A Facility for Communication: A New Website for the International Asteroid Warning Network

A Report to the IAWN Steering Committee

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UNIVERSITY OF MARYLAND

IAWN Website at UMD

- UMD is the home of the NASA Planetary Data System's Small Bodies Node – responsible for data concerning Asteroids and Comets.
- As of January, 2017, UMD began oversight of the Minor Planet Center as a sub-node of the SBN. Regular, unfettered communications with the MPC and quality assurance are key factors of this relationship.
- NEO Sciences LLC CEO, Tim Spahr, a founding member of the IAWN Steering Committee now also has a sub-award with the SBN to help in overseeing the MPC and in managing the IAWN activity.
- The SBN already participates in worldwide distribution of data and international agreements with, for example, ESA and its PSA.
- UMD has experience organizing data collection and distribution for worldwide observing campaigns, including observations of C/2013 A1 Siding Spring, the Mars close-approaching comet, the upcoming close approach of comet 46P/Wirtanen, and recently the October 12, 2017 close approach of 2012 TC4, in part for IAWN.

The 2012 TC4 Observing Campaign

RELATED LINKS

Planetary Defense Coordination Office
NASA PDS: Small Bodies Node
Minor Planet Center (MPC)
International Asteroid Warning Network
Center for Near Earth Object Studies

OBSERVING CAMPAIGNS

The Comet Wirtanen Campaign
4*P Coma Morphology Campaign
Amateur Observers Program

Contact Us

Introduction

Welcome to the website for the 2012 TC4 Observing Campaign. Our intention is to provide a central clearinghouse for basic information about the near Earth asteroid 2012 TC4 and about the observations that will be obtained during its upcoming apparition.

This site will contain background information about 2012 TC4, a list of observations that are planned/scheduled/obtained, and status reports on the events leading up to the close approach. We will also produce an email list where updates can be broadcast to subscribers.

What is special about 2012 TC4?

2012 TC4 is a near-Earth asteroid discovered in 2012
It has the potential to get very close to the Earth. There is significant interest in observing it this fall to improve its orbit so that future Earth encounters can be investigated.

2012 TC4 makes a very close approach to the Earth this fall
On 12 Oct 2017, it will pass within the orbit of the Moon, At closest approach, it will be ~50,000 km from Earth.

Observing conditions vary through the encounter
During its approach to the Earth, the observing conditions are good (near opposition for ~2 months, with Earth-facing surface mostly illuminated). After passing the Earth, however, it will be difficult to observe (small solar elongation, with most of the Earth-facing surface in shadow).

NASA Bulletins

2012 TC4 NASA Notification - Recovery - Exercise

2012 TC4 NASA Notification - Close Approach in 2 Weeks - Exercise

Updates & News

2017.10.16: **New orbit solution precludes any Earth impact for the next 100 years.** Orbit solution JPL#56, which included radar astrometry and close encounter optical data, has ruled out any impact with the Earth in the next 100 years. As of 16 Oct 2017, 2012 TC4 has been removed from the Sentry: Impact Monitoring List.

2017.10.13: **lots of updates!** Properties, new images and movies,...

2017.10.11: **Two movies showing 2012 TC4 moving across the sky have been obtained.** In both movies, the asteroid can be seen getting brighter and fainter, exhibiting its rapid rotation rate.

One was obtained by Ryou Ohsawa and collaborators at the Kiso observatory in Japan on Oct. 10 and 11, using a newly developed CMOS camera. It is available **here**.

The other is seen here, or enlarged on the Gallery Page.

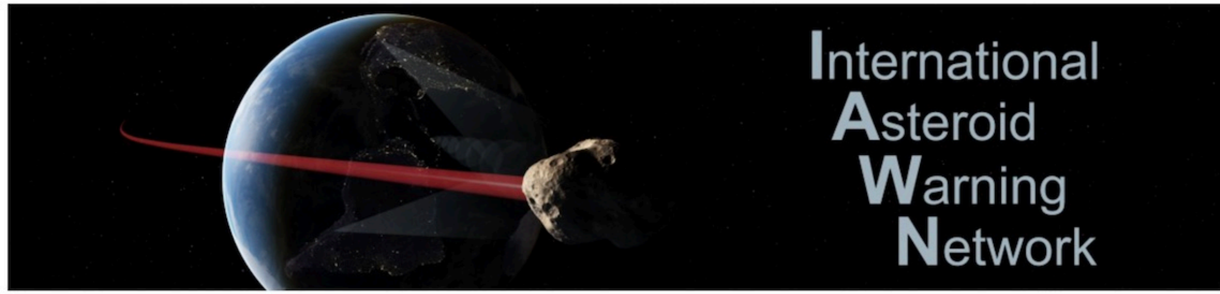
Details: *2012 TC4 moving across the sky on Oct 11, 2017*

Credit: *Alberto Quijano Vodniza and Mario Rojas Pereira, University of Narino Observatory, Colombia*

http://2012tc4.astro.umd.edu

Current IAWN Page

- Initial effort provides much of the critical content
- ***However,*** Free-flowing format, blog-like, lacks prioritization.
- Items sometimes difficult to find.



Asteroid 2018 BF3 close approach

January 23, 2018
Close approaches
Leave a comment

Asteroid designation: 2018 BF3
Discovery station: Catalina Sky Survey
Close approach date (UTC): 2018 01 19.13
Close approach distance (× lunar distance): 0.63
Discovery announcement
Latest orbit & observations

Asteroid 2018 BR1 close approach

January 20, 2018
Close approaches
Leave a comment

Asteroid designation: 2018 BR1
Discovery station: Catalina Sky Survey
Close approach date (UTC): 2018 01 16.56
Close approach distance (× lunar distance): 0.34
Discovery announcement
Latest orbit & observations

Asteroid 2018 BX close approach

Search …

RECENT POSTS

- Asteroid 2018 BF3 close approach
- Asteroid 2018 BR1 close approach
- Asteroid 2018 BX close approach
- Asteroid 2018 BW close approach
- Asteroid 2018 BD close approach

RECENT COMMENTS

- Current List of IAWN Signatories – International Asteroid Warning Network on Statement of Intent

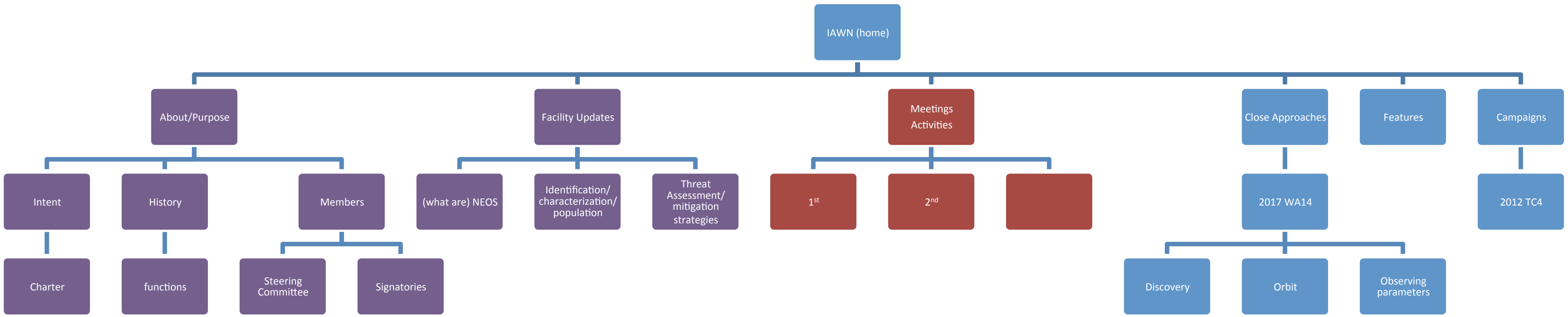
ARCHIVES

- January 2018
- December 2017
- November 2017
- October 2017
- September 2017

Changes in Website Organization

- More compartmentalized – Landing pages should provide user with a path to the information they are seeking.
- NEO community resource.
- Also serves a resource for IAWN members in providing "Uniform and timely announcement(s) of discovery/ designation of new PHAs ("Astronomers discover new potentially hazardous asteroid"): when discovered, by whom, what's known, what's not, next opportunity to observe. … with consistent definitions" (Levels 1-3 – c.f. Billings 2015)

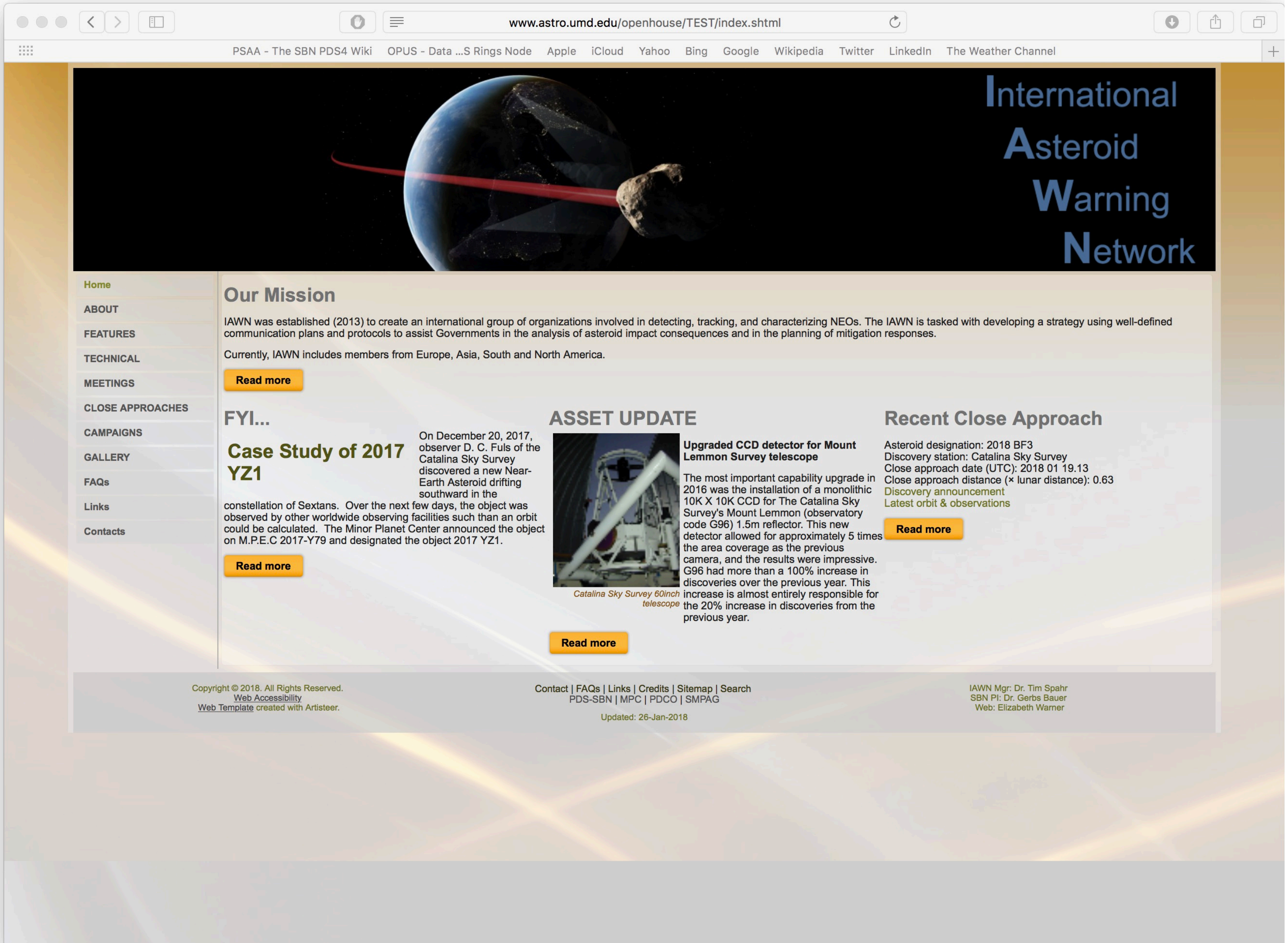
Notional Top-down Structure

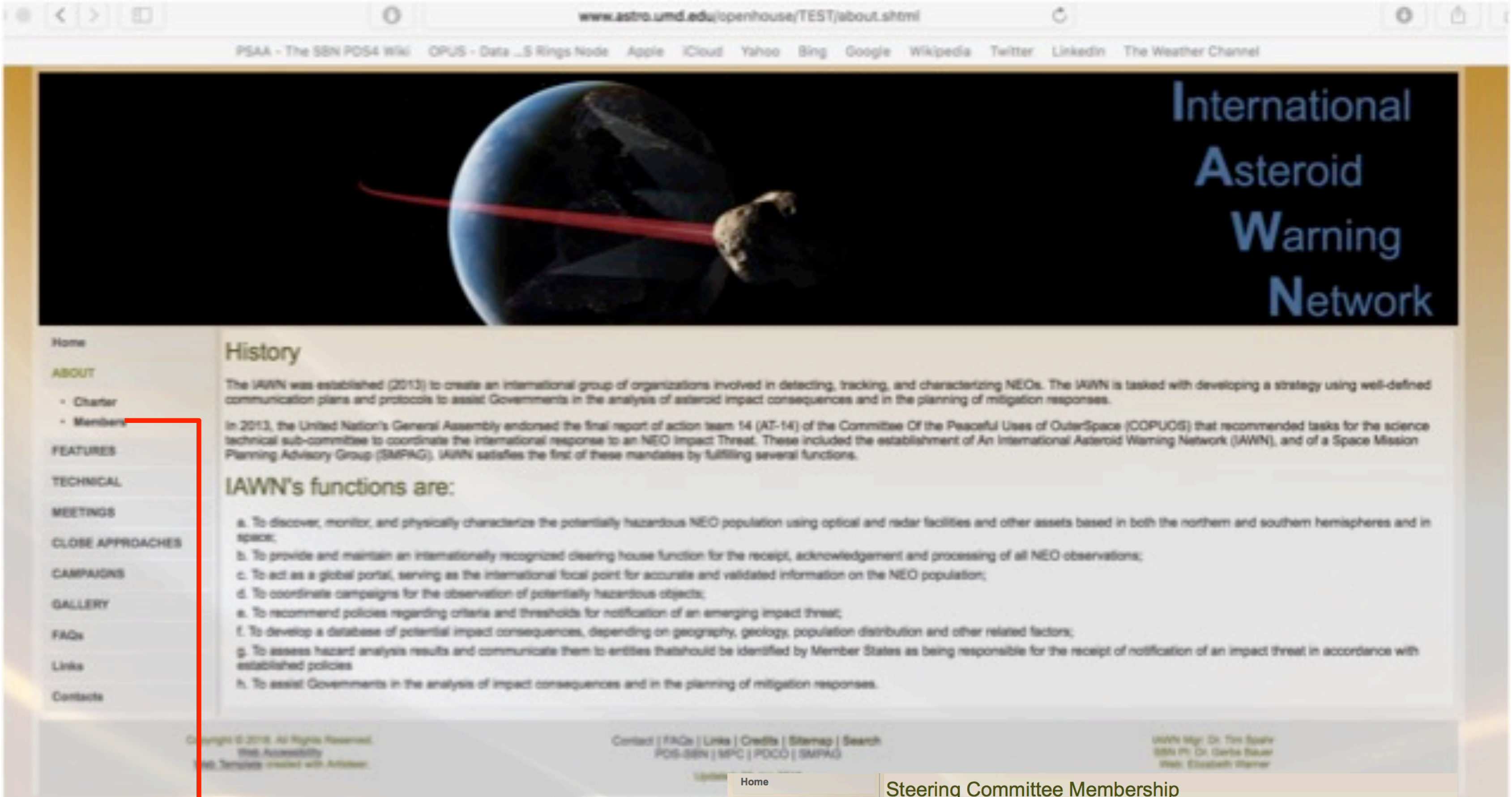


1 to 3 clicks to get to the desired information

IAWN.net -> umd

Mock-up of New Website: http://www.astro.umd.edu/openhouse/TEST/index.shtml




www.astro.umd.edu/openhouse/TEST/about.shtml

International Asteroid Warning Network

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History

The IAWN was established (2013) to create an international group of organizations involved in detecting, tracking, and characterizing NEOs. The IAWN is tasked with developing a strategy using well-defined communication plans and protocols to assist Governments in the analysis of asteroid impact consequences and in the planning of mitigation responses.

In 2013, the United Nation's General Assembly endorsed the final report of action team 14 (AT-14) of the Committee Of the Peaceful Uses of OuterSpace (COPUOS) that recommended tasks for the science technical sub-committee to coordinate the international response to an NEO impact Threat. These included the establishment of An International Asteroid Warning Network (IAWN), and of a Space Mission Planning Advisory Group (SMPAG). IAWN satisfies the first of these mandates by fulfilling several functions.

IAWN's functions are:

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 thatshould 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.

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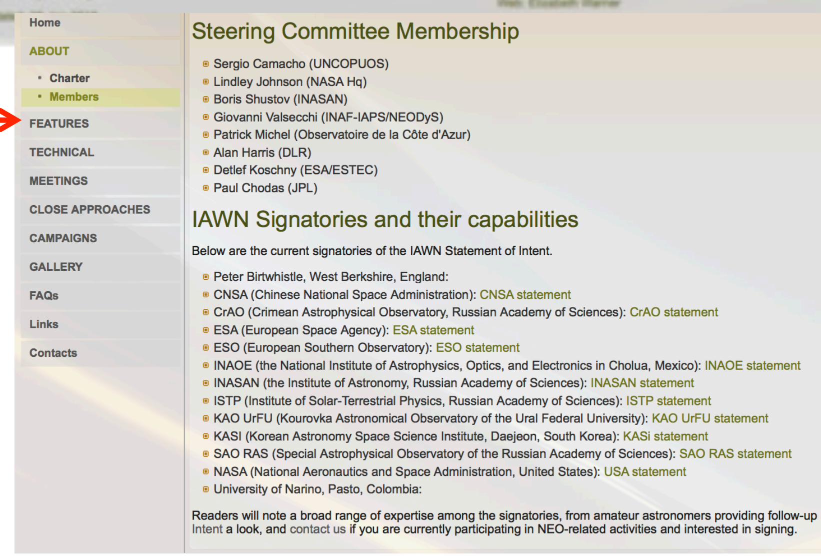
PDS-SBN | MPC | PDCO | SMPAG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Steering Committee Membership

- Sergio Camacho (UNCOPUOS)
- Lindley Johnson (NASA Hq)
- Boris Shustov (INASAN)
- Giovanni Valsecchi (INAF-IAPS/NEODyS)
- Patrick Michel (Observatoire de la Côte d'Azur)
- Alan Harris (DLR)
- Detlef Koschny (ESA/ESTEC)
- Paul Chodas (JPL)

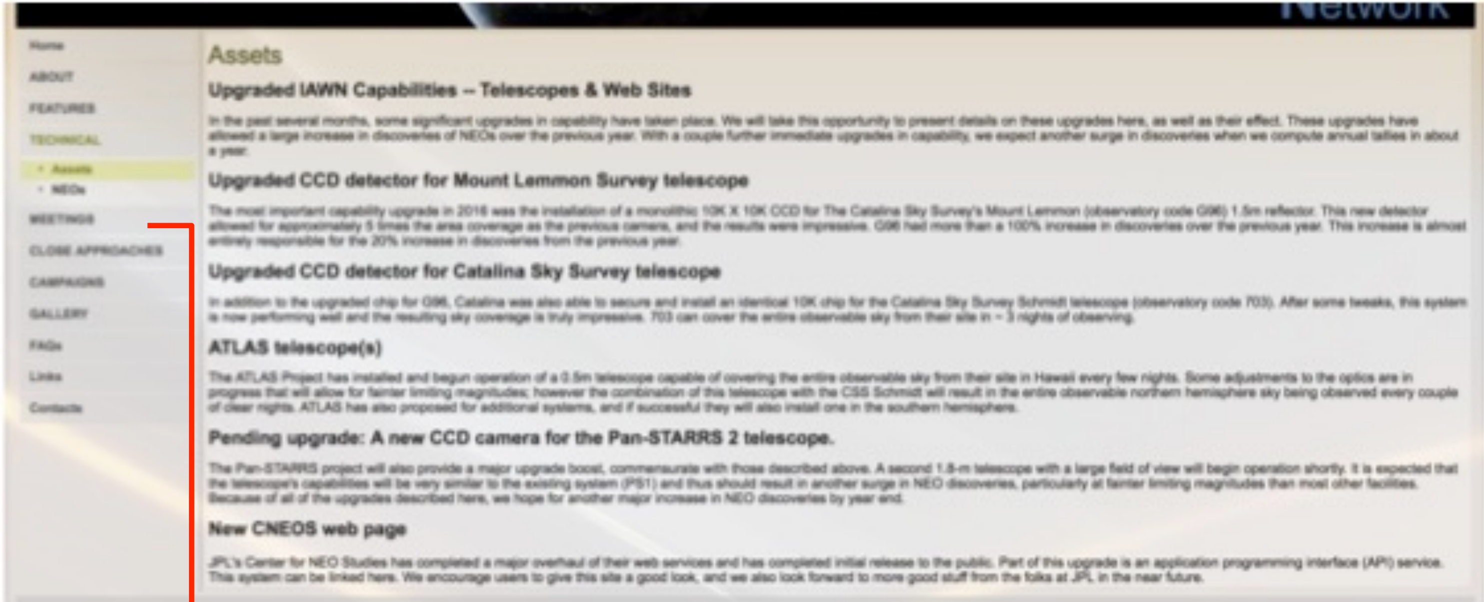
IAWN Signatories and their capabilities

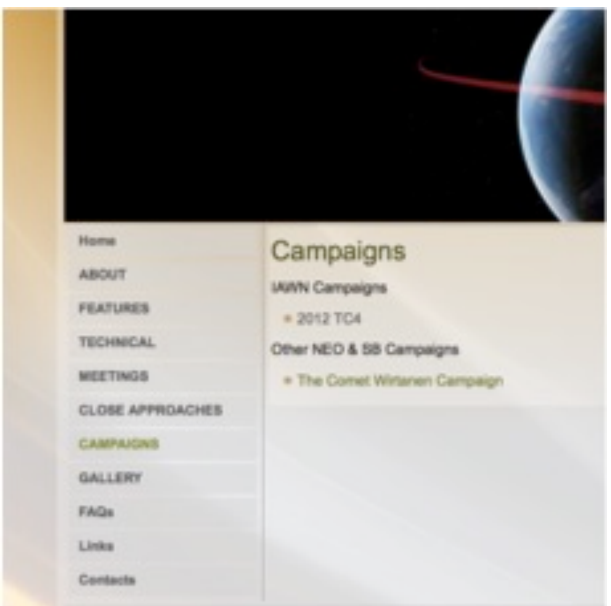
Below are the current signatories of the IAWN Statement of Intent.

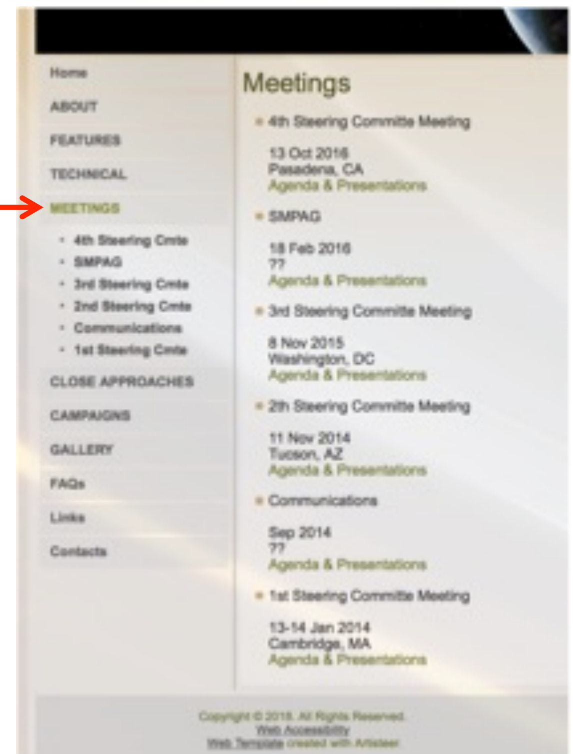
- Peter Birtwhistle, West Berkshire, England:
- CNSA (Chinese National Space Administration): CNSA statement
- CrAO (Crimean Astrophysical Observatory, Russian Academy of Sciences): CrAO statement
- ESA (European Space Agency): ESA statement
- ESO (European Southern Observatory): ESO statement
- INAOE (the National Institute of Astrophysics, Optics, and Electronics in Cholua, Mexico): INAOE statement
- INASAN (the Institute of Astronomy, Russian Academy of Sciences): INASAN statement
- ISTP (Institute of Solar-Terrestrial Physics, Russian Academy of Sciences): ISTP statement
- KAO UrFU (Kourovka Astronomical Observatory of the Ural Federal University): KAO UrFU statement
- KASI (Korean Astronomy Space Science Institute, Daejeon, South Korea): KASi statement
- SAO RAS (Special Astrophysical Observatory of the Russian Academy of Sciences): SAO RAS statement
- NASA (National Aeronautics and Space Administration, United States): USA statement
- University of Narino, Pasto, Colombia:

Readers will note a broad range of expertise among the signatories, from amateur astronomers providing follow-up a
Intent a look, and contact us if you are currently participating in NEO-related activities and interested in signing.

IAWN History/ Membership

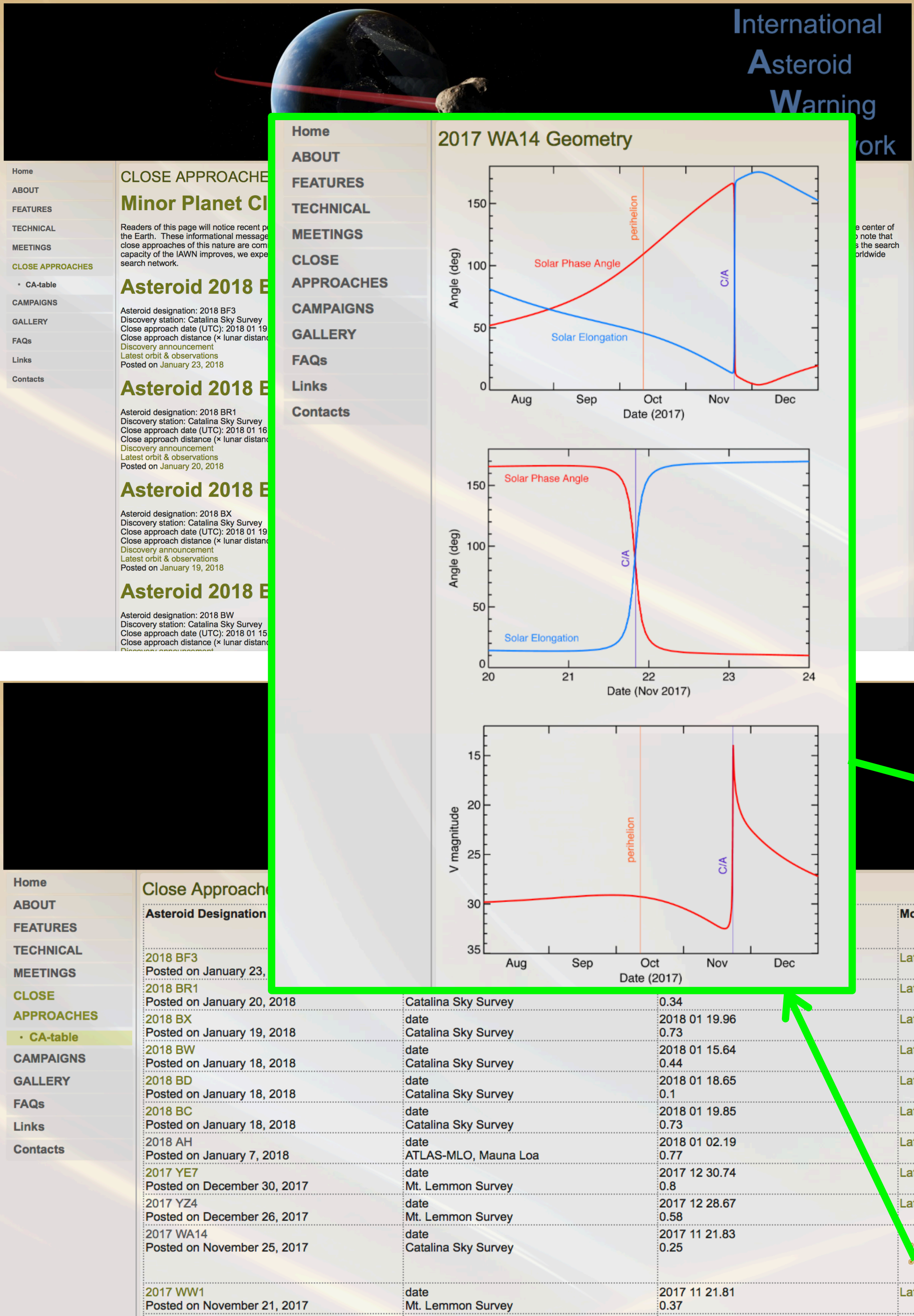


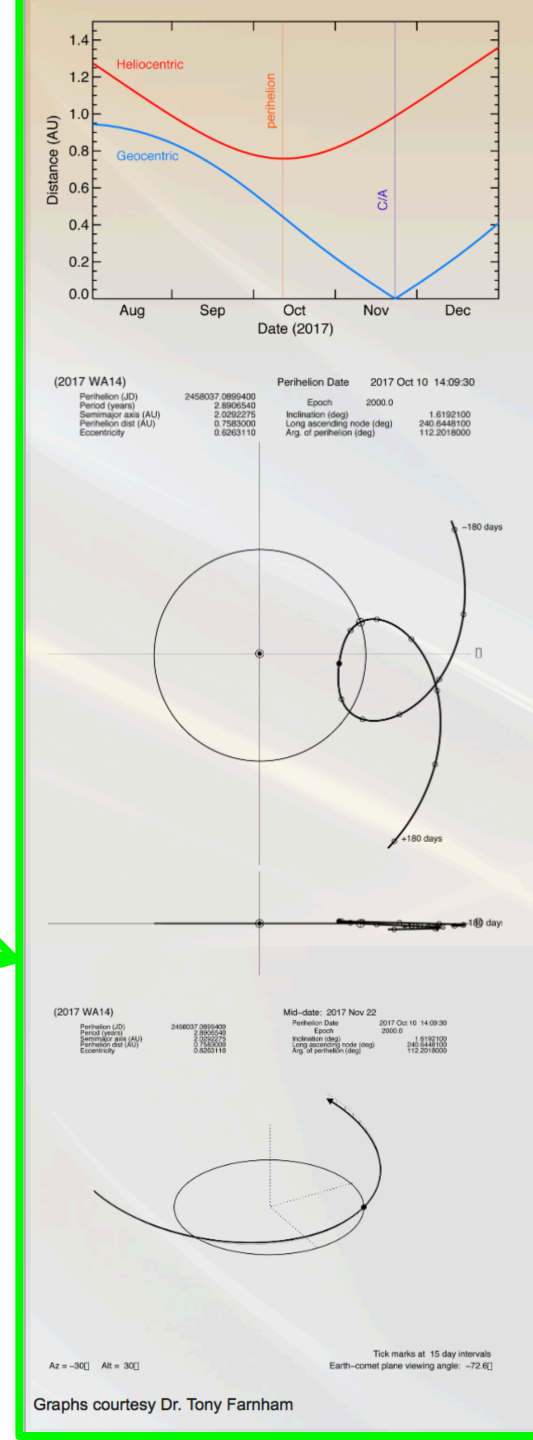




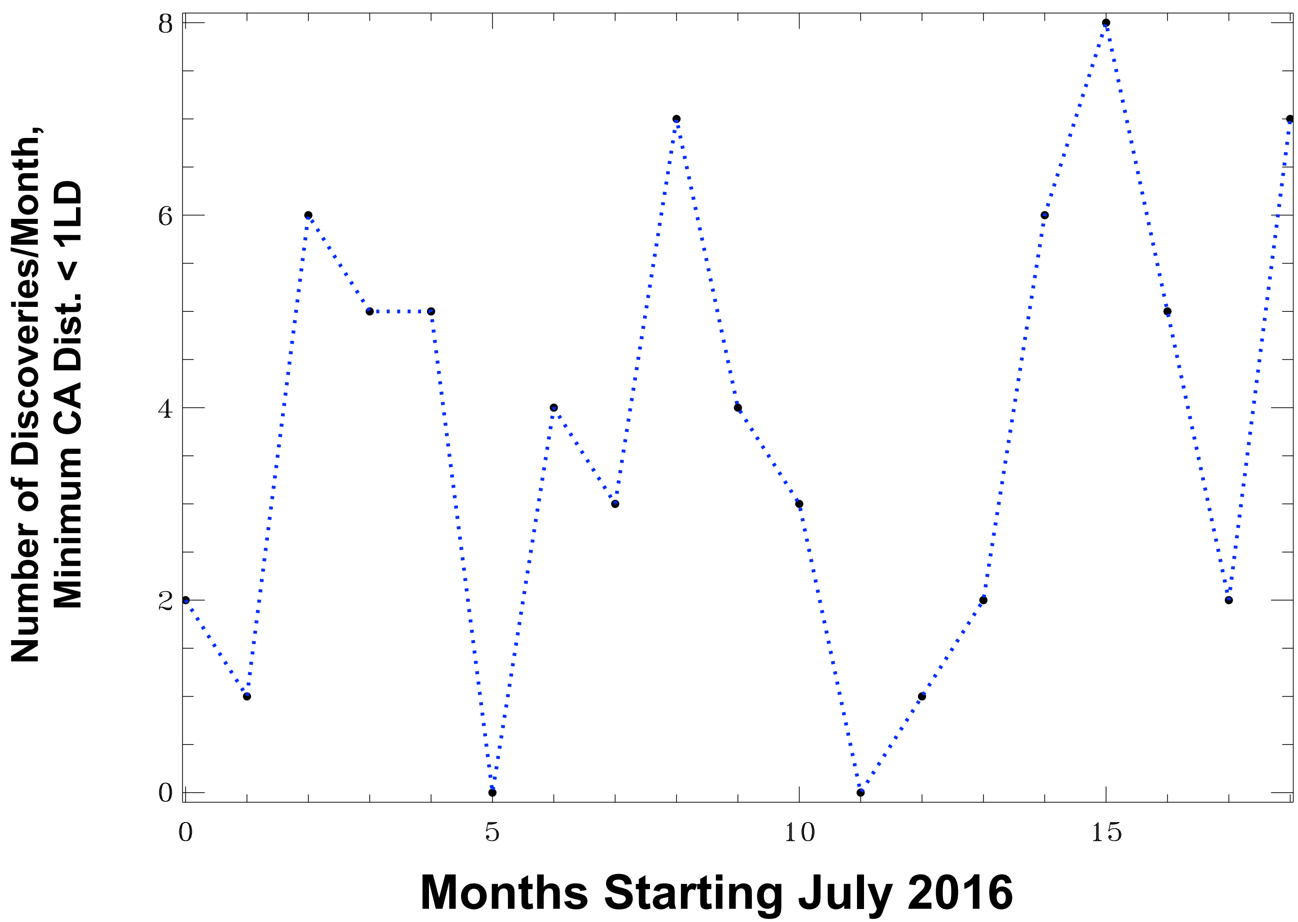
IAWN Logistics

Enhanced CA Content:



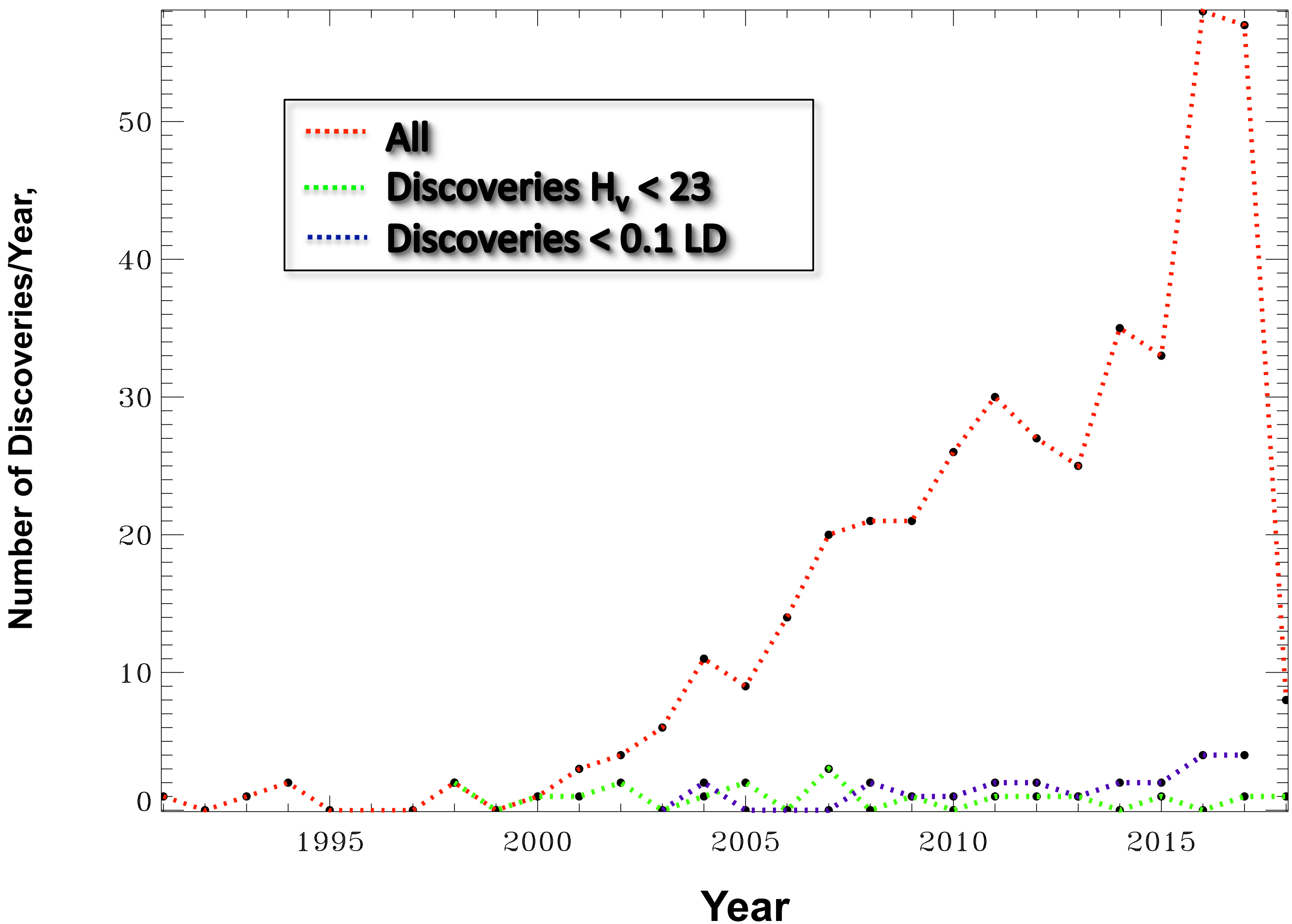


By Month, Number of Discoveries On the IAWN Close Approach Pages

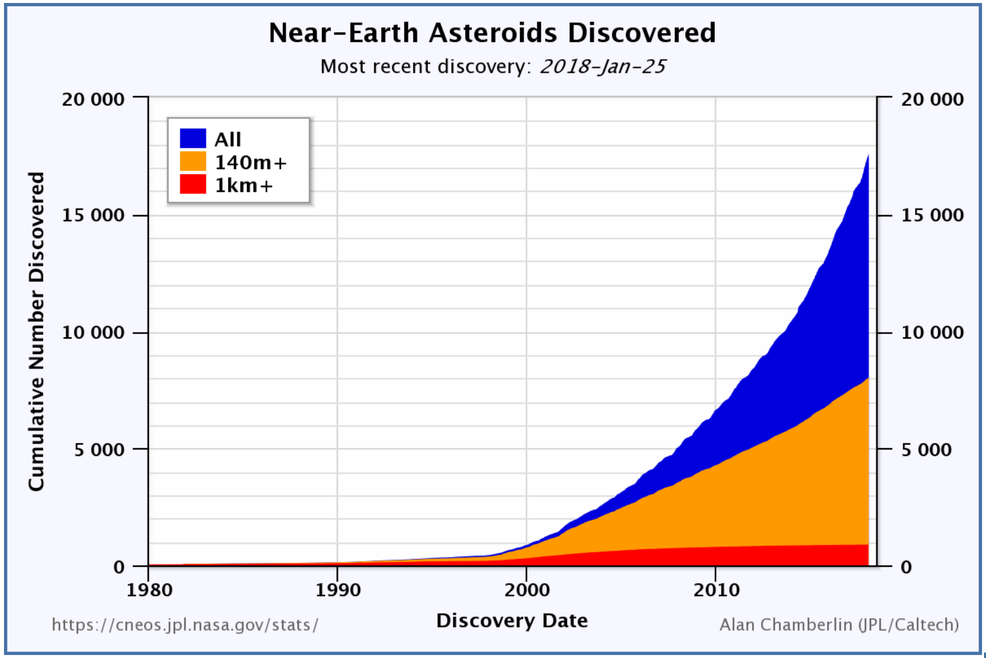


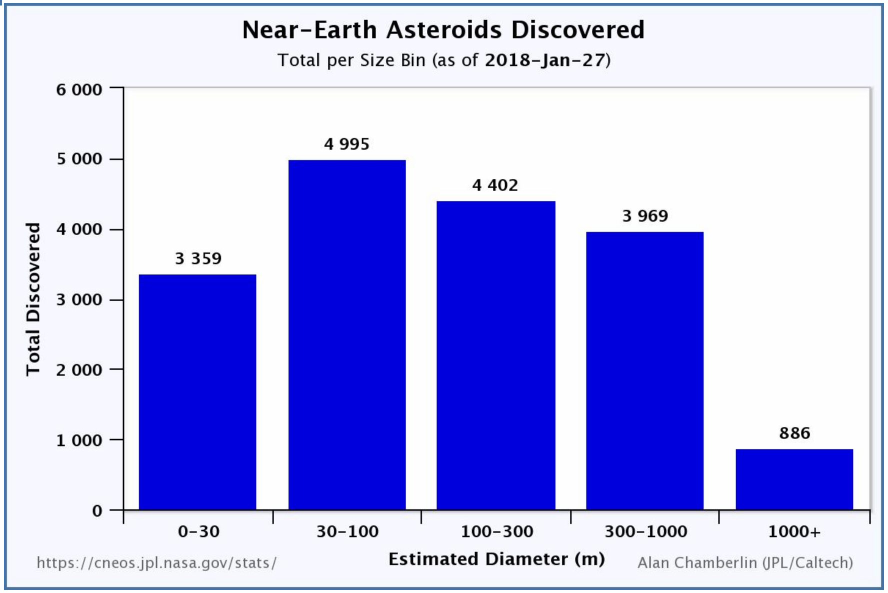
- Slow trend towards more over time, with statistical variations.

Number of Discoveries/Year within 1LD



Context: Total Numbers of NEOs





17611 Total

Guidance of the IAWN Steering Committee

- Look and Usability of the website
- Key Decision of Close Approach Criteria
  - Distance (presently 1LD)
  - No Mag. Limit