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Campus News

Student's summer project used to detect asteroids

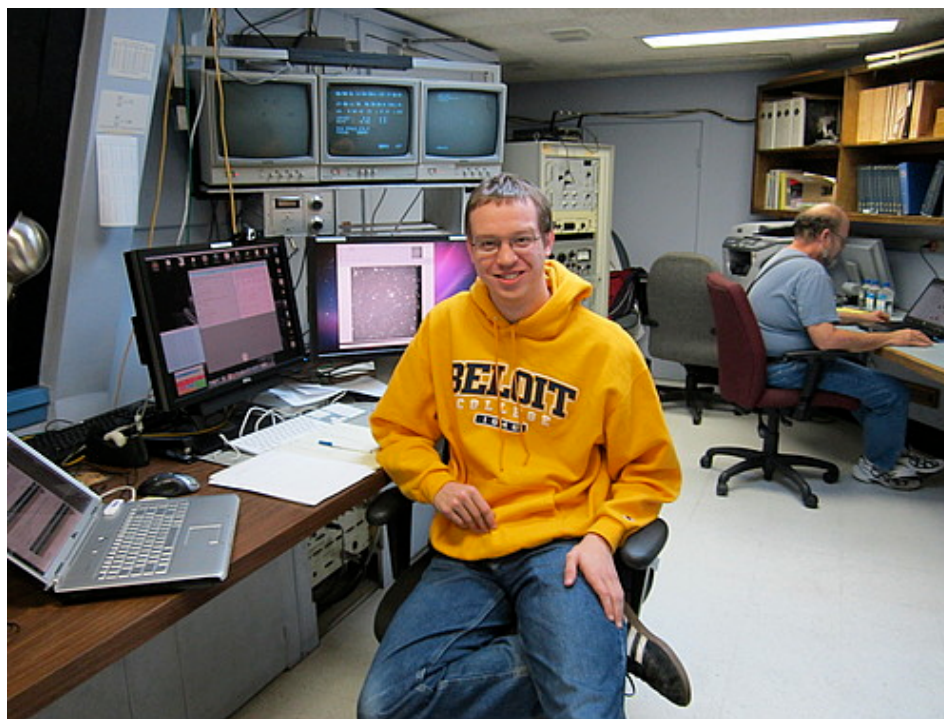
November 29, 2011 at 5:26 pm

No need to take shelter or stockpile food.

A catastrophic asteroid is not on its way.

Still, if it was, Morgan Rehnberg'12 would know about it.

While working at the National Optical Astronomy Observatory (NOAO) last summer, the physics major and mathematics minor from York, Pa., developed a computer program that detects asteroids that may hit the Earth.



Called "PhAst" (for Photometry and Astrometry), the program specifically tracks asteroids called Near Earth Objects (NEOS) whose orbits cross the orbit of the Earth. According to Rehnberg,

NEOs hit the Earth every day, but most are small and burn up in the atmosphere. It is the big asteroids that could potentially harm the Earth – such as the large one that hit Siberia in the early 1900s and subsequently leveled 2,000 square kilometers – that Rehnberg hopes to detect.

Rehnberg said PhAst is helpful because it allows astronomers to study NEOs, figure out how to deflect them from earth, and better understand what materials comprise the objects should scientists want to capture and mine them.

Just last month during a trial run of the software program at Kitt Peak National Observatory near Tucson, Ariz., a NOAO scientist detected a potentially hazardous asteroid. Furthermore, Rehnberg's program correctly computed the position and brightness of the object with half the measurement errors of the previous software.

Unlike other software programs that only obtain one image of an asteroid, Rehnberg's program captures multiple digital images of asteroids that allow astronomers to see movement – the concept is similar to how a flipbook works. Rehnberg's program is also free and available to download on the web, which means anyone can make modifications to it.

"We've done a good service for the astronomical community by providing software that's free and open-source, so if I made a mistake or someone thinks they can do it better, they can make those changes," he said. "That's really powerful because it invites the opportunity to improve the work collectively."

Rehnberg, who hopes to go on to graduate school for astronomy and planetary science, worked at NOAO as part of a Research Experience for Undergraduates (REU) program, which is supported through the National Science Foundation and aims to teach undergraduates what an astronomical career is really like.

"It's great to get to work one-on-one with leading researchers in the fields of science and engineering and to collaborate with them," he said. "I wouldn't have gotten this opportunity without the assistance of professors here at Beloit, mainly my advisor (Assistant Professor of Physics and Astronomy) Britt Scharringhausen."

Rehnberg's computer program can be found at <http://www.noao.edu/noao/staff/mighell/phast>.

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