Reducing the Public Cost of Asteroid Hazard Detection

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Abstract

The availability of private funding sources for asteroid detection and planetary hazard impact assessment are examined from the perspective of the creation of commercial development rights for asteroid resource targets. A preliminary evaluation of the future economic value of asteroids will be used to determine the expected level of private investment. Asteroid ownership claims would be based on the principle of first right of refusal for private investors who finance their discovery and orbital delineation, creating a low-cost method of assessing the planetary impact threat by appealing to commercial interests.

Optimal private development rights for asteroids will be incentive-based, encouraging orbital delineation and spectral characterization at first, then spacecraft flyby and sample return as follow-on activities. A full exclusive right of development would be incrementally awarded to investors who fund increasing levels of discovery about a particular body. The existing body of discovered asteroids would be awarded to the institution that funded their discovery, and could be auctioned to determine their market value. Experience from the field of international mineral exploration economics demonstrates a strong link between property rights and privately funded mineral exploration. The level of exclusive development rights is a major decision factor in commercial investment in mineral exploration, as demonstrated in recent transition economies, where geological data is commonly collected through public-private partnerships.