

## Heavy-Launch Vehicles And Planetary Defense

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**LPAC:** If it weren't an issue of budgetary constraints right now, what, in your view, would be the next steps that would have to be taken, concrete steps, to do exactly that? What sorts of missions are we talking about?

**Maccone:** Let me first refer to the United States, since we are in the United States. But of course, this is a problem that affects the whole of humanity. In the United States, before 2011, which is one year ago, NASA was planning to build two launchers, called Ares I and Ares V. And I was part of a study in 2007, led by NASA, about this thing; essentially, we had to make an assumption, just to give you an idea about

what we did.

We hoped that we could have a ten-year lead time, meaning we would come to know ten years in advance whether an asteroid was going to hit or not. So, on the basis of this, we would have planned two



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different space missions. The first mission to be carried forward by Ares I was a survey mission, sending the probe around the asteroid, picking up pictures, finding the mass, the shape, rotation, whatever.

After that, the second mission would have arrived, launched by Ares V, and that would have been a much more effective thing, shooting six projectiles, 1.5 tons each, against the asteroid, in order to move it away from the collision course. If this was not enough, then, we also considered the possibility of

using nuclear weapons. . . .

Now, the point is that, just one year ago, your President Obama decided to give up these two missiles, Ares I and Ares V, and replace them with a single transportation system. So this, in plain words, means that we have to re-do a whole lot of calculations, because we are using different missiles. And, at the moment, no such system is in existence at all, so if we discover that there is something on a collision course with the Earth, at the moment, we are unable to do anything against it.