### Hashtags: #asteroid, #asteroidwatchers

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### Tags: Citizen Science, Platform

**Description**

Amateur astronomers have made many discoveries. Create an open source network of quick-response robotic telescopes that would enable fast follow-up observations of potentially-threatening asteroids. Solutions should enable telescopes in all hemispheres to be controlled from a central location quickly, much like moving a webcam. Ideal solutions will integrate hardware and software, though ambitious Autonomous Robotic Observatories (ARO) network concepts and methods for building and maintaining the network would be highly desirable.

**Background**

In June 2013 NASA announced a grand challenge to “find all asteroid threats to human populations and know what to do about them.” A large part of this Grand Challenge is to expand the role of individual inventors, tinkerers, citizen scientists, developers and technologists in participating meaningfully in addressing the work of this challenge with their individual skill sets. Asteroids are both a threat and an opportunity to the planet and humankind; the threat of their impact is one of the few natural phenomenon that we could expand our knowledge base enough to prevent devastation from.

The Chelyabinsk meteor that exploded in the atmosphere over Russia was an example of a small Near Earth Object (about 17m wide) that was undetected before it collided with Earth. Chelyabinsk caught the world by surprise. Location of these small, fast-moving Near Earth Objects (NEOs) requires space-based hardware or large professional telescopes. Once their position is identified, rapid follow-up from smaller, amateur AROs might help to quickly assess the threat they pose and characterize their composition, rotation and other attributes.

There are a number of proprietary telescope controllers already on the market that enable amateurs to control large telescopes remotely. Your solution can be optimized for asteroid hunting and open-source to allow for amateurs to set up AROs in every hemisphere around the globe. (I.e. your user-base is global.) Consider using low-cost platform technologies as a basis of your solution, to keep costs as low as possible.

**Solution Ideas**

Here are some ways for you to frame this solution:

Integrate hardware and software in a way that can be easily replicated by others; endeavor to leverage existing low-cost platforms; provide open-source documentation (diagrams or 3D files) for others to build on; use open components for hardware; and cite open source tools or APIs. Bring your own hardware for this challenge.

**Sample Resources**

* [http://www.minorplanetcenter.net](http://www.minorplanetcenter.net/)
* <http://neo.jpl.nasa.gov/programs/neowise.html>
* <http://en.wikipedia.org/wiki/Remote_Telescope_Markup_Language>
* <http://www.hindawi.com/journals/aa/2010/496765/>

Asteroid Grand Challenge:

* <http://www.nasa.gov/mission_pages/asteroids/initiative/index.html>
* <https://b612foundation.org/news/faq-on-the-chelyabinsk-asteroid-impact/>