

The background of the slide is a dark space filled with stars. On the left, a large, detailed Earth is shown, displaying continents and clouds. In the center-right, a large, dark, irregularly shaped asteroid with numerous impact craters is the primary focus. To its right, a smaller, similar asteroid is visible, appearing to move away from the larger one, leaving a faint white trail behind it.

# ESA's SSA-NEO Segment

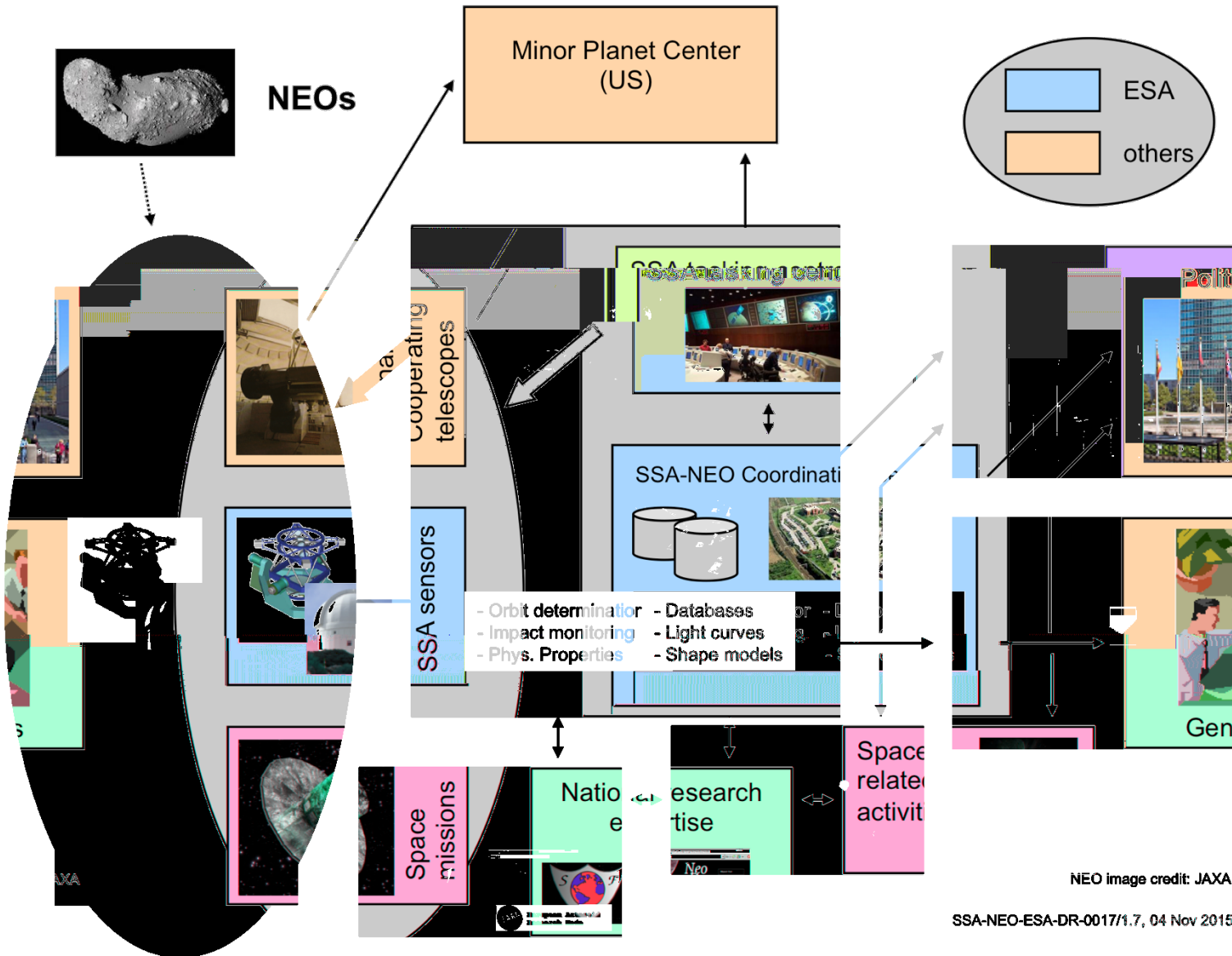
Status 2015 Nov

Gerhard Drolshagen, Detlef Koschny (ESA)  
SSA-NEO Segment Managers



- **ESA's SSA-NEO segment shall be aware of the situation in space related to natural solar system objects. In particular, it shall provide warnings of potentially impacting objects. It shall prepare for mitigation of the resulting risk.**

# SSA-NEO setup - context





# NEO Coordination Centre – ESRIN, Italy



SSA-NEO  
Coordination Centre—  
Inauguration  
22 May 2013  
Image: Google Earth

- **Optical Ground Station (OGS)**
  - 1 m f/4.4
  - 0.7 deg x 0.7 deg FoV
  - 4-6 nights per month
- **Klet observatory**
  - 1 m f/4
  - 0.8 deg x 0.8 deg FoV
  - Only used for NEOs
- **Very Large Telescope**
  - ESO 8 m telescope
  - 11 hours per semester
  - Used for follow-up of faint NEOs on risk list
- **Precovery searches**





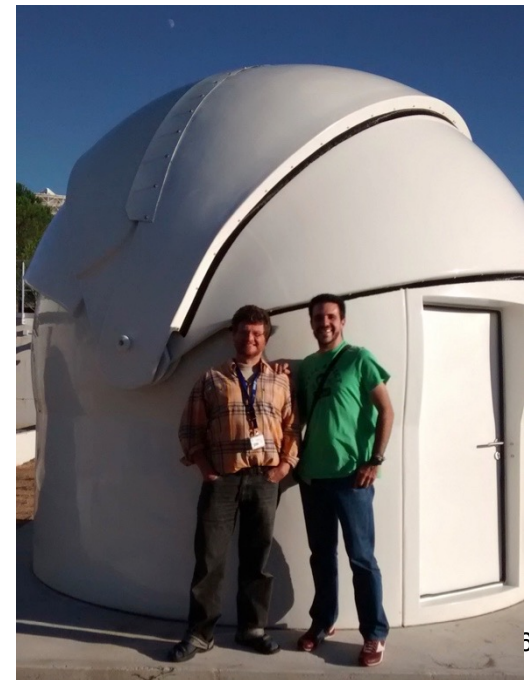
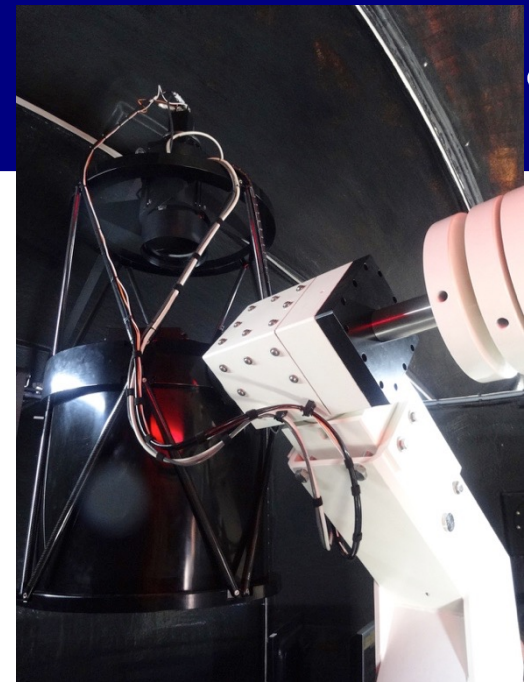
# Observations – main assets

## ■ Test-Bed Telescope

- 56 cm aperture
- 2.2 deg x 2.2 deg field of view
- For testing scheduling/tasking and data processing
- 1<sup>st</sup> telescope being commissioned in Spain
- 2<sup>nd</sup> telescope should start in 2016 in Chile

## ■ Fly-Eye Telescope

- 1 m effective aperture
- 6.7 deg x 6.7 deg field of view
- Prototype with two optical channels under development
- 1<sup>st</sup> telescope 2017



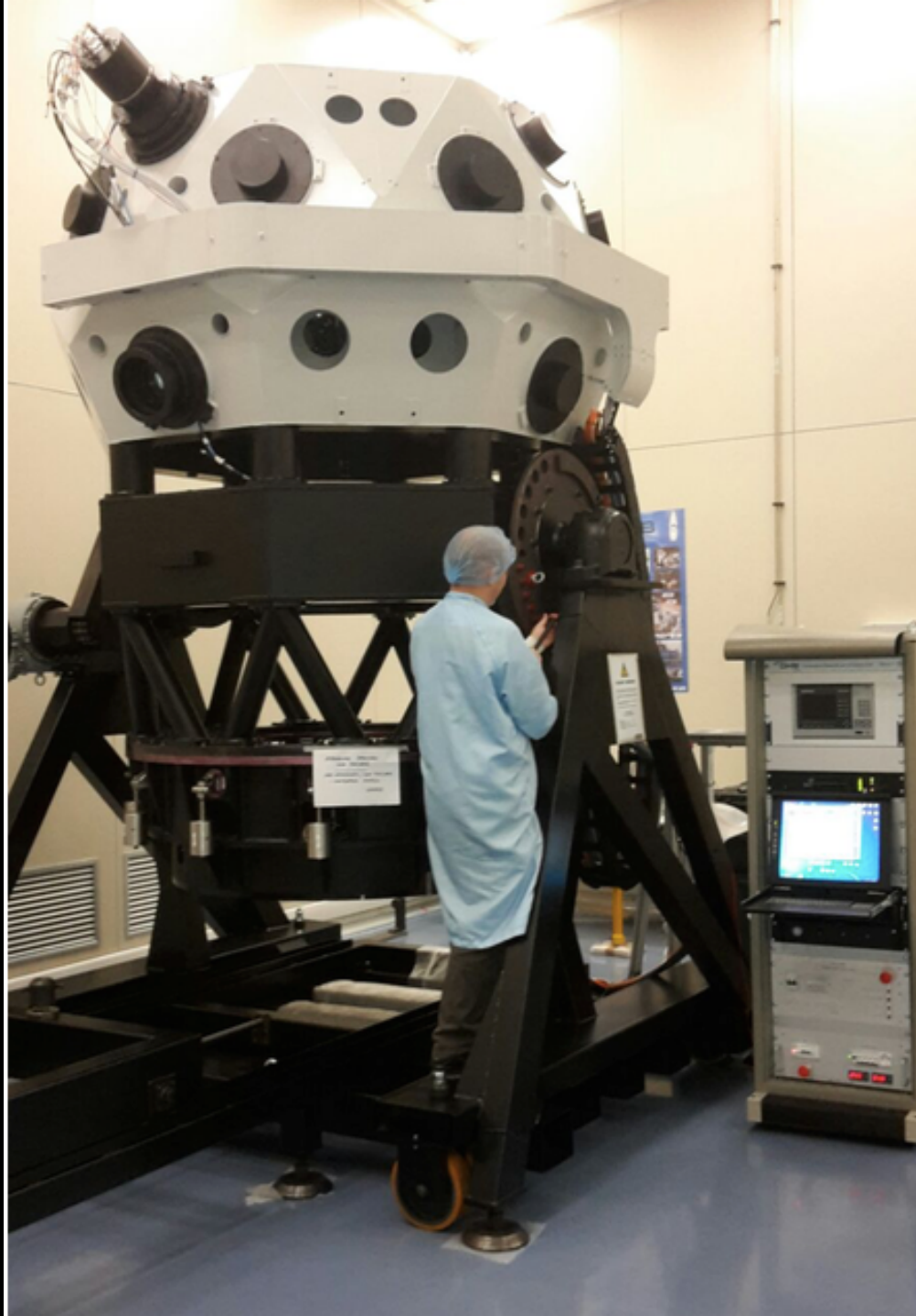
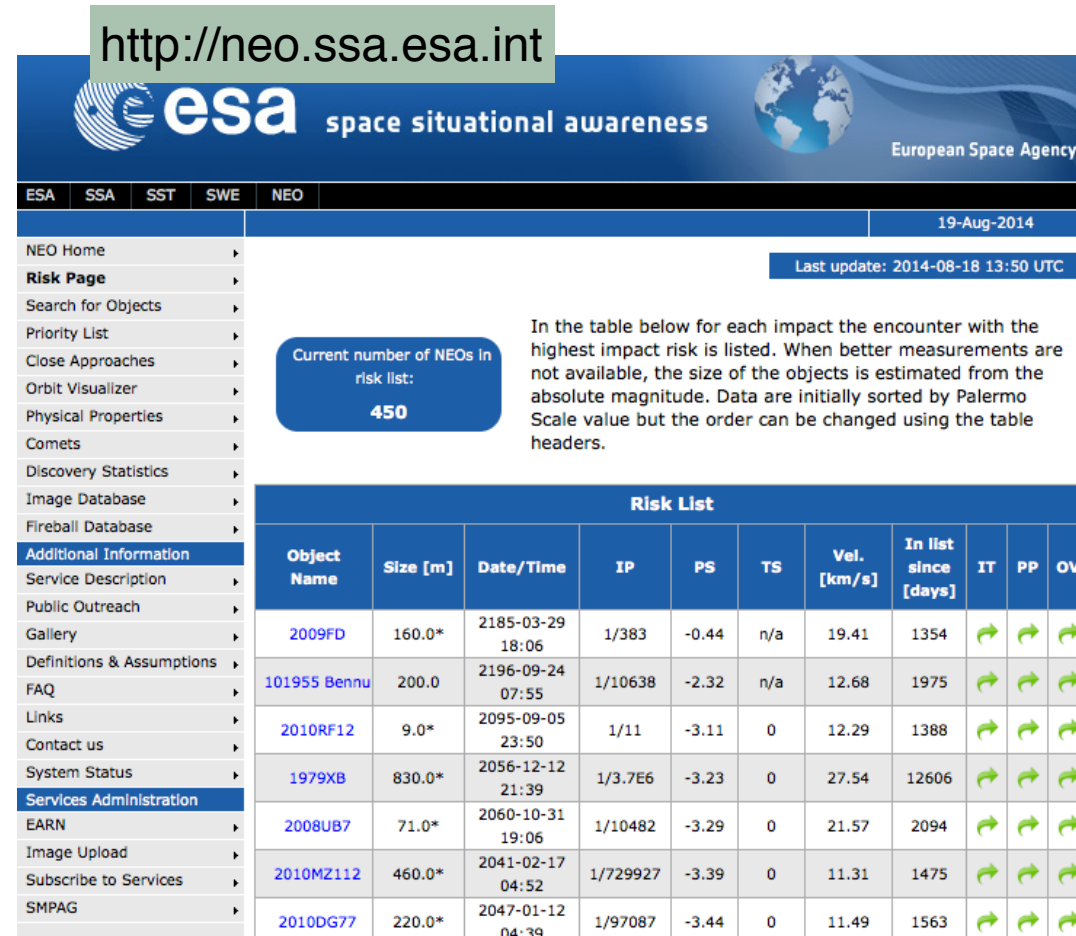


Image CGS/Cibin

- NEOCC maintains 'risk list'

- NEODyS is one of the 'federated' assets of the NEOCC
- Computes precise orbits including co-variances
- Makes impact prediction
- In the process of establishing long-term support, integrate more into NEOCC

<http://neo.ssa.esa.int>



Current number of NEOs In risk list: **450**

In the table below for each impact the encounter with the highest impact risk is listed. When better measurements are not available, the size of the objects is estimated from the absolute magnitude. Data are initially sorted by Palermo Scale value but the order can be changed using the table headers.

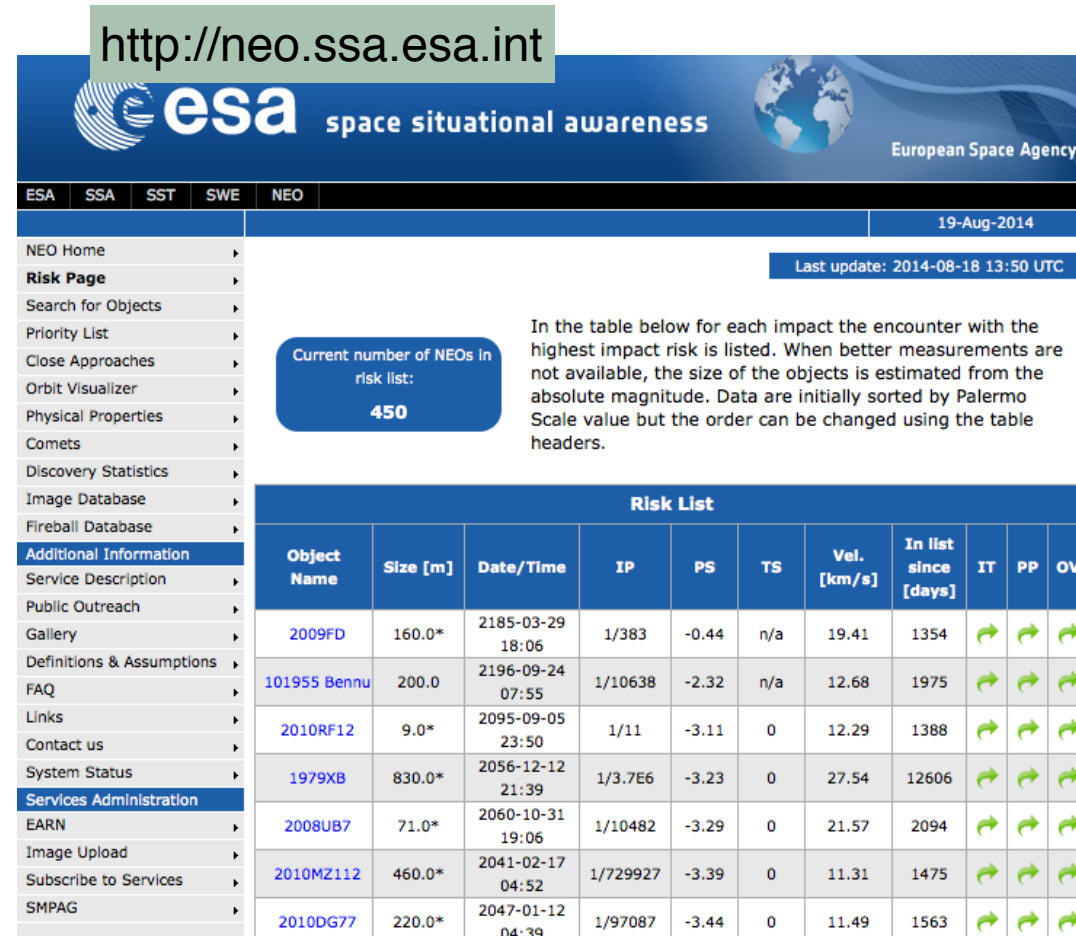
Risk List										
Object Name	Size [m]	Date/Time	IP	PS	TS	Vel. [km/s]	In list since [days]	IT	PP	OV
2009FD	160.0*	2185-03-29 18:06	1/383	-0.44	n/a	19.41	1354	➡	➡	➡
101955 Benu	200.0	2196-09-24 07:55	1/10638	-2.32	n/a	12.68	1975	➡	➡	➡
2010RF12	9.0*	2095-09-05 23:50	1/11	-3.11	0	12.29	1388	➡	➡	➡
1979XB	830.0*	2056-12-12 21:39	1/3.7E6	-3.23	0	27.54	12606	➡	➡	➡
2008UB7	71.0*	2060-10-31 19:06	1/10482	-3.29	0	21.57	2094	➡	➡	➡
2010MZ112	460.0*	2041-02-17 04:52	1/729927	-3.39	0	11.31	1475	➡	➡	➡
2010DG77	220.0*	2047-01-12 04:39	1/97087	-3.44	0	11.49	1563	➡	➡	➡

The 'risk list' showing all NEOs having an impact probability >0 within the next 100 years



- Orbit visualization tool
- NEO chronology by IAU
- Physical properties database
- Image database under development
- NEODyS is being moved to ESRIN

http://neo.ssa.esa.int



The screenshot shows the ESA NEO web portal interface. At the top, there is a navigation bar with the ESA logo and the text "space situational awareness". Below this, there are tabs for "ESA", "SSA", "SST", "SWE", and "NEO". The current date is "19-Aug-2014" and the last update is "2014-08-18 13:50 UTC".

On the left side, there is a menu with the following items:

- NEO Home
- Risk Page
- Search for Objects
- Priority List
- Close Approaches
- Orbit Visualizer
- Physical Properties
- Comets
- Discovery Statistics
- Image Database
- Fireball Database
- Additional Information
- Service Description
- Public Outreach
- Gallery
- Definitions & Assumptions
- FAQ
- Links
- Contact us
- System Status
- Services Administration
- EARN
- Image Upload
- Subscribe to Services
- SMPAG

In the center, there is a blue box that says "Current number of NEOs In risk list: 450".

Below this, there is a table titled "Risk List" with the following columns: Object Name, Size [m], Date/Time, IP, PS, TS, Vel. [km/s], In list since [days], IT, PP, and OV. The table contains the following data:

Object Name	Size [m]	Date/Time	IP	PS	TS	Vel. [km/s]	In list since [days]	IT	PP	OV
2009FD	160.0*	2185-03-29 18:06	1/383	-0.44	n/a	19.41	1354	➔	➔	➔
101955 Benu	200.0	2196-09-24 07:55	1/10638	-2.32	n/a	12.68	1975	➔	➔	➔
2010RF12	9.0*	2095-09-05 23:50	1/11	-3.11	0	12.29	1388	➔	➔	➔
1979XB	830.0*	2056-12-12 21:39	1/3.7E6	-3.23	0	27.54	12606	➔	➔	➔
2008UB7	71.0*	2060-10-31 19:06	1/10482	-3.29	0	21.57	2094	➔	➔	➔
2010MZ112	460.0*	2041-02-17 04:52	1/729927	-3.39	0	11.31	1475	➔	➔	➔
2010DG77	220.0*	2047-01-12 04:39	1/97087	-3.44	0	11.49	1563	➔	➔	➔

Below the table, there is a note: "In the table below for each impact the encounter with the highest impact risk is listed. When better measurements are not available, the size of the objects is estimated from the absolute magnitude. Data are initially sorted by Palermo Scale value but the order can be changed using the table headers."

- Workshops to collect input, training, raise awareness
- 'NEO Information Plan' describes information distribution
- Presented to SSA Delegate body in Dec 2015

ESA Unclassified – For official use

ESA/PB-SSA(01)  
Paris, xx Septe  
(Original: Eng

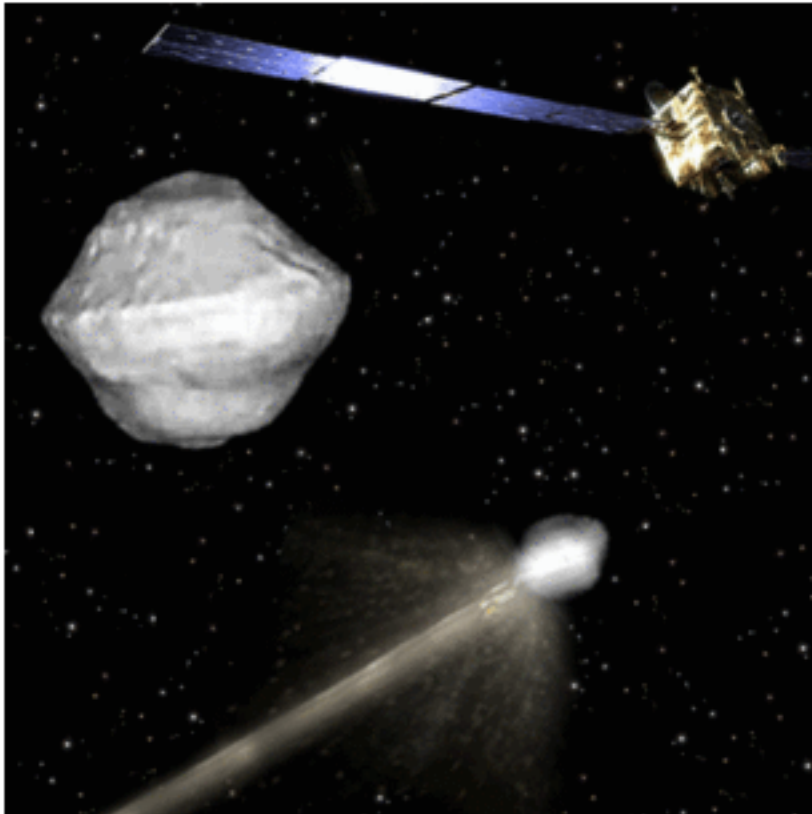
EUROPEAN SPACE AGENCY

SPACE SITUATIONAL AWARENESS PROGRAMME BOA

Outcome of the second workshop on NEO impact hazards  
for national civil protection authorities



## ASTEROID IMPACT & DEFLECTION ASSESSMENT (AIDA) STUDY



AIDA mission concept

### The Asteroid Impact & Deflection Assessment

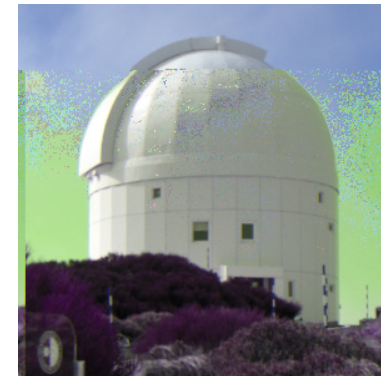
Phase A study of AIM ongoing (within ESA's 'General Studies Programme')

Using star trackers as test-bed for space-based asteroid observations

Studies for NEO cameras in L1 or L4, L5



- **2016 Dec: ESA council meeting on ministerial level**
- **New funding will be requested for 2017-2020**
- **Coordination with IAWN needs to be enforced**



Space situational awareness

European Space Agency

Last update: 2013-02-17 09:01 UTC

Number of NEOs in risk list: 361

In the table below for each impact the encounter with the highest impact risk is listed. When better measurements are not available, the size of the objects is estimated from the absolute magnitude. Data are initially sorted by Palermo Scale value but the order can be changed using the table headers.

Object Name	Size [m]	Date/Time	IP	PS	TS	Vel. [km/s]	In list since [days]	IT	PP	OV
2012YJ5	200.0	2182-06-24 22:20	1/3623	-1.52	n/a	12.86	1484	🟢	🟢	🟢
1999RQ36	170.0*	2048-06-03 02:08	1/1801	-1.81	1	19.21	1919	🟢	🟢	🟢
2007VK184	170.0*	2209-09-29 18:09	1/1894	-1.9	n/a	19.39	814	🟢	🟢	🟢
2009FD	160.0*	2093-12-11 12:58	1/104493	-2.85	0	23.51	16	🟢	🟢	🟢
2013BF73	390.0*	2030-02-14 15:56	1/2762	-3.07	0	18.94	1830	🟢	🟢	🟢
2008CK70	98.0*	2095-09-05 23:50	1/11	-3.11	0	12.29	892	🟢	🟢	🟢
2010FR12	9.0*	2096-12-12 21:39	1/3.706	-3.23	0	27.54	12115	🟢	🟢	🟢
197608	830.0*	2041-02-17 04:52	1/552486	-3.27	0	11.31	951	🟢	🟢	🟢
2010M212	470.0*							🟢	🟢	🟢

