

2021 PDC Exercise Fact Sheet: Day 3

Date: June 30, 2021 (Asteroid Day, and less than 4 months before impact)

Suggested Headline: SPACE-BASED INFRA-RED MEASUREMENTS ENABLE IMPROVED PREDICTION OF ASTEROID'S POTENTIAL IMPACT EFFECTS

Asteroid Designation: 2021 PDC

Discovery Date: April 19, 2021

Discovered By: Pan-STARRS near-Earth object survey project, operated by University of Hawaii for the NASA Planetary Defense Program

Apparent Magnitude at Discovery: 21.5

Distance at Discovery: 35 million miles (57 million kilometers)

Object Orbit: Perihelion: 0.92 au, Aphelion: 1.60 au, Period: 516 d, Inclination: 16 deg

Currently Observable?: Yes

Impact Probability: 100%

Impact Date and Time: October 20, 2021 17:13 UTC +/- 82 s

Impact Region or Location: The impact is expected to occur somewhere within an area of central Europe roughly 800 km long by 250 km wide. Countries in which the impact may occur include Germany, Czech Republic, Austria, Slovenia and Croatia (see first image below). These and other surrounding countries lie within a larger damage risk swath, about 1400 km long by 700 km wide, where serious impact damage is possible (see second image below).

Absolute Magnitude: 22.4 +/- 0.3

Object Size: Still very uncertain, but new space-based infra-red measurements from the NEOWISE satellite indicate that the asteroid cannot be as large as previously thought possible. The new estimate for the largest possible size is 500 m (1600 ft). The average (mean) estimated size is now about 140 m (460 ft), and the smallest possible size is 35 m (100 ft).

Size of Damage Area Around Impact Site: Still highly uncertain. Depending on the object size, serious damage from the airblast could extend anywhere from Minimal (a few kilometers) to Local (tens of kilometers) to Regional (hundreds of kilometers).

Prospects for Future Observations: The asteroid continues to be tracked almost every night and will remain observable from now until the potential impact. Even larger telescopes will now be required for these observations, since the asteroid has become very faint and will remain so until September.

Effect of Future Observations on Impact Probability: None. The impact probability is expected to remain 100%.

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Effect of Future Observations on Predicted Impact Region: The region is expected to continue to shrink as observations are made over the next few months. Future predicted regions are expected to nest somewhere within the current region (see image below).

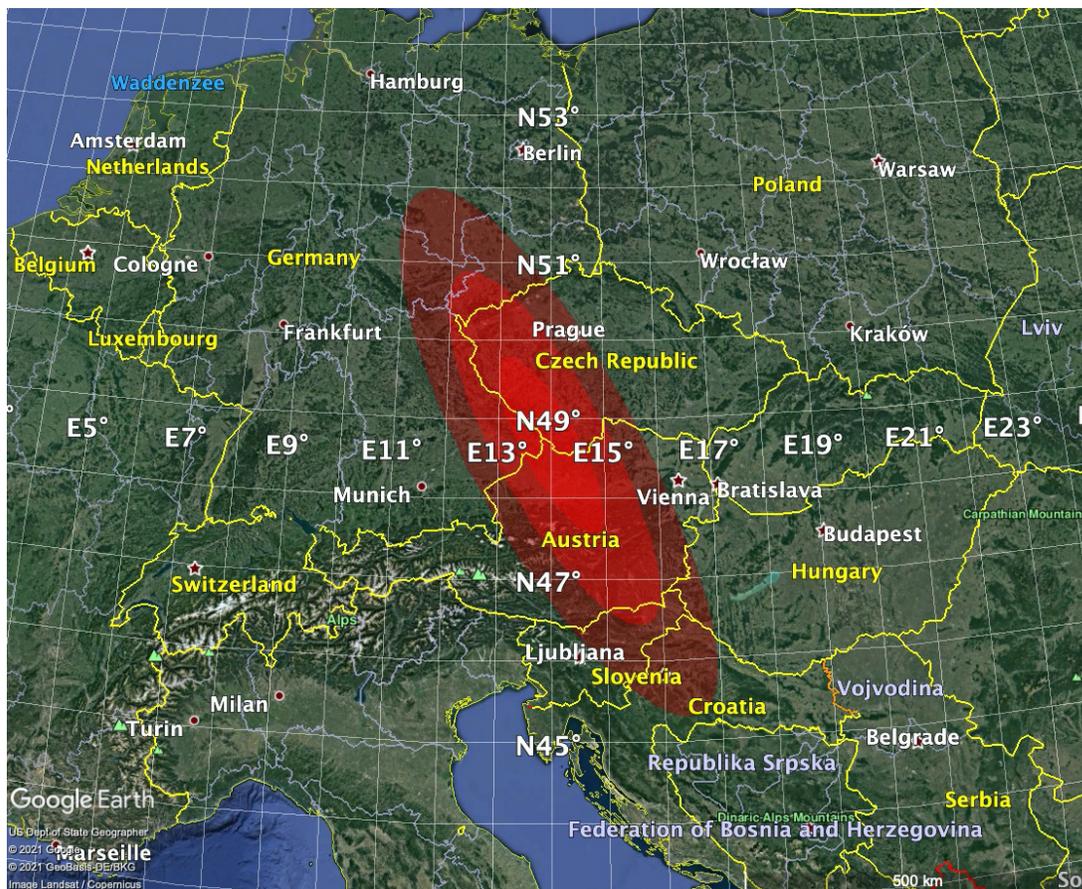
Expected Population Affected:

- Chance of more than 10,000 people being affected: 97%
- Chance of more than 100,000 people being affected: 74%
- Chance of more than 1 million people being affected: 21%
- Average number of people affected: 580,000

Possibility of Space Missions for Reconnaissance or In-Space Mitigation: SMPAG (the Space Missions Planning and Advisory Group), an international forum for space agencies, has concluded that no space missions can be launched to 2021 PDC in time to deflect or disrupt the asteroid.

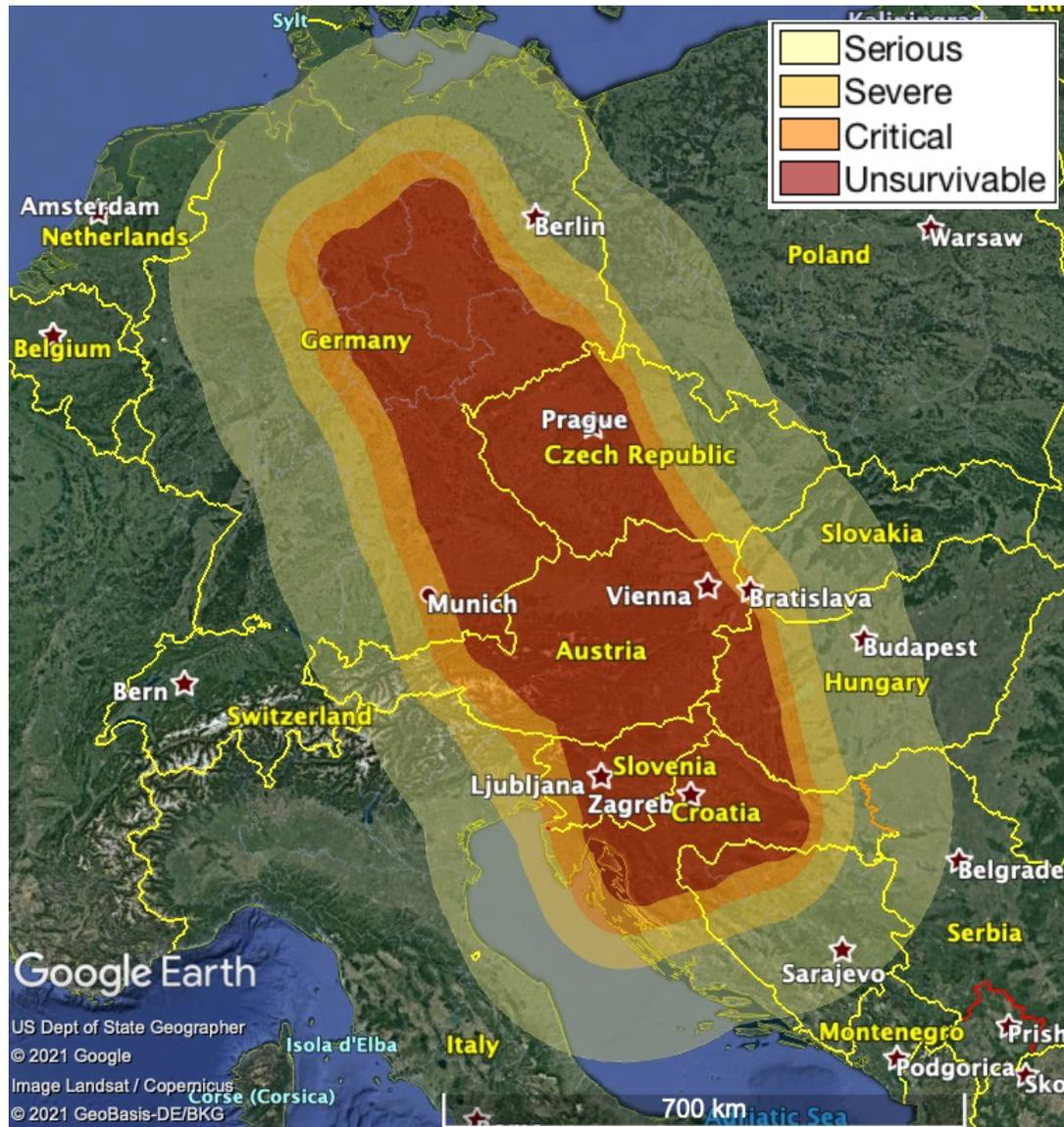
Images:

The following image delineates the region where the impact is most likely to occur. There is a 99% chance the impact will be located within the large shaded region, an 87% chance it will occur within the middle contour, and 40% inside the central dark red region. Future predicted impact regions will be smaller, and they will nest within the current large shaded region.



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The following 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 tens or even hundreds of kilometers around the impact point. This potential damage risk region is about 1400 kilometers long by 700 kilometers wide.



The International Asteroid Warning Network (IAWN) is disseminating this information pursuant to United Nations General Assembly resolution 71/90, paragraph 9. IAWN is an international network of organizations that detect, track and characterize potentially hazardous asteroids. IAWN will publish weekly updates of the predicted impact region as this asteroid is tracked throughout 2021.

For more information: <https://cneos.jpl.nasa.gov/pd/cs/pdc21/day2.html> and <http://iawn.net>.