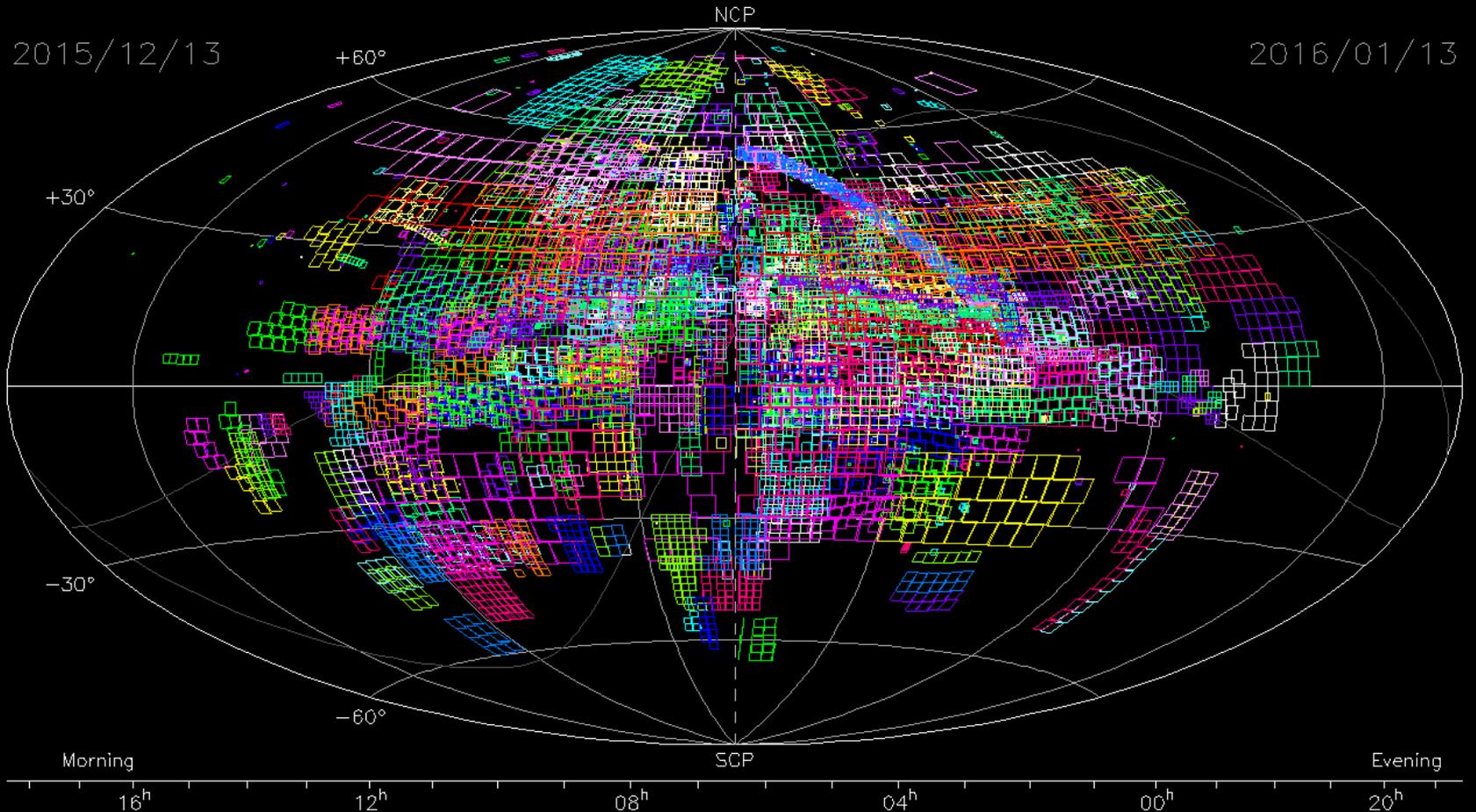
* In parallel with NEODyS

Historical NEO Surveys



SKY COVERAGE

Plot prepared 2016/01/13.505 by the Minor Planet Center



Morning

Evening

16^h

12^h

08^h

04^h

00^h

20^h

Opposition Point = 06 27.0,+23 18. Fields reaching fainter than $V = 18.0$.

- | | | | | |
|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 2016/01/13 (2016 013) | 2016/01/12 (2016 012) | 2016/01/11 (2016 011) | 2016/01/10 (2016 010) | 2016/01/09 (2016 009) |
| 2016/01/08 (2016 008) | 2016/01/07 (2016 007) | 2016/01/06 (2016 006) | 2016/01/05 (2016 005) | 2016/01/04 (2016 004) |
| 2016/01/03 (2016 003) | 2016/01/02 (2016 002) | 2016/01/01 (2016 001) | 2015/12/31 (2015 365) | 2015/12/30 (2015 364) |
| 2015/12/29 (2015 363) | 2015/12/28 (2015 362) | 2015/12/27 (2015 361) | 2015/12/26 (2015 360) | 2015/12/25 (2015 359) |
| 2015/12/24 (2015 358) | 2015/12/23 (2015 357) | 2015/12/22 (2015 356) | 2015/12/21 (2015 355) | 2015/12/20 (2015 354) |
| 2015/12/19 (2015 353) | 2015/12/18 (2015 352) | 2015/12/17 (2015 351) | 2015/12/16 (2015 350) | 2015/12/15 (2015 349) |



SONEAR—discovery station in Brazil

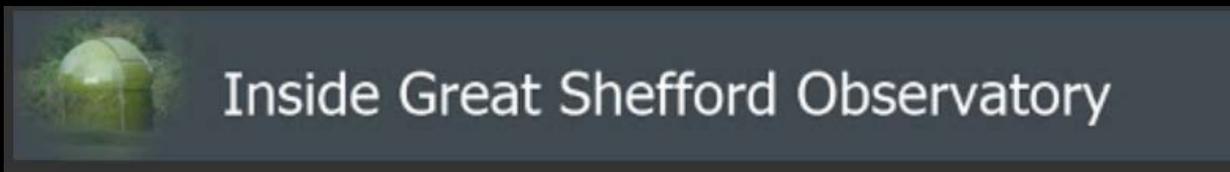


Astronomical Research Institute



Tenagra Observatory follow-up station

Great Shefford



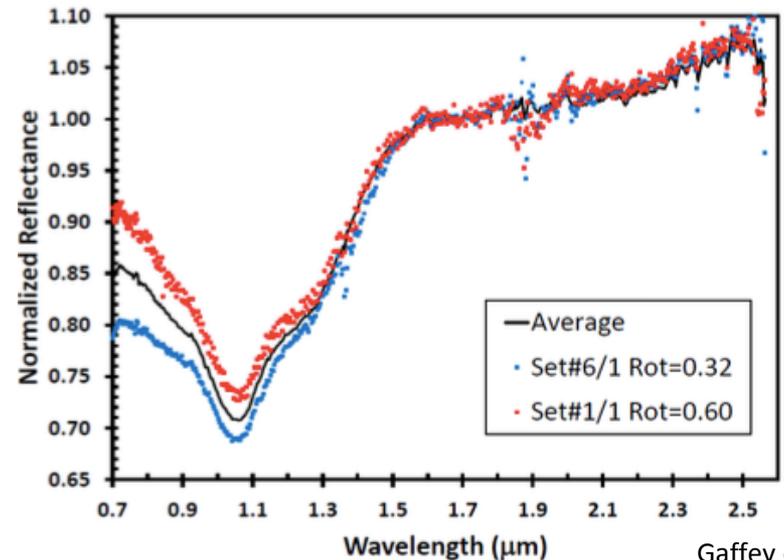
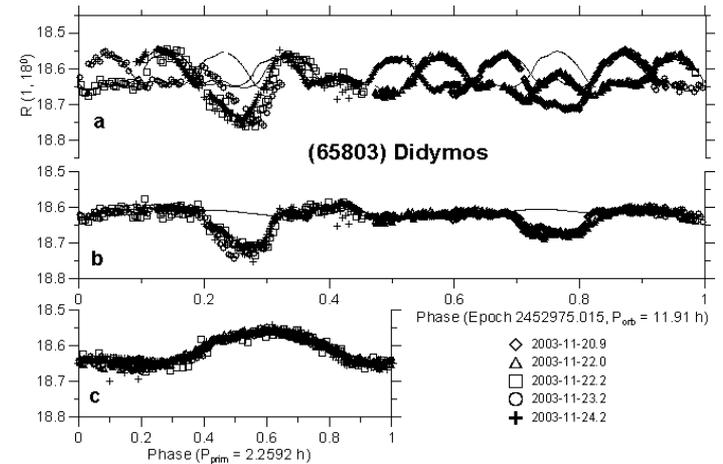
Physical Characterization

Petr Pravec lightcurve/physical observations:

<http://www.asu.cas.cz/~ppravec/>

Nick Moskovitz MANOS project:

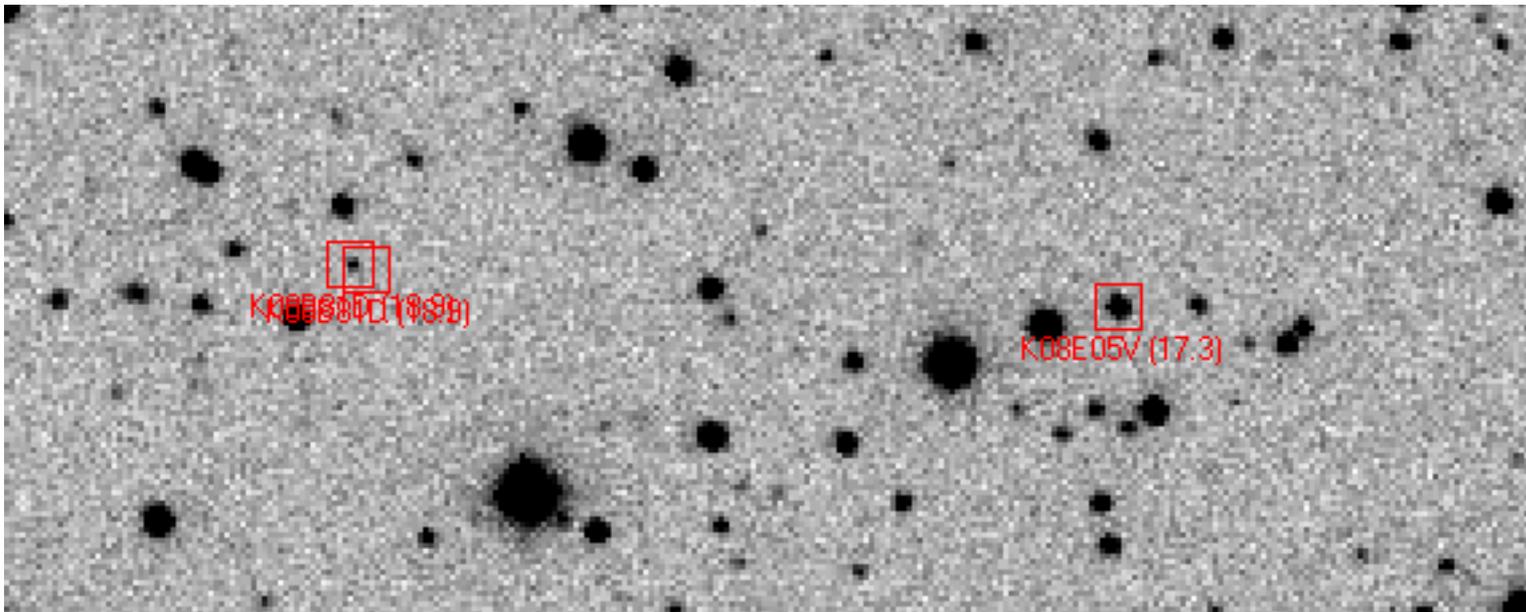
<http://impact.seti.org/manos.html>



Existing large telescopes can help!

—*Follow instructions on this web page to obtain an observatory code.*
(please contact me for assistance tspahr44@gmail.com)

<http://www.minorplanetcenter.net/iau/info/Astrometry.html>



Some Room for Contribution

- Rapid complete all-sky coverage, both north and south*
- Additional deep coverage from southern hemisphere skies*
- longitudinal coverage around the globe for discovery and follow-up*
- additional physical observations (lightcurves, spectra)*
- small telescopes (diameters < 1 meter) are unlikely to make large contributions to the field of NEO discovery and follow-up*
- clear, precise and culturally sensitive communication*