THE SSA-NEO COORDINATION CENTRE

operation, maintenance, enhancement

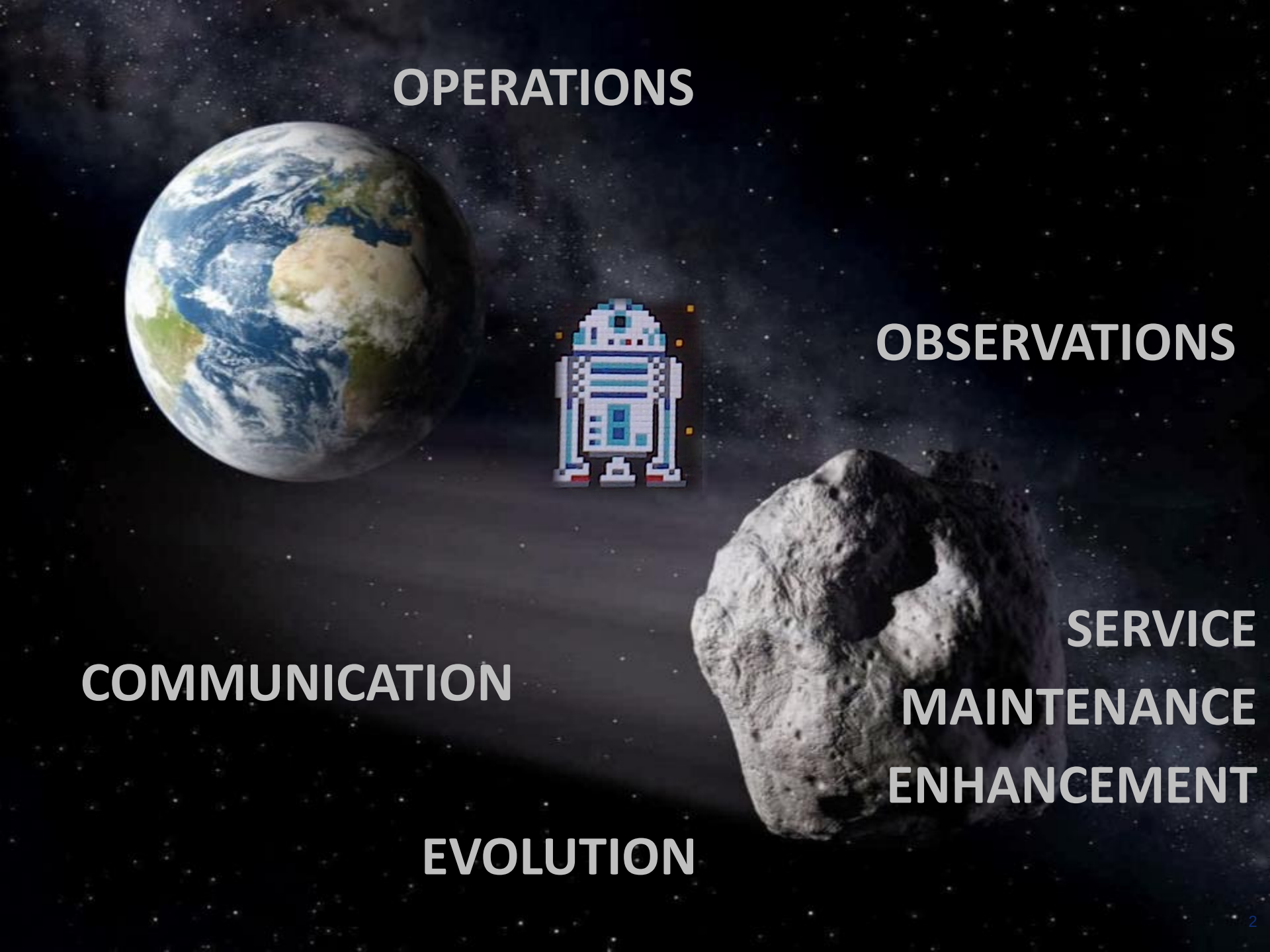
P2-NEO-I

SSA-NEO SEGMENT FINAL PRESENTATIONS DAY

ESRIN 1 FEBRUARY 2016

ETTORE PEROZZI

Deimos Space


OPERATIONS
OBSERVATIONS
SERVICE
MAINTENANCE
ENHANCEMENT
COMMUNICATION
EVOLUTION

timeline

- **2009-10: Enabling Technologies**
  design the NEO Segment
  SBDC, Collaborating Observatories, Wide Survey
- **2011-12: SN-III Precursor Services**
  establish the NEO SW System
  Web Portal, Database, ESRIN offices
- **2013-14: SN-V Precursor Services Operations**
  operate the NEO Coordination Centre
  System maintenance & improvement, Astronomical Observations, on-site operations
- **2014-15: P2-NEO-I Operations, maintenance, enhancement**
  toward nominal NEOCC operations
  System maintenance & improvement, Astronomical Observations, on-site operations
- **2015-16: P2-NEO-IX, P2-COM-V, Operations & maintenance**
  nominal NEOCC operations & system maintenance
  system corrective & evolutionary maintenance, Astronomical Observations, on-site operations

The NEO Team

Ettore Perozzi
Ana Maria Teodorescu
Claudiu Teodorescu
Esther Parrilla-Endrino

Andrea Tesseri
Fiammetta Cerreti
Federica Volpi

Fabrizio Bernardi
Barbara Borgia
Andrea Chessa
Laura Faggioli
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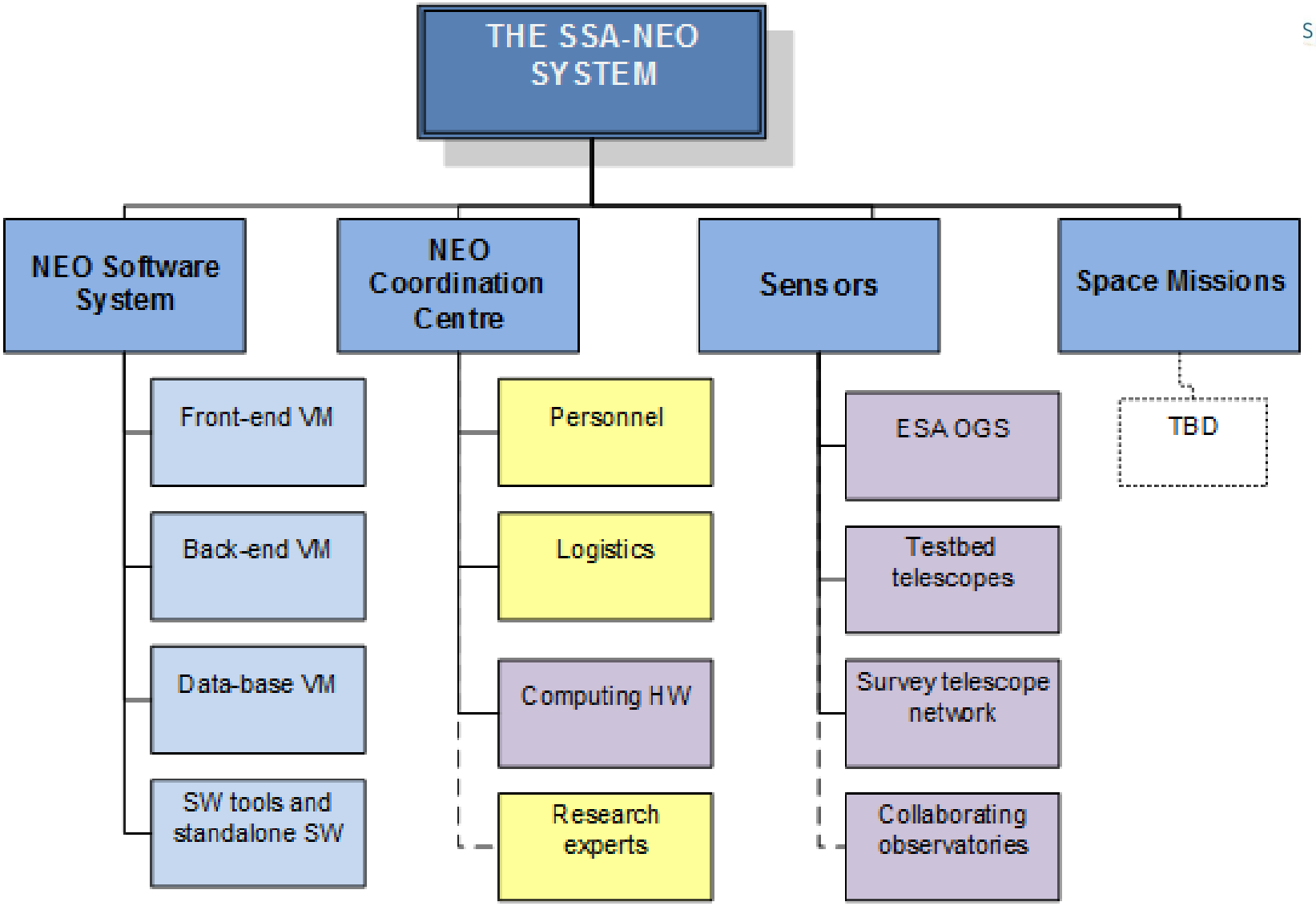
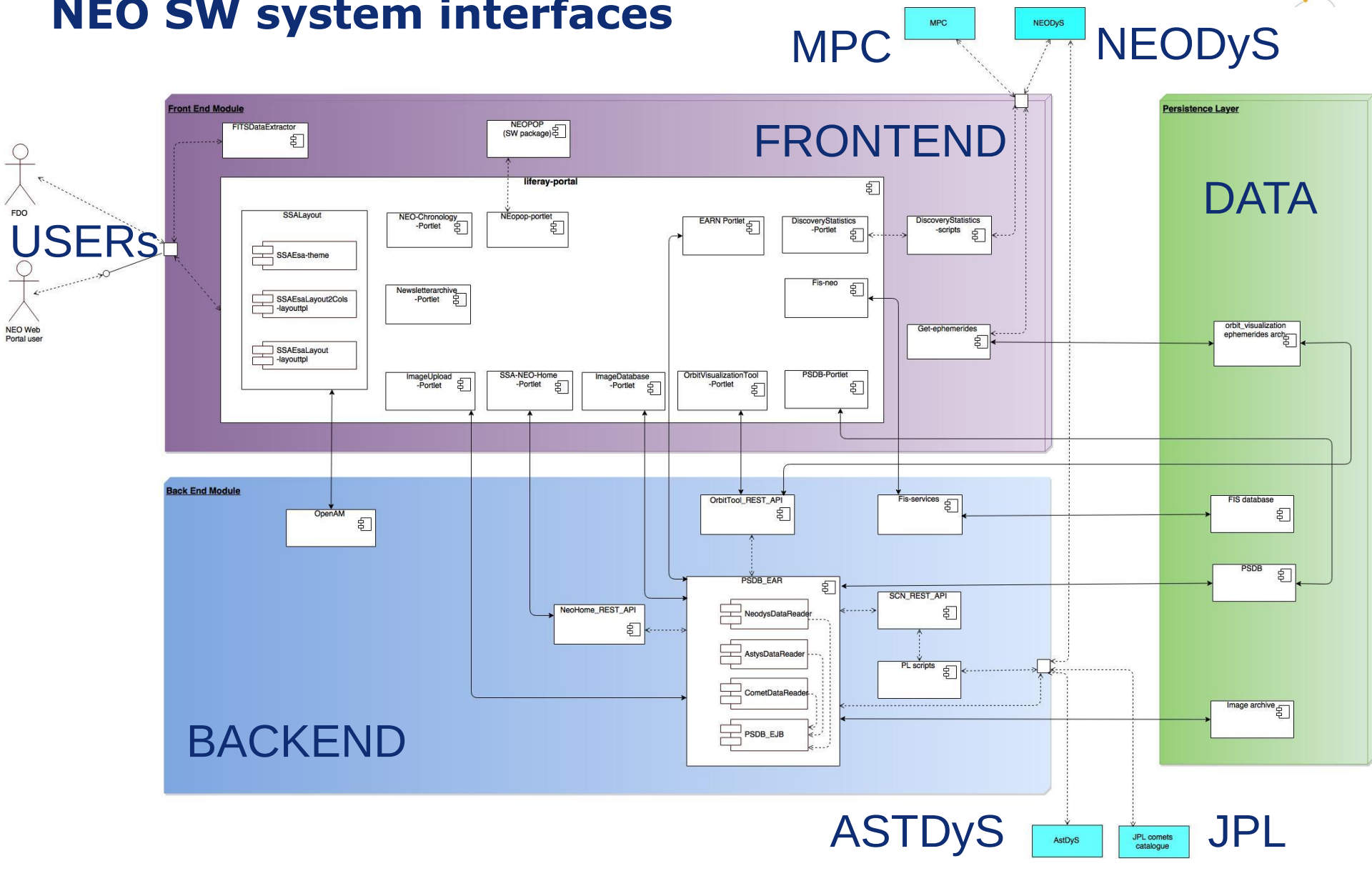
Detlef Koschny
Gerhard Drolshagen
Gian Maria Pinna
Gianpiero Di Girolamo
Arturo Vinue' Visus
Laura Fernandez
Fernando Iglesias

SSA-NEO system consolidation



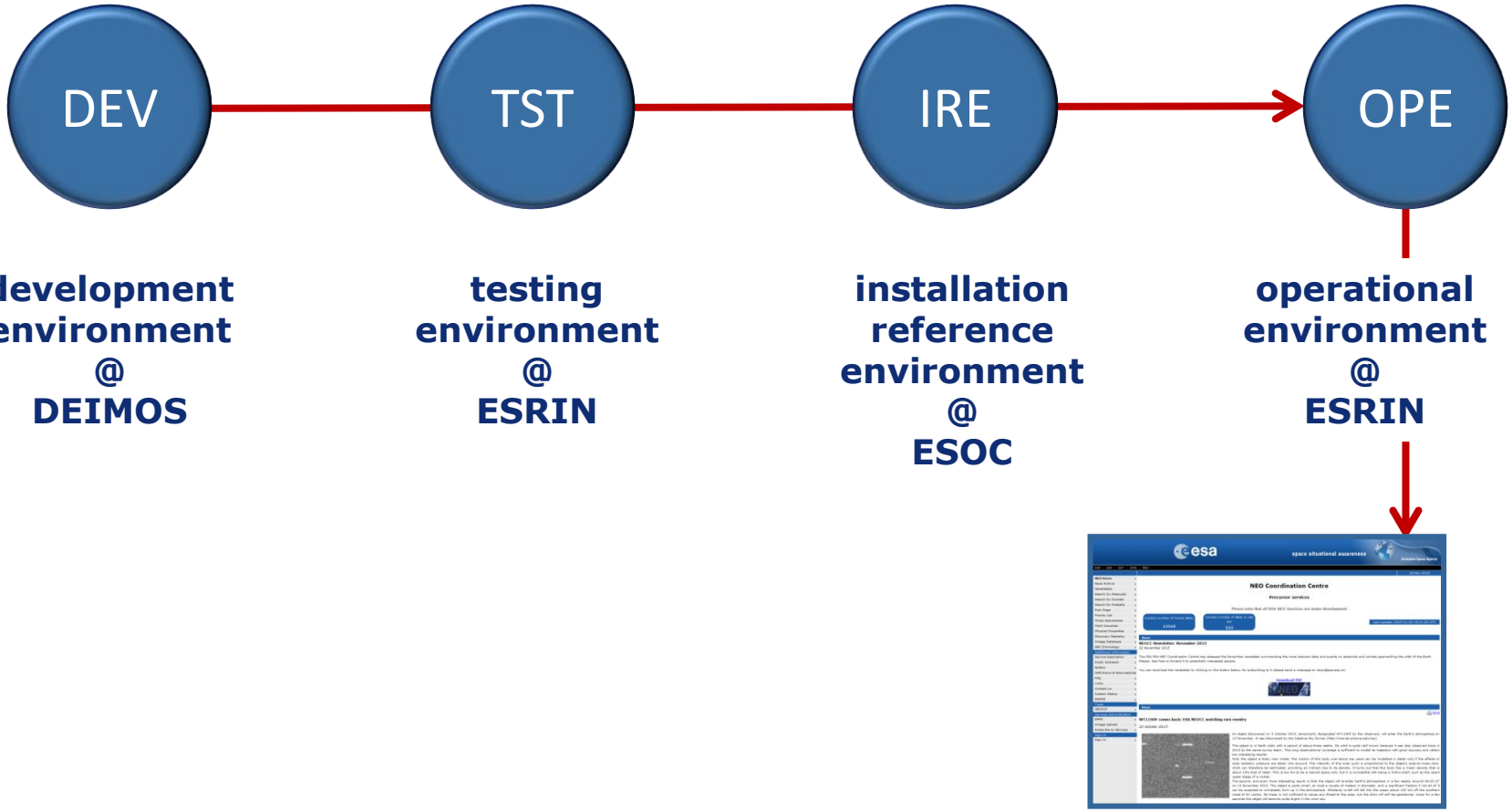
SSA-NEO system consolidation

NEO SW system interfaces



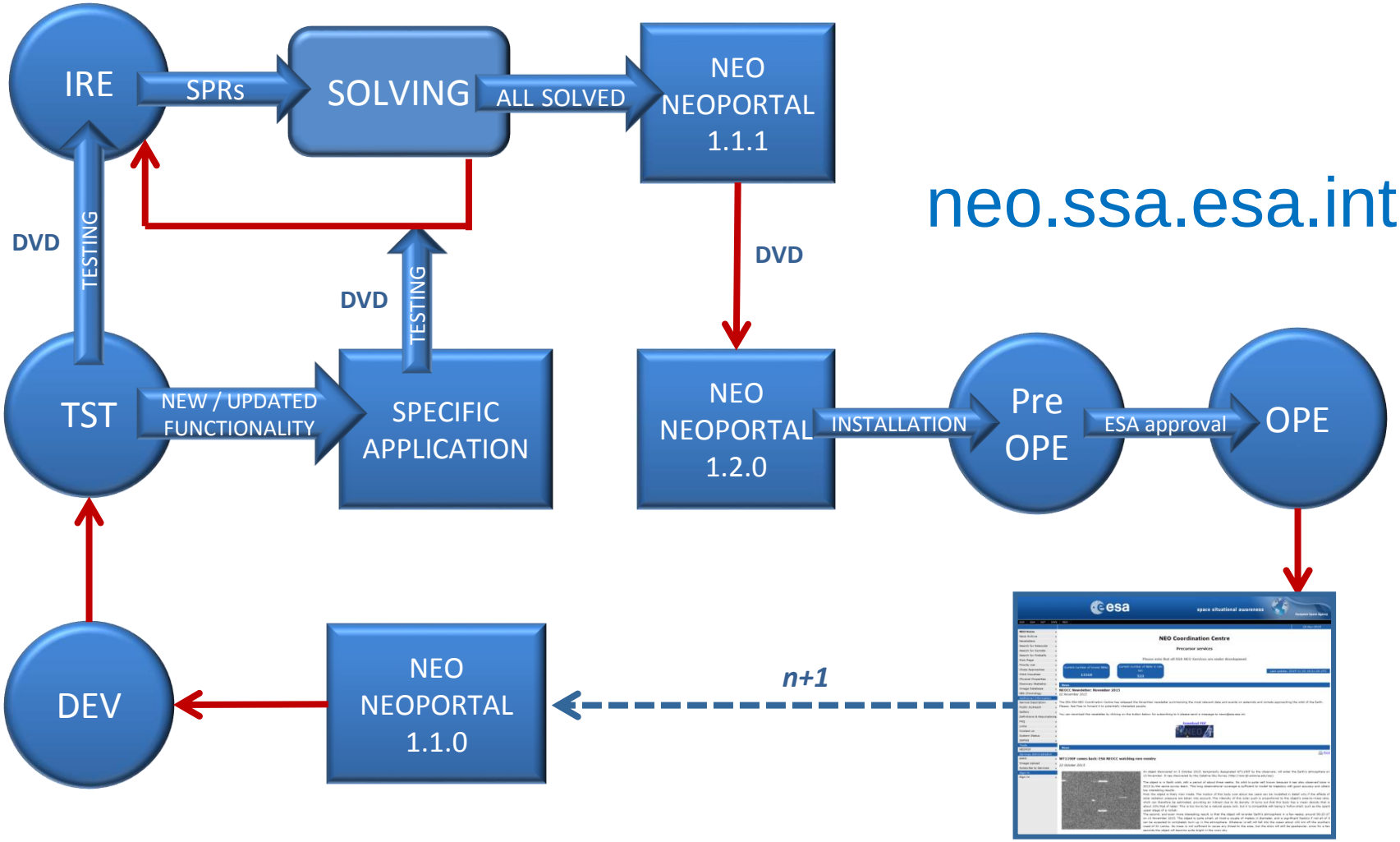
SSA-NEO system consolidation

delivery & installation procedures



NEO system consolidation

delivery & installation procedures



NEO SW system 1.2.0 release

elecnor deimos

serco SpaceDyS

ESA NASA

science engineering

SN-III

SN-V

P2-NEO-I

P2-NEO-II

P2-NEO-VI

P2-NEO-VII

1.0.0

- NEO Home
- Risk Page
- Search for Objects
- Priority List
- Close Approaches
- Orbit Visualizer
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- Discovery Statistics
- Image Database
- Fireball Database
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- Service Description
- Public Outreach
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1.1.0

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- Sign In

1.2.0

- NEO Home
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- SMPAG
- Tools
- NEOPOP
- Services Administration
- EARN
- Image Upload
- Subscribe to Services
- Sign-In
- Sign In

non-grav. pert.
impact corridor
flyby visualization

sky charts
visibility chart
animations

NEODyS migration

NEO SEGMENT OBSERVATIONS

the faintest NEO ever seen @ V~27.1

the faintest NEO precovery @ V=24.5

Final Presentations Day

Observational activities of the NEOCC

Marco Micheli

(marco.micheli@esa.int)

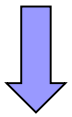
SpaceDyS

European Space Agency

NEO Statistics

~ 13 700 known NEOs
…of which…
~ 510 (4 %) have impact solutions (VIs) in the next century (according to NEODyS and Sentry)

However… of those VIs:
- Only ~2 % have more than one apparition
- ~90 % are lost!

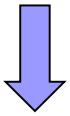


We need to find a way to improve these numbers by:
- Prevent the new ones from being lost
- “Recover” some of the lost ones

How to do it

There are basically three ways to deal with this problem:

- Extend the observed arc at the discovery apparition
- Attempt wide-field recoveries at the next apparition
- Try to locate precovery observations in existing archives



These goals can be achieved using:

- Large aperture telescopes
- Wide-field imagers
- Large repositories of astronomical images

ESA Optical Ground Station (OGS)

A 1.0 meter ESA telescope in Tenerife, Canary Islands

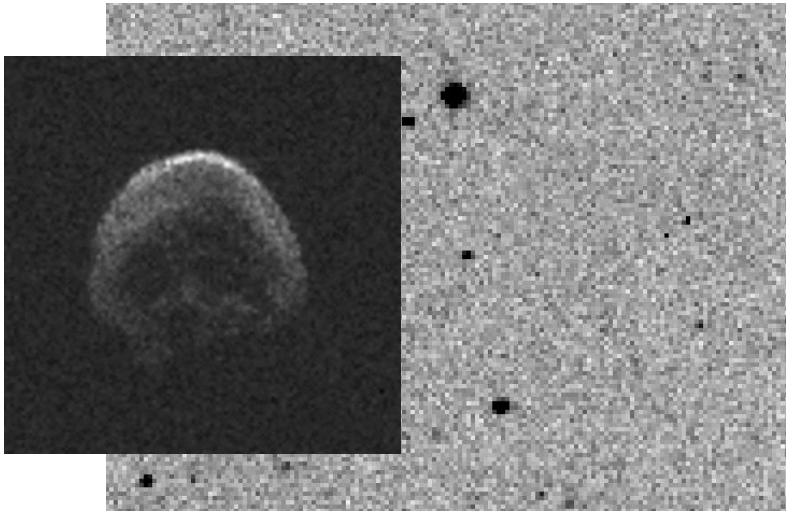
We have 4 to 8 nights per month, around new Moon

➢Follow-up

~20 NEOs observed per run

We can reach V~22

NEO or comet recoveries every month



➢Survey (with Matthias Busch)

Discovered 11 NEOs in 2014-2015

1 current VI discovery: 2014 QN266

2 comets, C/2014 C1 (TOTAS) and C/2015 C1 (TOTAS-Gibbs)

ESO Very Large Telescope (VLT)

Four large 8.2 meter telescopes at Cerro Paranal, Chile

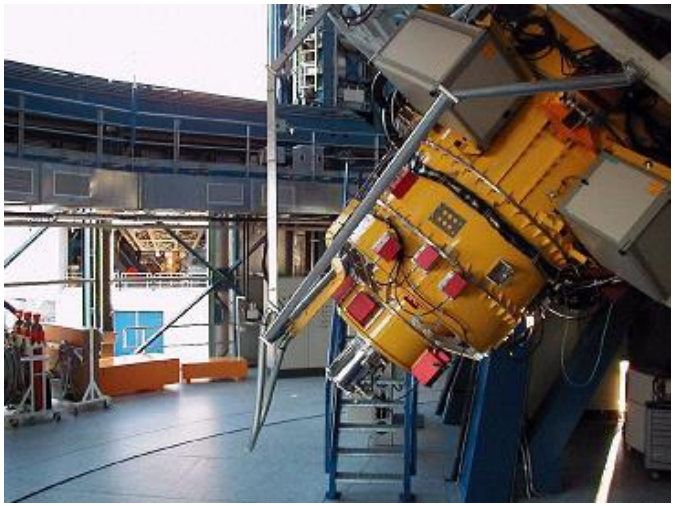
~11 hours per semester in cooperation with ESO

- Follow-up and recovery of VIs

FORS2 camera, 7' FoV

More than 30 VIs observed in 2014-2015

We can reach V>26



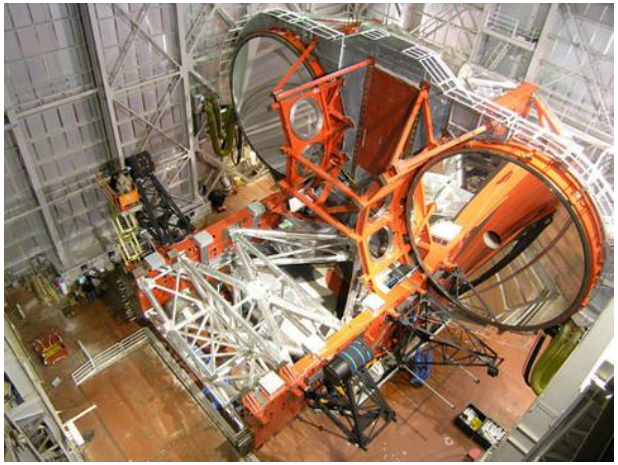
- The faintest NEO ever seen

Observed in September 2015 at V~27.1!

Large Binocular Telescope (LBT)

Two twin co-mounted 8.4 meter telescopes

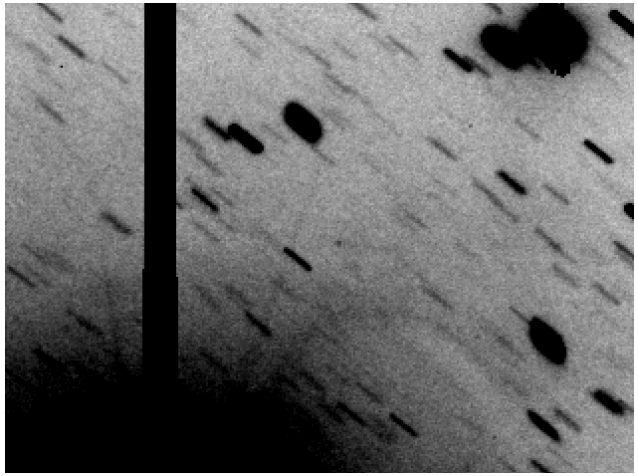
Cooperation with the Italian partnership (INAF, Observatory of Rome) for DDT time



➢Simultaneous imaging

Two wide field cameras, ideal for recoveries

Capable of reaching V~26 on a 27’ field



➢The first NEO with LBT

2014 KC46 recovery in October 2014

V=26, uncertainty spanning the whole field

Collaborations

ESA Service Level Agreements:

- Calar Alto Observatory, Spain
- Kleť Observatory, Czech Republic

Collaborations with existing networks:

- GAIA FUN-SSO
- EURONEAR
- Las Cumbres (LCOGT) Network

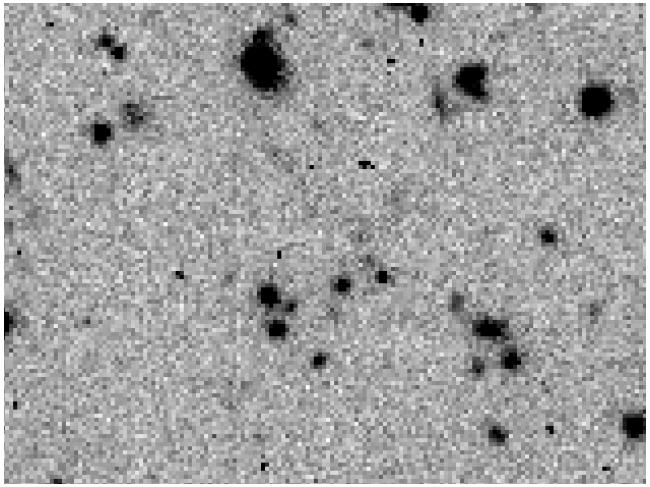
Other observatories:

- Campo Imperatore, Asiago and Loiano, Italy
- Mauna Kea Observatories, Hawaii, USA
- NOAO CTIO Blanco Telescope + DECam, Chile
- OASI Observatory, Brazil
- …and many others

Precoveries

Outside sources:

- Large telescopes (e.g. CFHT, DECam, VST)
- Asteroid surveys (e.g. Pan-STARRS)



- The faintest NEO precovery

2008 CK70, top-10 in the list of VIs

5-day arc, effectively lost

Found in CFHT at V=24.5!

Developing our own archive (integrated with CADC)

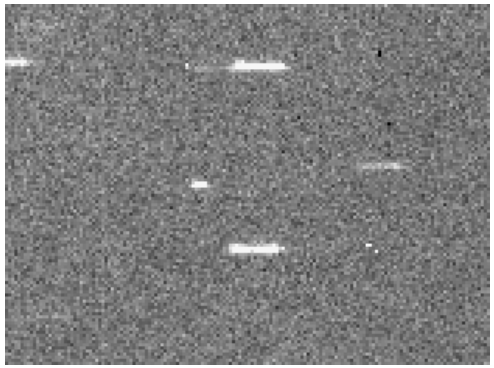
- Images from our observational activities (e.g. OGS)
- Images from collaborating partners

Observation campaigns: WT1190F

A peculiar artificial object as a test for an NEO impact

We alerted our collaborators to obtain:

- Astrometric observations (Mauna Kea, Asiago, Loiano, OASI, DeSS, Lumezzane, Schiaparelli)
- Precoveries (Pan-STARRS archive)
- Colors (Loiano, Asiago)
- Spectroscopy (Successful DDT at VLT)
- Lightcurve observations (Asiago, Loiano, Schiaparelli, Lumezzane)
- Airborne observation campaign (University of Stuttgart)

From…  … to 

At the last Final Presentations Day…

Objects removed from the Risk List

Object	Date	PS0	Telescope	Instrument	People	Archive
2007 UW1	2013-11-28	-3.4	CFHT	MegaCam	M. Micheli, D. J. Tholen	-
2013 XE2	2013-12-10	-4.0	PS1	GPC	M. Micheli, P. Veres, R. J. Wainscoat	PS1
2008 CK70	2013-12-18	-3.1	CFHT	MegaCam	M. Micheli	CADC
2013 BP73	2013-12-20	-3.8	SDSS	SDSS	M. Micheli	CADC
2013 YC	2014-01-22	-2.9	VLT (UT1)	FORS2	M. Micheli, O. R. Hainaut, D. V. Koschny	-
2014 BD33	2014-01-29	-4.2	PS1	GPC	M. Micheli	PS1
2004 BX159	2014-02-18	-4.5	CFHT	MegaCam	M. Micheli	CADC
2014 AF16	2014-03-11	-2.4	VLT (UT1)	FORS2	M. Micheli, O. R. Hainaut, D. V. Koschny	-
2012 HP13	2014-04-09	-6.6	VLT (UT1)	FORS2	M. Micheli, O. R. Hainaut, D. V. Koschny	-
2014 DN112	2014-05-01	-3.6	VLT (UT1)	FORS2	M. Micheli, O. R. Hainaut, D. V. Koschny	-
2014 HM129	2014-05-22	-4.2	VLT (UT1)	FORS2	M. Micheli, O. R. Hainaut, D. V. Koschny	-
2014 HM187	2014-05-28	-4.5	VLT (UT1)	FORS2	M. Micheli, O. R. Hainaut, D. V. Koschny	-
2012 VU76	2014-06-09	-6.1	VLT (UT1)	FORS2	M. Micheli, O. R. Hainaut, D. V. Koschny	-
2013 YD48	2014-06-30	-4.8	VLT (UT1)	FORS2	M. Micheli, O. R. Hainaut, D. V. Koschny	-
2014 LU27	2014-07-17	-2.4	PS1	GPC	M. Micheli	PS1
2014 PB58	2014-08-12	-4.5	PS1	GPC	M. Micheli	PS1
2014 QF392	2014-08-14	-8.0	PS1	GPC	M. Micheli	PS1
2014 QJ392	2014-08-14	-6.1	PS1	GPC	M. Micheli	PS1
2014 RC	2014-09-04	-7.0	PS1	GPC	M. Micheli, R. J. Wainscoat	PS1
2014 KC46	2014-10-30	-4.1	LBT	LBC	M. Micheli, E. Dotto, E. Perozzi et al.	-

…plus almost 30 additional objects observed, with significant changes in their impact probabilities

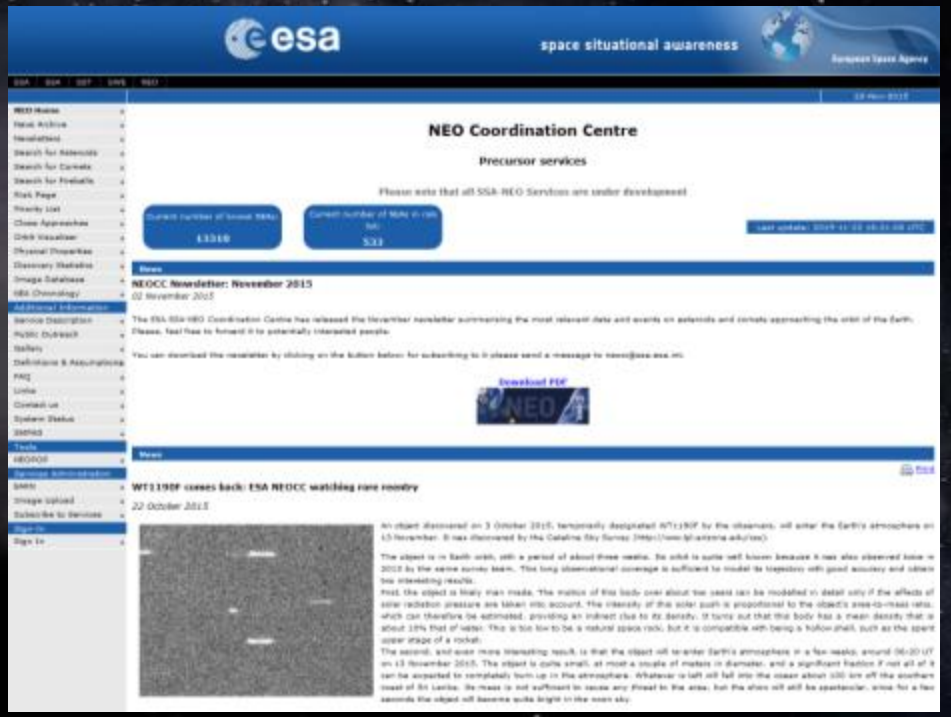
Today!

Objects removed from the Risk List

Object	Date	PS0	Telescope	Instrument	People	Archive
2007 UW1	2013-11-28	-3.4	CFHT	MegaCam	M. Micheli, D. J. Tholen	-
2013 XE2	2013-12-10	-4.0	PS1	GPC	M. Micheli, P. Veres, R. J. Wainscoat	PS1
2008 CK70	2013-12-18	-3.1	CFHT	MegaCam	M. Micheli	CADC
2013 BP73	2013-12-20	-3.8	SDSS	SDSS	M. Micheli	CADC
2013 YC	2014-01-22	-2.9	VLT (UT1)	FORS2	M. Micheli, O. R. Hainaut, D. V. Koschny	-
2014 BD33	2014-01-29	-4.2	PS1	GPC	M. Micheli	PS1
2004 BX159	2014-02-18	-4.5	CFHT	MegaCam	M. Micheli	CADC
2014 AF16	2014-03-11	-2.4	VLT (UT1)	FORS2	M. Micheli, O. R. Hainaut, D. V. Koschny	-
2012 HP13	2014-04-09	-6.6	VLT (UT1)	FORS2	M. Micheli, O. R. Hainaut, D. V. Koschny	-
2014 DN112	2014-05-01	-3.6	VLT (UT1)	FORS2	M. Micheli, O. R. Hainaut, D. V. Koschny	-
2014 HM129	2014-05-22	-4.2	VLT (UT1)	FORS2	M. Micheli, O. R. Hainaut, D. V. Koschny	-
2014 HM187	2014-05-28	-4.5	VLT (UT1)	FORS2	M. Micheli, O. R. Hainaut, D. V. Koschny	-
2012 VU76	2014-06-09	-6.1	VLT (UT1)	FORS2	M. Micheli, O. R. Hainaut, D. V. Koschny	-
2013 YD48	2014-06-30	-4.8	VLT (UT1)	FORS2	M. Micheli, O. R. Hainaut, D. V. Koschny	-
2014 LU27	2014-07-17	-2.4	PS1	GPC	M. Micheli	PS1
2014 PB58	2014-08-12	-4.5	PS1	GPC	M. Micheli	PS1
2014 QF392	2014-08-14	-8.0	PS1	GPC	M. Micheli	PS1
2014 QJ392	2014-08-14	-6.1	PS1	GPC	M. Micheli	PS1
2014 RC	2014-09-04	-7.0	PS1	GPC	M. Micheli, R. J. Wainscoat	PS1
2014 KC46	2014-10-30	-4.1	LBT	LBC	M. Micheli, E. Dotto, E. Perozzi et al.	-
2014 WV363	2014-12-01	-3.4	PS1	GPC	M. Micheli	PS1
2014 XL7	2015-01-15	-3.0	VLT (UT1)	FORS2	M. Micheli, O. R. Hainaut, D. V. Koschny	-
2003 LN6	2015-01-23	-5.2	VLT (UT1)	FORS2	M. Micheli, O. R. Hainaut, D. V. Koschny	-
2015 BU92	2015-01-27	-2.9	LCOGT FTN	Spectral	M. Micheli, J. D. Armstrong	-
2014 XM7	2015-02-09	-6.5	PS1	GPC	M. Micheli	PS1
2015 DA54	2015-02-26	-5.4	PS1	GPC	M. Micheli	PS1
2015 DF198	2015-02-26	-5.4	PS1	GPC	M. Micheli	PS1
2014 NG65	2015-03-25	-4.5	PS1	GPC	M. Micheli	PS1
2014 WP362	2015-04-10	-4.8	VLT (UT1)	FORS2	M. Micheli, O. R. Hainaut, D. V. Koschny	-
2008 LG2	2015-06-16	-5.8	VLT (UT1)	FORS2	M. Micheli, O. R. Hainaut, D. V. Koschny	-
2015 KL157	2015-07-13	-3.9	OGS	SDC	M. Micheli, D. Abreu, et al.	
2015 OL35	2015-08-02	-3.9	PS1	GPC	M. Micheli	PS1
2015 PR228	2015-08-18	-3.6	PS1	GPC	M. Micheli, B. Borgia	PS1
2015 PK57	2015-08-18	-9.7	PS1	GPC	M. Micheli	PS1
2000 UK11	2015-08-26	-5.6	VLT (UT1)	FORS2	M. Micheli, O. R. Hainaut, D. V. Koschny	-
2015 RA36	2015-09-14	-4.5	OASI	-	M. Micheli, D. Lazzaro, J. S. Silva, F. Monteiro, et al.	-
2011 SE191	2015-12-14	-8.5	PS1	GPC	M. Micheli, A. Chessa	PS1
2011 HP4	2015-12-14	-7.6	PS1	GPC	M. Micheli, A. Chessa	PS1
2006 XP4	2015-12-14	-7.3	VLT (UT1)	FORS2	M. Micheli, O. R. Hainaut, D. V. Koschny	-

…plus almost 100 additional objects observed, with significant changes in their impact probabilities

NEO SW SYSTEM SERVICES



Final Presentation Day 2016-02-02

SSA –NEO Software System

Marco Micheli, Laura Faggioli

(marco.micheli@esa.int)

SpaceDyS

European Space Agency

In the SSA-NEO software system

- Core Services
- Database
- Information

Data Sources

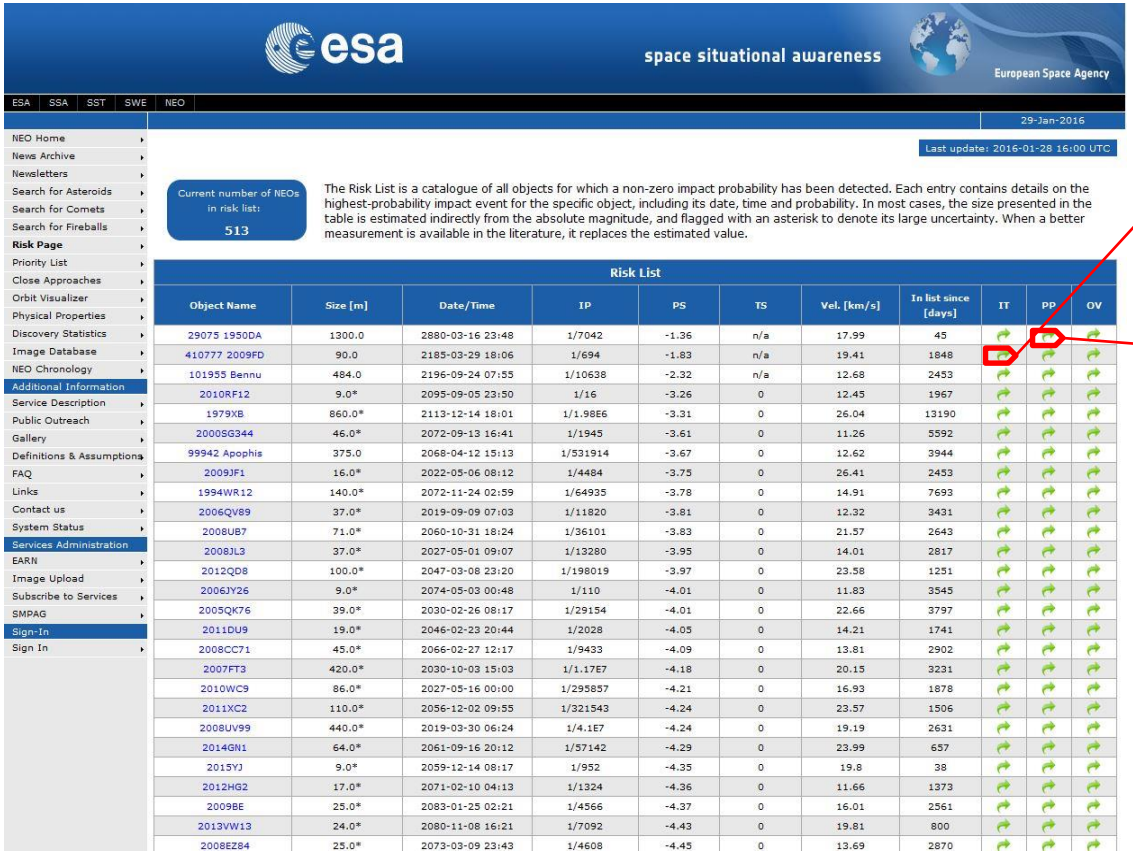
External

- NEODyS: to be migrated
  - Risk List
  - Ephemerides
  - Orbit Properties
- AstDyS
  - Orbit properties (MB)
- JPL
  - Comets catalogue
- MPC
  - Discovery Statistics

Internal: already migrated

- EARN
  - Physical Properties
- Spaceguard Central Node
  - Priority List

The Risk Page contains a continuously updated list of all NEAs for which a non-zero impact probability has been detected.

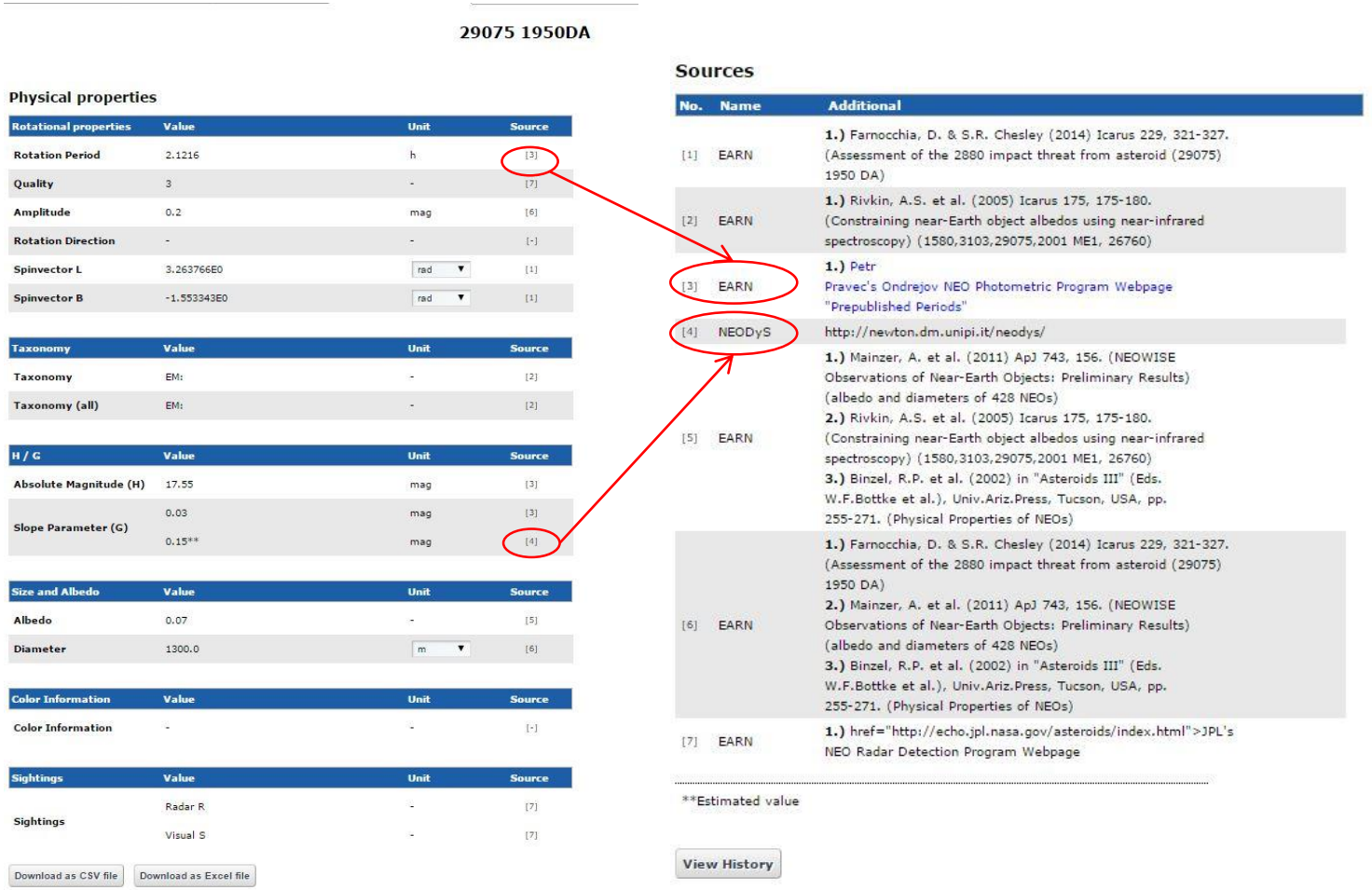


Object Name	Size [m]	Date/Time	IP	PS	TS	Vel. [km/s]	In list since [days]	IT	PP	OV
29075 1950DA	1300.0	2880-03-16 23:48	1/7042	-1.36	n/a	17.99	45			
410777 2009FD	90.0	2185-03-29 18:06	1/694	-1.83	n/a	19.41	1848			
101955 Bennu	484.0	2196-09-24 07:55	1/10638	-2.32	n/a	12.68	2453			
2010RF12	9.0*	2095-09-05 23:50	1/16	-3.26	0	12.45	1967			
1979XB	860.0*	2113-12-14 18:01	1/1.98E6	-3.31	0	26.04	13190			
2000SG344	46.0*	2072-09-13 16:41	1/1945	-3.61	0	11.26	5592			
99942 Apophis	375.0	2068-04-12 15:13	1/531914	-3.67	0	12.62	3944			
2009JF1	16.0*	2022-05-06 08:12	1/4484	-3.75	0	26.41	2453			
1994WR12	140.0*	2072-11-24 02:59	1/64935	-3.78	0	14.91	7693			
2006QV89	37.0*	2019-09-09 07:03	1/11820	-3.81	0	12.32	3431			
2008UB7	71.0*	2060-10-31 18:24	1/36101	-3.83	0	21.57	2643			
2008JL3	37.0*	2027-05-01 09:07	1/13280	-3.95	0	14.01	2817			
2012QD8	100.0*	2047-03-08 23:20	1/198019	-3.97	0	23.58	1251			
2006JY26	9.0*	2074-05-03 00:48	1/110	-4.01	0	11.83	3545			
2005QK76	39.0*	2030-02-26 08:17	1/29154	-4.01	0	22.66	3797			
2011DU9	19.0*	2046-02-23 20:44	1/2028	-4.05	0	14.21	1741			
2008CC71	45.0*	2066-02-27 12:17	1/9433	-4.09	0	13.81	2902			
2007FT3	420.0*	2030-10-03 15:03	1/1.17E7	-4.18	0	20.15	3231			
2010WC9	86.0*	2027-05-16 00:00	1/295857	-4.21	0	16.93	1878			
2011XC2	110.0*	2056-12-02 09:55	1/321543	-4.24	0	23.57	1506			
2008UV99	440.0*	2019-03-30 06:24	1/4.1E7	-4.24	0	19.19	2631			
2014GN1	64.0*	2061-09-16 20:12	1/57142	-4.29	0	23.99	657			
2015YJ	9.0*	2059-12-14 08:17	1/952	-4.35	0	19.8	38			
2012HG2	17.0*	2071-02-10 04:13	1/1324	-4.36	0	11.66	1373			
2009BE	25.0*	2083-01-25 02:21	1/4566	-4.37	0	16.01	2561			
2013VW13	24.0*	2080-11-08 16:21	1/7092	-4.43	0	19.81	800			
2008EZ84	25.0*	2073-03-09 23:43	1/4608	-4.45	0	13.69	2870			

Link to NEODyS impact table

Physical Properties

The Physical Properties Page contains the latest available physical data. The source of each value is referenced at the bottom of the page.



29075 1950DA

Physical properties

Rotational properties	Value	Unit	Source
Rotation Period	2.1216	h	[3]
Quality	3	-	[7]
Amplitude	0.2	mag	[6]
Rotation Direction	-	-	[-]
Spinvector L	3.263766E0	rad	[1]
Spinvector B	-1.553343E0	rad	[1]

Taxonomy	Value	Unit	Source
Taxonomy	EM:	-	[2]
Taxonomy (all)	EM:	-	[2]

H / G	Value	Unit	Source
Absolute Magnitude (H)	17.55	mag	[3]
Slope Parameter (G)	0.03	mag	[3]
	0.15**	mag	[4]

Size and Albedo	Value	Unit	Source
Albedo	0.07	-	[5]
Diameter	1300.0	m	[6]

Color Information	Value	Unit	Source
Color Information	-	-	[-]

Sightings	Value	Unit	Source
Sightings	Radar R	-	[7]
	Visual S	-	[7]

Download as CSV file | Download as Excel file

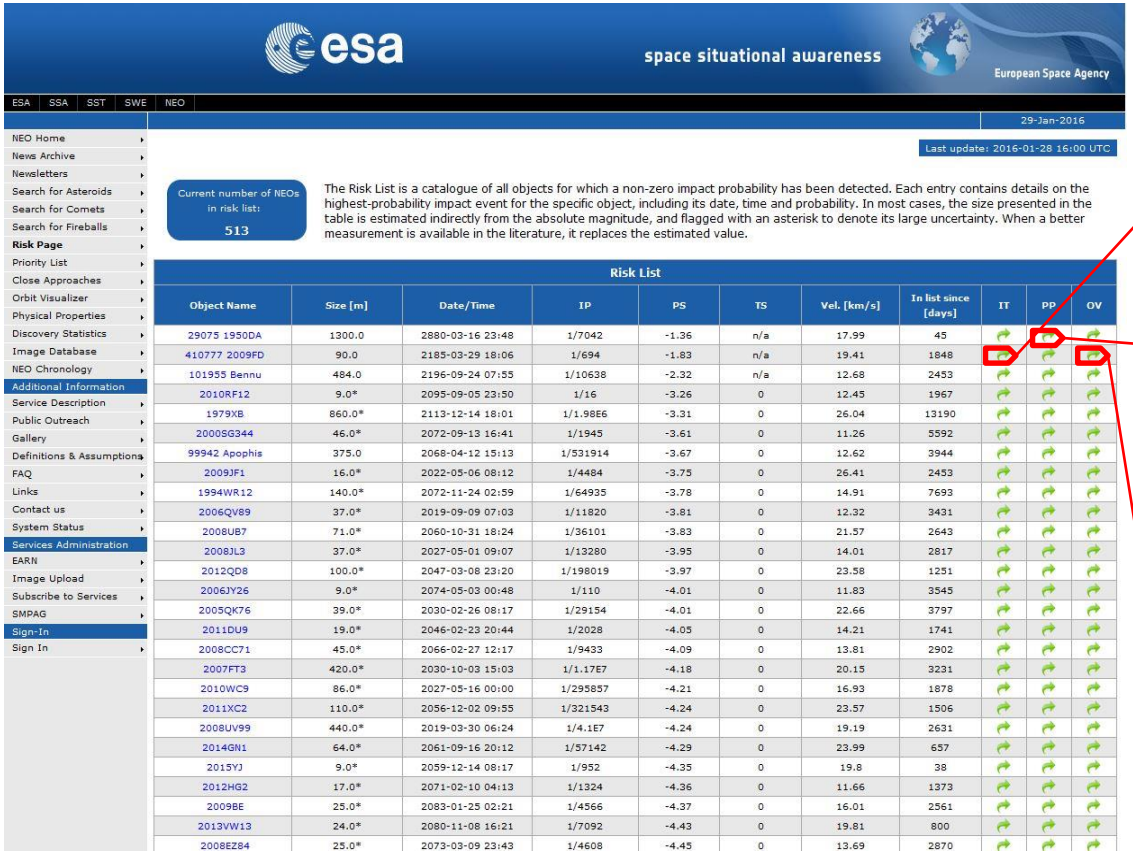
Sources

No.	Name	Additional
[1]	EARN	**1.)** Farnocchia, D. & S.R. Chesley (2014) Icarus 229, 321-327. (Assessment of the 2880 impact threat from asteroid (29075) 1950 DA)
[2]	EARN	**1.)** Rivkin, A.S. et al. (2005) Icarus 175, 175-180. (Constraining near-Earth object albedos using near-infrared spectroscopy) (1580,3103,29075,2001 ME1, 26760)
[3]	EARN	**1.)** Petr Pravec's Ondrejov NEO Photometric Program Webpage "Prepublished Periods"
[4]	NEODyS	http://newton.dm.unipi.it/neodys/
[5]	EARN	**1.)** Mainzer, A. et al. (2011) ApJ 743, 156. (NEOWISE Observations of Near-Earth Objects: Preliminary Results) (albedo and diameters of 428 NEOs) **2.)** Rivkin, A.S. et al. (2005) Icarus 175, 175-180. (Constraining near-Earth object albedos using near-infrared spectroscopy) (1580,3103,29075,2001 ME1, 26760) **3.)** Binzel, R.P. et al. (2002) in "Asteroids III" (Eds. W.F.Bottke et al.), Univ.Ariz.Press, Tucson, USA, pp. 255-271. (Physical Properties of NEOs)
[6]	EARN	**1.)** Farnocchia, D. & S.R. Chesley (2014) Icarus 229, 321-327. (Assessment of the 2880 impact threat from asteroid (29075) 1950 DA) **2.)** Mainzer, A. et al. (2011) ApJ 743, 156. (NEOWISE Observations of Near-Earth Objects: Preliminary Results) (albedo and diameters of 428 NEOs) **3.)** Binzel, R.P. et al. (2002) in "Asteroids III" (Eds. W.F.Bottke et al.), Univ.Ariz.Press, Tucson, USA, pp. 255-271. (Physical Properties of NEOs)
[7]	EARN	**1.)** href="http://echo.jpl.nasa.gov/asteroids/index.html">JPL's NEO Radar Detection Program Webpage

**Estimated value

View History

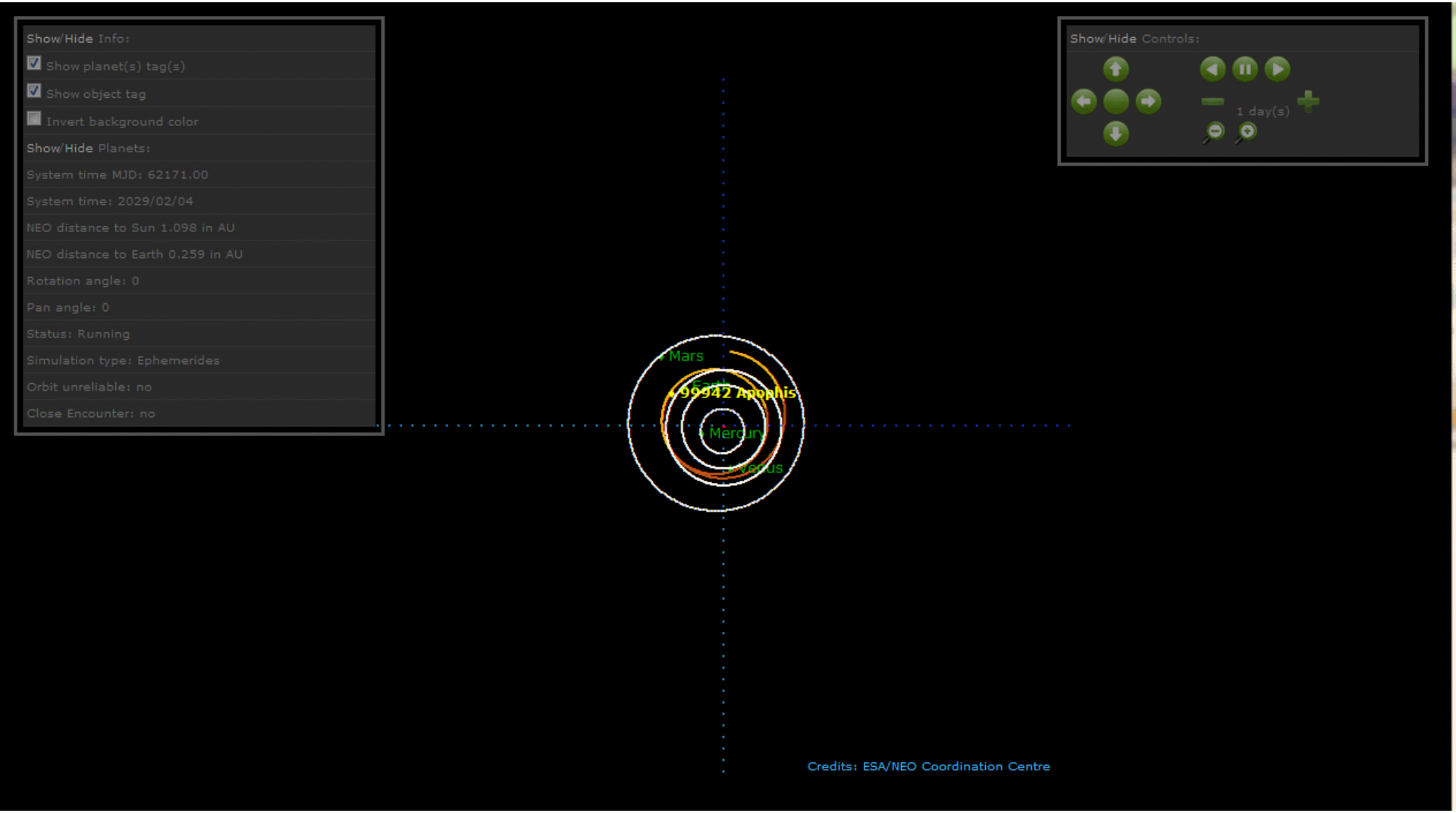
The Risk Page contains a continuously updated list of all NEAs for which a non-zero impact probability has been detected.

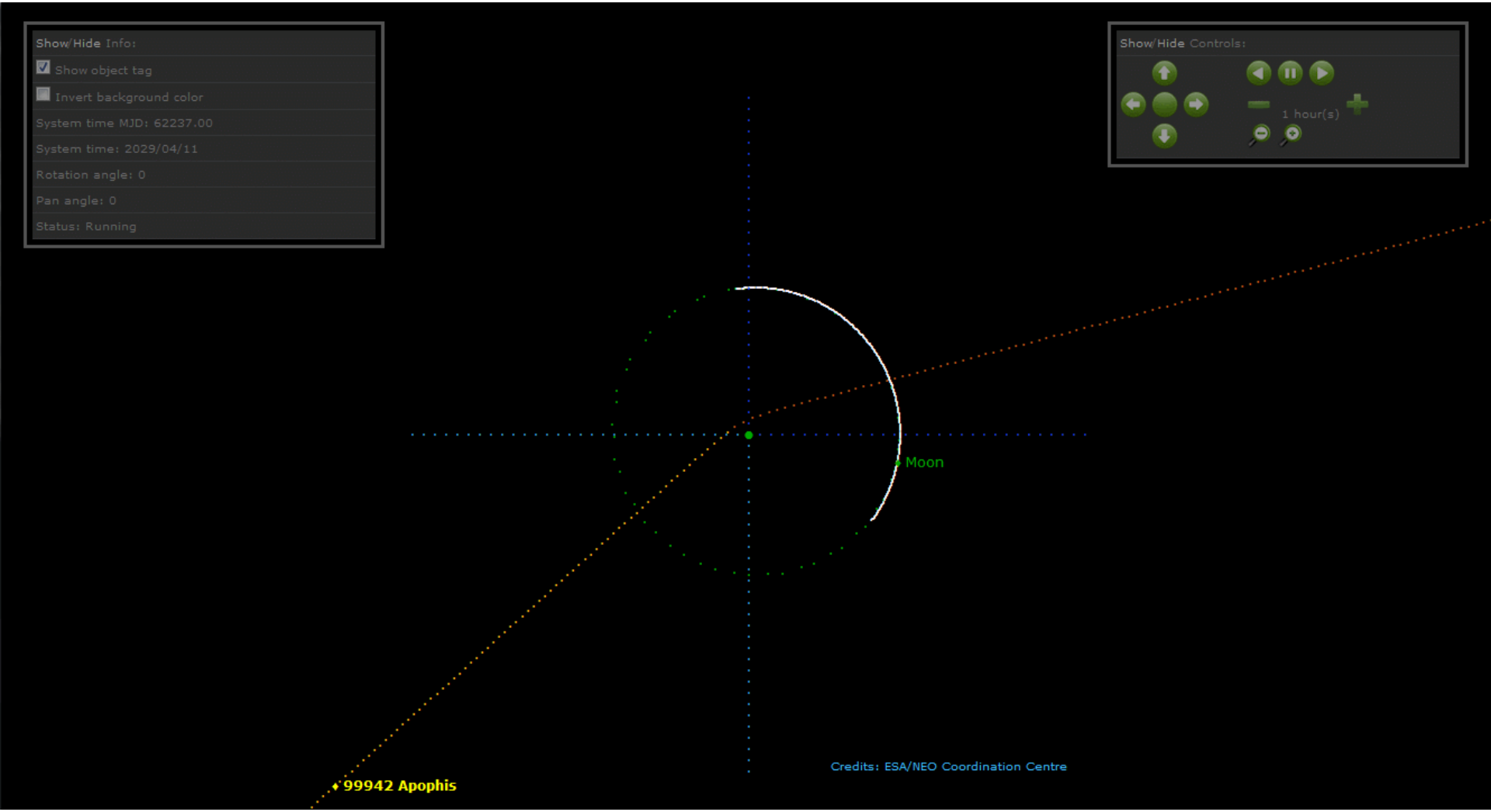


Link to NEODyS impact table

Physical Properties

Orbit Visualizer


Show/Hide Info:
Show planet(s) tag(s)
Show object tag
Invert background color
Show/Hide Planets:
System time MJD: 62171.00
System time: 2029/02/04
NEO distance to Sun 1.098 in AU
NEO distance to Earth 0.259 in AU
Rotation angle: 0
Pan angle: 0
Status: Running
Simulation type: Ephemerides
Orbit unreliable: no
Close Encounter: no
Show/Hide Controls:
1 day(s)
Mars
99942 Apophis
Mercury
Venus
Credits: ESA/NEO Coordination Centre


Show/Hide Info:
Show object tag
Invert background color
System time MJD: 62237.00
System time: 2029/04/11
Rotation angle: 0
Pan angle: 0
Status: Running
Show/Hide Controls:
1 hour(s)
Moon
99942 Apophis
Credits: ESA/NEO Coordination Centre

The Close Approaches Page displays two tables with information about recent and upcoming close approaches of asteroids to the Earth.

Next 12 months

Past 1 month

esa space situational awareness European Space Agency

ESA | SSA | SST | SWE | NEO

- NEO Home
- News Archive
- Newsletters
- Search for Asteroids
- Search for Comets
- Search for Fireballs
- Risk Page
- Priority List
- **Close Approaches**
- Orbit Visualizer
- Physical Properties
- Discovery Statistics
- Image Database
- NEO Chronology

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Every month dozen
encounter circumst

Among the quantiti
when the encounte
description see the

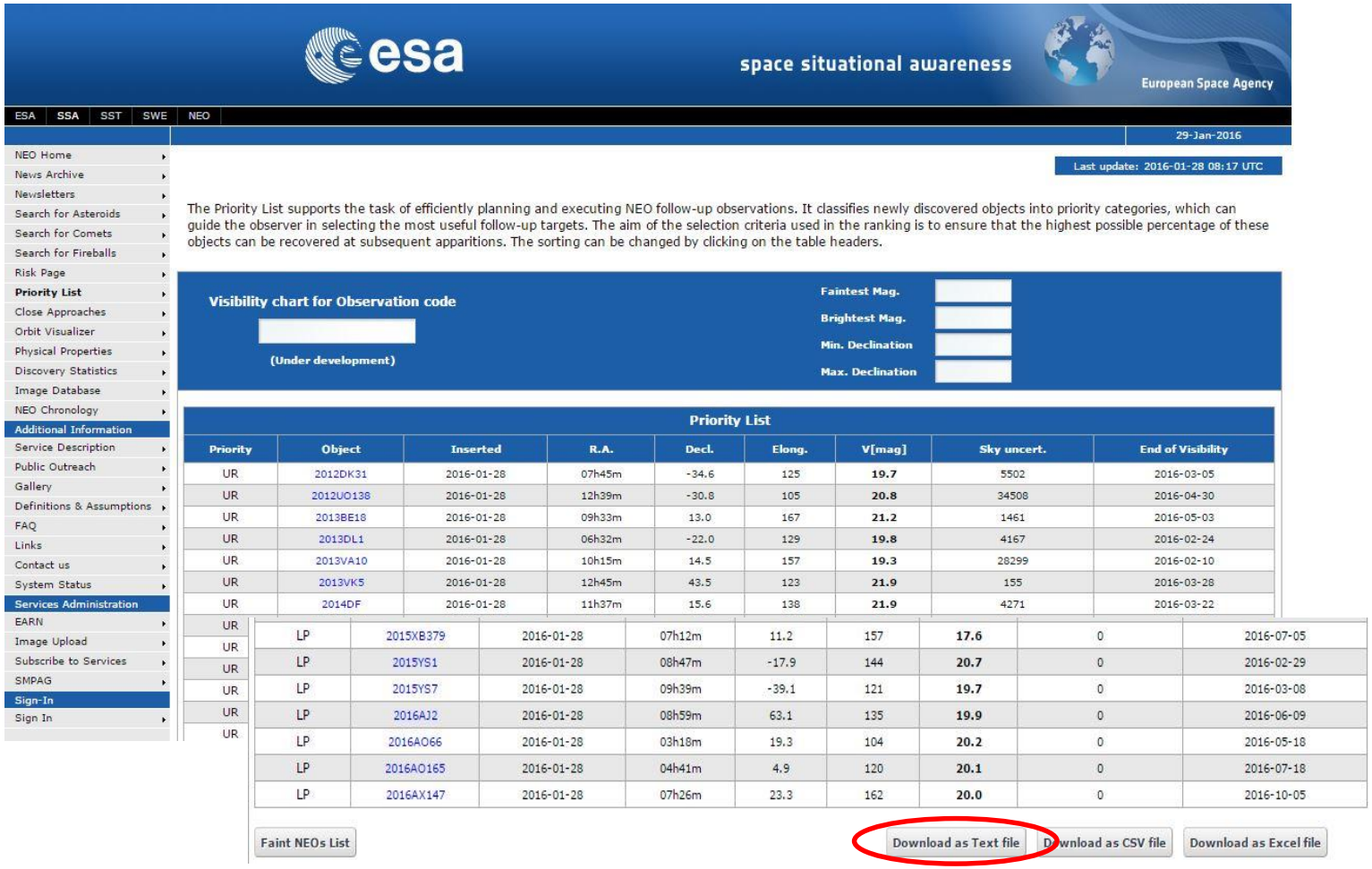
Object Nam
2016BE
2016BQ
2013VA10
2014QD36
2015XA37
2014EK24
2010WD1
2008DL5
2011EH17
2013TX68
2004FX1
2003EW59
2010FX9
2016BA14
1994UG
2012HC25

Recent close approaches to Earth

1 AU = ~150 million kilometers
1 LD = Lunar Distance = ~384000 kilometers

Object Name	Close Approach Date	Miss Distance [AU]	Miss Distance [LD]	Estimated Diameter [m]	H [mag]	Maximum Brightness [mag]	Relative Velocity [km/s]
2015XC352	2015-Dec-30	0.0133	5.2	30.0*	25.8	19	4.6
2015YT1	2015-Dec-31	0.0348	13.5	17.0*	27	21.2	6.1
2011YE40	2015-Dec-31	0.0407	15.8	39.0*	25.1	20.2	12.7
2016AN66	2015-Dec-31	0.0037	1.4	14.0*	27.4	19.2	5.4
2016AU193	2015-Dec-31	0.0212	8.2	36.0*	25.3	19.3	21.9
2016AV64	2016-Jan-01	0.0111	4.3	15.0*	27.3	19.7	14.6
2016AY64	2016-Jan-01	0.0186	7.2	23.0*	26.4	19.6	11.2
2016AE2	2016-Jan-02	0.0329	12.8	22.0*	26.4	20.3	6.2
2012BU61	2016-Jan-02	0.0307	11.9	210.0*	21.5	16.2	24
2015YC10	2016-Jan-04	0.0267	10.4	43.0*	25	19.2	15.6
2016AH65	2016-Jan-04	0.0211	8.2	28.0*	25.9	18.9	8.8
2016AX64	2016-Jan-04	0.0423	16.5	36.0*	25.3	19.9	15.1
2016AV164	2016-Jan-04	0.0386	15	43.0*	25	19	7.6
85990 1999JV6	2016-Jan-06	0.0324	12.6	451.0	20.1	14.7	9.6
2016AT193	2016-Jan-06	0.0169	6.6	21.0*	26.5	19.7	15
2016BR	2016-Jan-07	0.0345	13.4	32.0*	25.6	19.7	7.7
2016AN9	2016-Jan-07	0.0197	7.7	19.0*	26.7	19.8	8.7
2016AD166	2016-Jan-08	0.0352	13.7	80.0*	23.6	19.1	15
2016AT131	2016-Jan-08	0.0183	7.1	16.0*	27.1	19.7	6.2
2016AW192	2016-Jan-08	0.0166	6.4	37.0*	25.3	18.7	20

The Priority List supports the task of efficiently planning and executing NEO follow-up observations. It classifies newly discovered objects into four priority categories, which can guide the observer in selecting the most useful follow-up targets.



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29-Jan-2016

Last update: 2016-01-28 08:17 UTC

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The Priority List supports the task of efficiently planning and executing NEO follow-up observations. It classifies newly discovered objects into priority categories, which can guide the observer in selecting the most useful follow-up targets. The aim of the selection criteria used in the ranking is to ensure that the highest possible percentage of these objects can be recovered at subsequent apparitions. The sorting can be changed by clicking on the table headers.

Visibility chart for Observation code

(Under development)

Faintest Mag.
Brightest Mag.
Min. Declination
Max. Declination

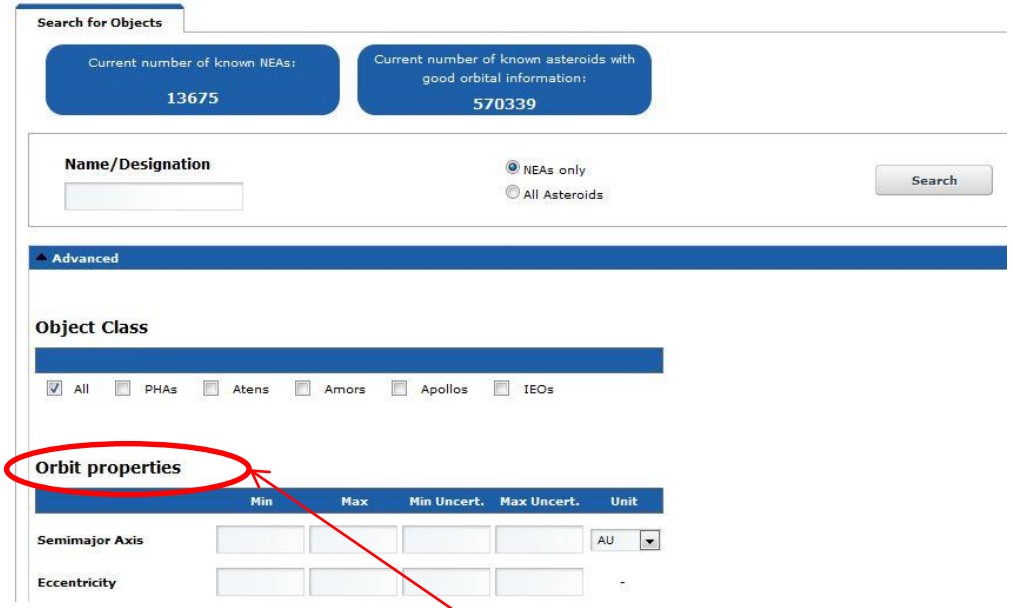
Priority List

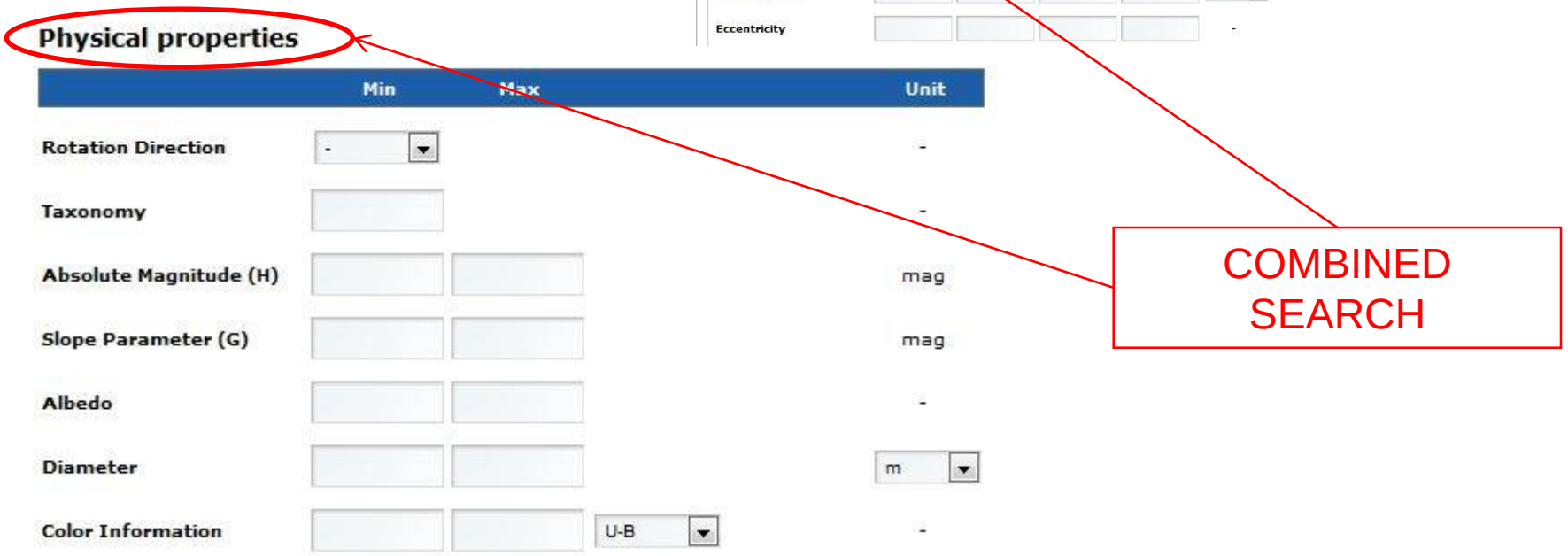
Priority	Object	Inserted	R.A.	Decl.	Elong.	V[mag]	Sky uncert.	End of Visibility
UR	2012DK31	2016-01-28	07h45m	-34.6	125	**19.7**	5502	2016-03-05
UR	2012UO136	2016-01-28	12h39m	-30.8	105	**20.8**	34508	2016-04-30
UR	2013BE18	2016-01-28	09h33m	13.0	167	**21.2**	1461	2016-05-03
UR	2013DL1	2016-01-28	06h32m	-22.0	129	**19.8**	4167	2016-02-24
UR	2013VA10	2016-01-28	10h15m	14.5	157	**19.3**	28299	2016-02-10
UR	2013VK5	2016-01-28	12h45m	43.5	123	**21.9**	155	2016-03-28
UR	2014DF	2016-01-28	11h37m	15.6	138	**21.9**	4271	2016-03-22
UR								
UR								
UR								
UR								
UR								
UR								
LP	2015XB379	2016-01-28	07h12m	11.2	157	**17.6**	0	2016-07-05
LP	2015YS1	2016-01-28	08h47m	-17.9	144	**20.7**	0	2016-02-29
LP	2015YS7	2016-01-28	09h39m	-39.1	121	**19.7**	0	2016-03-08
LP	2016AJ2	2016-01-28	08h59m	63.1	135	**19.9**	0	2016-06-09
LP	2016AO66	2016-01-28	03h18m	19.3	104	**20.2**	0	2016-05-18
LP	2016AO165	2016-01-28	04h41m	4.9	120	**20.1**	0	2016-07-18
LP	2016AX147	2016-01-28	07h26m	23.3	162	**20.0**	0	2016-10-05

Faint NEOs List | Download as Text file | Download as CSV file | Download as Excel file

Database

- NEAs
  - ✓ orbit properties
  - ✓ physical properties
  - ✓ ephemerides





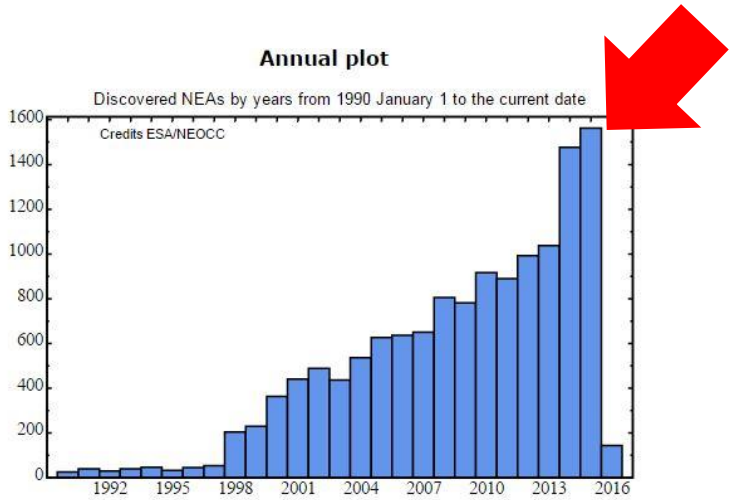
COMBINED SEARCH

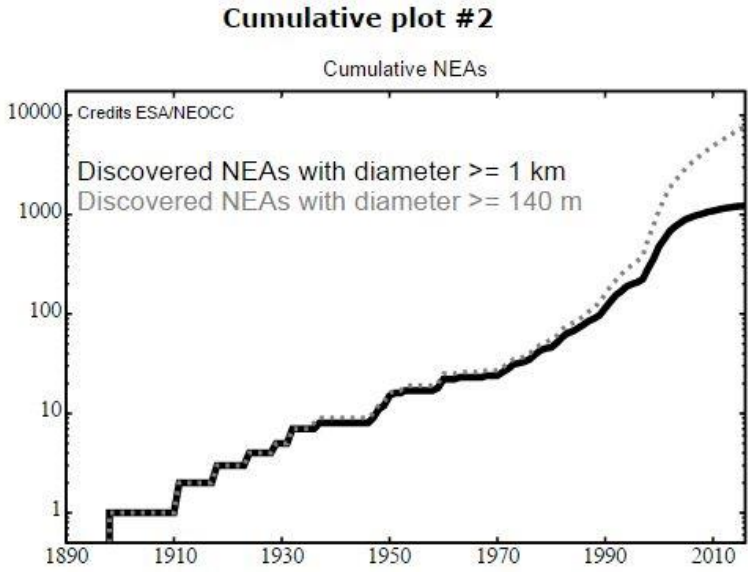
Database

- NEAs
  - ✓ orbit properties
  - ✓ physical properties
  - ✓ ephemerides
- Main belt asteroids, Transneptunian Objects, Centaurs, etc…
  - ✓ orbit properties
  - ✓ physical properties
- Comet:
  - ✓ orbit properties
  - Orbit Visualization Tool under development: DEV
  - perturbed orbits: future development
- Fireball data ingestion on going: DEV →TST
- Precovery system under development: DEV →TST

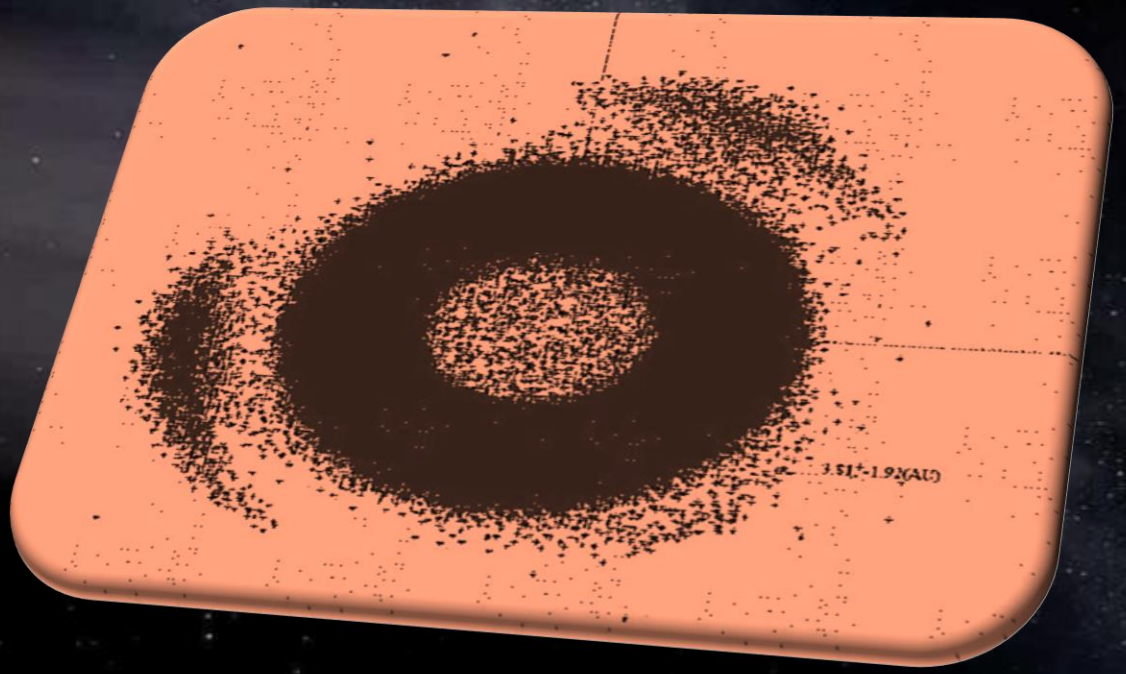
Information

- Discovery statistics
  - ✓ Basic statistical considerations summarized in simple histograms
- Data mining
  - Historical data mining of main interesting data, e.g. the Impact Probability change over time of a given object: DEV
- Notification
  - Internal and external e-mail notification system: DEV →TST



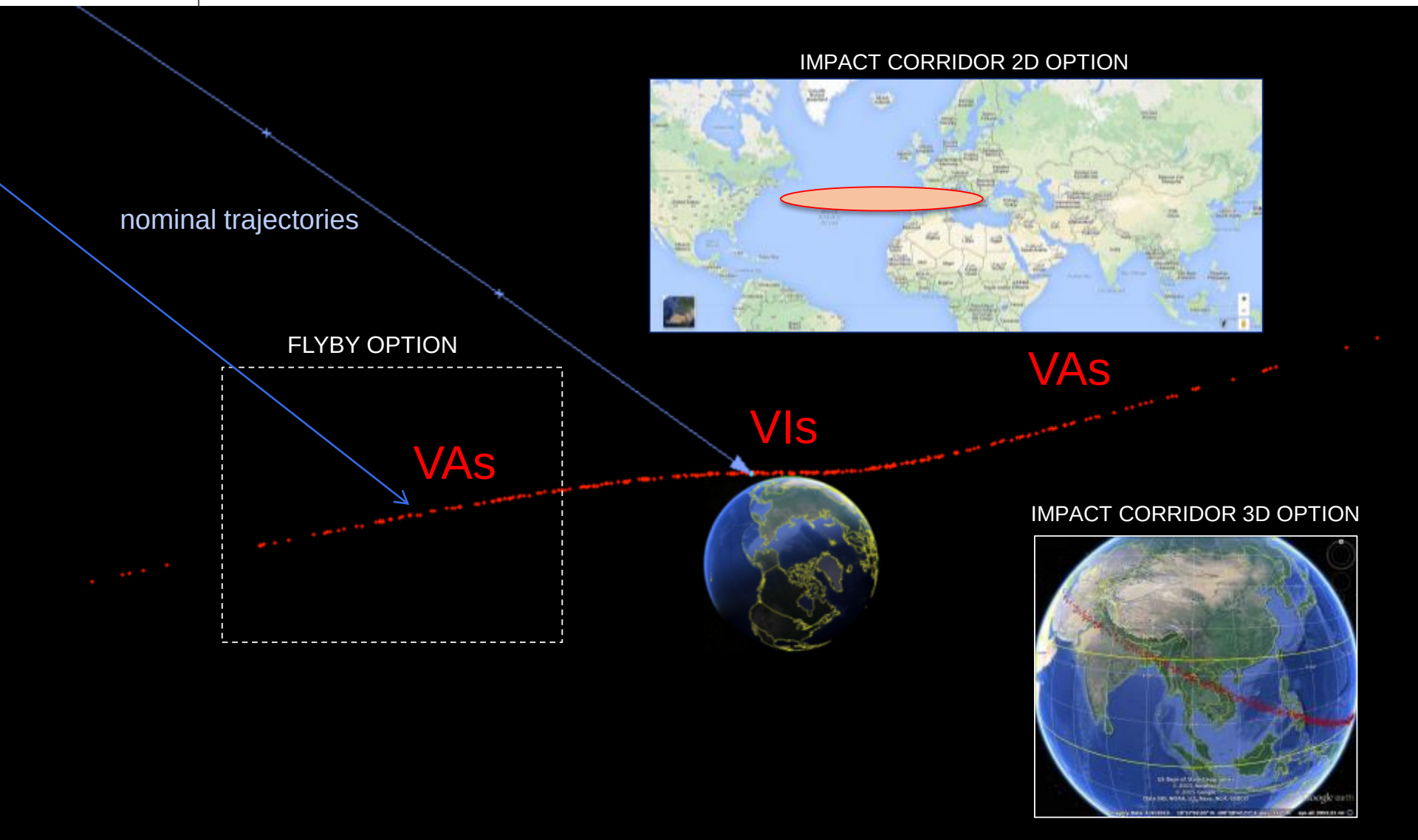


SSA-NEO SYSTEM
EVOLUTION



P2-NEO-II VISUALIZATION TOOLS

UR-009	The data processing system shall be enhanced with a tool that allows displaying the corridor of the impact locations on ground and fly-by locations in space for given orbital uncertainty (i.e. the impact ground corridor and the complete area of fly-by locations in space if the Earth or other body is not hit.)



toward SSA phase 3

elecnor deimos

serco SpaceDyS

non-gravitational perturbations
updated error model

models → MAINTAIN STATE-OF-THE-ART TECHNIQUES FOR NEO DYNAMICAL MODELLING

impact corridor visualization
flyby area visualization
sky charts
visibility chart
animations

tools → PROVIDE SSA USERS WITH ADVANCED VISUALIZATION TOOLS FOR UNDERSTANDING THE NEO HAZARD

NEOPROP
NEODyS migration

systems → ACHIEVE INDEPENDENCE IN NEO IMPACT MONITORING SW SYSTEMS

Fly-eye prototype
Follow-up network
NEOShield-2 collaboration

observations → COMPLETE THE DESIGN OF THE SSA-NEO SEGMENT OBSERVATIONAL SCENARIO

NEO SEGMENT
COMMUNICATION


EUROPEAN SPACE AGENCY
ABOUT US
OUR ACTIVITIES
CONNECT WITH US
ESA
OPEN DAYS
ESRIN
Space Weather - Segment
Near-Earth Objec
NEO Segment
Rappresentazione
Nessun pericolo dall'asteroide 2014 U
ottobre è stato avvistato dall'osserva
bimestrale, dicembre 2015
ISSN 0036-4681- anno 81°, n. 6 - 978-88-220-9416-2 / € 7,50
Sapere
edizioni Dedalo
idee e progressi della scienza
ASTRONOMIA
il rischio asteroidi
ENERGIE RINNOVABILI
l'energia cinese è sempre più verde?
AMBIENTE
misurare la sostenibilità
notteEuropea dei ricercatori
25 SETTEMBRE 2015 FRASCATI ROMA TRIESTE MILANO
FERRARA PISA BARI CAGLIARI
15 SETTIMANA DELLA SCIENZA
Borexino nella Top Ten
TREBBE INTERESSARTI ANCHE...
nocuo asteroide che "sfiorerà" la Terra
teroide sfiorerà la Terra
nillesimo asteroide vicino alla Terra
adro è falso, parola di fisico
e elettromagnetismo. Parola di quasar!
GIORNO
14 al 01.01.2015 - Capodanno tra le
PIÙ RECENTI

Monthly newsletter from ESA's NEO Coordination Centre

space situational awareness

→ NEAR-EARTH OBJECTS

Current NEO statistics

October is usually one of the richest months for asteroid discoveries in the year.

- Known NEOs: 13 176 asteroids and 104 comets
- NEOs in risk list*: 522
- New NEO discoveries since last month: 138
- NEOs discovered since 1 January 2015: 1220

Focus on

Over the past few days there has been a significant media interest in 2015 TB145, a large asteroid that flew past Earth on the night of Halloween. Apart for the popularity of the event generated by the date, the fly-by itself is interesting from a scientific perspective, because it was discovered only three weeks before its closest approach. This asteroid was spotted with short notice because of its peculiar high-eccentricity orbit, which brings it far from Earth for a significant fraction of its orbital period. This discovery highlights the importance of continuous monitoring of the sky, since even a large asteroid may be discovered only during its incoming approach to Earth, and not years in advance.

Upcoming interesting close approaches

Only one large object is known to have a close approach to Earth in November.

- (413577) 2005 UL5 is the only asteroid discovered so far that will come closer than 10 lunar distances in November.

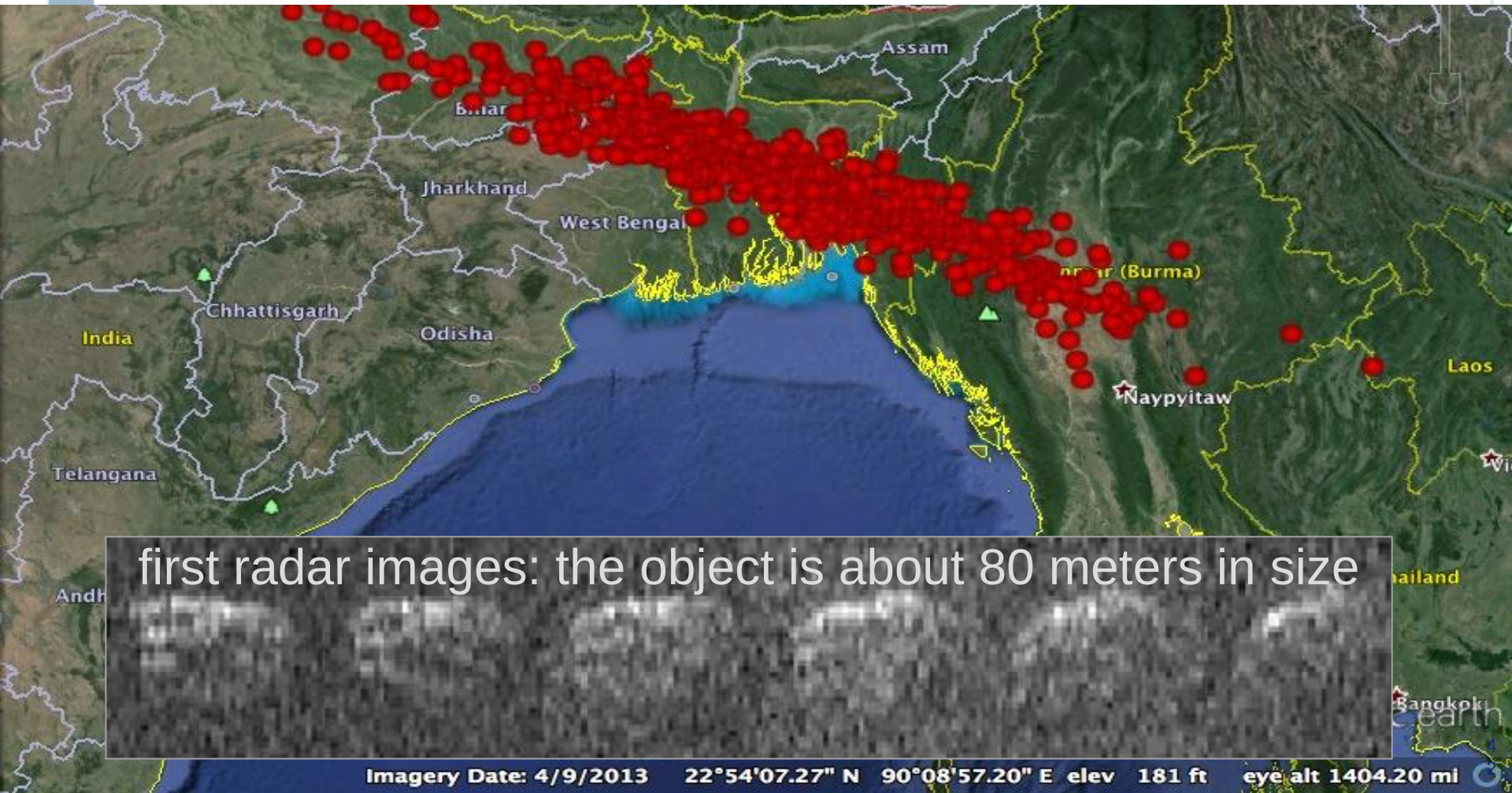
PLANETARY DEFENSE CONFERENCE

ESRIN, 13-17 APRIL 2015

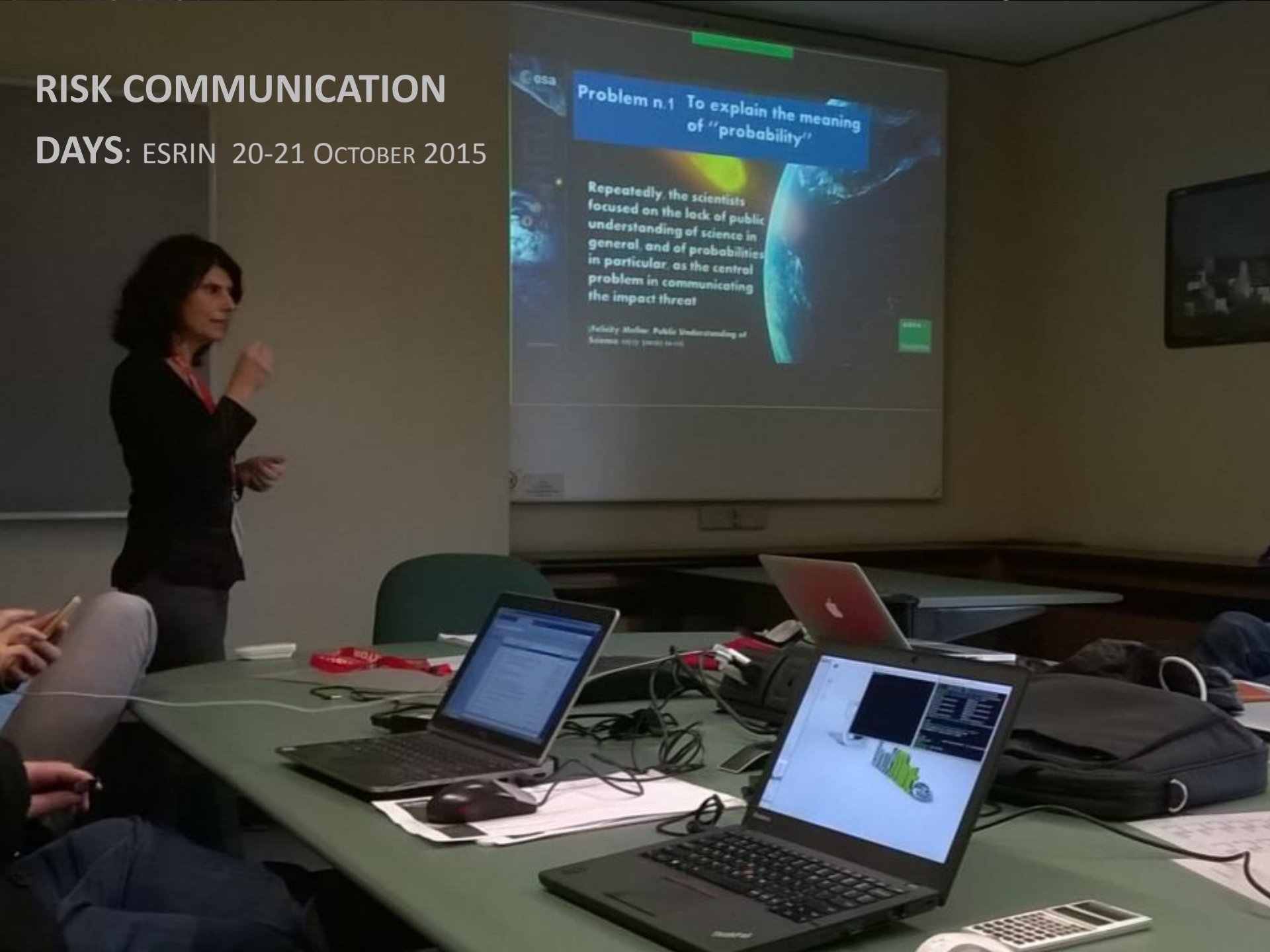
Asteroid 2015 PDC Impact Now Certain

Paul W. Chodas (International Asteroid Warning Network/JPL)

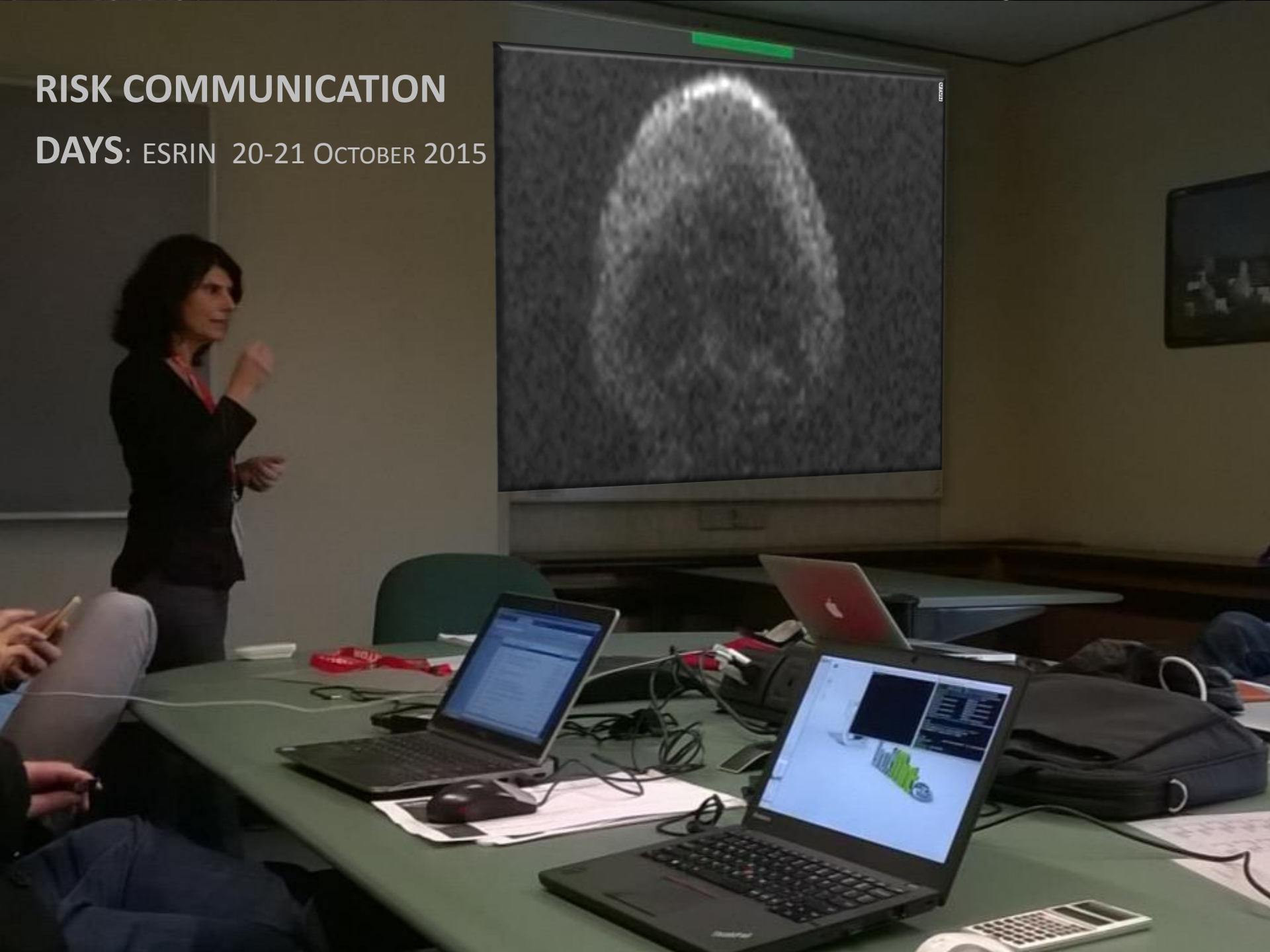
Press Conference, December 27, 2016



RISK COMMUNICATION DAYS: ESRIN 20-21 OCTOBER 2015



RISK COMMUNICATION DAYS: ESRIN 20-21 OCTOBER 2015



THANK YOU

FROM THE NEO TEAM

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