

→ CAFS FOR 2021 PDC - DAY 4

ESA's NEO Coordination Centre

This document does not describe a real potential asteroid impact. The information here is fictional and provided only to support an emergency response exercise conducted during the International Academy of Astronautics (IAA) 2021 Planetary Defense Conference (virtually) in Vienna, Austria, 26-30 April 2021. This is only an exercise.

Close approach fact sheet for asteroid 2021PDC

Status as of: 2021 October 14 12:30 UTC.

A large asteroid has 100% probability to impact the Earth in 20 October. NEOCC is providing this CAFS as this case fulfils the criteria of both ESA and IAWN for generating an *impact warning message*.

Possible impact date	2021-10-20
Possible impact time	~ 17:02 UTC
Velocity at entry interface point	~ 15.2 km/s
Size range	94-116 m
Discovery date	2021-04-19
Discovery site	PDC EXERCISE

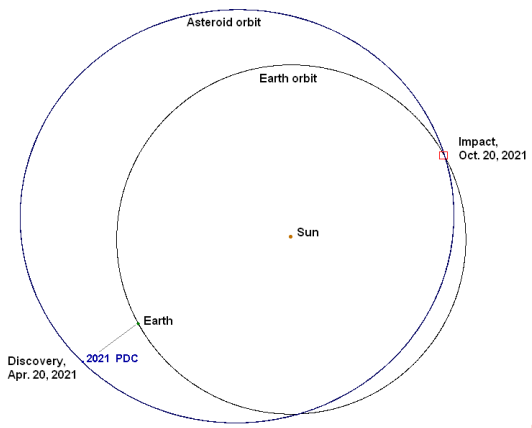
All error bars quoted in this table correspond to one standard deviation.

Orbit information

All orbital elements in this table are referred to the ecliptic reference system at J2000.0 epoch and to the pre-impact conditions.

Date before the possible impact	Orbital period (years/days)	Aphelion distance (au)	Perihelion distance (au)	Eccentricity	Inclination (deg)
2021-09-19	1.41/515	1.596	0.923	0.2673	15.73

EXERCISE



Source: JPL

EXERCISE

Physical and mitigation information

Days to closest approach	Impact probability	Composition	Rotation period (hours)
~ 6	1	Unknown	Unknown

Observational information

The asteroid is still tracked optically every night, and now by Goldstone radar every day.

Other information

Encounter peculiarities	Previous encounter	Next encounter
Impact predicted	2014-06-06	Unknown

Only encounters within 0.05 au are considered.

Links

NEO information:

<https://neo.ssa.esa.int/pdc-2021-impact-exercise>

Close approaches page:

<https://neo.ssa.esa.int/close-approaches>

neo.ssa.esa.int

For further information please send an email to neocc@ssa.esa.int



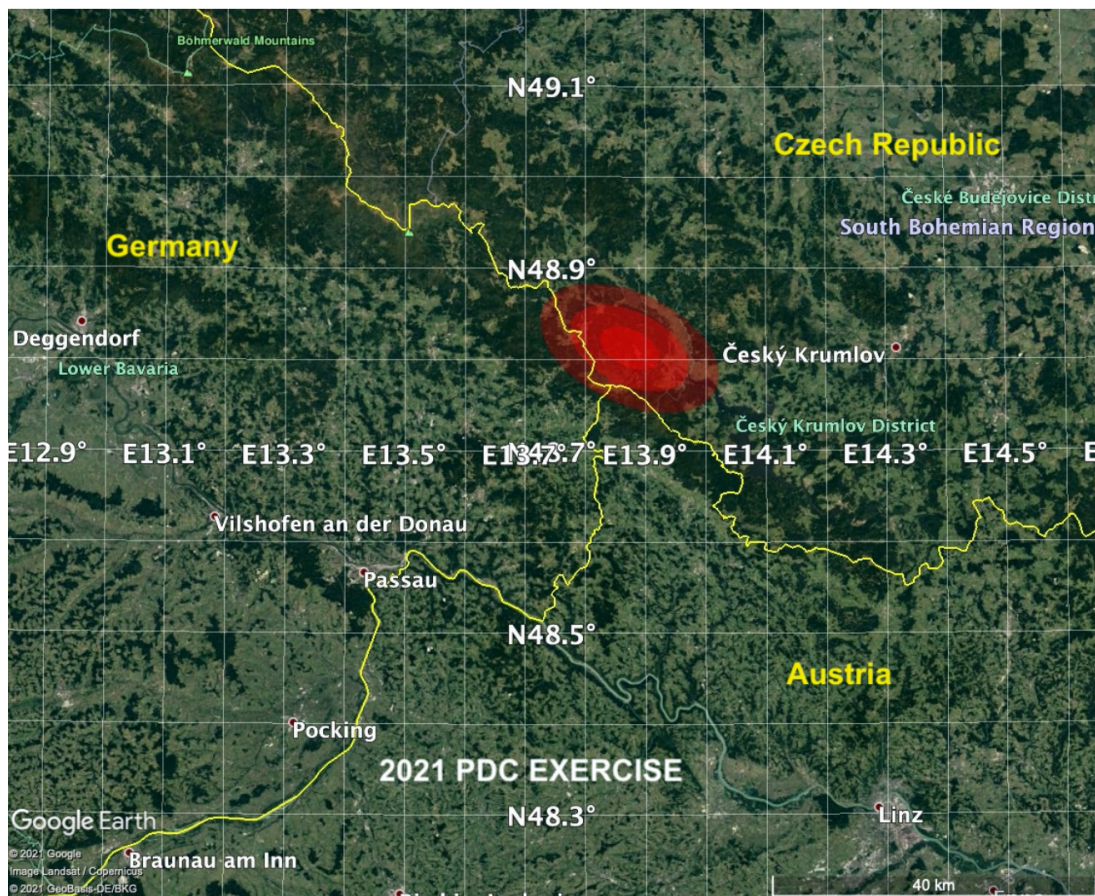
Impact risk information sheet for asteroid 2021PDC

Impact information

Size (m)	Impact date (UTC)	IP	TS	Velocity (km/s)	Angle (°)	Expected energy (Mt TNT equiv.)
94-116	2021-10-20 17:02:25	1	9	15.2	45-50	30-60

Impact corridor plot

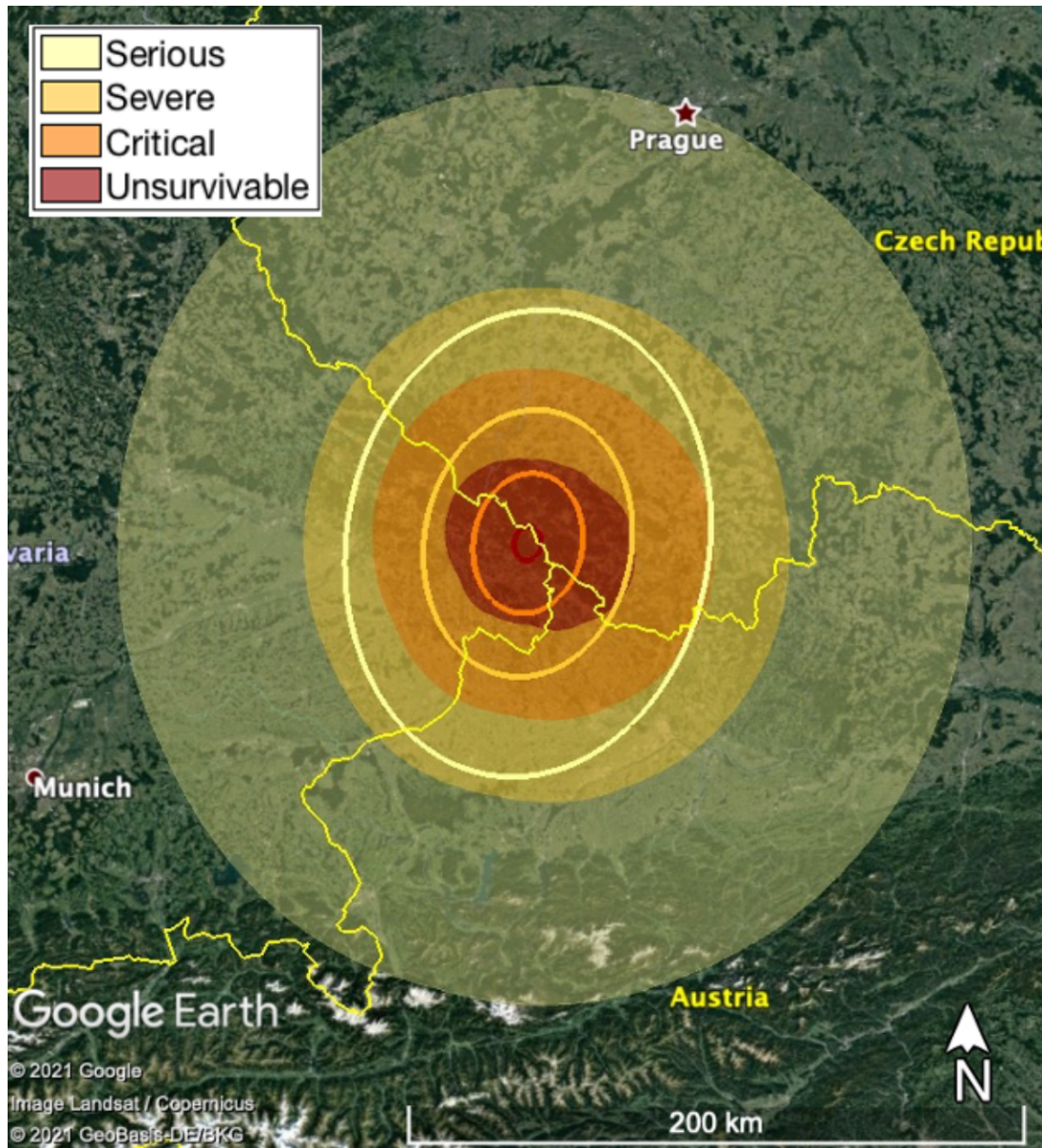
The impact is expected to occur in a region about 23 km across centered near the borders of three countries: Germany, Czech Republic and Austria.



The shaded regions in the image show where the impact is most likely to happen. There is a 99% chance the impact will be located within the large shaded region; the boundaries of the two inner shaded regions indicate other probability levels: the chance of impact is 87% inside the middle contour, and 40% inside the central dark red region.

Source: JPL.





The image shows the region of potential damage risk, which is much larger than the region in the previous image because serious damage could extend for up to a hundred kilometers or so from the impact point. In the highest impact-energy case, the region for serious potential damage risk is about 300 km across, as indicated by the shaded region; the extent of serious damage for the average case, indicated by the line contours, is about 150 km across.
Source: JPL.

Impact effects

The expected impact effects are a crater of several hundreds of meters up to ~ 1 km in diameter, unsurvivable levels of overpressure in a radius of tens of km and dangerous overpressure levels in a radius of up to ~ 100 km in which also ejecta of considerable size are to be expected. Seismic effects are minor and can be felt throughout most of the surrounding countries.

