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ASTRONOMY

Preventing the Next Chelyabinsk

More asteroid-detecting
telescopes are coming soon

In the next few years NASA will amass reams of new data about near-Earth objects (NEOs), including asteroids and comets. Unfortunately, nothing is likely to protect us from a meteor the size of the one that barreled into the sky over the Russian city of Chelyabinsk (*below*) in February, injuring more than 1,000 people. That 17-meter object was too small to be systematically tracked—asteroid spotters naturally focus on the largest objects that could cause the most mayhem. Fortunately, impacts on the scale of Chelyabinsk occur only once a century, so perhaps humankind will have figured out even better techniques by then.

Here is a rundown of some of the best tools that researchers currently have for asteroid detection and defense:

Since the mid-2000s the Catalina Sky Survey has been the leading project for near-Earth object detection and now discovers about 600 NEOs every year from telescope sites in Arizona and Australia. It has helped NASA reach its goal of cataloguing 90 percent of all NEOs more than one kilometer in diameter.

The first of four planned Panoramic Survey Telescope and Rapid Response

System (Pan-STARRS) telescopes in Hawaii recently came online and is now the second-leading NEO search in existence, in terms of objects detected per year. It should help discover many asteroids with diameters in the hundreds of meters, but the bulk of smaller objects will remain out of reach.

The Large Synoptic Survey Telescope (LSST), planned for the end of the decade in Chile, will be a survey instrument of astonishing capability. The 8.4-meter telescope, equipped with a three-gigapixel digital camera, will eventually catalogue the vast majority of much larger objects—those 140 meters and up in diameter—thereby meeting NASA's next asteroid-detection goal.

The Asteroid Terrestrial-Impact Last Alert System (ATLAS), due in 2015, has the goal of detecting asteroids in time for threatened areas to be evacuated. Planners estimate that the series of small Hawaii-based telescopes could identify a 50-meter "city killer" one week ahead of possible collision.

The nonprofit B612 Foundation recently unveiled plans to build the Sentinel space telescope, which would scan the inner solar system from an orbit similar to the planet Venus. It would be launched in 2018 and would make quick work of the truly dangerous asteroids out there, with the goal of cataloguing 90 percent of NEOs bigger than 140 meters over its 5.5-year mission.

—John Matson



Meteor damage

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