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DISTANT EKOs
The Kuiper Belt Electronic Newsletter



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`www.boulder.swri.edu/ekonews`

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NEWS & ANNOUNCEMENTS

There were 2 new Centaur/SDO discoveries announced since the previous issue of *Distant EKOs*:
2013 RN30, 2013 TP145

Reclassified objects:

2011 GM27 (SDO → TNO)

Current number of TNOs: 1259 (including Pluto)

Current number of Centaurs/SDOs: 377

Current number of Neptune Trojans: 9

Out of a total of 1645 objects:

642 have measurements from only one opposition

631 of those have had no measurements for more than a year

324 of those have arcs shorter than 10 days

(for more details, see: http://www.boulder.swri.edu/ekonews/objects/recov_stats.jpg)

Discovery of a New Member of the Inner Oort Cloud from The Next Generation Virgo Cluster Survey

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We report the discovery of 2010 GB₁₇₄, a likely new member of the Inner Oort Cloud (IOC). 2010 GB₁₇₄ is one of 91 Trans Neptunian Objects (TNOs) and Centaurs discovered in a 76 deg² contiguous region imaged as part of the Next Generation Virgo Cluster Survey (NGVS) — a moderate ecliptic latitude survey reaching a mean limiting magnitude of $g' \simeq 25.5$ — using MegaPrime on the 3.6m Canada France Hawaii Telescope. 2010 GB₁₇₄ is found to have an orbit with semi-major axis $a \simeq 350.8$ AU, inclination $i \simeq 21.6^\circ$ and pericentre $q \sim 48.5$ AU. This is the second largest perihelion distance among known solar system objects. Based on the sky coverage and depth of the NGVS, we estimate the number of IOC members with sizes larger than 300 km ($H_V \leq 6.2$ mag) to be $\simeq 11\,000$. A comparison of the detection rate from the NGVS and the PDSSS (a characterized survey that ‘re-discovered’ the IOC object Sedna) gives, for an assumed a power-law LF for IOC objects, a slope of $\alpha \simeq 0.7 \pm 0.2$, with only two detections in this region this slope estimate is highly uncertain.

Published in: The Astrophysical Journal Letters, 775, L8 (2013 September 20)

For preprints, contact `charles@astro.ncu.edu.tw`

or on the web at <http://iopscience.iop.org/2041-8205/775/1/L8/>

and <http://arxiv.org/abs/1308.6041>

A Study of the High-inclination Population in the Kuiper Belt – 1. The Plutinos

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The dynamics of the high-inclination Plutinos is systematically studied. We first present the peculiar features of the 2:3 Neptune mean motion resonance (NMMR) for inclined orbits, especially for the correlation of resonant amplitude A_σ with inclination i . Using the numerical integrations for the age of the Solar system, the dynamical structure of the 2:3 NMMR is mapped out on the plane of semi-major axis versus i for different eccentricities. We have shown that i of stable resonant orbits could be as high as 90° ; and the stable region is roughly surrounded by the contours of $A_\sigma = 120^\circ$. These new findings allow us to further explore the 2:3 NMMR capture and retention of planetesimals with initial inclinations $i_0 \leq 90^\circ$ in the frame of the planet migration model. We find that the outward transportation of Plutinos is possible for any inclined or even perpendicular orbits.

The role of i_0 in the formation of Plutinos during Neptune's migration is highlighted and interesting results are obtained: (1) The capture efficiency of the 2:3 NMMR decreases drastically first with the increase of i_0 , but it then raises instead when i_0 exceeds $\sim 50^\circ$; (2) The magnitude of i -variation is limited to less than 5° for any i_0 , and moreover, for Plutinos with $i \geq 48^\circ$, their i are forced to decrease throughout the outward migration; (3) Plutinos with $i \geq 48^\circ$ are certainly outside the Kozai mechanism, since an inclination increase is prohibited by the migrating 2:3 NMMR; (4) The 7:11 inclination-type NMMR could be responsible for nearly-circular Plutinos, and a minimum $i_0 \sim 15^\circ$ is required to intrigue this mechanism.

To appear in: Monthly Notices of the Royal Astronomical Society

Preprints available on the web at <http://arxiv.org/abs/1310.0907> *and*

<http://mnras.oxfordjournals.org/content/early/2013/10/25/mnras.stt1872.full.pdf>

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The Small Numbers of Large Kuiper Belt Objects

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We explore the brightness distribution of the largest and brightest ($m(R) < 22$) Kuiper belt objects (KBOs). We construct a luminosity function of the dynamically excited or hot Kuiper belt (orbits with inclinations $> 5^\circ$) from the very brightest to $m(R) = 23$. We find for $m(R) \lesssim 23$, a single slope appears to describe the luminosity function. We estimate ~ 12 KBOs brighter than $m(R) \sim 19.5$ are present in the Kuiper belt today. With 9 bodies already discovered this suggests that the inventory of bright KBOs is nearly complete.

To appear in: The Astronomical Journal

Preprints available at <http://arxiv.org/abs/1310.7049>

PAPERS RECENTLY SUBMITTED TO JOURNALS

The Size-distribution of Scattered Disk TNOs from that of JFCs between 0.2 and 15 km Effective Radius

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Submitted to: Icarus

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CONFERENCE CONTRIBUTIONS

Positions of Pluto Extracted from Digitized Pulkovo Photographic Plates Taken in 1930 – 1960

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We present the results of determination of Pluto's positions derived from photographic plates taken in 1930–1960. Observations were made with Normal Astrograph at Pulkovo Observatory. Digitization of these plates was performed with high precision scanner at Royal Observatory of Belgium (ROB Digitizer). Mean values of standard errors of plate positions (x, y) lie between 12 and 18 mas. The UCAC4 catalogue was used as an astrometric calibrator. Standard errors of equatorial coordinates obtained are within 85 to 100 mas. Final table contains 63 positions of Pluto referred to the HCRF/UCAC4 frame. This work was performed with support from the Russian Foundation for Basic Research (project no. 12-02-00675a).

Published in: Proc. of All-Russian Astronomical Conference, Saint Petersburg, 2013 September 23–27, 2013, 265

For preprints, contact deimos@gao.spb.ru

or on the web at <http://arxiv.org/abs/1310.7502>

CONFERENCE INFORMATION

48th ESLAB Symposium: New insights into volcanism across the Solar System

First announcement

<http://congrexprojects.com/2014-events/48-ESLAB/>

Dear colleagues,

We are pleased to invite you to the 48th ESLAB Symposium on "New insights into volcanism across the Solar System". The Symposium will take place from 16–20 June 2014 at the European Space Research and Technology Centre (ESTEC) located in Noordwijk, The Netherlands.

It will focus on volcanism in the Solar System. Of particular interest, but not limited to, will be new insights obtained over the last years from international space missions to planets (e.g., MESSENGER, LRO, Selene, etc.), Moons and cryo-volcanism. The connection with Earth by will be covered by experts on terrestrial volcanism.

The format will be made up of plenary sessions on topics related to volcanism in the Solar System, with contributed oral and poster presentations. Part of the Symposium may be devoted to parallel sessions on specialized topics where details can be discussed at greater length. This will depend on the response to the Call for Papers.

The second announcement with the call for abstracts and other detailed information is available on the meeting website: <http://congrexprojects.com/2014-events/48-ESLAB/>

Pre-registration is already available on this website which will ensure that you receive regular updates from the Symposium organisers.

Financial support may be available for students.

Kind regards,

The LOC, 48th ESLAB

The *Distant EKO*s Newsletter is dedicated to provide researchers with easy and rapid access to current work regarding the Kuiper belt (observational and theoretical studies), directly related objects (e.g., Pluto, Centaurs), and other areas of study when explicitly applied to the Kuiper belt.

We accept submissions for the following sections:

- ★ Abstracts of accepted papers
- ★ Titles of submitted (but not yet accepted) papers and conference articles
- ★ Thesis abstracts
- ★ Short articles, announcements, or editorials
- ★ Status reports of on-going programs
- ★ Requests for collaboration or observing coordination
- ★ Table of contents/outlines of books
- ★ Announcements for conferences
- ★ Job advertisements
- ★ General news items deemed of interest to the Kuiper belt community

A L^AT_EX template for submissions is appended to each issue of the newsletter, and is sent out regularly to the e-mail distribution list. Please use that template, and send your submission to:

`ekonews@boulder.swri.edu`

The *Distant EKO*s Newsletter is available on the World Wide Web at:

`http://www.boulder.swri.edu/ekonews`

Recent and back issues of the newsletter are archived there in various formats. The web pages also contain other related information and links.

*Distant EKO*s is not a refereed publication, but is a tool for furthering communication among people interested in Kuiper belt research. Publication or listing of an article in the newsletter or the web page does not constitute an endorsement of the article's results or imply validity of its contents. When referencing an article, please reference the original source; *Distant EKO*s is not a substitute for peer-reviewed journals.

Moving ... ??

If you move or your e-mail address changes, please send the editor your new address. If the newsletter bounces back from an address for three consecutive issues, the address will be deleted from the mailing list. All address changes, submissions, and other correspondence should be sent to:

`ekonews@boulder.swri.edu`