

A SEARCH FOR DISTANT SOLAR SYSTEM BODIES IN THE REGION OF SEDNA

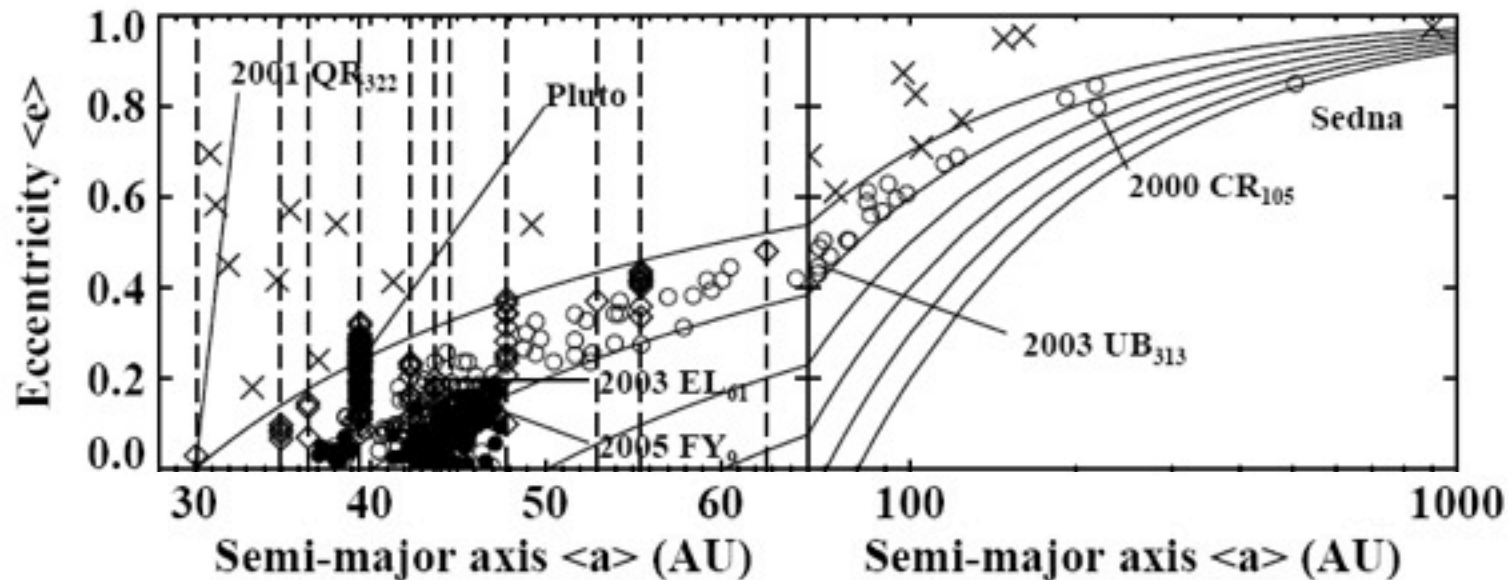
**Reference: Schwamb, M.E., Brown, M.E., Rabinowitz, D.L., 2009,
ApJ 694, L45**

2009.4.16

Yeh, Lun-Wen

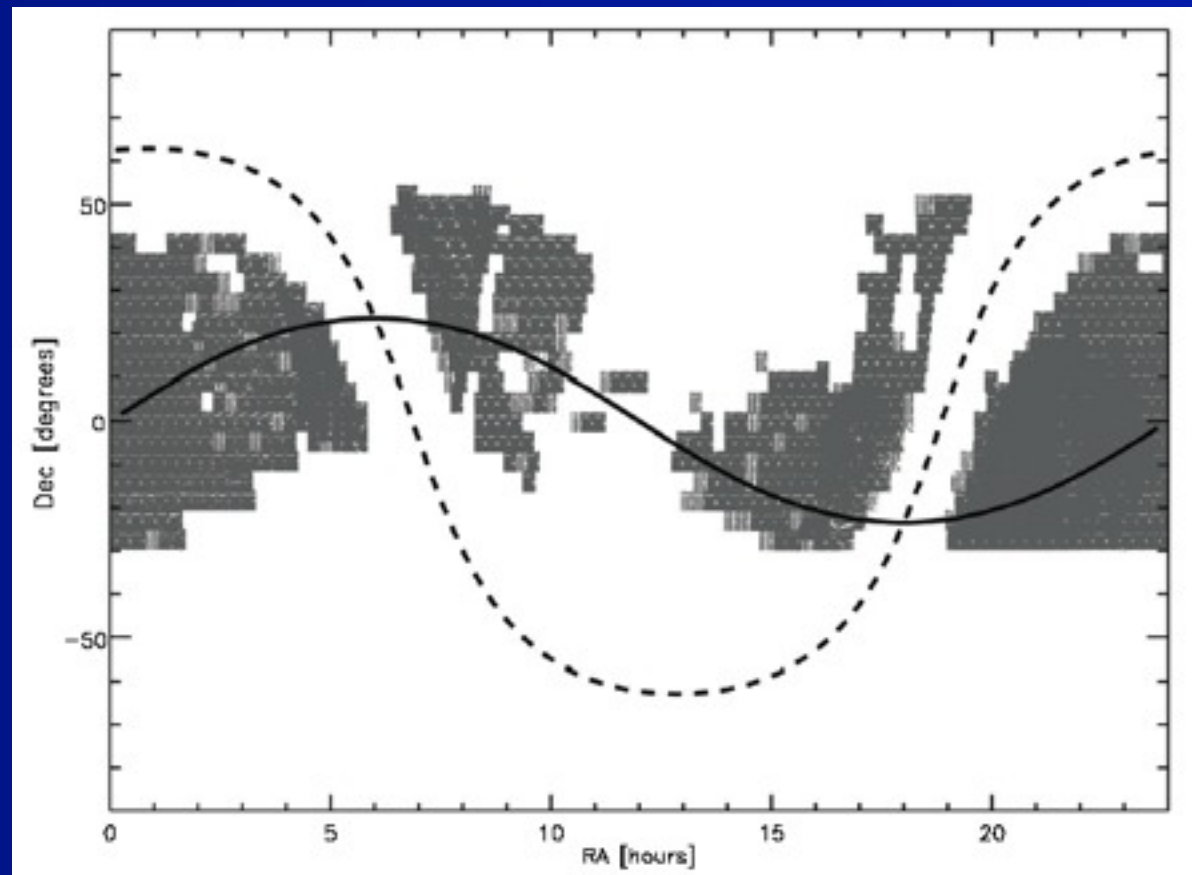
Background

- 90377 Sedna: $a=526$ AU, $e=0.86$, $i=12^\circ$, $q=76$ AU, $Q=976$ AU, $D=1200\text{--}1600$ km .
- Sedna is well beyond the reach of the giant planet and, could not be scattered into its highly eccentric orbit from interactions with Neptune alone.
- Sedna's aphelion at ~ 1000 AU is too far from the edge of the solar system to feel the perturbing effects of passing stars or galactic tides in the present-day solar neighborhood.
- Some other mechanism no longer active in the solar system today is required to emplace Sedna on its orbit.



Observation

- 1.2 m Samuel Oschin Telescope located at Palomar Observatory.
- From 2007 May 8 to 2008 September 27, they surveyed 11786 deg² within $\pm 30^\circ$ of the ecliptic.



Observation results

- A total number of 53 KBOs and Centaurs have been detected, of which 25 are new discoveries from this survey.
- No new Sedna-like bodies with perihelia beyond 70 AU were found in the survey despite a sensitivity out to distances of ~ 1000 AU.

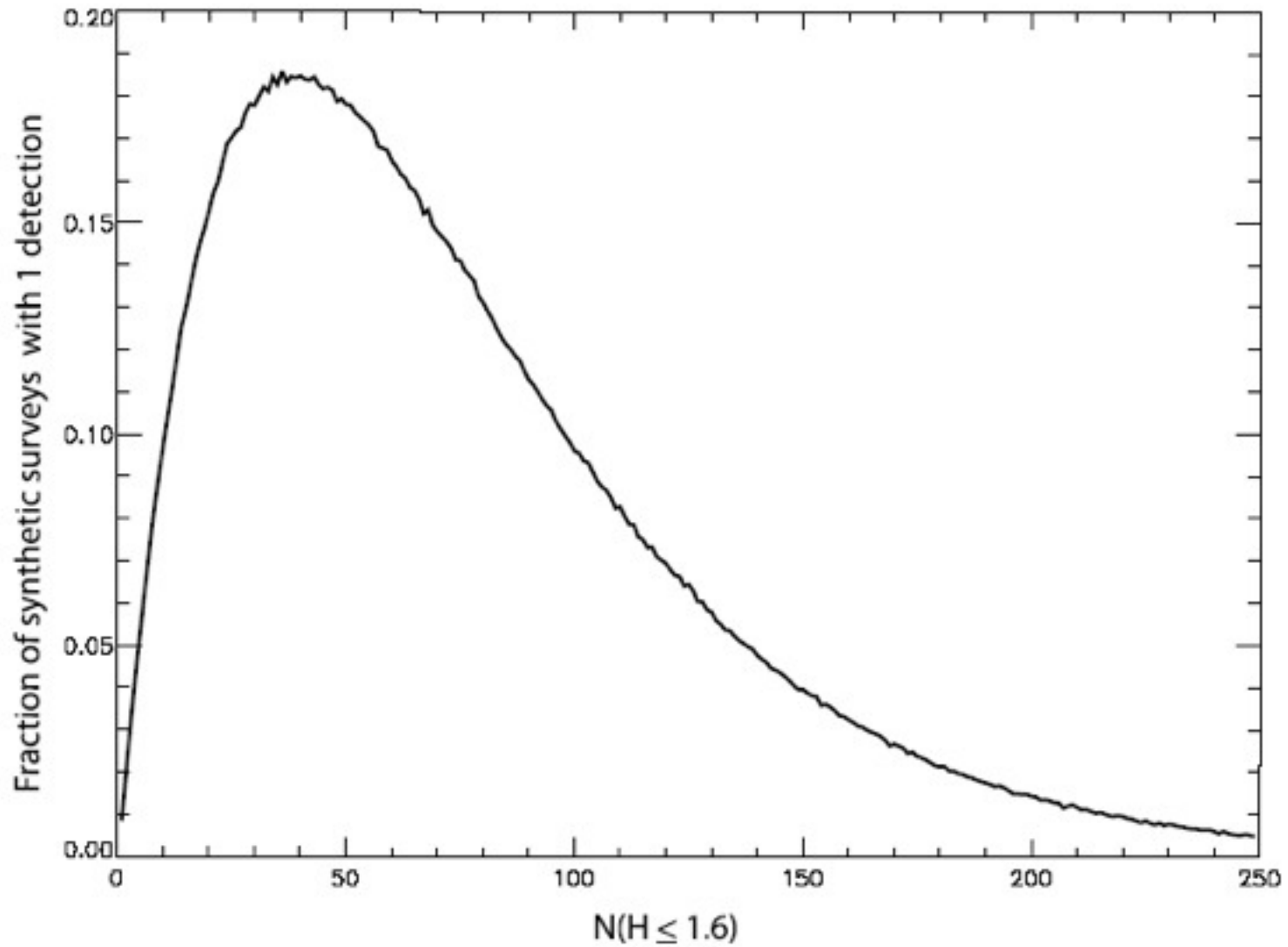
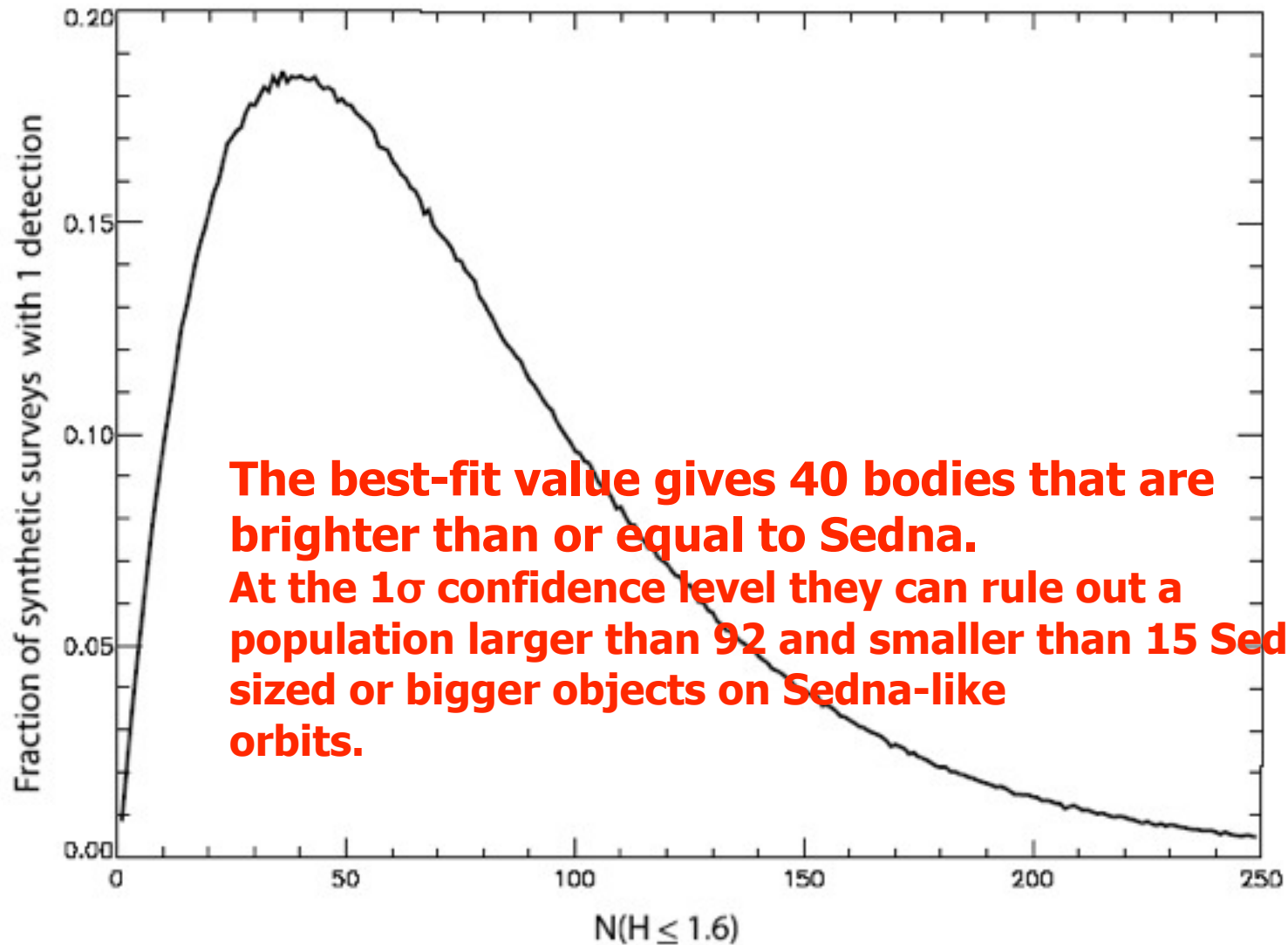


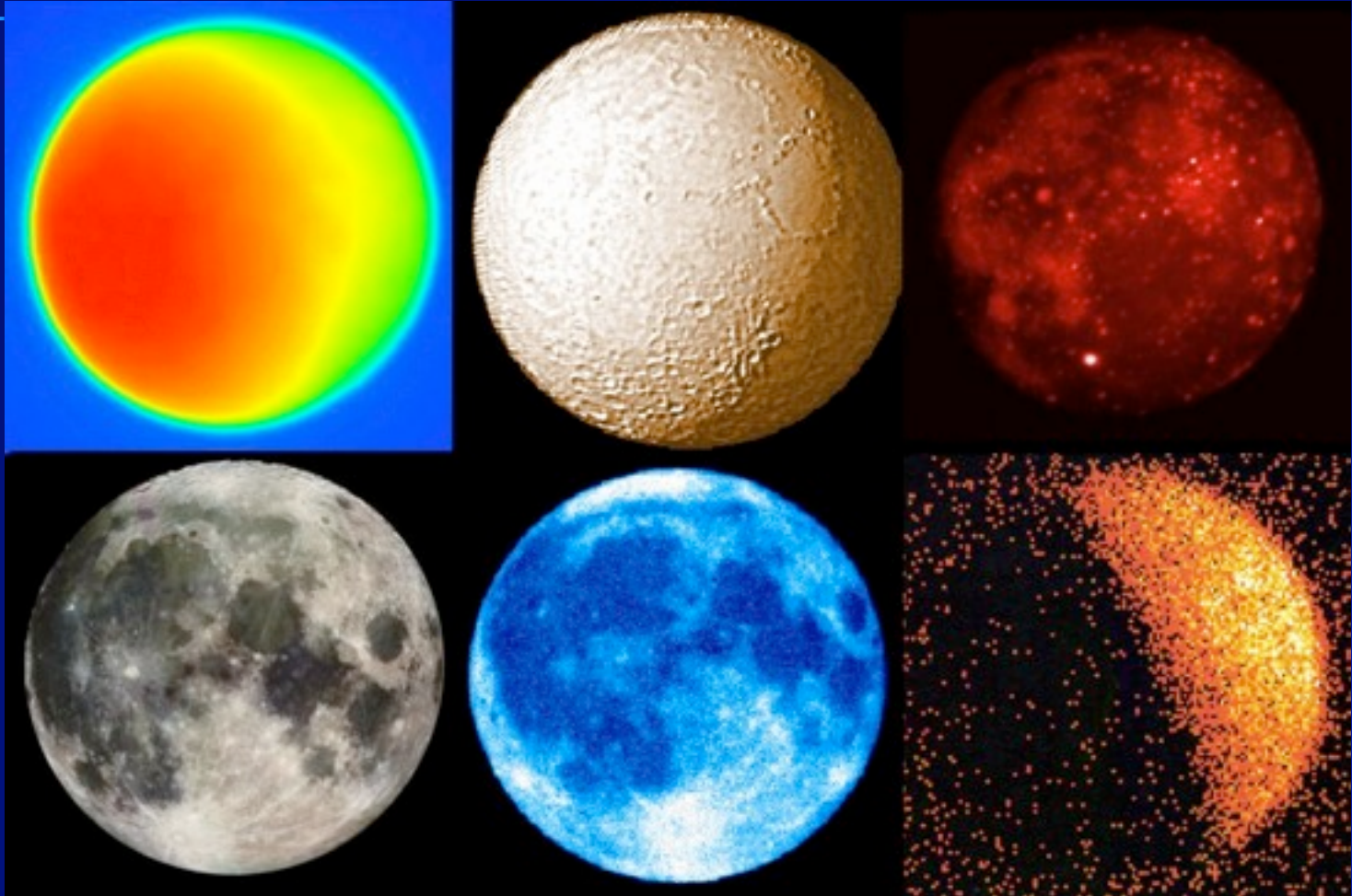
Figure 3. Fraction of synthetic surveys with one detectable Sedna-like body as a function of the number of bodies bigger and brighter than Sedna.



The best-fit value gives 40 bodies that are brighter than or equal to Sedna. At the 1σ confidence level they can rule out a population larger than 92 and smaller than 15 Sedna-sized or bigger objects on Sedna-like orbits.

Figure 3. Fraction of synthetic surveys with one detectable Sedna-like body as a function of the number of bodies bigger and brighter than Sedna.

Thank you



Another interesting astronews

Isotropic Gamma-Ray Background: Cosmic-Ray-Induced Albedo from Debris in the Solar System?

Igor V. Moskalenko and Troy A. Porter

The Astrophysical Journal Letters, 692, L54 (2009 February 10)

