

## Space Dilemmas

By Nicola Sarzi-Amade, Howard Bloom, Geoff Notkin, Ian O'Neill, and Madhu Thangavelu.

### The Setting

The 33rd International Space Development Conference, Sponsored by the National Space Society (NSS), was held at Los Angeles, May 15-18, 2014. It continued the NSS's valuable series of major Space knowledge-sharing events. The Kepler Space Institute (KSI) played a significant role in the planning and conduct of the convention. Dr. Sherry Bell, Board Member of KSI and long-time leader in the NSS, was a spark plug before and during the conference. She joined Bob Krone in planning the final panel, Sunday morning, titled "Space Dilemmas." Ian O'Neill, Discovery News TV Host, acted as the chair. One of his dilemmas was "the unsolved Space debris problem". Dr. Nicola Sarzi-Amade had done an outstanding job of chairing the Convention Planning Committee. His dilemma was "profitability." University of Southern California Space Engineering and systems design Professor, Madhu Thangavelu, joined the panel with three dilemmas: "extra-territorial destinations," "human-machine logic mix," and the need for space nomenclature standardization. Howard Bloom, scientist, space development leader, and author cites "capturing public imagination" as his dilemma. Geoff Notkin cites "deep space industries and meteorite mining: can we mine useful materials in space?" All five leading Space experts brought a combination of science, technology, humanity, and humor to the panel.



Madhu

Howard

Nicola

Geoff

Ian

The Kepler Space Institute takes pride in capturing the essence of their presentations for this Fall 2014 issue of the *Journal of Space Philosophy* and thanks the National Space Society for its video coverage of the two-hour panel, which captured knowledge that would otherwise have been lost. [Bob Krone and Gordon Arthur](#).

### Space Dilemma – Is Space Profitable? Dr. Nicola Sarzi-Amade.

I chose to talk about the dilemma: *Is space profitable?* because I have an interest in possibly starting my own space company at some point in the future. The reason why I ask myself if space is profitable is that by looking at the current picture of the space arena it seems that only wealthy people can start a successful space company. So, probably I can re-state my

space dilemma in the following way: “Can a space entrepreneur be financially successful, without having to already be a billionaire?” Why is this question important? Not just because I want to possibly run a company myself in the future, but also because the answer to this question can effectively determine if space is going to be a prominent part of everybody’s lives in the future.

If only billionaires can start a space company and make it successful, then the only hope is that there will always be billionaires who like space and want to invest in it. Otherwise, the only way to develop space will be to find a new type of business model that has not been used before. Will the future situation be better than today? Even though today only rich people can take the risk of starting a space company, can this change in the future and how will it happen? And when will it happen? Well, let us take a look at the present before we can make predictions for the future. Today, which private space companies have been started, are run, or are backed by very wealthy individuals? The few that come to mind immediately are:

SpaceX – Elon Musk  
Virgin Galactic – Richard Branson  
Blue Origin – Jeff Bezos  
Stratolaunch – Paul Allen  
Bigelow Aerospace – Robert Bigelow  
Inspiration Mars – Dennis Tito

Their companies seem to be starting on a very positive note, although some of these companies still have to prove that they are going to be successful. Even for very wealthy people, getting into the space business is not an easy endeavor. It might take many years to start making money out of a space company. As a consequence, it is also harder to find investors because the return on investment can take many years to materialize. Until a steady income is guaranteed, these wealthy founders actually lose some of their money and they need to invest more of their own money. They say “Do you want to make a modest fortune in space? Start with a big fortune.”

The reasoning I have made so far mostly refers to the NewSpace companies that are planning to involve a crew (or passengers) in their programs, be it suborbital or orbital. That is where the difficulty really is. The most promising, and most near-term opportunity, is space tourism. After the flight of Dennis Tito in 2001, a whole new world opened up. The space tourism companies that were started in following years have had a solid ground to build upon. The other major event was the 2004 Ansari X Prize that enabled the subsequent creation of Virgin Galactic. These efforts are proceeding well and many commercial spaceports are being

created all over the world. A viable, self-sustaining space tourism industry is expected to be created within the next five years.

Is it easy to make money in space? Not at all. Space is a difficult market to crack. On the other hand, when it is cracked, it can be hugely profitable. Think at all the money that can be obtained from mining asteroids. Once that market is up and running, it will be very thriving and very profitable. The challenge is to get there.

Humanity needs a multi-planet society in the Solar System. International cooperation will be a unifying factor.



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### **Space Dilemma: Howard Bloom**

In an e-mail of April 28, 2014 to Bob Krone, Howard Bloom wrote, *“Bob, Space’s biggest obstacle its biggest dilemma, its biggest challenge, is to capture the public imagination, to get Westerners as passionate in wanting their Space as they were in 1981 when the public cry was ‘I want my MTV.’”*

Howard had typically insightful and original comments throughout the two hours. For instance:

The sports world gives us the best example for Space of the benefits of competition within a peaceful context... Competition makes magic! NASA has suppressed the whole subject of conflict between astronauts so we do not know enough about interpersonal conflict for Space travelers.

Every catastrophe is also an opportunity.

I do not doubt there is intelligence in Space; but is there any here on Earth?



**Howard’s Books**

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**Space Dilemma: Geoff Notkin**

The dilemma of space colonization is huge. Reality TV thrives on fake drama and personal conflicts where somebody wins and others lose. It is the wrong model for space settlements. The military discipline and culture are much better suited for people living and working in harmony.

Earth's youth, like the ones who presented their studies at this conference, will have to address the whole package of dilemmas for space colonization.

How do we solve the international cooperation dilemma for the future of space? Nationalism and corrupt corporations feed that dilemma.

Costs are a dilemma. Space travel should be affordable for everyone.

What entertainment should be provided on long space flights?

We should all be happy that we live in a time when these fascinating and exciting dilemmas exist.



**Geoff's Expertise**

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**Space Dilemmas: Ian O'Neill**

Human factors will be the most significant dilemmas for Space travelers and settlers. Those adventures will be different and the greatest experiment humans have ever tried.



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## **Space Dilemma: Madhu Thangavelu**

Here are some dilemmas to consider, Bob:

### **1. What is the next human extraterrestrial destination? Why? And who will be the next person to set foot there?**

The Moon is the next logical and practical destination because it is close by and exhibits all the environmental characteristics of an ideal extraterrestrial destination. Every report from the space agencies, the National Research Council, and independent committees has said this over and over. If we can learn to live and thrive on the Moon, which is just three days away from home (without constant supplies from Earth), we will be ready to settle the rest of the solar system. Once we hone the technologies and tools for permanent lunar settlements, Mars and other destinations in our solar system will become easy to settle permanently.

### **2. Who will return to the Moon and when?**

I think a series of missions by a private entity will be the next sensation to orbit and then land on the Moon. First, a lunar orbital round trip by a space adventure company, followed by lunar landing. Which nation has the technology, the means and muscle to do this? Private space companies in the United States! They will completely circumvent the policy boondoggles that have slowed the progress of spacefaring nations to a crawl and their reams of memoranda of understanding and all the intrigue and cloak and dagger of behind-the-scenes governmental horse trading and dilemmas will be swept up in the trash heap of history.

### **3. The Philosophy of Man or the Logic of Machine; which way does the arc bend today?**

Terms like artificial intelligence, self-organized criticality in swarms of rudimentary machines (stigmergy?), are based on machine logic. While machines are able to assist in sorting and making sense of large piles of data, the human brain and the workings of the human mind are clearly far superior in the process of creativity. Human explorers can appreciate and do things without being instructed or prompted. See how geologists work.

Robotic agents, employing machine logic, need continual input from mission controllers (humans). And, Or, If, Then based logic is at the heart of machine logic. Humans reason through emotional and social intelligence, via experiences, and seek new horizons by the power and freedom of sheer curiosity, paying attention to peripheral details, connecting the dots in subtle relationships to realize new visions, seizing serendipity when it occurs, always looking for opportunities to expand the realm of human experience through empirical world processes.

The day computers start to compose music like Chopin, or write poetry like Longfellow, Wordsworth, or Nash or write plays like Shakespeare,

Shaw, Miller, the day when they ask us “Why?” is when we can really say that machine logic has arrived on the same playing field. It does not seem that we are in that era yet at all. So, I think the mind and works of humanity continually trump machine logic today.

Are there things in life processes that make us think and act the way we do? Self-preservation and procreation, perhaps? I think some answers lie hidden in the riddle of life. When a machine shuts down by itself to dream or catch a breath, or demands a break to take a walk in the park or playfully to kick and toss sand dollars or pick up and examine seashells in the beach sand (for inspiration), that is when I think machine logic will start to show emergence of human intelligence, when they might merge with the human predicament. The Turing test is a joke (Marvin Minsky). When will we emulate or create a machine that can pen a verse with rhyme and rhythm/meter like Frost’s “Whose Woods these are...?” I am waiting....

#### **4. What’s in a name? Space Mission Nomenclature**

ISS – International Space Station – is not international. How can a select group of partners who constitute a small percentage of the human population claim that ISS is a truly international effort? How can we leave out China and India in such a global endeavor, especially since both of those nations have their own prestigious space agencies and projects?

Madhu also cited the dilemma of the inability to extrapolate technology more than twenty to thirty years due to the exponential progress in many sciences.



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**Editors’ Notes:** Space exploration, development and settlement have presented dilemmas ever since humans gazed with wonder at the stars. Science, technology, creative management, and international cooperation have increasingly solved dilemmas over the past sixty years – but this is a subject that will never disappear. The dilemma on which this panel spent the most time was *how do we make it international?* That is also the subject of the feature article of this issue, “Leadership Will Be Key: Applying Yehezkel Dror’s Avant-Garde Politician: Leadership for a New Epoch” (12-17).

Kepler Space Institute thanks **Nicola Sarzi-Amade, Howard Bloom, Geoff Notkin, Ian O’Neill, and Madhu Thangavelu** for committing their Sunday morning time to share their important Space dilemmas with ISDC 2014 participants and now with the global Space community via this article. Readers are encouraged to submit their own thoughts on Space Dilemmas to [BobKrone@aol.com](mailto:BobKrone@aol.com). **Bob Krone and Gordon Arthur**.