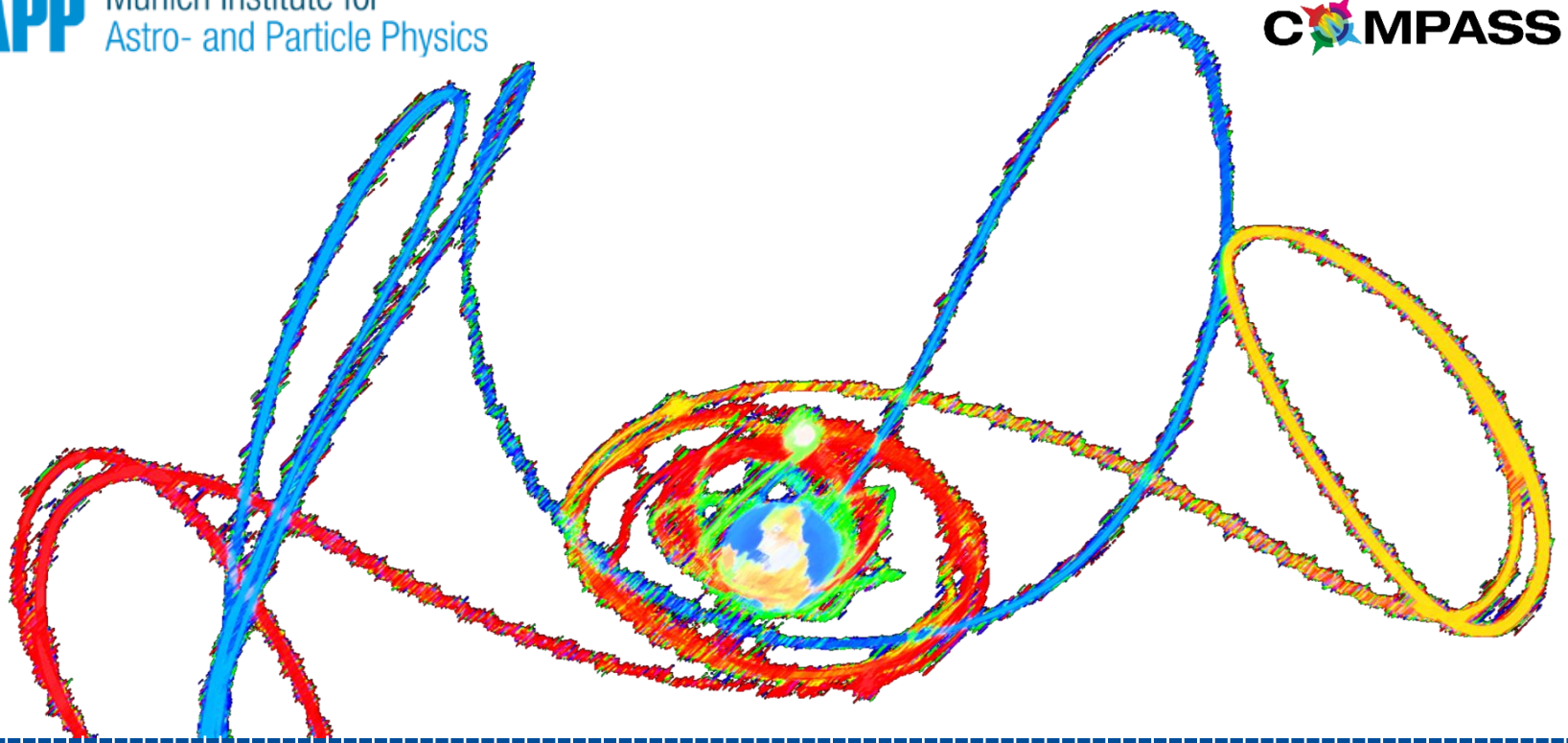
MIAPP Munich Institute for Astro- and Particle Physics

COMPASS erc



Science communication

Camilla Colombo, Robert Jedicke, Detlef Koschny, Richard Wainscoat, Andreas Burkert

With: Giovanni Carrada, Peter Jedicke, Felicitas Mokler, Ivonne Maier

Near-Earth Objects: Properties, Detection, Resources, Impacts and Defending Earth

14 May - 8 June 2018, Munich Institute for Astro- and Particle Physics (MIAPP)

An example

Asteroid close approach

TIME

An Asteroid the Size of the Statue of Liberty Will Whiz Past Earth T...

SCIENCE • WORLD

An Asteroid the Size of the Statue of Liberty Will Whiz Past Earth Tomorrow. Here's How to See It

News › Science

Huge, 'lost' asteroid found returning back to Earth for close flyby

The rock will be much closer to us than the moon is

Andrew Griffin | @_andrew_griffin | Tuesday 15 May 2018 12:03 BST | 21 comments

562 shares

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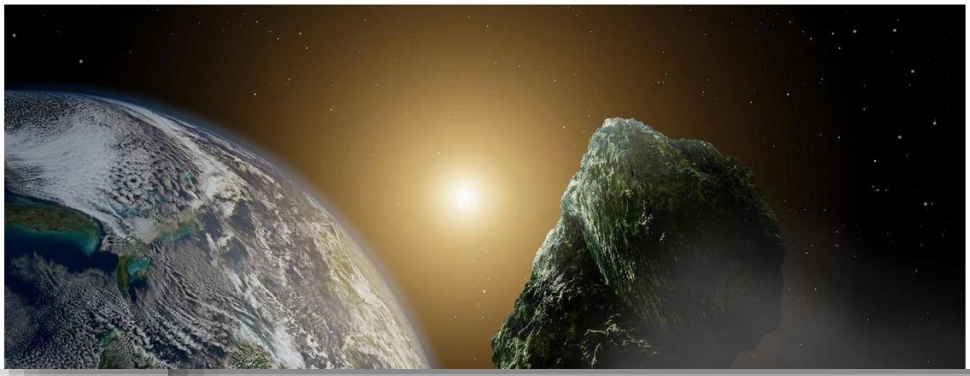
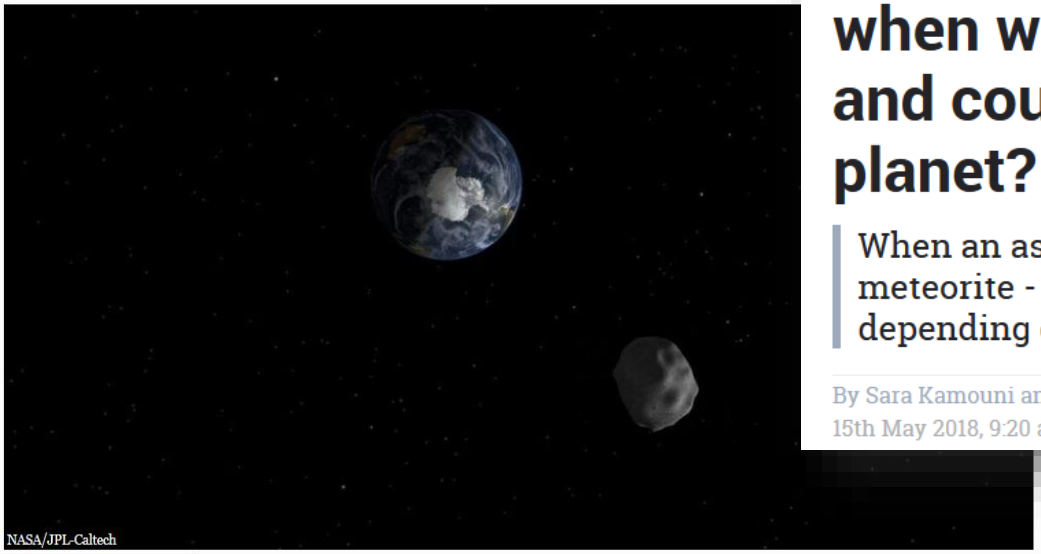


Today's Asteroid Flyby Will Miss But The Threat Is Real

Brian Koberlein Contributor

May 15, 2018, 02:49pm • 5,317 views • #WhoaScience



FLYING VISIT What is an asteroid, when will 2010 WC9 fly past Earth and could a meteor strike destroy the planet?

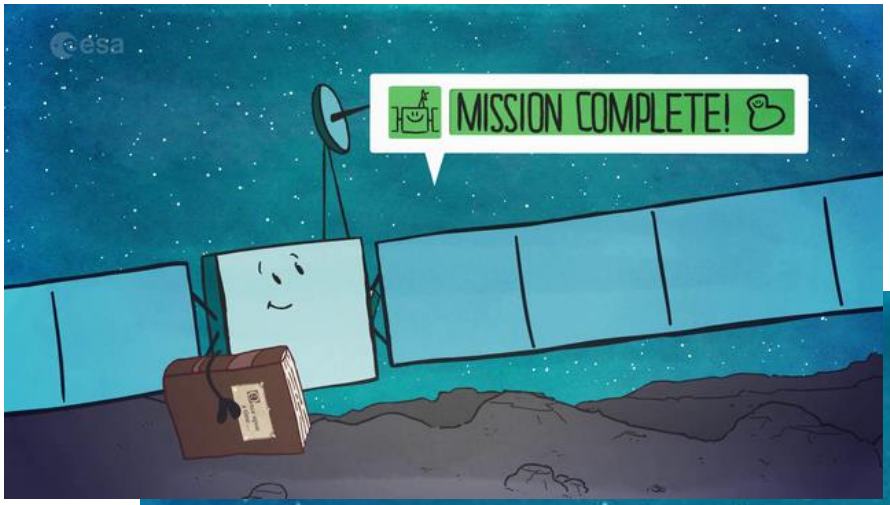
> When an asteroid crashes into the Earth, it's known as a meteorite - and it can cause potentially huge damage, depending on the size

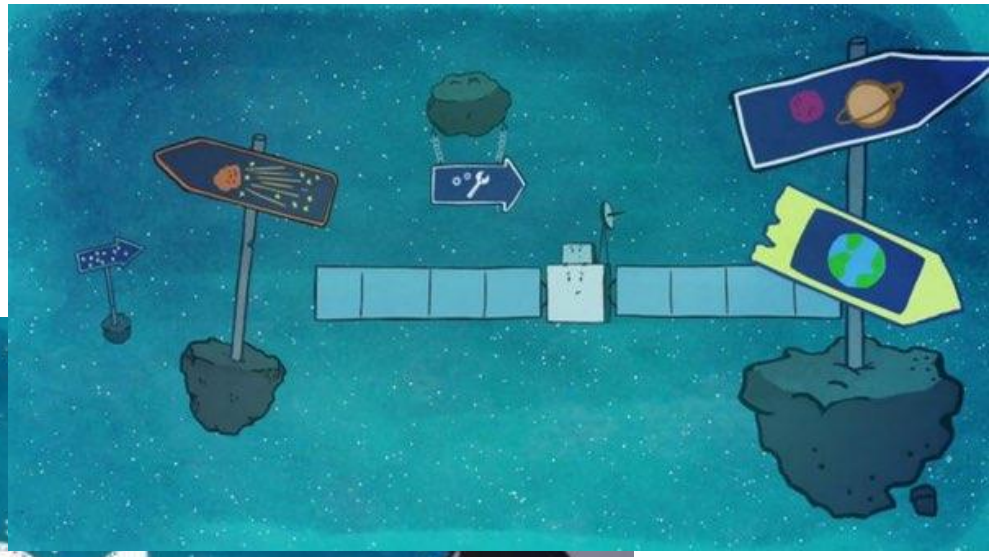
By Sara Kamouni and Mark Hodge

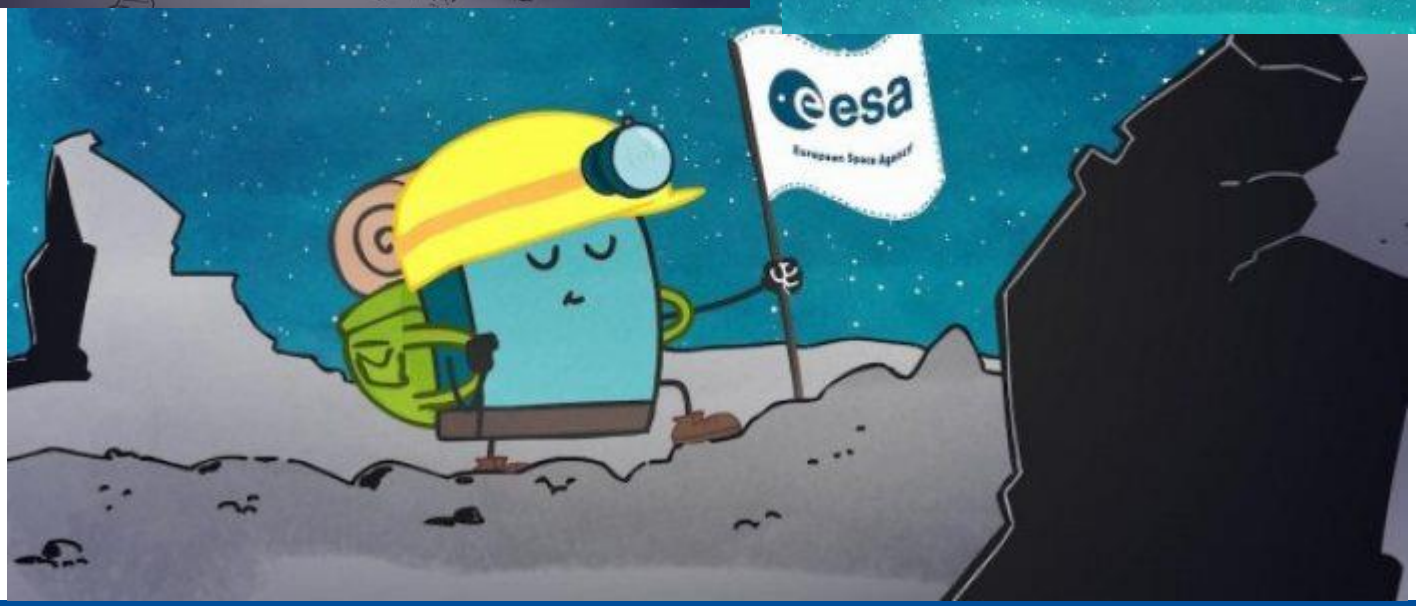
15th May 2018, 9:20 am | Updated: 15th May 2018, 11:49 am

A successful example

Rosetta





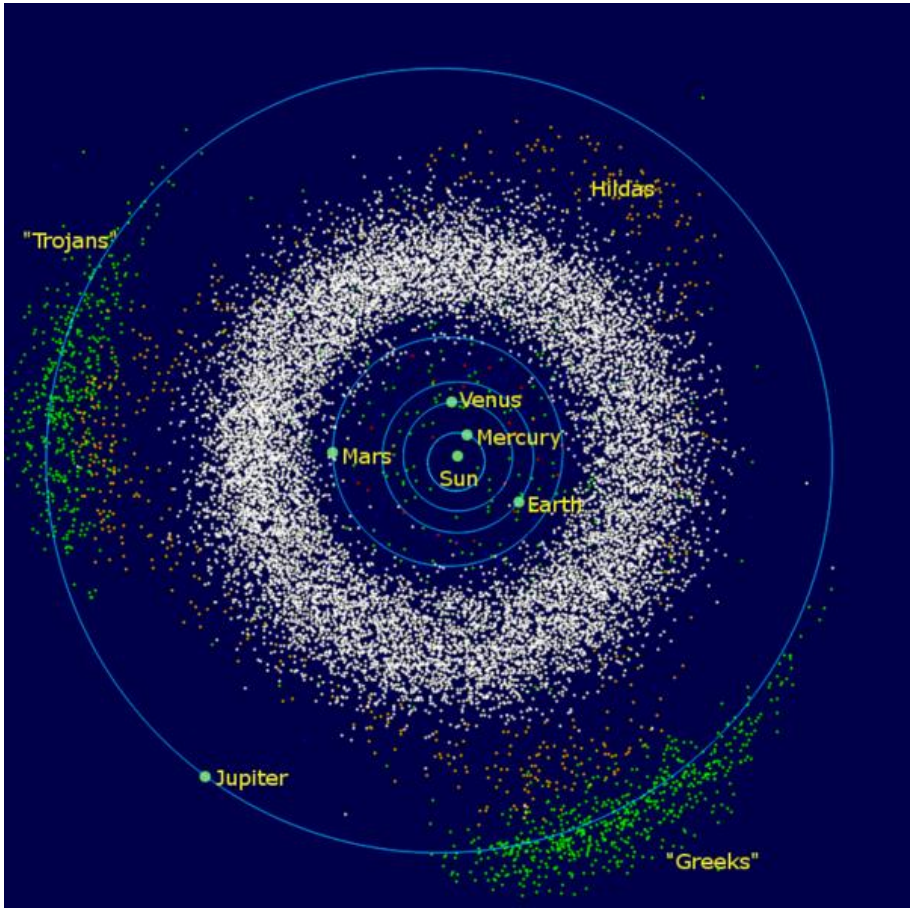


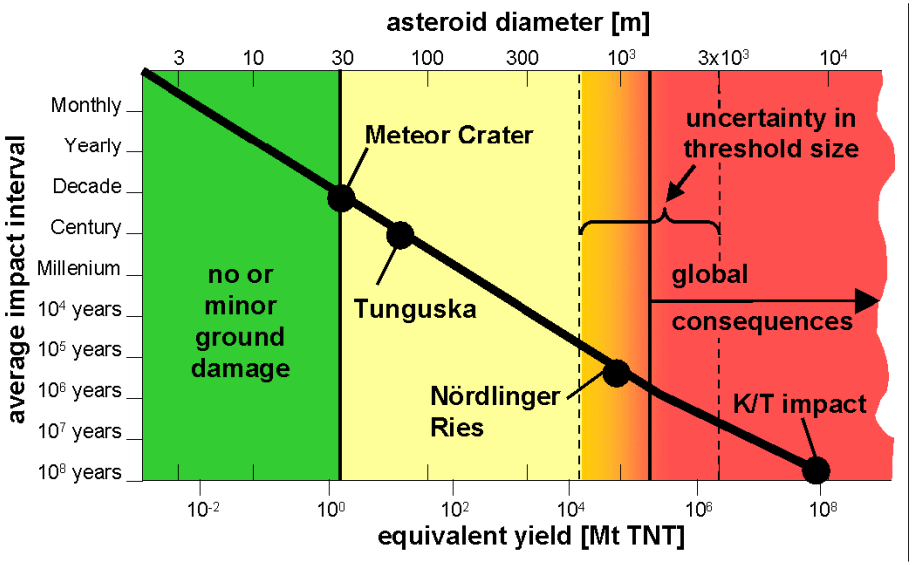
The Boy Who Cried Wolf

Armageddon

Picture of the Fable of Aesop

How to communicate



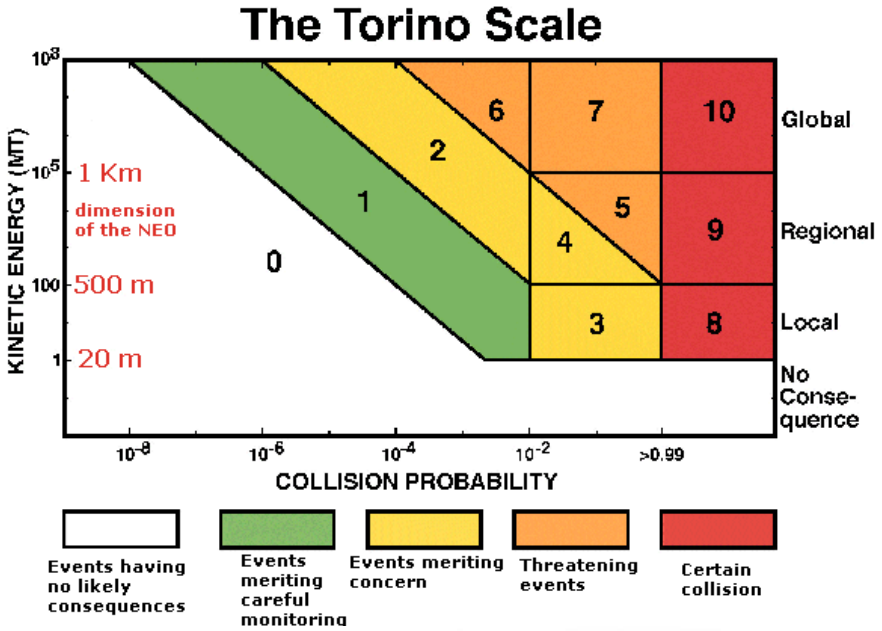


THE INNER SOLAR SYSTEM

This animation shows the motion of the inner part of the solar system over a two-year time period. The sun is at the center and the orbits of the planets Mercury, Venus, Earth and Mars are shown in light blue (the locations of each planet are shown as large crossed circles). Comets are shown as blue squares (numbered periodic comets are filled squares, other comets are outline squares). Main-belt minor planets are displayed as green circles, near-Earth minor planets are shown as red circles.

The individual frames were generated on an OpenVMS system, using the PGPLOT graphics library. The animation was put together on a RISC OS 4.03 system using !InterGif.

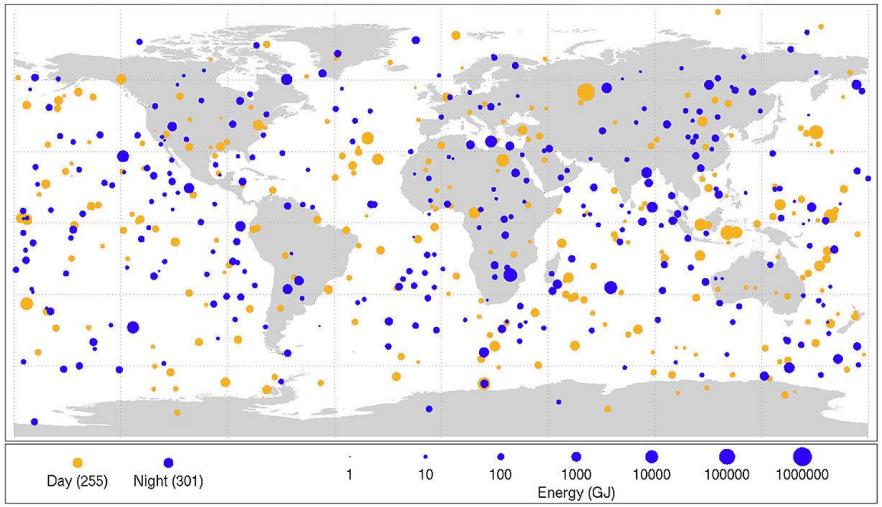
How to communicate



No Hazard (White Zone)	0	The likelihood of a collision is zero, or is so low as to be effectively zero. Also applies to small objects such as meteors and bodies that burn up in the atmosphere as well as infrequent meteorite falls that rarely cause damage.
Normal (Green Zone)	1	A routine discovery in which a pass near the Earth is predicted that poses no unusual level of danger. Current calculations show the chance of collision is extremely unlikely with no cause for public attention or public concern. New telescopic observations very likely will lead to re-assignment to Level 0.
Meriting Attention by Astronomers (Yellow Zone)	2	A discovery, which may become routine with expanded searches, of an object making a somewhat close but not highly unusual pass near the Earth. While meriting attention by astronomers, there is no cause for public attention or public concern as an actual collision is very unlikely. New telescopic observations very likely will lead to re-assignment to Level 0.
	3	A close encounter, meriting attention by astronomers. Current calculations give a 1% or greater chance of collision capable of localized destruction. Most likely, new telescopic observations will lead to re-assignment to Level 0. Attention by public and by public officials is merited if the encounter is less than a decade away.
	4	A close encounter, meriting attention by astronomers. Current calculations give a 1% or greater chance of collision capable of regional devastation. Most likely, new telescopic observations will lead to re-assignment to Level 0. Attention by public and by public officials is merited if the encounter is less than a decade away.
Threatening (Orange Zone)	5	A close encounter posing a serious, but still uncertain threat of regional devastation. Critical attention by astronomers is needed to determine conclusively whether or not a collision will occur. If the encounter is less than a decade away, governmental contingency planning may be warranted.
	6	A close encounter by a large object posing a serious but still uncertain threat of a global catastrophe. Critical attention by astronomers is needed to determine conclusively whether or not a collision will occur. If the encounter is less than three decades away, governmental contingency planning may be warranted.
	7	A very close encounter by a large object, which if occurring this century, poses an unprecedented but still uncertain threat of a global catastrophe. For such a threat in this century, international contingency planning is warranted, especially to determine urgently and conclusively whether or not a collision will occur.
Certain Collisions (Red Zone)	8	A collision is certain, capable of causing localized destruction for an impact over land or possibly a tsunami if close offshore. Such events occur on average between once per 50 years and once per several 1000 years.
	9	A collision is certain, capable of causing unprecedented regional devastation for a land impact or the threat of a major tsunami for an ocean impact. Such events occur on average between once per 10,000 years and once per 100,000 years.
	10	A collision is certain, capable of causing global climatic catastrophe that may threaten the future of civilization as we know it, whether impacting land or ocean. Such events occur on average once per 100,000 years, or less often.

Bolide events 1994-2013

(Small asteroids that disintegrated in the Earth's atmosphere)



How to communicate

space situational awareness

→ NEAR-EARTH OBJECTS

Close approach fact sheet for asteroid 2010 WC9

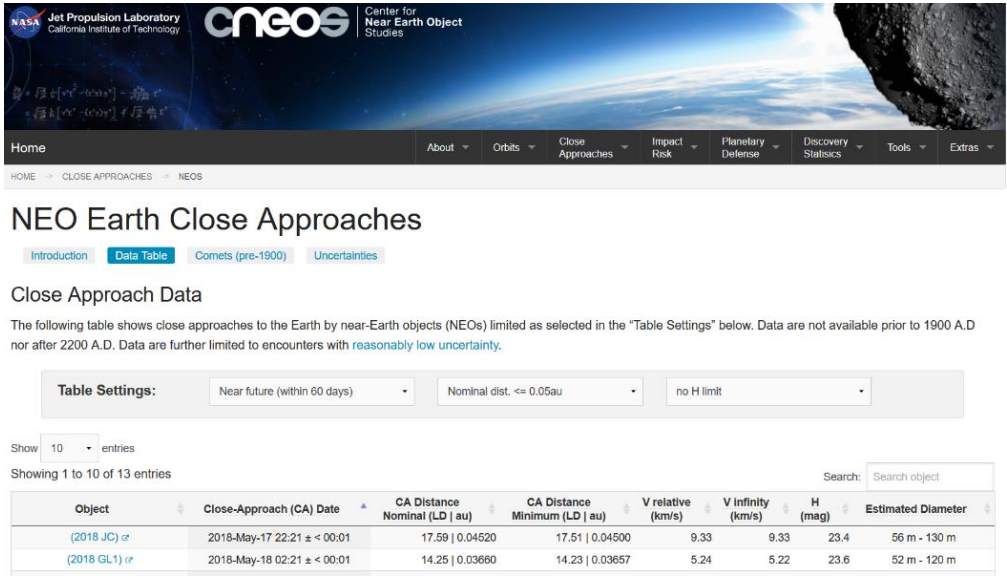
A small size asteroid will approach the Earth on 15 May 2018.

Fly-by date	2018-05-15
Closest approach time	22:03:51 UTC (± 2 s)
Minimum distance from Earth surface	196 573 km, 0.511 Lunar Distances 0.001 314 au (± 3 km)
Fly-by speed	12.8 km/s
Size range	50-120 m

Orbit information

As the approach distance to the Earth is not small the changes in the orbital elements are very limited.

Date before and after fly-by	Orbital period years (days)	Aphelion Distance au	Perihelion distance au	Eccentricity	Inclination deg	Rotation Period hours
2018-04-15	1.12 (409)	1.380	0.778	0.279	17.994	Not



Some questions…

- Does Education and public outreach provide benefits to scientists? to science?
- What are the problems and misperceptions? How do we correct them?
- How do we best convey the danger of an asteroid impact to the press in a way that we avoid miscommunication?
- Are we desensitising the public to asteroid impacts because every close approach of a small object is in the press?
- Can we develop guidelines for reporting objects to the public? e.g. impact threat
- Should scientists ever write anything for the public?
- When should impact corridors be published?
- Do we need a colour scale for flybys - to give journalists an idea of how important it would be to report on a flyby from a technical/scientific view? E.g. based on fly-by distance and size.
- From the journalist's perspective what is the point of reporting the flybys? Science or sensationalism?
- Are refereed scientific journals no longer the best way for scientists to publish research?

Giovanni Carrada

- MSc in Biological sciences
- Author, curator and consultant,
  - Communication of science and innovation
  - Communication of cultural heritage
- Author of TV program SuperQuark, Rai
- Worked for:
  - World Health Organization
  - European Commission
  - Bayer Cropscience
  - RAI
  - ENEA
  - National Institute of Research for Food and Nutrition
  - Etc..

Peter Jedicke

- Based in London, Canada
- Retired college teacher
- Royal Astronomical Society of Canada
- Public lectures
- Edited collections
- Six children's books
- Media work
- Philosophy of Science

Felicitas Mokler

Felicitas Mokler has a research background in astrophysics (PhD in planet formation); since several year she works in science communication and journalism. As a free lance science writer she covers topics in astronomy and physics for print and online media such as Neue Zürcher Zeitung, Spektrum der Wissenschaft or Frankfurter Allgemeine Zeitung. She recently founded the online platform weltraumreporter.de as a member of the cooperative of free lance science writers in Germany RiffReporter, which is currently nominated for the Grimme Online Award 2018.

Waldenmaier Stefan

- Manager Public Relations of the Excellence Cluster Universe
- Press Officer of an International Technology Company (Giesecke + Devrient)
- Journalist and Senior Editor of a German Technology Magazine (Funkschau)
- Studies: Physics (Saarland University), Journalism (University of Hohenheim)