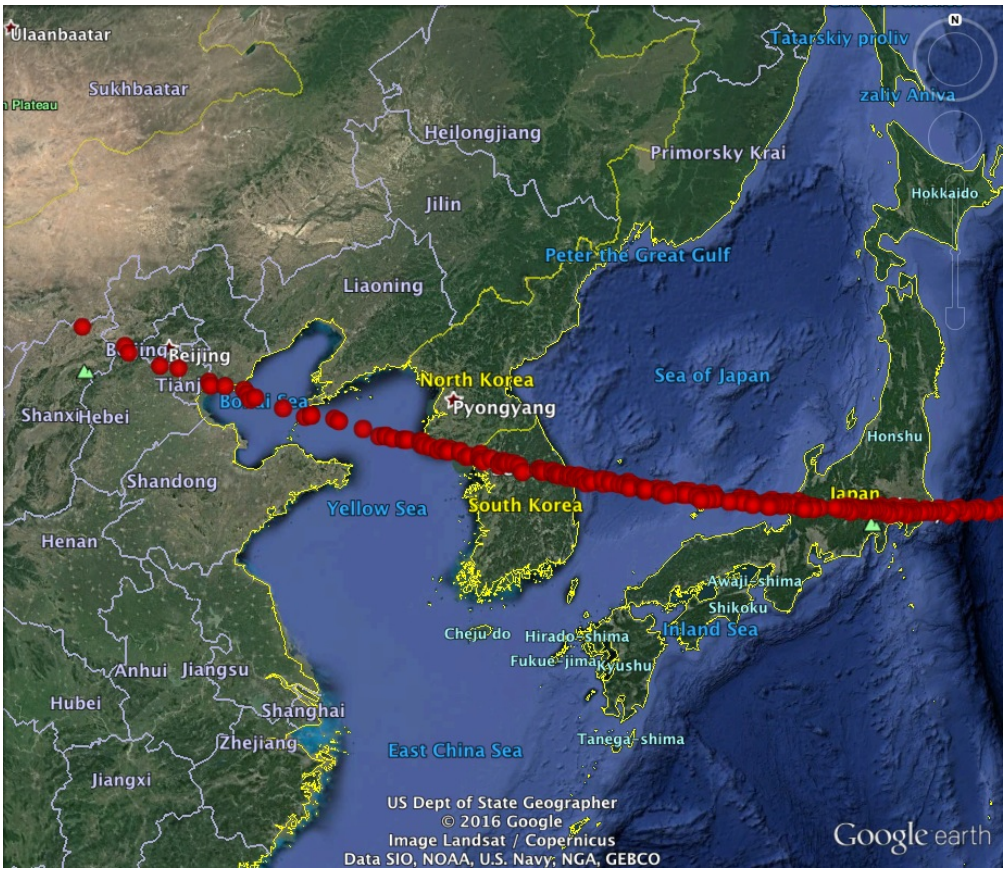
DAY 2

PRESS RELEASE: NOVEMBER 30, 2018

ASTEROID'S CHANCE OF EARTH IMPACT IN 2027 NOW 96%

Based on new tracking measurements taken this week, the International Asteroid Warning Network (IAWN) has confirmed that asteroid 2017 PDC is on a course that will almost certainly impact Earth on July 21, 2027, less than nine years from now. IAWN estimates that the chance of impact is 96%, and the possible locations of impact are confined to a long narrow region outlined by the red dots on the image below.



Nations most at risk from the effects of a land impact or an airburst are: China, North and South Korea, and Japan. The impact footprint extends into the North Pacific Ocean, but does not intersect any other land mass. Many nations bordering the Pacific could be affected if the impact generates a tsunami.

The critical new measurements of 2017 PDC taken this week came from NASA's Hubble Space Telescope and the National Astronomical Observatory of Japan's 8-meter Subaru Telescope on Maunakea, Hawaii. The new data did not eliminate the possibility of impact, as had been hoped, but instead revealed that the asteroid is almost certainly on a trajectory that will impact on July 21, 2027. Prior to this week, the asteroid had been

unobservable from Earth for almost a full year as it travelled through the glare of the Sun, and IAWN's estimate of its impact probability remained fixed at 26%. No further ground-based observations are possible for the next 11 months, as 2017 PDC has become too faint once again to be observed from Earth.

IAWN has refined its estimate of the size of 2017 PDC, based on data from the NEOWISE spacecraft. The asteroid is now estimated to be between roughly 200 and 280 meters (650 to 900 feet) in size. Spectral measurements taken last year suggest that 2017 PDC is a C-class asteroid, which typically implies that it has a low albedo (reflectivity), which is now believed to be in the range of 4% to 8%. Further refinements to that taxonomic classification will be available soon from the recently launched James Webb Space Telescope (JWST). A size larger than 300 meters (1000 feet) was ruled out by a radar non-detection in 2017; radar astronomers are confident they would have detected the object if it were larger than 300 meters. Photometric light curves taken in 2017 are ambiguous, and a definitive rotation period has not been established. Scientists stress that the more that is known about the asteroid, the better the chances of successful deflection.

Over the last eighteen months the UN Space Missions Planning Advisory Group (SMPAG) has been very active in advising for and coordinating an international response to the impact threat posed by 2017 PDC. Spacefaring member states have begun development of several types of space missions that could be launched towards the asteroid. SMPAG plans call for a fast flyby characterization mission to be launched 11 months from now (October 2019) to fly by the asteroid in May 2020. This spacecraft will provide data on the asteroid's size, shape and composition, and establish the asteroid's precise trajectory, which pinpoints the impact location. The data from this mission will aid in the design of the deflection campaign. To rendezvous with the asteroid, a pair of missions with a would launch 18 months from now (May 2020). Those spacecraft require 3 years to get to their target, but will then remain in place to observe the deflection attempts and assess the results. SMPAG, the UN, and the space agencies are considering the option of adding a deployable nuclear explosive device on the rendezvous spacecraft.

SMPAG is considering two different kinetic impactor (KI) deflection campaigns, both designed to deflect the asteroid near its perihelion point in early 2024. One campaign would deflect the asteroid so that the impact location moves westwards along the risk corridor, across Asia and Europe. The kinetic impactor missions in this campaign are simpler and have shorter flight times, but a series of 4 individual spacecraft working in tandem would still be required to prevent the impact. The missions could launch as late as mid-2023. The alternate campaign would change the asteroid trajectory in the other direction, moving the impact location eastwards across Japan and into the Pacific Ocean. That is a more difficult direction for KI deflections, because the missions would require a more difficult-to-obtain orbit and a longer flight time. To succeed, this campaign would have to launch its spacecraft only 16 months from now, in March 2020, and a minimum of 3 deflections would be required in combination to prevent the impact.

For more information, visit: **https://cneos.jpl.nasa.gov/pd/cs/pdc17/day2.html**.