



**The Space Renaissance International 1st Congress**

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**SRI CONGRESS FINAL RESOLUTION**

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*“Assuring survival, employment and a future for all of our children by bootstrapping the Solar Civilization.”*

**1. Summarizing the achievements of the SRI First Congress**

Approaching the conclusion of our first international congress, we can say that our tenacity and patience, to hold this congress, though just online, was prized, in terms of participation and high quality of the discussion we had.

Such a high level of discussion allowed us to get several relevant achievements, in theory and in practice, with some new organizational structures, which began to work in these two weeks, even before the congress was completed!

In summary, we were able to identify some key items, to be addressed in our outreach communication effort:

- fighting the abysmal lack of knowledge and continuing misinformation around the most promising space industrial developments, such as Space Tourism and SBSP
- bringing some rather neglected space topics to the public attention, such as space debris, human life and health protection against hard radiation in space and low/zero gravity, astrobiology in general, exo-agriculture and exo-farming, Near Earth Asteroids capture and mining, all topics very relevant for a serious space settlement plan
- enhancing the public awareness about the global civilization risk, paying special attention to the communication methods, and always associating this argument with our message of hope, pointing out that this is a growth crisis for our civilization, while the birth of a Civilization spanning the Solar System is approaching
- bringing a wind of innovation in the political / ideological environment, with our proposal to replace the obsolete ideologies of liberalism and socialism by astronautic humanism, based on compassion, exo-development, assuring abundance of resources for free and democratic civil development
- running a visionary project, the Virtual Orbital Space Settlement, that will be able to catch the imagination and raise hope in the future into the true heritage of humanity: the children of the Earth
- running two other projects, the Civilization Risk Assessment & Management and spotting the Best Space Business Industrial Development, to engage researchers, universities and students in the urgent needs of our civilization, to step over the current global crisis and finally aiming high again

The congress also allowed us to make some essential organizational improvements, giving birth to two very important committees:

- the SRI Executive Committee, that for the first time in our still brief history, can become the true direction for our international association
- the SRI Public Relations Committee, that is already drawing its Plan, and in these days sent our first Press Release to a relevant number of media and agencies

The large interest arrived from our congress inspired many new supporters to join us, especially from the South East regions, such as India, Nepal, Malaysia, and others. The founding nucleus of the SRI India



Chapter has been born, and now we will have to provide proper coordination for this very exciting effort that can be reproduced in many other countries, where we have supporters and sympathizers, if not yet registered members.

After this congress, the SRI is stronger than before, and this is not to be measured only by membership and active support, but also in our increased capacity to agree on methodologies and to take initiatives in a team spirit.

And maybe it is not a case that we are celebrating our first congress while the Shuttle Atlantis is flying for the last time. As many newspapers are writing, this the end of an age: the age of space used for Earth.

And a new age is beginning: the age of the space used for human development outside Earth, or exo-development.

The age of Space Renaissance

## **2. Political guidelines emerging from the congress, for our public outreach viral campaign**

Few words to explain the meaning of the term '*exo-development*'. E could use '*space development*', and maybe within our community it would be clear enough, but I think exo-development is more appropriate: when people will ask what we mean, we will have a chance to develop our discourse.

'Exo-development' means human industrial development out of Earth, while the term 'space development' was used traditionally for any space business, including the telecommunication satellites during the 40 years of use of space for Earth. Exo-development means use space for human development outside Earth, the new strategy, as Jeff Greason indicated clearly. According to David Dunlop, NSS is talking about bootstrapping the exo-development too.

### **2.1. Fighting Misinformation, toward Exo-Development**

#### **2.1.1. The privatization of space - key to open the high frontier**

We keep on reading and observing in the media, superficial and misleading opinions about space tourism. According to these views, space tourism would be a kind of very expensive amusement for rich people. Some of these opinions charge space tourism with immorality in a time of crisis, as a waste of money and valuable resources.

Since we don't only talk inside the space community, we shall develop a *wide popular campaign*, against such positions, focusing on commonsense with public opinion, the key elements of which are the following.

Space tourism – pioneered by Patrick Collins and David Ashford since the early 90's – got a boost by Gregg Maryniak and Peter Diamandis in 1996<sup>1</sup>, when they gave birth to the X-Prize, granting \$10 million to the first private company able to fly at 100 km, carrying three passengers and repeating the flight within a couple of weeks, after refuelling and maintenance of the vehicle.

From a field of 20 entrants, Burt Rutan's Scaled Composites won the prize in 2004, with the legendary suborbital craft Space Ship One, with a project costing less than US \$30 million.

This ground-breaking event triggered a number of processes that were not yet fully realised. First was the crisis with the large space agencies, charged for their absurdly high costs: each flight of the Space Shuttle has cost \$500 million, about 17 times the cost of SpaceShipOne.

Space Ship One demonstrated that the cost to orbit can be downsized and that the *privatization of space* is no longer in the realm of science fiction, but can be a reality.

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<sup>1</sup> This paragraph was changed (July 12<sup>th</sup> 2011) after the vote of the Congress (July 9<sup>th</sup> 2011), accepting a remark given by Jan MacKinlay, with his letter to the SRI President. The previous formulation was historically incorrect.



When we wrote our book “Three Theses for the Space Renaissance”, the number of companies in the new space industry has grown by magnitude, from 20 companies in 2004 to more than 100 and some of them (Virgin galactic) are well positioned to develop the suborbital tourism industry. Others, such as Bigelow and SpaceX, aim directly for the Earth Orbit market, developing inflatable hotel accommodation and low cost orbital vehicles.

Space Tourism, starting at suborbital and progressing to orbital, is the business segment that can progressively grow, accumulating capital for progressively improving the technologies, until a fully Reusable Launch Vehicle is achieved.

Therefore, despite its unhappy name of ‘tourism’ (something to be made just for fun), space tourism, or *civilian space passengers transportation*, or *civilian space flight*, has an incomparably high social value, as the sole business development that could, by its force alone, open the space frontier.

If civilian space flight will lead to synergies with other promising developments, including SBSP and will, supported by government grants and fiscal discounts, make the difference and achieve what humanity desperately needs before 2020: a true full RLV.

Therefore our line is to solicit both government support and increased private investments in this industry, the only one that will assure a return when the space economy will really take off.

This story shall be communicated and repeated everywhere, since it is continuously the target of both interested and ideological attacks and criticisms.

The SRI holds several champions of this story (Patrick Collins, first of all), and our PR Committee should interview them with regularity, to always gain fresh information on the latest developments and achievements.

This will not be our only song, however we should keep on singing it (☺).

### **2.1.2. Space Based Solar Power - key to the Space Development**

If Space Tourism is the preferred ideological target of backward-thinking *anti-capitalist* ideologists, SBSP is the preferred target of vested interests in oil and other well-entrenched energy lobbies.

Energy beams from space have been the subject of endless conspiracy theories and withering scrutiny, despite a 2009 NASA study that concluded microwaves from space would be slightly less intense than the Sun’s rays and would pose no danger to people.

We also discussed, in our congress, about the risk that SBSP could represent another Earth-only-targeted business for next 40 years, which became the case with telecommunication satellites, scuttling astronautics in this field after Apollo 11. Dr Feng Hsu, a member of the SRI Board since its beginning, argued that SBSP could never be realized without a true RLV technology.

Dr Hsu position is quite reasonable, if we think that the cost of Earth-based solar energy is still too high to be competitive with the other energy sources. The earthly photovoltaic industry stays on the market only because of government incentives: when the money runs out, such industries fail and many people are jobless again.

Let’s think what it would be like to fly power satellites with the expendable rocket technology: SBSP could never hope to be competitive!

SBSP, in order to take off, desperately needs RLV and low cost to orbit technologies. Therefore SBSP is not exactly a learning industry, like civilian space flight. We shall promote synergies between the SBSP research and the validation of technologies for low cost access to orbit. Also see this paper “Synergies Between Solar Power Supply from Space and Passenger Space Travel” by our Patrick Collins on the SpaceFuture web site.

We also need to consider how to promote SBSP, where there is an immense quantity of technical and engineering work to be done. People tend to undervalue the effort required. Consider that nothing has been sent into orbit, so far, in the field of energy and nobody funds anything that is not already demonstrated as a working option...



Considering the very huge effort still to be made to fly demonstrators and then building the first operative plants, this is still mainly a matter for governments and international cooperation: after throwing so much public money out the window (absurd military expense, just for an example), this would be a very worthwhile use of public funding.

Having achieved the low cost access to orbit, establishing space based solar plants is the logical next step, in the direction of exo-industry development.

We should make it definitely clear, that the space solar plants are indispensable to all space development in the Geo-Lunar space region. The SBSP stations will fuel hotels, industrial orbiting platforms, and ion-propulsion passenger and cargo vehicles for any destination.

Without SBSP, no exo-development program can happen.

If directed to Earth rectennas, the SBSP energy will also contribute to solve the energy problems on Earth, though this may not be their main goal.

This vision, strongly projected outward and upward, shall be communicated everywhere, always countering any Earth-centric view that would confine SBSP to Earth use alone.

## **2.2. Raising public attention on some disciplines essential for Space Development**

As Jeff Greason said in his address to ISDC 2011, space settlement was never the strategy for any space agency so far. Therefore some research lines were neglected.

### **2.2.1. Space debris**

With almost 6000 tonnes of trash in the space above Earth orbit, a life-threatening danger now confronts all astronautics, especially when we will really start flying, working and living in the space beyond Earth.

From another point of view, orbital debris also represent 6000 tonnes of materials that are already outside the Earth gravitational well. As this material has already cost a lot of money (20K / Kg, more or less \$120 billions). Most of this investment will be burned in the atmosphere as the orbits of each item decays. Should we collect the biggest items at least, to help build the space infrastructure?

It is also interesting to note that a technology to move quickly and easily among different orbits still doesn't exist. The development of this kind of technology continues to be a prime interest for the military (moving fast among orbits, to catch possible hostile satellites), but it could be of interest to civilian astronautics too, with a view to a large debris recovery program.

In our vision for bootstrapping exo-development, cleaning debris from orbit is a critical step: especially as any increase human spaceflight will inevitably raise the probability of impacts with debris, where even a small item with a high velocity presents a risk.

### **2.2.2. Human life and health protection against space hard radiations and low/zero gravity**

These are topics of enormous importance for any serious civilian space flight development program.

Protection against radiation is essentially a matter of shielding. Therefore the studies related to shields shall be boosted, even vs. the many science fiction items with which our scientists like to play taxpayer support (an aggressive position will not be discounted in our outreach). Inflatable shields seem very promising in this regard and the use of water as well, when a Moon water extraction industry will be available.

Astrobiology research in general shall be boosted too, like exo-agriculture and exo-farming, all topics very relevant for a serious space settlement plan.

As far as the low and zero gravity threat to human health and physiology is concerned, the most immediate answer is to build big spinning habitats, like we will develop in our Virtual Orbiting Space Settlement project. Other possibilities are a traded-off, such as medical countermeasures.



### **2.2.3. Near Earth Asteroids capture and mining**

The general understanding of this matter is that NEA mining will be feasible in a near future, as the effort needed to “jump” on some NEA’s is not that critical.

The orbits of some of these objects pass quite near Earth – which also present a danger, of course – on more or less the same ecliptic plan, therefore the delta-V needed to reach them is surprisingly low. Of course, since we want to extract minerals from them, we will have to follow the objects in their orbit around the Sun (they could even pass dangerously near it!) or to schedule short missions, catching them when they fly nearest to Earth in their orbit.

However, the age of exploiting exo-resources could begin earlier than people may now imagine.

### **2.3. Heralding a new breeze of innovation in the political / ideological environment**

As we wrote in our Issue I for this congress, we keep on voting for collectivist or liberist utopias, but we are expected to be satisfied by real socialism and real liberalism, both of which have famously failed, as demonstrated by a long series of terrible catastrophes. The current political leaderships of our globalized society are demonstrably inadequate to the challenges now being faced.

It is time to replace those obsolete ideologies – that have repeatedly demonstrated their tragic inadequacy – with a brand new ideology: astronautic humanism, based on compassion for all humans and for all the sentient beings.

Astronautic humanism is the sole philosophy that can claim to support seven billion people in their aims to fully realize their happiness, and to give expression to a fully inclusive civilization, having the material, cultural and spiritual means to apply a true compassion, honour and dignity toward all. Our resources and energy are based on space development, assuring the boundless abundance of resources of the Solar System, to develop a Solar Civilization of thousand trillions human beings, a wide free market of thousands trillions, a multicultural society based on millions of communities, each one developing their preferred values and cultural diversification, able to exchange their experiences and achievements, toward a true human status, though bodies shapes and physiologies will of course progressively differ.

Counting on the trillions comets made of ice and basic life components, and orbiting around our Solar System in the immense Oort Cloud, our offspring will never die of starvation or thirst.

The power of astronautic humanism is that it will never seek to impose any “ideal social model” to anybody, since the immense resources of the Solar System, the Kuiper Belt and the Oort Cloud, will allow an endless democratic revolution, and the conditions of scarcity of resources that favour the growth of bureaucratic powers will never rise again in human history.

The history of the past demonstrates that, more than the social model, the moral qualities of the leaders are highly relevant in human communities and national governance.

Astronautic Humanism is the sole ideology that will allow each community the complete freedom of experimenting the preferred social models.

Orbiting cities and islands in space will favour self-government and direct democracy, much more than large nations. It could be in space communities that humans will find again, in another environmental dimension, the human sized relationships, where each one is appreciated and respected for their abilities.

Astronautic Humanism is the sole ideology that can support the birth of a social environment in which each one can *aim and get what their imagination can conceive* and where the people with less imagination will not need to be angry and jealous, since the general abundance of resources will allow everybody to share everything. That kind of society is likely the nearest thing to a society where people will have the realization of their own happiness.

We are aware this is a utopian view, but it is the highest utopia ever conceived and by means of astronautic humanism every utopia becomes feasible, so why not the highest one possible?



## **2.4. Is this the end or the beginning of the space age?**

On June 30<sup>th</sup> The Economist published an article titled "*The end of the Space Age: Inner space is useful. Outer space is history*", [www.economist.com/node/18897425](http://www.economist.com/node/18897425).

The article postulates simply that, with the last flight of space shuttle Atlantis, the space age has ended. "Space tourism" says the article "is a luxury service that is, in any case, unlikely to go beyond low-Earth orbit at best (the cost of getting even as far as the moon would reduce the number of potential clients to a handful). The other source of revenue is ferrying astronauts to the benighted International Space Station (ISS), surely the biggest waste of money, at \$100 billion and counting, that has ever been built in the name of science."

The article contemptuously calls us (space advocats) "space cadets", and teases us saying that Obama is talking about our "ultimate dream", a mission to Mars in 2030.

I think this article is the best sample of what the real society and economists in particular, think about the new space industry – a market that "seems small and vulnerable". In this aspect, at least, they sadly confirm our analysis: the new space industry likely will not make it through the current economic crises, without a vigorous public support. The position expressed in the Economist fails to consider the emerging space economy as an alternative to the crisis!

The article also says that space -- the inner space, inside Earth Orbit – worked greatly for Earth business during the last 40 years: exactly as we say in our analysis: the satellite age was excellent for earthly business, but not for astronautics and not for the advancement of human civilization!

In this article we can see clearly the place from where we must start and how long the road ahead will be. Our problem is one of time, as the need for action is now critical.

### **2.4.1. How to answer to lobbyists and ideological adversaries**

One of our main tasks is: *how to answer the Economist*.

Will our answer be effective enough, should we try to reply on a purely terrestrial business level?

Of course not! If we want to be effective, and catch the people's attention, showing the cultural ignorance of the economist's approach to global problems, we have to use our analysis of the Civilization global risk.

It was said, in our discussion: "despite the end of world forecasts of the catastrophists, the world is always spinning around in the cosmos". It was also proposed that we should point out more of the positive aspects of our proposals, in order not to scare people.

However, we shall consider (see the book "Three Theses for the Space Renaissance", chapter "The Status of Civilization") that we are living in unprecedented times, characterized by the global extension of several social and physical processes:

- the world never had seven billions inhabitants before
- the world was never 70% industrialized
- the world never had before repeated default of countries, such as Argentina, Ireland, Greece, Portugal, ...
- the world has never before had a rate of "apocalypse size" disasters so high, e.g. tsunamis, earthquakes, hurricanes, oil spills (Gulf of Mexico 2010), nuclear accidents following earthquake and tsunamis (Japan 2011)
- the world has never before had a global economic crises like the current one, which started in 2008 and has yet to end.

Other growing concerns at this time include:

- a global shortage of fish and other food resources (also due to use of agriculture for energy generation)
- a shortage of fresh water



- global pollution and decay of the human living environment
- acidification of the oceans, due to excess of CO<sub>2</sub> (also due to increasing use of coal by China for energy production)

Only the Space Renaissance has an explanation for the above. We call it *the closed world syndrome*. We are facing the incredible contradiction between a growing population, meaning potentially larger markets and at the same time a decrease of jobs!

Such contradiction can be caused only by a general shortage of resources and energy!

Yes, when the world reached similar conditions -- though they were never global like nowadays!—it always kept on spinning; but how? By terrible wars and blood baths.

The risk of a global civilization (unrecoverable) crash is very real. This is nothing to be scared of, but a challenge that we can take on and fight against.

Astronautic humanists are dead against wars as a way to 'solve' the problems of the Earth and we have the good alternative: exo-development, in the outer space!

Nobody else promotes this analysis – except Stephen Hawking and a few others, mostly unheeded – and nobody else is proposing a global solution. We do, and shall keep on doing it, amplifying our voice many times.

#### **2.4.2. The extreme ecologist position**

Ideological adversaries, such as radical ecologists (mainly in Europe), will put forward their Earth-limited thought, as if the only ecology to take care of was the Earth's surface! They even don't care about space debris, since they don't see it (they never raise their eyes to the sky...).

Their answer to the global metaphysical warming is to hide their head in the sand, to de-industrialize the world and decrease the economy (they call themselves supporters of the "happy decrease") and pray to the nature goddess to save their lives...

These are backward positions that shall be faced and opposed, mainly by the European SRI members.

There is a huge struggle to be undertaken, in favour of quality, culture and good technologies against decrepit ideological positions that bring these movements to say NO, by default, to any technological project: first they say NO, then they look for reasons to support their position.

There's another (more rare) category of ecologists, with those who include the solar system in their reflection, but just to say that we, humans, don't have the right to change the environments of the Moon or Mars and that we should leave them untouched.

Of course, we will discuss such a position, since nobody lives on the Moon or Mars, except maybe some viruses and/or simple vegetable form of life.

We can argue that comets and asteroids are quite volatile components of the Solar System, including the Oort Cloud System. The comets are subject to losing most of their mass, when they come near the Sun. Having asteroids with very unsteady orbits that are often captured by Jupiter and hurled into the inner solar system.

Therefore, using such materials for life support and building orbital cities and islands in space, which environment would we change? Nothing that wasn't already destined to change very quickly, and in many cases to vaporise without being used by anyone!

#### **2.4.3. The "common sense" positions**

Many people say:

- going to space? first we should solve problems on Earth,
- now we are not mature, but maybe in one century...,
- now we don't have money, maybe in 20 years, when the economy has recovered...



- the tendency of people toward inertia, that the world is always spinning, despite all of the cassettes, etc...

The rationale listed in previous paragraphs applies. Besides,

- the birth rate is decreasing, and trends say the demographic vector will revert before 2050: this is the true danger, an older and older society, on the way into the sunset...
- if we remain on Earth, human history is in its old age
- if we expand into space, our species is very young, and our civilization will be at the dawn of a new era, counted in millennia, not centuries
- the point is that exo-development shall be bootstrapped now, or our civilization is condemned, as not just us, but a living genius like Stephen Hawking said

Our mission is based on the above global risk, concerning events that will occur within this century.

Otherwise the need would not be that urgent.

Shouldn't we be able to communicate such urgency?

If we are silent, we will have failed our mission.

#### **2.4.4. The birth of a Baby Solar Civilization**

How is the best way to communicate our analysis and proposals?

This will be a task for our PR Committee, and for our creative intelligence.

The only effective answer to the Economist's and other foolish positions, by increasing public awareness of the extreme danger humanity is going to face.

Who will we believe? Stephen Hawking or the lobbies who led the civilization into the current cul de sac?

This is a critical point:

The Space Renaissance would lose its scope and mission, should it change its nature from a philosophical association, to entertain radical positions to reduce human numbers on Earth, or promote forms of collective suicide: there are already too many views of this kind at large.

We also have a positive metaphor, which we can keep using: when we wrote "Earth is not sick: She's Pregnant!" it was a great self-explaining metaphor.

It means that this is a growth crisis, for our civilization, since we have the technological and cultural means to expand to a larger ecological niche.

Should we not having such means, than our world will be a tunnel, with no way out for our civilization, if not our species.

Should we deny the right of the Earth to give birth, it would be a way for killing both Mother Nature and her baby Solar Civilization!

We shall say the truth about the labour pains, and about the extremely critical period of the birth, including the tremendous risk of stillbirth. We will also present the possibility of a happy event, if we will be accurate, firm and long-sighted in our vision.

With our communication we shall always present the two alternatives:

- the death by stillbirth of our civilization, should the world remain closed
- an unprecedented age of social and economic growth, with the birth of the Solar Civilization and the Space Renaissance.

### **3. The three projects, to balance our communication**

Our three projects present the right answer to all of our communications needs during the next four years:



The Civilization Risk Assessment & Management project will deepen the global civilization risk and the countermeasures (provide enough *midwives* to help Gaia in her childbirth). We will use this project to communicate with all the scientific and non scientific communities potentially interested to analyzing the future of our civilization and related challenges.

The Best Space Industrial Development project will trade-off the different space business lines, in order to fight the Economist-like positions by solid figures, not only through our very reasonable social analysis. We will use this project to communicate with all the economic and sociological communities potentially interested in analyzing the future of the globalized economy and the related challenges.

The Virtual Orbital Space Settlement project will develop a realistic model environment. We will use it to communicate with all the young and less young people who would like to experience what life could be like in an orbital space settlement, city or island. This project will offer the joy of playing, a human natural behaviour, that stimulates creativity indeed, as well as opportunities for scientific enquiry into how human communities in space could function.

#### **4. Organization**

In a separate document, we will introduce our organizational proposals for the vote of the Congress.