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)

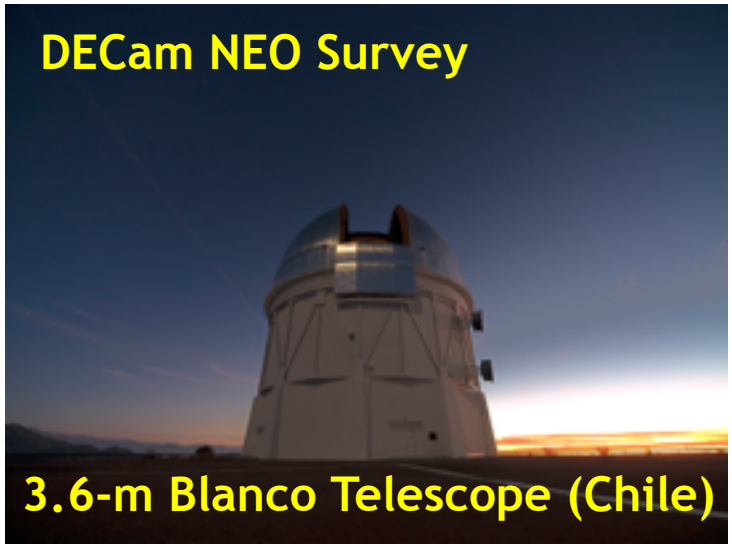
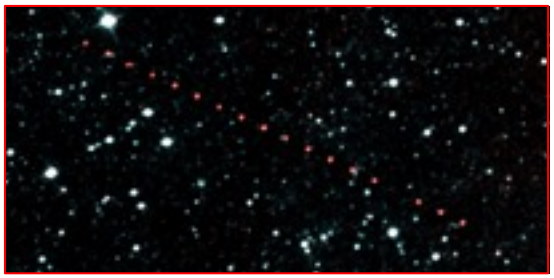


Photo credit: T. Abbott and NOAO/AURA/NSF

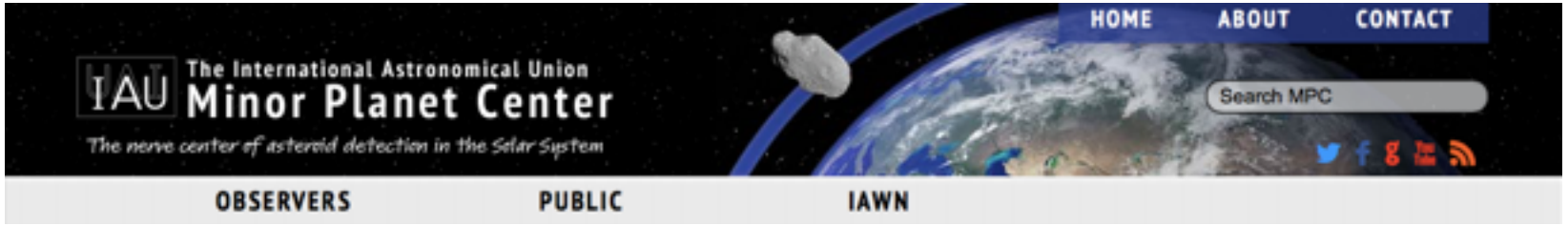
Operations:
Jan 2010 - Feb 2011

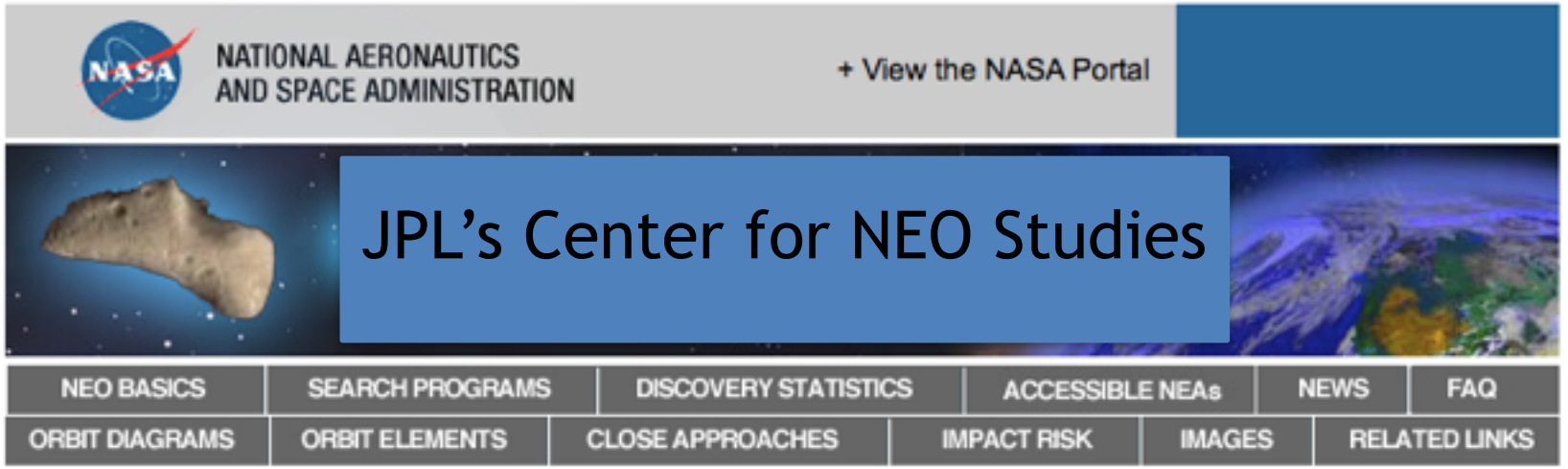
Re-activated:
Sept 2013



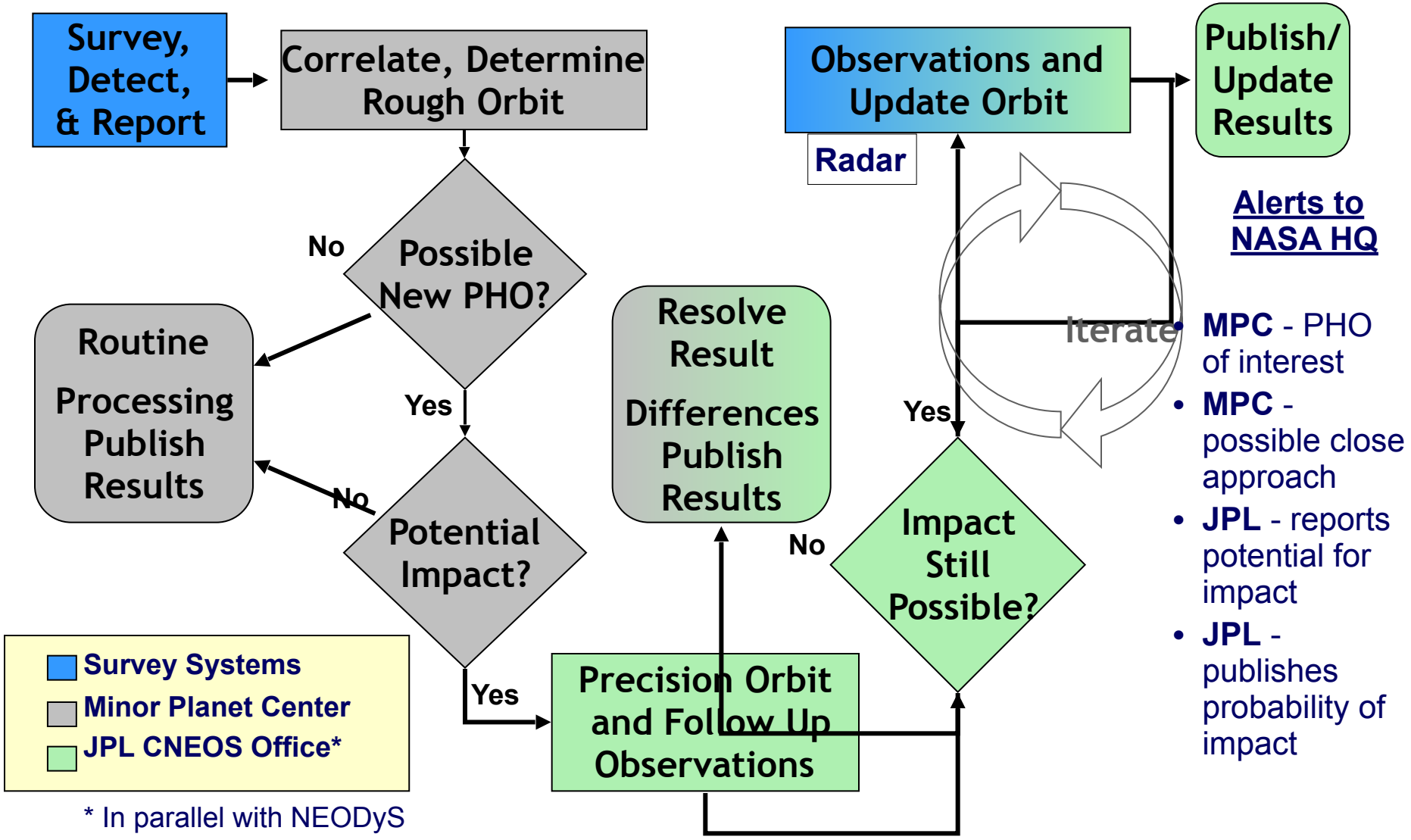
Initial Reactivation Image
872 Holda (large Main Belt asteroid, ~30 km, H_{mag}= 9.9)

Worldwide Orbit Computation Centers



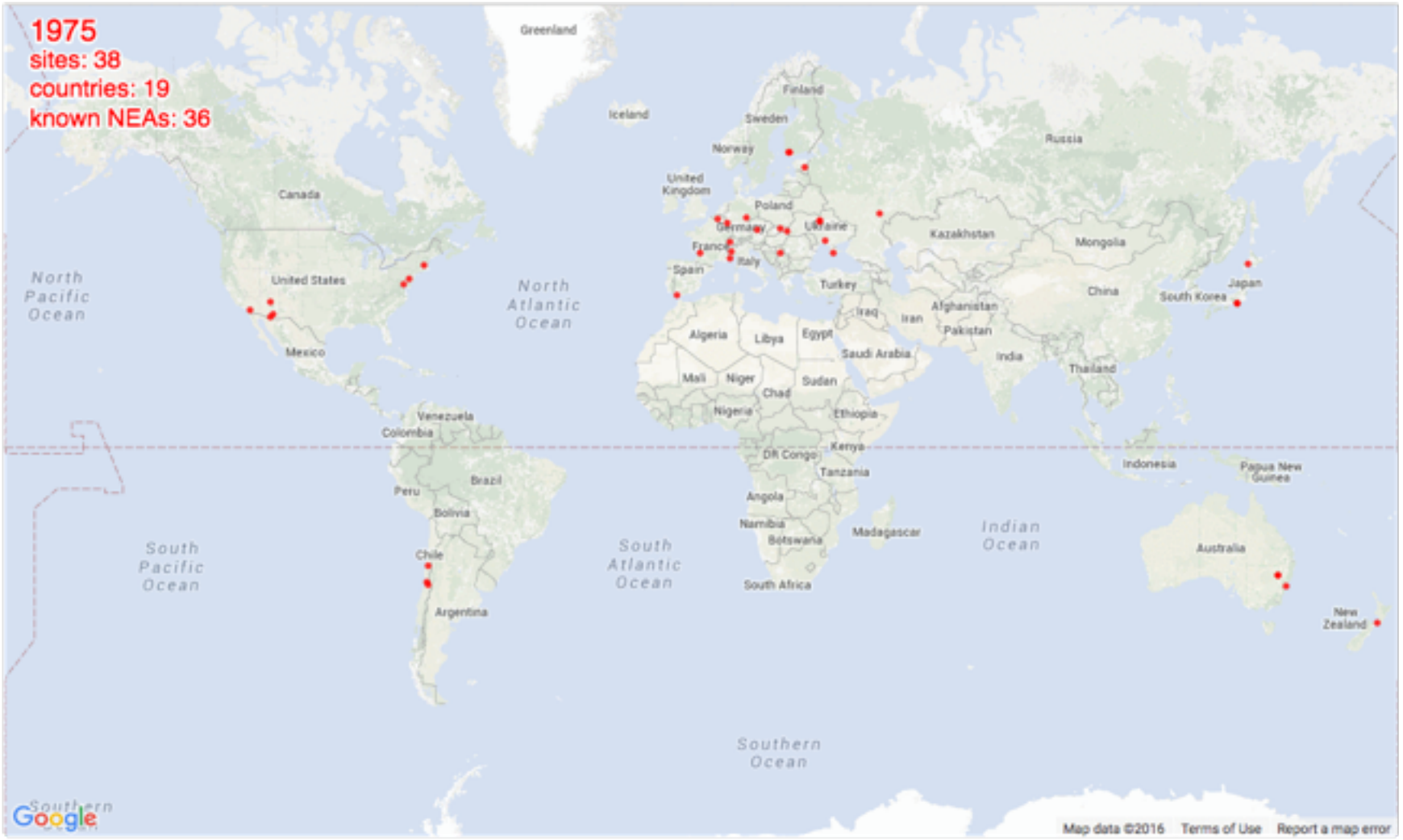


Spaceguard Survey Catalog Program
(current infrastructure & process)



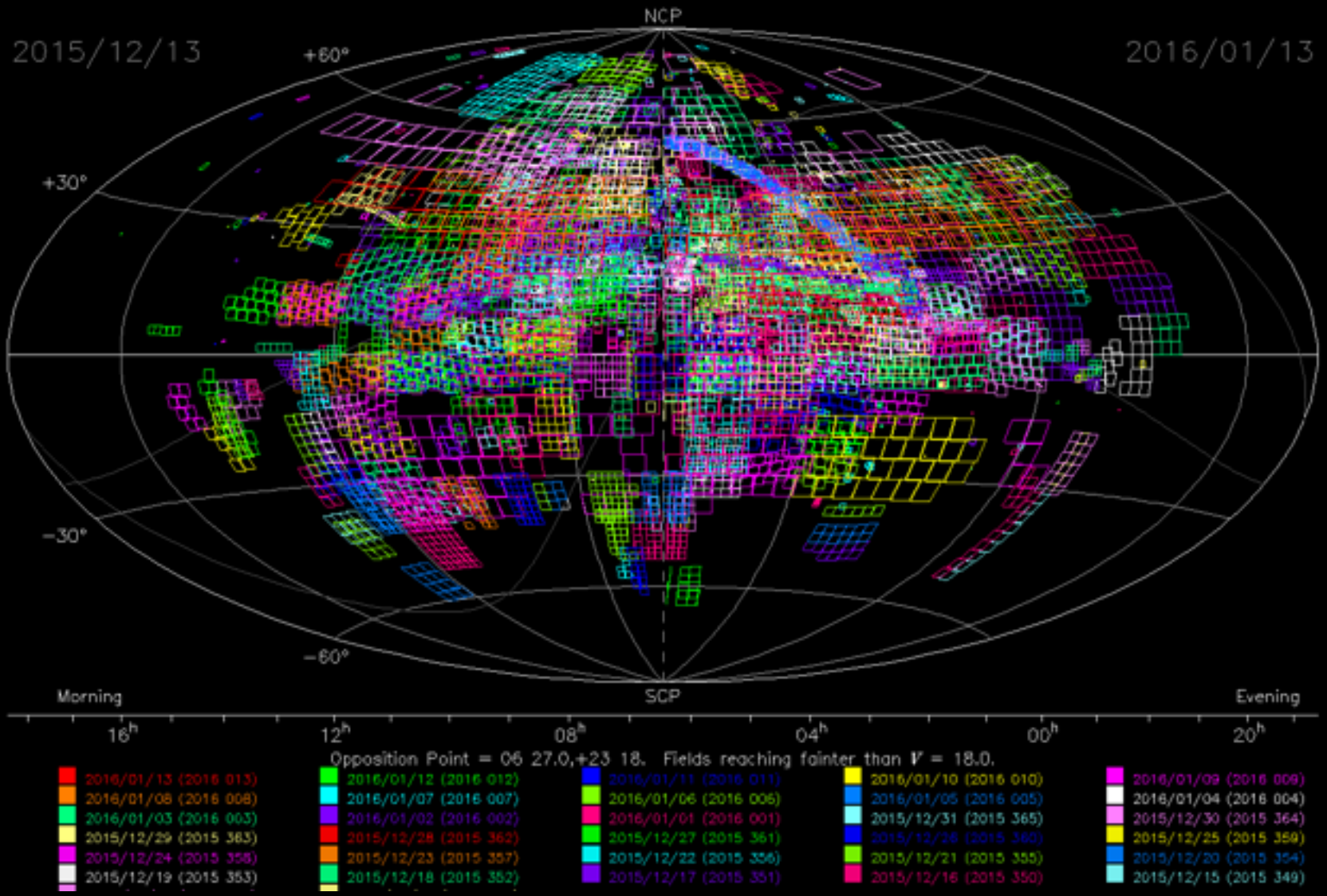
- **MPC** - PHO of interest
- **MPC** - possible close approach
- **JPL** - reports potential for impact
- **JPL** - publishes probability of impact

Historical NEO Surveys



SKY COVERAGE

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

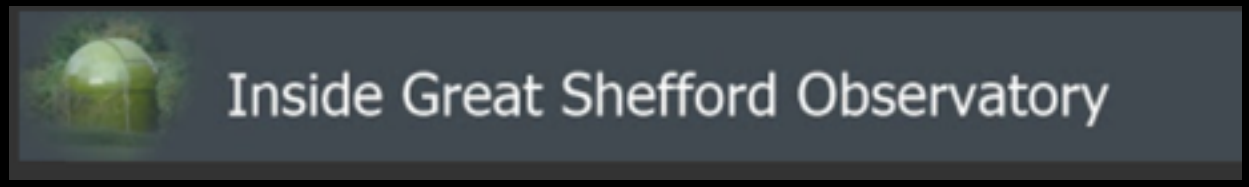


SONEAR—discovery station in Brazil

Astronomical Research Institute

Tenagra Observatory follow-up station

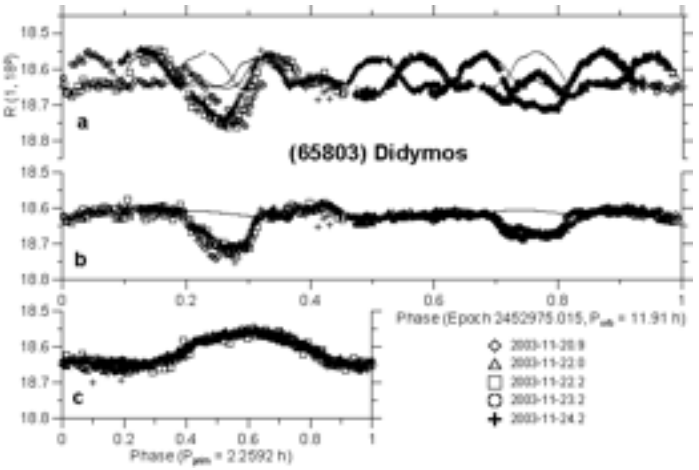
Great Shefford



Physical Characterization

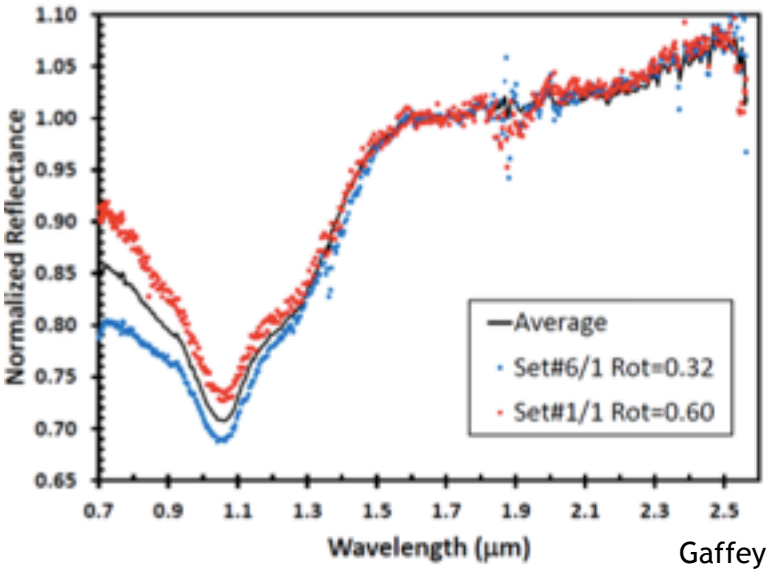
Petr Pravec lightcurve/physical observations:

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



Nick Moskovitz MANOS project:

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

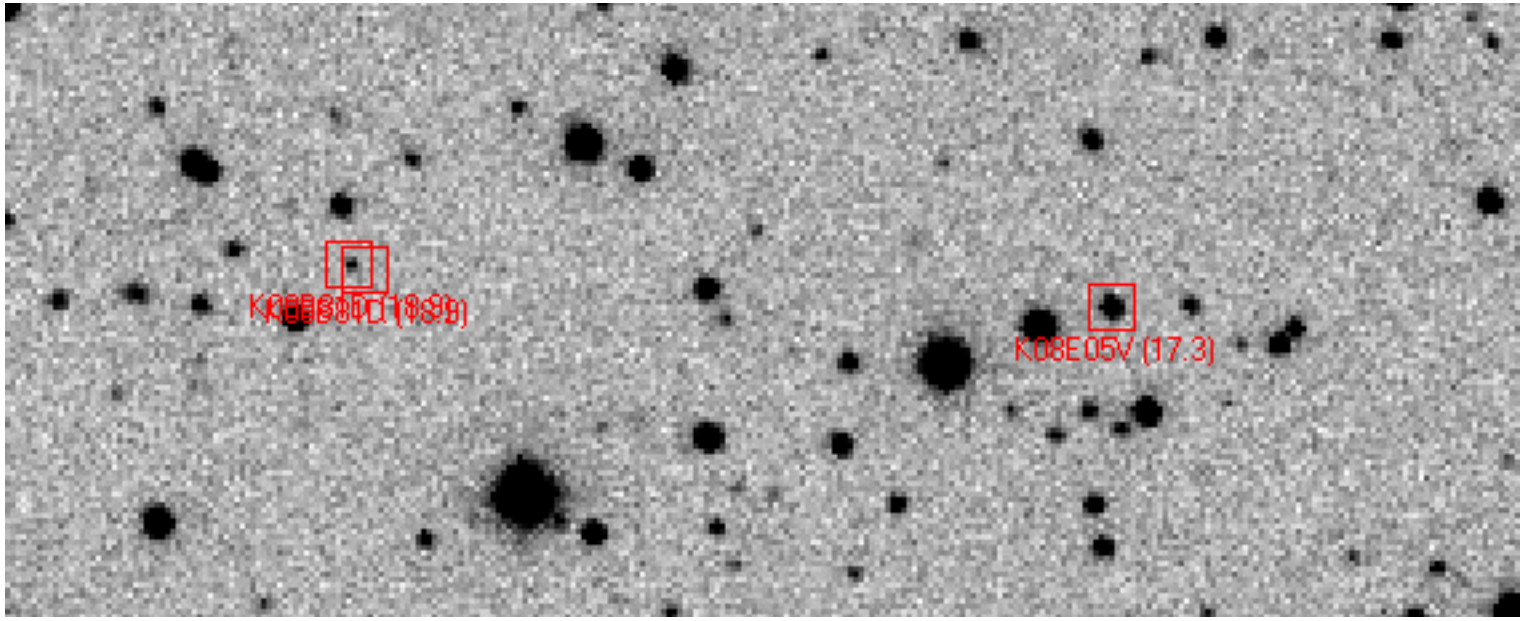


Gaffey et al.

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