

THE NEXT-PRIZE

An Interview with Peter Diamandis

By Tim Ventura & Peter Diamandis, April 12, 2005

AAG: Like most people, I'd been thinking of the X-PRIZE as an event — not a process. When Burt Rutan's SpaceShip One won the prize last October, one of my first thoughts was that the contest was over. That's not the case, though, and we've been hearing talk about a "round 2" event with different prizes. Can you tell us "what's next for X"?

Diamandis: Now that the X-PRIZE has been won, we have two follow-on projects in mind. First is the creation of the next prize. We are thinking about a point-to-point prize. For example, a challenge which would involve a spacecraft travelling from New York to Sydney Australia, achieving a trajectory which takes it into space along the route, and then has to travel back within a certain time period from Sydney to New York. Vehicles developed to win this prize could play an important roll in the development of same day package delivery of particular interest to companies such as FedEx and UPS.



Dream Come True: Burt Rutan's SpaceShip One winning the X-PRIZE in October 2004.

AAG: It takes years to bring an idea like the X-PRIZE from concept to reality. As the visionary behind it, there must have been a long period of "building momentum" before you could really drive the contest forward. When did you initially come up with the contest idea, and when did it take root as a real company?

Diamandis: It was in 1994, after the sale of International MicroSpace, Inc, that I came up with the idea for the X-PRIZE and at the same time, co-founded my present company Angel Technologies (www.angelcorp.com). Since 1994 my focus has been on making Angel and the X-PRIZE blossom into reality.



Peter Diamandis:
Founder of the X-PRIZE.

The objectives of the X-PRIZE are well known to all those involved: my goal is to use the X PRIZE Foundation to keep pushing the boundaries of human exploration. There will be other prizes, and other efforts to move humanity past the Earth's boundaries out into space.

AAG: The support of billionaire Paul Allen has been tremendously helpful in making the dream a reality, but it also created concern that the X-PRIZE was simply "space travel for the rich". Normally, economics would dictate that a trickle-down effect would make spaceflight affordable at a later point for the common person, but fuel-costs to reach altitude are going to be an issue. How soon will it be before this technology becomes accessible to the "man on the street"?

Diamandis: There is sufficient public worldwide demand to launch this new industry, but in the beginning, as with any new technology, the price will be high, affordable by only a small number of people. A market survey recently completed by FUTRON Corporation indicated that the marketplace for sub-orbital launches was as large as 15,000 people per year paying between \$50,000 and \$98,000.

However, the price will rapidly fall as we continue to learn and develop new approaches the spaceflight. It happened the same way with air travel and computers. Once the commercial forces of capitalism and competition have an opportunity to take effect in the space travel arena we'll see some substantial improvements. Until now, human space travel has only been available through government vehicles...

The X-PRIZE and the other companies I have founded and co-founded (Space Adventures, Zero Gravity Corporation, International Space University) are all focused on making space available to the general public... and not just a few government trained astronauts. If we can begin a true, profitable industry in this arena, the prices will come down and the availability of access to space will increase where it will eventually become an arena accessible to most people.

Today the price of a ticket on a Sub-Orbital flight (up to 100 km altitude and back down, like Alan Shepard did in 1961) is about US\$100,000. The cost of that ticket will eventually drop to \$10,000.



Space, Inc: Diamandis posing for a shot during a ride in a Zero-G tourist-flight.

AAG: How is the X-PRIZE evolving over time? Will it still be around in 10 years, and if so, do you think that it may end up becoming like the Nobel prize -- a prestigious annual award for outstanding achievement?

Diamandis: We're currently in the process of creating something called the X-PRIZE Cup. The X-PRIZE Cup (XPC) is a follow-on event intended to carry on the competitive and sponsorship aspects of the X-PRIZE into an annual, publicly attended event. The X-PRIZE is one of the first stepping-stones in the direction of private human spaceflight and the XPC is next. The XPC has the potential to become the largest space related event on the planet attracting hundreds of thousands to millions of people from around the world to witness the next step in the evolution of spaceflight.



Innovation: The annual X-PRIZE CUP will foster competition for a number of prizes.

The XPC will be a two-week long event, which takes place at the same host location during the same dates each year. The Cup invites all X PRIZE-Class vehicles to attend and participate for cash prizes in a competitive series of races culminating in a single Cup winner. The competition rules of the XPC allow different teams to take dissimilar approaches in optimizing their vehicle. For example, while one team might focus on maximizing the altitude of their vehicle, another team could design for a large payload of people. The first team could potentially sell their key technology to satellite launching companies where the other team could open the space tourism market. The end result of the work done by these teams would produce overall spaceship design improvements.

AAG: As a member of the general public, I'm seeing the X-PRIZE progress one event at a time. You have a unique vantage point, though, which gives you an equally unique perspective. What's the timeline for achievement – both for the X-PRIZE and on a larger scale?

Diamandis: Here's my timeline for future developments:

- 2004 – X PRIZE won
- 2005- 2008: Suborbital market begins
- 2008 – 2010: Suborbital market matures; Orbital market begins
- 2010 – 2012: Orbital market matures
- 2012 – 2015: First private lunar missions
- 2015 – 2020: First private asteroid missions

AAG: It's interesting to see that NASA's begun welcoming private-sector efforts into their latest renovation of the "big government space program". American Antigravity has made considerable inroads in getting NASA to begin looking at gravity-modification technologies, but we've still got a considerable distance to travel. Your case is a bit different, though, since you're talking about a similar set of technologies to what NASA's already using: what are your thoughts on the NASA program?

Diamandis: Humans get trapped in modes of thinking and doing things. It's very difficult to be a Renaissance thinker like da Vinci, who could set aside old ways of thinking and look at things from first principles.

In my opinion, NASA needs to reestablish a bold vision, once sufficiently bold to break the fiefdoms that have developed and re-align the entire organization around a specific goal. Whether that is putting humanity on Mars or establishing a permanent Lunar base or searching for life on the Jovian Icy moons, that is less important than setting a goal and pursuing it in a coordinated manner.

"The personal spaceflight revolution is not reversible. The fun will start in 2015 or 2020, when we'll see thousands of private people going to orbit..."

The second concern I have is that NASA has become very risk averse. Without risk there can be no breakthroughs! NASA needs to embrace a certain level of risk. We are, after all, opening a frontier and not performing routine operations.



Innovation: NASA needs more innovation, like this TGV drag-recovery technology.

Finally, NASA needs to get out of the area of routine operations of vehicles, whether that is the Space Shuttle or their KC-135. Allow private industry to do this. In the same way that NASA employees don't fly "air-NASA," we need to allow companies to bid on, and provide, commercial transport of humans into space.

The government simply isn't prepared to take the risks involved in real breakthroughs. Trying something new and innovative involves significant risks. Most breakthroughs come after many serial failures.

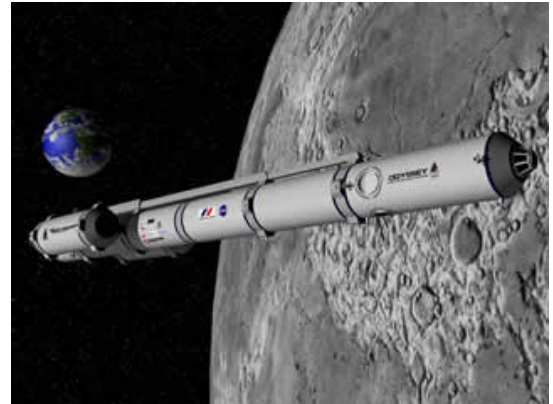
Finally, the government today is focused on creating jobs, and the current infrastructure employees 10,000 – 20,000 people... the way to bring down the cost of

getting into space includes reducing the amount of labor and creating more efficient vehicles.

In the same fashion that private industry, not governments, gave us the personal computer, rather than room-size computers, private companies not federal agencies will need to give us efficient space travel.

AAG: Space Tourism is an obvious first step, but the payoff by offering passenger-flights doesn't hold a candle to some of the other commercial opportunities that await us in space. One of my favorites is Asteroid Mining -- Jerry Pournelle indicated that the revenue from mining even a single near-Earth asteroid would pay for the entire space-program to get there in the first place. Also, offworld mining preserves our environment here at home. Can you tell us if you've considered being involved in any future endeavors like these, and suggest what the timeline to see these industries begin will be.

Diamandis: We lit the fuse. The personal spaceflight revolution is not reversible. The fun will start in 2015 or 2020, when we'll see thousands of private people going to orbit. When that happens, a successful group will go to the moon and make a land grab for some things we fight wars over on Earth: real estate, energy, metals, and minerals. You can make the analogy of Alaska being purchased from the Russians in the 1850s for \$4 million. Alaska was difficult to get to, it was desolate, and you'd die if you didn't have life-support systems. The same thing describes space today.



Space Flight Evolves: Vanguard Spacecraft is an X-PRIZE contender betting on the moon

AAG: Another near-term commercial payoff from the X-PRIZE may be orbital satellite deployments. At present, the government seems to rely on expensive launch platforms for putting satellites in orbit – a cost equation that makes the satellites themselves more expensive to reduce potential maintenance. Do you believe that Uncle-Sam may someday rely on the X-PRIZE technology for orbital deployments?

Diamandis: The X-PRIZE ships are likely to help bring down the cost of launching small satellites into orbit, and government agencies will eventually buy access to orbit from private companies the same way they buy airplane tickets today. The larger geostationary communication satellites will not initially benefit, but in time, the lessons learned in the small launch systems will eventually flow into the larger vehicles as well.

It is important to note however that the market for launching satellites is extremely small compared to the market for space tourism. Over the past 5 years, the number of commercial satellite launches has typically been 15 to 20 launches per year. This is miniscule compared to the expected rate of 500 to 1,000 public spaceflight launches per year.

AAG: What does the future hold for you on a personal level, and in a “big picture” perspective regarding mankind’s future in space?

Diamandis: I hope to be on one of the first commercial flights that goes into space. I have already traveled on a Russian MiG-25 to 85,000 feet at Mach 2.5 (near the edge of space) and have had many Zero-gravity flights on a Russian and American zero-g aircraft. I can't wait to have my first flight into space as an explorer and industrialist.

Space Colonization, while it is a long way off, is an important part of humanity's future. Humanity has its greatest breakthroughs and cultural advances on the frontier. Colonies will allow groups of humans to explore new ways of thinking, living and working without the restrictions of current governments.



One of the early pieces of work I did as a freshman in College was to write about the implementation of a Plato's Ideal City in space. A population of 10,000 people living in the perfect platonic society.

AAG: Bigelow Aerospace seems to be stealing a bit of your thunder with their recently-announced "America's Space Prize" contest, which targets orbital payload delivery for their proposed Space Hotel. Are we going to see orbital competition from the X-Prize teams in the near future?

Diamandis: Yes, orbital flights will follow as soon as the technology for low-cost systems is developed. The energy requirement for getting into orbit is about 40 – 60 times greater than conducting an X PRIZE Flight, for that reason it is more expensive. We will need to develop more efficient systems and significant markets. Once that is achieved, it's like what happened with computers, the price will drop and performance will increase.

Meet Virgin Galactic: So where exactly are all of these commercial X-PRIZE spin-off's that Diamandis has been talking about? Well, the first has already arrived – in the form of Virgin Galactic, which is already selling tickets for what they promise to be the ride of a lifetime!



Virgin Galactic is a joint collaboration between Burt Rutan's 'Scaled Composites' company and billionaire Richard Branson's vast empire of aerospace, media, and technology holdings.

The hope is to kick start the space-tourism industry by operating a fleet of spacecraft modeled after Scaled Composites 'SpaceShip One', which will carry passengers to altitudes of 50,000 feet and then return them using Rutan's trademark glide-configuration re-entry.

Peter H. Diamandis is the Founder of the X-PRIZE Competition and the Chairman and CEO of the X-PRIZE Foundation. He leads a collaborative effort to make the dream of personal spaceflight a reality, and has been featured on Television and in print around the world. You can visit the X-PRIZE Foundation online at <http://www.xprize.org>