Schweickart Prize
for Planetary Defense

The Prize
Planetary Defense
The Larger Context

Founded in 2023, the Schweickart Prize recognizes a young researcher for their exceptional contributions to the field of asteroid science, research, and policy work.

The prize commemorates the illustrious career and public leadership of Rusty Schweickart, Apollo 9 astronaut and co-founder of B612 Foundation.
The Prize

The Schweickart Prize is a $10,000 annual award to a graduate student who by the elaboration and development of an idea, a concept, or a proposal, materially advances the field of planetary defense.

Planetary Defense

Planetary defense is the protection of life on Earth from the devastating consequences of asteroid impacts.

The Larger Context

Though it seems an audacious statement, we, in partnership with our machines, now have the capability to slightly modify the clockwork of the solar system to enhance our evolutionary survival.
$10,000 awarded annually on Asteroid Day (30 June) to a graduate student chosen by the Schweickart Prize organization. The Prize is open to students worldwide.

- Schweickart Prize Ambassadors will be chosen from around the world to inform students and evaluate their applications.

- Interested students will submit pre-applications via our website to the Schweickart Prize for evaluation. If qualified, a full application will be invited and assigned to the relevant Schweickart Prize Ambassador for consideration.
Planetary defense is comprised of two fundamental parts; early warning and mitigation.

- Early warning refers to the discovery, tracking, orbit determination, and impact prediction of near-Earth asteroids (or objects) commonly referred to as NEOs.

- Mitigation of the consequences of asteroid impacts comes in two fundamentally distinct forms; deflection and evacuation.
Early warning refers to the discovery, tracking, orbit determination, and impact prediction of near-Earth asteroids (or objects) commonly referred to as NEOs.

While in this projection the asteroid crosses the Earth's orbit twice, it is only the bottom crossing (in the small circle) that is actually a three dimensional intersection. It is there that the impact with Earth will occur, IF both the Earth and the NEO arrive at the same time.

If a deflection is required a spacecraft is sent out to the asteroid several years ahead of the impact. Using one of several techniques the asteroid's speed is very slightly increased or decreased, resulting, years later, in the asteroid passing through the intersection after the Earth has already passed through, or before the Earth has gotten to the intersection.
When an asteroid’s orbit is determined, and it is found to have any probability of impacting Earth, it is placed into a "risk" table and further observed at every opportunity to improve the accuracy of our predictions.

The vast majority of asteroids that are tracked will, with improved knowledge of their orbits over time, will prove not to be on a collision course with Earth. But if one in the table is indeed on such a course, its probability of impact will continue to increase until such time as a decision to take protective action is reached.

This is the highly technical early warning process at the front end of planetary defense.
While the early warning process thus far described is essential and highly significant in terms of knowing if a discovered NEO actually threatens an impact, it is extremely technical and somewhat abstract to the public in general.

If instead one looks at the situation from the point of view of the NEO approaching the Earth, it becomes a bit more meaningful.

From that perspective the intersection of the plane of the orbit of the NEO and the surface of the Earth becomes a corridor of probable impact that is called the risk corridor.

This is the identical risk corridor simply inscribed on a Mercator projection of the Earth’s surface.

Here the Earth is cross-crossed by a hypothetical (but representative) set of 100 such risk corridors where the Earth’s orientation and NEO orbit planes are chosen randomly.

Given the thousands of currently known potential NEO impacts in the risk table, this diagram is dramatically understated!

Within the next several years, with the increasing NEO discovery rate anticipated from new, more capable telescopes, virtually no spot on Earth will be far from such a risk corridor.
This more technical presentation of a risk corridor shows “virtual” impact locations generated by a Monte Carlo simulation of the NEO orbital path. The actual location of the impact will be somewhere within the region depicted by this collection of points.

This specific hypothetical asteroid impact was used as an example in the recent 2023 Planetary Defense Conference.
While seeing the risk corridor crossing the entire Earth is somewhat more real to the ordinary person than orbit diagrams, when one expands the map to the level of one’s hometown, this reality becomes far more personal.

In this image, were one a resident of Timbuktu or Ilurin, one might become very interested indeed in the specifics of this particular asteroid. Many questions, in addition to the set shown, would certainly come to mind. What would we do if this one is, indeed, going to impact? Dozens of serious questions come to mind, few of which have well defined answers and many of which will not even have been asked yet.
Humanity, in partnership with its machines, now has the capability to very slightly modify the precise clockwork of the solar system to help assure the continued evolution of humanity itself, and indeed of all Earthlife.

At the largest scale we are Earthlife, together. Whether we will be born into the local cosmos successfully, will in all likelihood depend on the degree to which we address this, and other, existential challenges as one family. Happily, planetary defense is a natural cosmic hazard and therefore dealing with it collectively will probably be less challenging than dealing with other existential challenges of our own creation!
Our challenge...

Our responsibility
We are currently seeking both student and Ambassador applications for the 2024 Prize.

For further information please access the Schweickart Prize website:

https://www.schweickartprize.org
Thank you