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THIS WEEK 19 February 2014

# Earth is prepared enough for the next asteroid strike

THE next Russian-style meteor strike may come as a surprise, but that's OK.

A study of a potential early-warning system has found that it will be unlikely to spot incoming space rocks the size of the one that burst apart above Chelyabinsk, Russia, a year ago. However, the chances of such a meteor causing a dangerous crash are so low that catch-all

warning systems are not worth the cost.

The Chelyabinsk meteor was a 20-metre rock that unexpectedly hurtled into the atmosphere on 15 February 2013. It exploded with the force of about 600 kilotonnes of TNT, creating a shock wave that shattered windows and knocked people off their feet. The event sparked [global interest in meteor warning systems](#).

Millions of smallish rocks are thought to swing by Earth as they orbit the sun. They are tough to find and study because they reflect very little sunlight and can only be spotted when they are close. Even then, there might not be a telescope trained on that part of the sky at the right time.

Wide-field telescopes that sweep the whole sky several times a night would show up more of the potential impactors. From late 2015, the [ATLAS telescope array](#) in Hawaii will start searching for Chelyabinsk-sized rocks. The aim is to find them within about two days of possible collision, says project leader John Tonry at the University of Hawaii in Honolulu. And the European Space Agency is considering a plan to build a bigger, global array that would more than double that warning time, says [Andrea Milani](#) at the University of Pisa in Italy.

But those surveys would have missed Russia's meteor. Ground-based surveys can only see rocks that appear in the night-time part of the sky, and that one, like about half of all potential impactors, [came from the daytime sky](#).

In fact, a survey like ATLAS would spot just one-third of the smaller objects heading for Earth, a recent simulation suggests ([arxiv.org/abs/1402.2466](http://arxiv.org/abs/1402.2466)). "The only way you can get around that problem is having a spacecraft," says Robert Jedicke of the University of Hawaii in Manoa, one of the team who carried out the simulation.

There are no plans to build such spacecraft. But Tim Spahr, director of the [Minor Planet Center](#)



The advertisement features a woman in a white space suit with a helmet, standing against a light purple and blue background. In the top left corner, there is a yellow square containing a black geometric logo consisting of a square with a smaller square inside, which is further divided into four quadrants. A small blue play button icon is in the top right corner. At the bottom, a dark grey banner contains the text: "YOU'RE A VISIONARY. SHOULDN'T YOUR WEBSITE BE ONE, TOO? PRE-ORDER NOW LOCK IN YOUR EARLY ADOPTER DISCOUNT".

in Cambridge, Massachusetts, is not worried. Chelyabinsk-sized meteors hit the planet only once or twice a century, and most fall over the ocean or unpopulated areas. A spacecraft able to find these dim bodies would need a large, sensitive telescope and would cost over \$1 billion. For less money, we could launch missions that would net brighter objects at least 100 metres across that have greater potential for devastation.

Even those are not worth the cost, says retired NASA astronomer [Alan Harris](#). Ground-based surveys should provide shorter, but still sufficient, warning times. Earth may not be fully prepared for another impact, but perhaps we're prepared enough, he says.

## **“Earth may not be fully prepared for another impact, but perhaps we're prepared enough”**

*This article appeared in print under the headline “There's no good way to warn of meteor strikes”*

By Maggie McKee

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