RECENT EVOLUTIONS IN ESA's NEO COORDINATION CENTRE SYSTEM

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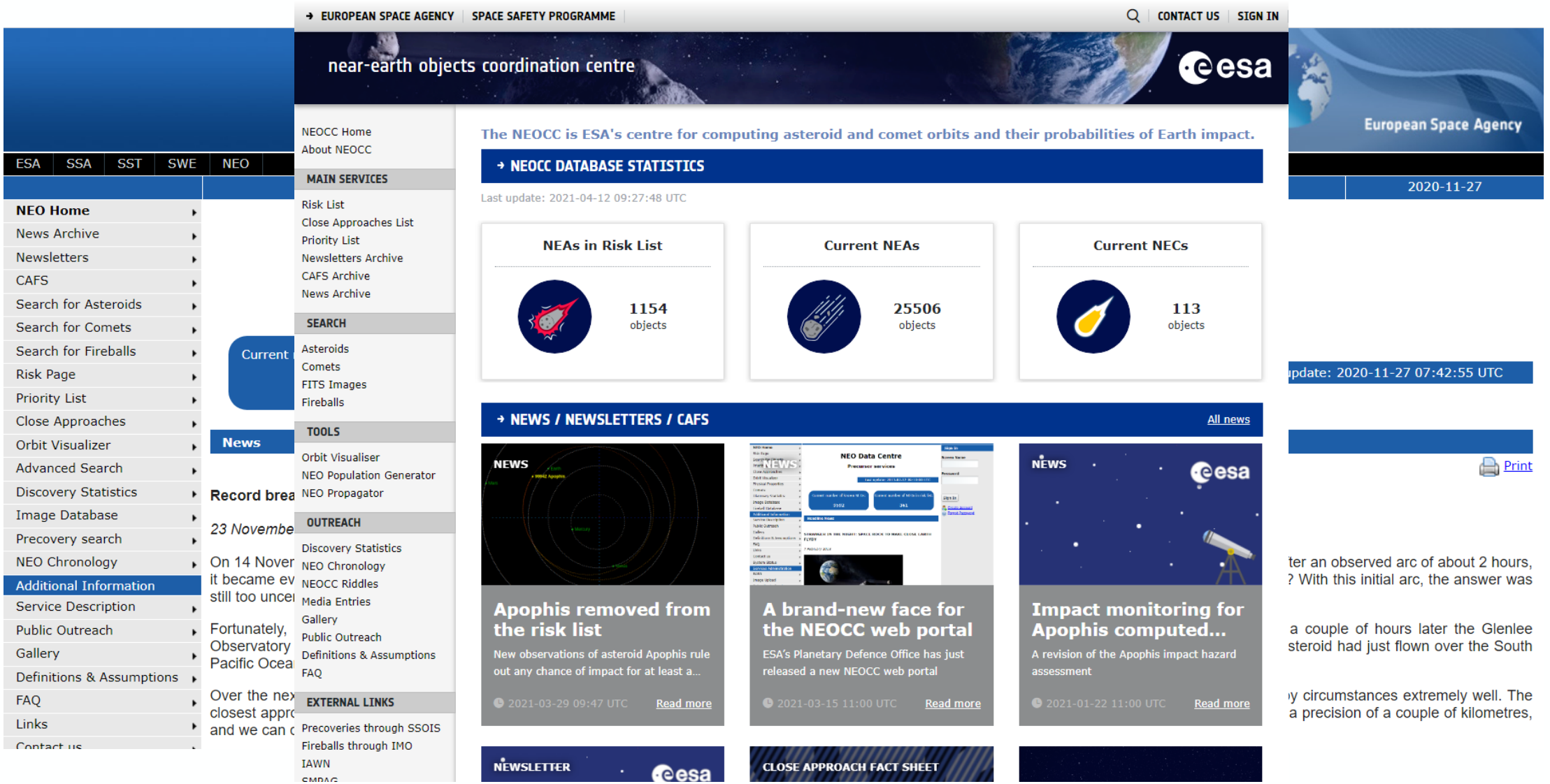
7th IAA Planetary Defense Conference - 30/04/2021

NEW DESIGN OF THE NEOCC WEB PORTAL



NEW DESIGN OF THE NEOCC WEB PORTAL

- Old NEOCC portal has been discontinued in favour of a completely new look
- All our services are continued but presented under a **brand-new image**
- Access protocol changed from http to **https**
- Use of **Liferay Portal 7.1**
- Access to the main services still through a **menu at the left** of the page
- **Search tool** now applicable to the whole portal contents
- Better suitability for use in **mobile devices**
- Find us at: https://neo.ssa.esa.int/

NEW DESIGN OF THE NEOCC WEB PORTAL

→ RISK LIST

Last update: 2021-04-13 06:23 UTC

The Risk List is a catalogue of all objects for which a non
been computed. Each entry contains details on the parti
poses the highest risk of impact (as expressed by the Pa
date, size, velocity and probability. Impact history data c
graphical form. Links to the impactor table, the physical
visualiser are given. In most cases, the size presented ir
indirectly from the absolute magnitude, and flagged with
its uncertainty is large. When a better measurement is a
the maximum Paler

No.	Object Name
1	2010RF12
2	1979XB
3	2000SG344
4	2020OB
5	2008JL3
6	2009JF1

→ CLOSE APPROACHES

Last update: 2021-04-13 05:33 (

Every month dozens of NEAs con
of forthcoming and recent close a
encounter circumstances.
Among the quantities in the table
approach, useful to estimate its c
occurs in daylight, the maximum
geometry is unfavourable for obs
Assumptions page. By default, er
on the table headers.

Object name	Close App Date
2021GC8	2021-0
2021GQ2	2021-0
2020UY1	2021-0
2021GE6	2021-0
2017HG4	2021-0
2021GG2	2021-04-16
2020HE5	2021-04-17
2021GU5	2021-04-17

→ PRIORITY LIST

Last update: 2021-04-12 15:43 UTC

The Priority List addresses the problem of efficiently planning and executing
newly discovered objects into four categories, urgent, necessary, useful and
these bodies can be recovered at other apparitions. The sorting order can b

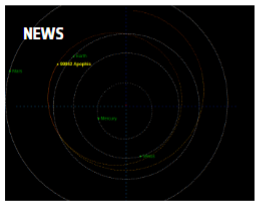
The software running at the NEC
INAF's Spaceguard portal. It was
Boattini et al. (2006), A New Pro

Brightest Mag.

Priority	Object
UR	2012HK
UR	2012HN40
UR	2012LL9
UR	2013FM9
UR	2014FO38
UR	2014TJ33
UR	2014UX34
UR	2014WC7
UR	2014YT14
UR	2016GP220

→ NEWS ARCHIVE

Filter by: Filter



→ 99942 APOPHIS

Last update: 2021-04-13 05:33

Summary

ORBIT

Epoch	
Orbit type	
Perihelion (q)	
Aphelion (Q)	
Eccentricity (e)	
Inclination (i)	
Orbit period (P)	
Earth MOID	

NEXT EART

Date	
Nominal distance (from E center)	
Maximum Brightness	

ORBI

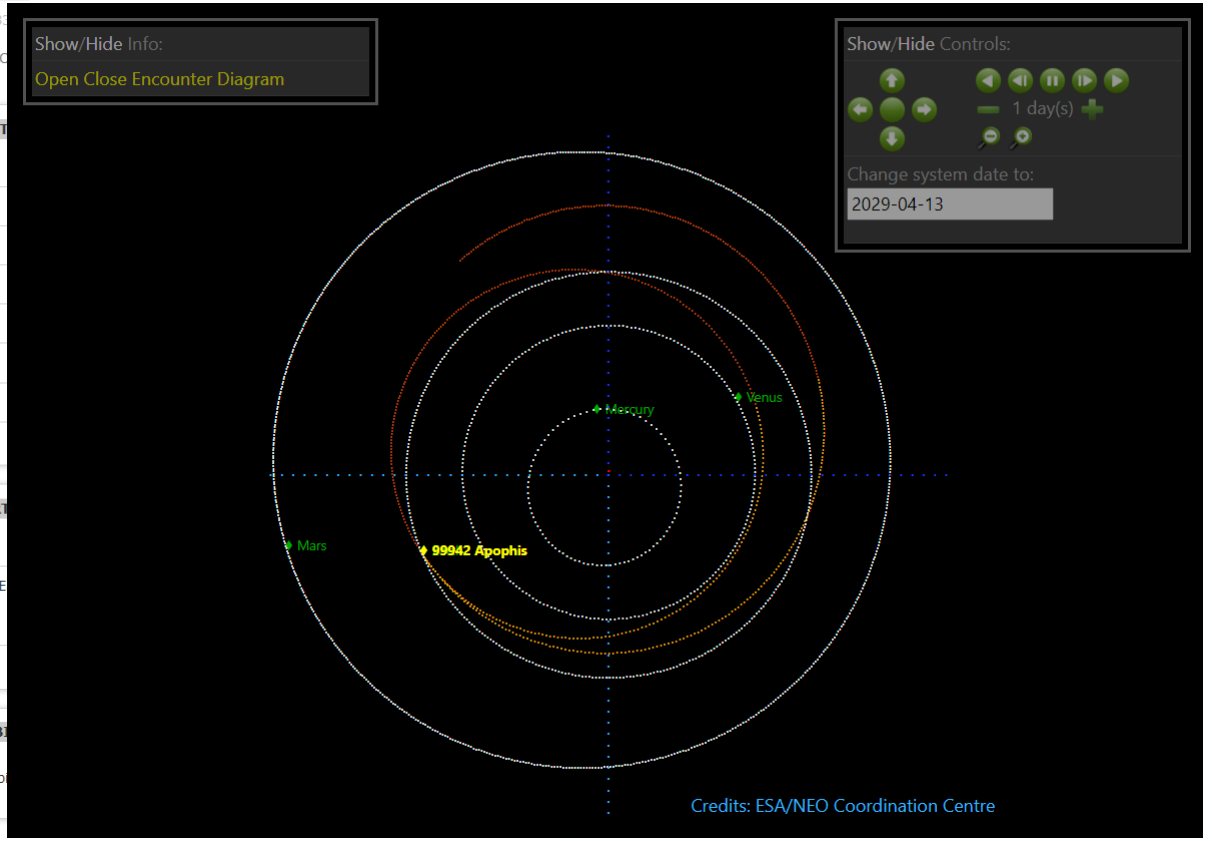
Click the button to start Orbi

→ IMAGE DATABASE

The FITS image archive is hosted by NEO Coordination Centre at ESRIN. It is a searchable catalogue of astronomical images dedicated to small body observation campaigns provided by ESA's telescopes (or telescopes under agreement with the agency), such as the Optical Ground Station or the La Sagra Sky Survey.

All of the available in the archive images have already been analysed to discover or follow-up asteroids, and their astrometric measurements have been submitted to the Minor Planet Center.

Current number of Images in Database:
502050



MIGRATION OF IMPACT MONITORING FROM NEODYS

- The **Impact Monitoring System (IM)** was delivered to NEOCC as migrated from NEODyS in mid-2019 by SpaceDyS
- It propagates the orbits obtained by the ODS and checks for **virtual impactors** in the **next 100 years**
- A **scoring formula** is used to evaluate what NEAs are to be submitted to the full IM computations
- For each object presenting a sufficient score value al **algorithm based on the LOV** is used to identify the possible impact areas within the confidence region
- A **long validation campaign** was carried out until the tool was considered ready to provide releasable results
- The **full risk list was recomputed** after the validation

MIGRATION OF IMPACT MONITORING FROM NEODYS

- The results are provided since November 2020 within the **Risk Page** in the NEOCC web portal:

  https://neo.ssa.esa.int/-/impact-monitoring-information-now-computed-by-neocc

- The tool has recently been used to compute the effects of the **Yarkovsky acceleration** in the trajectory of **Apophis** and its impact solutions:

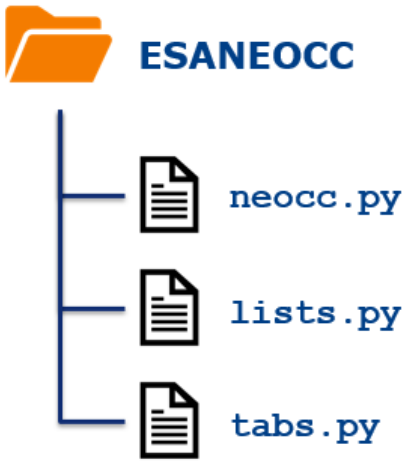
  https://neo.ssa.esa.int/-/impact-monitoring-for-apophis-computed-including-the-yarkovsky-effect

- Also to compute the **non-gravitational accelerations** over more than 100 NEAs
- It has been also recently used to **remove Apophis from the risk list** in the next 100 years:

  https://neo.ssa.esa.int/-/apophis-removed-from-the-risk-list

PYTHON INTERFACE TO THE NEOCC PORTAL DATA

- The goal of the library is to **make easier the access** to the data from the NEOCC
- Developed in Python 3, the library:
  - Requests the required information to the NEOCC portal
  - Data is processed and parsed quickly
  - Obtained data can be shown and accessed easily
- The data structures selected are **data frames**
- The library is currently under **beta-testing**
- Future work: inclusion in **Astroquery**
- If you want to be a beta-tester, just send us an email to: neocc@ssa.esa.int



Upcoming close approaches to Earth

Object name	Close Approach Date	Miss Distance [km]	Miss Distance [au]	Miss Distance [LD]	Diameter [m]	H [mag]	Maximum Brightness [mag]	Relative Velocity [km/s]
2021GS	2021-04-05	249193	0.001666	0.648	6*	28.7	18.1	11.9
2021GP	2021-04-06	1702335	0.011379	4.429	7*	28.5	20.7	4.5
2015MB54	2021-04-06	5200160	0.034761	13.528	60*	23.9	20.2	3.7
2021GL1	2021-04-06	1967473	0.013152	5.118	25*	25.8	18	12.4
2021GB	2021-04-06	3026171	0.020229	7.872	14*	27	19.8	3.9

Upcoming close approaches list from ESA NEOCC portal. Image credits: ESA's NEOCC

	Object Name	Date	Miss Distance in km	Miss Distance in au	Miss Distance in LD	Diameter in m	*=Yes	H	Max Brig
0	2021GS	2021.257420	249193	0.001666	0.648	6	*	28.7	18
1	2021GP	2021.260160	1702335	0.011379	4.429	7	*	28.5	20
2	2015MB54	2021.260160	5200160	0.034761	13.528	60	*	23.9	20
3	2021GL1	2021.260160	1967473	0.013152	5.118	25	*	25.8	18
4	2021GB	2021.260160	3026171	0.020229	7.872	14	*	27.0	19
..	...	...	...	...	...	...	...	...	.
149	2020FW5	2022.240982	3497630	0.023380	9.099	26	*	25.7	19
150	2007FF1	2022.246461	7423188	0.049621	19.311	150	*	21.9	119
151	2016GW221	2022.249201	3736693	0.024978	9.721	40	*	24.8	119
152	2021GN1	2022.249201	5029005	0.033617	13.083	18	*	26.5	19
153	2012TV	2022.257420	7052031	0.047140	18.346	30	*	25.2	121

Upcoming close approaches list from ESANEOCC Python library request.

OTHER ASPECTS AND FUTURE STEPS

- For a **global perspective** on the evolution of the **Planetary Defence Office** at ESA, please follow the presentation by **D. Koschny** in this conference
- **DevOps approach** to system management and evolution is now mature at the NEOCC (please, follow oral presentation by **G. Di Girolamo** in this conference)
- Updates in our **FITS database** are reported in a dedicated conference poster prepared by **R. Rudawska**

- Update of a **fireball information system**
- Release of new **visualisation tools** in the next months
- Inclusion in the close approaches page of the **close approach index** evaluation to be presented by **J.L. Cano** within this conference

SUMMARY

- The NEOCC web portal has a **brand-new face**
- The NEOCC system has fully incorporated in the last period the **Impact Monitoring System**
- A **Python interface** to access the NEOCC portal data is under beta-testing and it will be released in a few months


THANK YOU!