

CHINA RESEARCH SPOTLIGHT

A new series from East View that highlights Chinese research and resources on key topics.

Utilizing Chinese Research on Asteroids

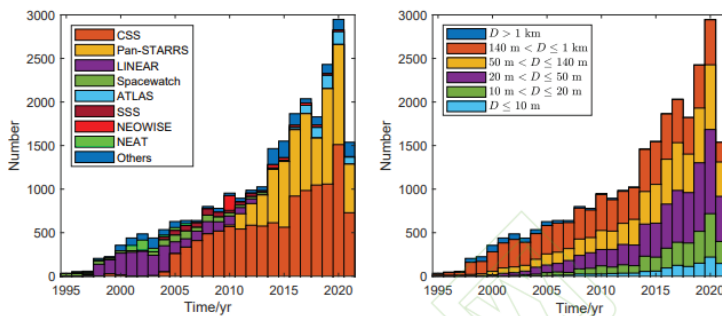


图 1 近地小行星累积发现数排名前8位的观测计划每年新发现的数目随时间的变化(左图)以及5个不同直径范围的近地小行星每年新增发现数目随时间的变化(右图), 只展示了1995年至今的发现结果。

Fig. 1 The annual change of discovered number of NEAs for the top 8 observational programs in terms of cumulative discoveries (left) and the annual change of discovered number for 5 different diameter ranges (right), showing discoveries from 1995 to present only.

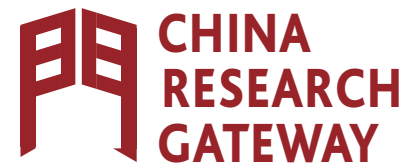
From CRG's China Academic Journals: the above chart shows the annual change to the number of discovered near-Earth asteroids (NEAs). Hu Shoucun et al. "Statistical Analysis of Discoveries and Discovery Scenarios of Near-Earth Asteroids." *Acta Astronomica Sinica*. Online First Publishing Date: September 28, 2022.

On September 26, 2022, NASA's Double Asteroid Redirection Test (DART) made history when it successfully hit and redirected the asteroid Dimorphos. The demonstration represented tremendous progress in planetary defense through the redirection of a near-Earth asteroid (NEA). An inherently global field, planetary defense has been challenged and complicated by relationships between nations and space agencies. Spurred on by international competition and cooperation, planetary defense experts must conduct research across national and linguistic barriers to advance the field. **Well-funded and quickly advancing research from China belongs in the libraries of North American scientists, who can make use of timely access to protect worldwide interests.**

The Gap

East View saw planetary defense and countless other similar STEM fields and realized that these fields were underserved by North American libraries. Historically, while North American libraries have acquired content from China in the Social Sciences and Humanities, significantly fewer North American libraries have had access to comprehensive STEM content from China. With that in mind, **East View created a**

transformative program, China Research Gateway, to vastly improve the breadth and depth of Chinese publications in North American libraries while making sure the program is accessible and affordable. To achieve accessibility and affordability, East View has created an English-language portal and English-language user guides to improve language accessibility and has negotiated an unprecedented package of databases with our Chinese partners.



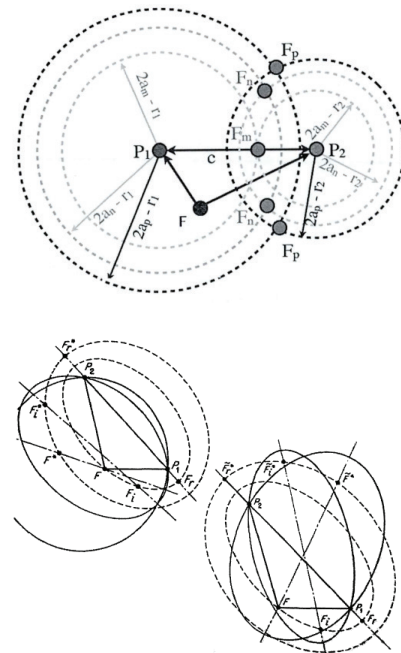
In this and future China Research Spotlight newsletters, we will highlight China Research Gateway (CRG) and its unparalleled offering of Chinese content and East View support for a North American audience.

What can CRG offer an asteroid researcher in North America?

Even from just the search results page, there is already a wealth of information available to researchers. After conducting a subject search for “asteroid,” the visual analysis tools in CRG show that the most published researcher on asteroids is Cui Pingyuan, at the Beijing Institute of Technology. Cui has published 62 articles on asteroids. However, the Beijing Institute of Technology is only the fourth most published institution on asteroids, following the Harbin Institute of Technology, the Purple Mountain Observatory (Chinese Academy of Sciences), and Qinghua University. The top four most published institutions have published over 100 articles each. The most downloaded journal article on asteroids, with 7,512 downloads, outlines the state of space mining in 2020. The most downloaded dissertation (see in-text picture), with 5,309 downloads, explores orbit models and analysis.

One of the most relevant recent journal articles to NEAs is “Statistical Analysis of Discoveries and Discovery Scenarios of Near-Earth Asteroids” (see in-text picture), which looks at the top observatories in number of NEA discoveries as well as geographic factors that may play a role in their efficacy. Because the manuscript for this article was only just accepted by *Acta Astronomica Sinica* on September 28, 2022, it is currently only available through a special function in CRG called Online First, which allows for accepted manuscripts to be published online before they are published in print. **Through Online First, researchers have access to the timeliest research from China without publication, translation, or logistical delays.**

With NASA’s recent DART success in the news, students and faculty alike will be looking for the next breakthrough in the management of NEAs. Given China’s massive investment in space technology, the next big breakthrough may be residing in the almost 37,000 asteroid articles in CRG.



From CRG’s China Doctoral Dissertations: Methods for calculating focal points in orbit. Yu Shengxian. 2013. “Orbit Analysis, Design and Control in Deep Space.” Doctoral Dissertation. Nanjing University.

See the below links for further reading on China’s efforts to research, monitor, and deflect near-Earth asteroids.

- **NASA’s DART Mission Hits Asteroid in First-Ever Planetary Defense Test – NASA** <https://www.nasa.gov/press-release/nasa-s-dart-mission-hits-asteroid-in-first-ever-planetary-defense-test>
- **China plans asteroid deflection test in 2026: reports – Space** <https://www.space.com/china-asteroid-deflection-test-planetary-defense>
- **China Plans Near-Earth Asteroid Smash-and-Grab – IEEE Spectrum** <https://spectrum.ieee.org/china-plans-near-earth-asteroid-smash-and-grab>
- **China is getting serious about planetary defense – The Planetary Society** <https://www.planetary.org/articles/china-planetary-defense-plans>
- **Chinese space watchers wish best of luck to NASA’s asteroid crash mission, the first planetary defense endeavor – Global Times** <https://www.globaltimes.cn/page/202209/1276160.shtml>
- **NASA Administrator Statement on Chinese Space Debris – NASA** <https://www.nasa.gov/press-release/nasa-administrator-statement-on-chinese-space-debris>
- **Chinese project will bounce signals off asteroids to see how dangerous they are to Earth – Space** <https://www.space.com/china-asteroids-planetary-radar-project>



China Research Gateway (CRG) presents the full spectrum of Chinese research, with exhaustive representation of STEM, social science, and humanities disciplines. Featuring an unparalleled breadth of sources, including scholarly journals, monographs, statistical publications, government documents, newspapers, dissertations, conference proceedings, patents, and many other content types, CRG offers a centralized means for discovery and access to this rich trove of research, specifically tailored to serve the needs of North American scholars and institutions.