

February 6, 1997

"Asteroids" are coming to NBC-TV February 16 and 17. While the NSS has never given a specific policy position on the issue of asteroid detection and deflection, we anticipate that members, chapter activists, board directors, etc., might be contacted for comment. The following information will provide you with the basic facts on asteroids, as well as NSS's position on their relevance to our vision. Our thanks to Board member Pete Worden for his assistance in drafting this document, and to Board member Jeffrey Liss for additional background and guidance. Please forward this document as you deem appropriate.

**** ASTEROIDS: BACKGROUNDER AND TALKING POINTS ****

From the National Space Society (NSS)

**** Are asteroids a real threat?**

Yes. Scientists believe the dinosaurs became extinct as the result of an asteroid ten miles in diameter impacting the Earth near what's now the Yucatan 65 million years ago, causing massive earth upheaval, a huge crater and a mile-high tidal wave that swept what is now the eastern United States.

The threat of a cataclysmic impact continues today. In 1908 a comet exploded over Siberia with a force of at least ten megatons leveling a forest 50 miles across. On Nov. 22, 1996 a small asteroid hit Honduras and made a crater 165 feet wide. In recent years, scientists have come to recognize just how much of Earth's surface evolution has been rapidly driven by catastrophic events such as asteroid strikes.

**** What are the odds?**

Experts estimate that an asteroid capable of cataclysmic impact on life on Earth hits once every 300,000 to one million years, meaning a one in 6,000 or one in 20,000 chance of one hitting in the next 50 years. According to planetary scientists Chapman and Morrison (1991), an individual's chance of dying from large scale devastation caused by a "doomsday" asteroid is 1 in 30,000, slightly higher than the lifetime chance of dying in an airplane crash (1 in 20,000).

**** What is an "asteroid" and how does it differ from a "comet"?**

Both asteroids and comets are the "stuff" left over from the formation of the solar system some four and a half billion years ago. Asteroids are made of rock or metal. The majority often reside in the orbit between Mars and Jupiter. Some, called "near Earth asteroids" or NEAs, come close to the Earth and can even collide with the planet. Comets, also remnants of the early solar system, are partly comprised of ice and reside in the outer reaches of our solar system and beyond.

Occasionally a comet wanders into the inner solar system. As the sun melts the ice, it streams away and creates the impressive "tail" we see. In March and April a very large comet, designated "Hale-Bopp" after its discoverers, is expected to light up the night sky.

**** How big are asteroids and comets?**

The asteroids between Mars and Jupiter can be as large as several hundred miles across. Of the 2,000 NEAs tracked to date, most are between one and ten miles in diameter.

Comets are typically a few miles in diameter. A string of comet fragments called "Shoemaker-Levy 9" struck Jupiter in 1994 with spectacular results, releasing millions of megatons of energy into Jupiter's atmosphere.

** What should we do about asteroids?

Currently, there are three steps to addressing the threat of asteroids: survey, study and mitigate (deflection or destruction).

The U.S. government has considered a project that would use existing scientific and military space surveillance systems to survey the sky to catalog and watch for objects on a collision course with Earth. There is currently a handful of scientific investigators, most within the U.S. and funded by or associated with military surveillance missions, surveying the sky for NEOs (Near Earth Objects).

These efforts are a good start, but NSS members should insist that the U.S. government supplement them with many more telescopes and a much more systematic approach. The key is to be able to speed up the process of identifying potentially threatening objects to within 10 or 20 years, as compared to 200 years at our current rate.

NSS should support additional scientific and exploration missions to these objects to study their composition and vulnerabilities. A NASA satellite, NEAR (Near Earth Asteroid Rendezvous), launched in early 1996, is on its way to rendezvous with the asteroid Eros in early 1999. Information provided through such study is vital to determining the best option for mitigation, which currently include destruction or deflection through detonation of a missile or nuclear device, or vaporization.

** How are NEOs relevant to NSS's vision for a spacefaring civilization?

Besides the threat they represent, these objects also present great opportunity. The same objects that come near the Earth provide the raw materials for large scale space industry. The metal ones are almost pure iron and nickel, but also contain high abundance of such rare metals as platinum and gold. As humans move out into space, asteroids can actually be a resource.

Comets contain lots of water. Many contain complex hydrocarbons from which rocket fuel and even space habitats may be constructed. Both robotic and human missions to these objects could be the next step in solar system expansion.

TALKING POINTS TO USE WITH THE MEDIA

(1) Major asteroid impacts are a threat to our planet and the human race. They are infrequent, but potentially very destructive. They are a threat primarily because we still do not know how many are in a position to cross Earth's orbit. Completing a systematic process of identification and cataloguing as quickly as possible, within the next 10 to 20 years, is the real challenge.

(2) There is more than one way to look at an asteroid. Asteroids are a threat, but they are

also a valuable source of scientific knowledge and mineral resources. Asteroids are scientifically fascinating -- being made of the stuff from which our solar system was formed -- as well as commercially promising.

(3) The National Space Society, which advocates a spacefaring civilization, supports and calls for the funds to implement the international cataloguing project proposed by past NEO working groups. The information we desperately need to know about asteroid and comet structure will provide answers leading to further development of a realistic deflection strategy and also to identification of new resources that could spur space commercialization and greater human access to space.

(4) The National Space Society advocates the development of alternative launch vehicles which provide cheaper access to space and platforms for space-based defense against asteroids or for mining.

FINAL NOTES TO SPACE ADVOCATES:

When speaking with the media, keep your responses brief and to the point. If offering a viewpoint that is not a policy of the National Space Society, please begin by saying, "In my own personal view or opinion"

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