

AN UNFAVORABLE STAR  
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I felt like Chicken Little. The night before the close pass of near earth asteroid 2002 NY 40, I had brought a telescope to a Lick Observatory public event. Bright Moon made searching difficult, but after fifteen minutes, I found the asteroid near the Equuleus-Delphinus border. At 152x in my six-inch refractor, there were plenty of comparably bright stars in the field, and the apparent motion was obvious in half a minute. I must have showed it to fifty people.

The general public seems to think we are but spectators to the grand celestial drama, watching from safe, comfortable seats in the audience. This apparition should remind us that we are standing on the stage. We belong to the cast, and we are not yet sure that our part will be a happy one.

My fellow docents at Lick, amateur astronomers all, understood. From time to time we would start humming the ominous Star\_Trek theme for the evil galactic empire -- and the Deathstar. 2002 NY 40, and other asteroids like it, have a potential for disaster that is almost beyond belief.

The word "disaster" has the obsolete astrological meaning of "an unfavorable star". I rarely agree with astrologers, but in this instance, they certainly have the right term.

I struggled to explain sizes and energies beyond most human experience. "This rock is a good deal bigger in diameter than the World Trade Center was tall. If it ever hits, the energy release would equal tens of billion tons of TNT -- a thousand times more than the biggest hydrogen bomb the US ever deployed. That's more than a cubic mile of TNT. In solid rock, it might make a crater ten miles across and half a mile deep."

People asked about using hydrogen bombs to deflect or fragment such a threat. 2002 NY 40 is small enough that a few nuclear weapons might do just that. Unfortunately, ICBMs are not powerful enough to lift their warheads more than a few thousand miles above the Earth, and that's too close and too late. For a small nudge to cause a miss, it must occur a long way out. If the target breaks up, the hope would be that the pieces would spread out and disperse the impact energy widely, and that many would miss the Earth altogether.

With a month's warning -- like we had for 2002 NY 40 -- the only

technology I know of that would have a chance of getting to the asteroid in time would be an atomic-powered missile, perhaps based on the 1960s Project Orion. But it doesn't look like we are going to build any atomic powered spacecraft soon, and we would need to have one tested and ready to fly.

Everyone was relieved that the orbit of 2002 NY 40 rules out collisions for at least a century. Notwithstanding, humanity will have to keep close track of this particular rock for a long time to come.

What's more, collisions do happen. Many guests at Lick had seen Barringer Crater, in Arizona. This impressive meteor crater is scary, but comfortably prehistoric. Comfort disappeared when I explained that in 1908, near the Tunguska River in Siberia, a meteor ten times as heavy flattened or burned a forested area 30 miles across. Its energy has been estimated as 10 to 40 million tons of TNT. 2002 NY 40 would be about a thousand times more energetic, and the devastated area would be some ten times larger in diameter. I wouldn't care to guess exactly how effects scale, but if an asteroid the size of 2002 NY 40 hit a densely populated area of east or south Asia, the lives of hundreds of millions of people might be in jeopardy.

I don't want to be Chicken Little. I would rather be the wisest of the Three Little Pigs, who planned and built to forestall disaster, even when it seemed an unlikely possibility. Yet I haven't got any bricks that will shelter against a major asteroid impact. For all the silliness of the children's fable, Chicken Little was right: The sky does fall.