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SPACE WISHES:
A New Media Interdisciplinary Performance to be Created During A Suborbital Flight

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ABSTRACT

Access to space is becoming a reality for all. The author has long advocated for and has engaged in space arts endeavours in support of expanding the arts, humanities and culture in space exploration. This paper will discuss plans to take artists on suborbital spaceflights with a reusable launch vehicle provider such as XCOR Aerospace. Details discussed in the paper include the conception and design of an historic suborbital space arts project whose multicultural, interactive, and intergenerational aspects will harness the talents of a social media community and an international team of artists, designers, professors, historians, curators, business partners, space scientists and engineers. This worldwide artistic collaboration, *Space Wishes*, will use suborbital flights as medium for engaging support for Spaceship Earth's human development goals. *Space Wishes* will support the Zero Gravity Arts Consortium (ZGAC)'s Artist Into Space Program and XCOR Aerospace's mission to make space accessible to everyone, to help show people that space exploration is culturally important, and to showcase how artistic action coupled with social media can be utilized to help reduce global poverty and disease.

Two related concepts will be manifested: *Space Wishes: Spacecast Chorus* and *Space Wishes: Wish Link* both being executed as new media performance collaborations unfolding between an international audience, the Ground Crew, and 21st Century 'Artronauts,' the Flight Crew, experiencing suborbital flights. *Space Wishes: Spacecast Chorus*, will synthesize content that is created both in flight via video, audio, flight and biometric data and content created by selected Ground Crew members who will have opportunities to weave digital content into the chorus. To inspire audience imagination for personal space flight the artronaut will function during flight as a point of emotional human connection floating in microgravity while doing nothing but functioning as a feeling, sensing human conduit between the heavens and the earth. On the first *Space Wishes* flight, part of the earth will be carried into space in the form of quartz, diamond dust, and lapis lazuli serving as terrestrial anchors for the artronaut. The artronaut will sense the myriad of feelings and sensations that one experiences during any space flight: joy, fear, excitement, transcendence, pressure, and curiosity. These emotions will be monitored by an experimental in-flight EEG system worn by the artronaut to test a new user interface device to connect with a responsive zero gravity floating robot named BOTO.

INTRODUCTION

It is my intention to inform, educate, inspire, indulge and share with you some of my visions and wishes for flying into space to create new space arts works while helping improve the quality of life for some of our fellow citizens living here on our home planet, earth. In *Space Wishes*, artists utilize space flight technology as a medium for engaging support for global human development goals while creating new space arts works, and interactive social media performance projects. As an artist I find it a delight to write to an audience of other cultural workers while also addressing the space sciences and engineering communities. It is such an honour to contribute my voice to this global chorus.

Humanity is at a unique point in history where people of earth are going out into space in ever increasing numbers with newly accessible suborbital spaceflights provided by companies such as XCOR Aerospace [1] and Virgin Galactic. [2] It is my belief that people of all economic levels will access space, on a regular basis, within this 21st Century as the number of flights increase while the costs for such flights decrease over time. The proliferation of environmentally contientious suborbital, orbital and interplanetary space flight technologies will become as common as airline travel is today, when only sixty years ago air travel for the masses was non-existent.

Artists of all disciplines will adventure into outer space along side the space scientists and engineers, the educators and philosophers, as is the case with all great human journeys of discovery. The purpose of such interdisciplinary space flights will be to create new forms of art sublime, interactive, fresh, and literally out-of-this-world. Most important, it is our intention that these flights remain grounded and tethered to our home planet earth, looking back while wishing to help improve the quality of life for millions of people. We intend to create solutions that address the human development challenges of the 21st century that will, in part, help reduce global poverty and disease.

Through the Zero Gravity Arts Consortium (ZGAC) [3] Artists Into Space Program and the Space Wishes suborbital flights for artists, we have the unique opportunity to combine the arts, culture and the humanities with space science, engineering, and exploration. Such synergy impacts and creates effective ways for artists to expand the capacities of what space exploration will offer global human culture in the 21st century.

In Space Wishes, artists utilize space flight technology as a medium for engaging support for global human development goals while creating new space arts works, and interactive social media performance projects intended to be created before, during and after the flight.

XCOR Aerospace intends to fly paying customers in 2014 on its Lynx Mark 1 vehicle. [4] Prior to this first spaceflight, ZGAC will establish the Space Wishes Foundation that plans to oversee the creation of on-going space flights, in perpetuity. Orchestrated as a part of the ZGAC's Artists Into Space Program, [5] this space arts project is conceived to utilize performance, social interactivity, interdisciplinary, intergenerational, multicultural space arts video, and audio and works.

It is the intention to produce *Space Wishes* in collaboration with potential affiliates, suborbital flight service providers, corporate sponsors and organizations such as: Better World Associates; [6] The Frank-Ratchye STUDIO for Creative Inquiry at the College of Fine Arts, Carnegie Mellon University; [7] Golden Star Production; [8] Takasha University; [9] XCOR Aerospace, and Virgin Galactic. We also intend to partner with global citizens advocacy groups such as: RESULTS International [10] and ONE Campaign [11].

ZGAC and its affiliates, through a combination of sponsorships and various forms of crowd funding, intended to support flight production while also raising awareness and money for global humanitarian groups and projects ranging from UNICEF [12] and the Global Fund for AIDS, Tuberculosis and Malaria [13] to the Make A Wish Foundation. [14]

To enhance the social services support aspects of *Space Wishes*, all who participate will be encouraged to engage in letter writing campaigns and support various crowd-funding efforts while creating solutions to address humanitarian challenges faced by all on Spaceship Earth.

As an artist, artronaut, [15] and co-founder of ZGAC, I intend to take a suborbital spaceflight with a reusable launch vehicle provider such as XCOR Aerospace that I hope will in turn create opportunities for many other artists to fly into space. I had the opportunity to meet Khaki Rodway, Director, Payload Sales & Operations, XCOR Aerospace, while participating in a panel discussion during the opening reception UCR ARTSblock exhibition "Free Enterprise: The Art of Citizen Space Exploration." [16] Curated by Tyler Stalling [17] and Marko Pelejhan [18]

Free Enterprise is one of the first contemporary art exhibition in the U.S. to present an international array of artists and organizations who are exploring the

implications of civilian space travel that includes a major political and cultural shift away from state-sponsored, such as that by the U.S. federal government and towards a private enterprise model. Soon after meeting Khaki, I began to discuss chartering [19] a suborbital flight with a flight service provider like XCOR, with the goal of becoming an 'Artronaut.'

Having direct experience in collaborating with a space agency such as NASA, I know first hand the opportunities and constraints all primary investigators experience while planning and developing projects for space flight. As a private artist, there are now opportunities to charter space flights with entrepreneurial flight service providers.

The costs to charter such flights provides what I believe are many advantages. When working with a private company such as XCOR Aerospace is that creative artistic freedom prevails in terms of the content, theme, and the artistic objectives. Such artistic goals for my intended suborbital flight, take into consideration the risks of suborbital flight, hazards analysis, technical, and communications systems and other requirements of the Lynx Mark 1 User Manual.

When chartering these services I will have freedom to conceive the artwork to whatever my creative intention might conceive regardless or not if it has any relationship to science, technology, engineering or mathematics whatsoever. I have complete freedom as an artist, with welcomed responsibility, to produce whatever kind of creative content I wish. Such freedom is status quo within the context of my earth-bound gravity based studio. Our intent on these first flights is to perform initial experiments to conceive, design, build, and test interactive communication systems for interactive social media networking between earth and space, thus a 'spacecast' will be collaboratively co-created.

We are planning to create multi-inflight space arts projects (identified below) each of which offers a series of conceptual, creative, social, communications and technical challenges and opportunities for collaboration.

The *Space Wishes: Wish Link* concept was created to support social media networking strategies that are planned to happen in conjunction with the first *Space Wishes* flight: *Space Wishes: Spacecast Chorus*. One artistic outcome of *Space Wishes* is a new media, interactive, collaborative performance work, '*Space Wishes: Spacecast Chorus'* whose voices will collaboratively grow in social media spaces, over time, extended as virtual space wishes with the event's Ground Crew – the majority of people in the world.

During *Space Wishes: Wish Link* program, in partnership with The Flight Crew Artronauts members of this Ground Crew team will help create solutions to address global humanitarian challenges facing humanity in the 21st Century.

This first flight will include an international one-hour chorus of 'Ground Crew' voices joining together, from around the globe, as one performance voice creating a 'Spacecast chorus.' Small groups of colleagues will work within the initial phases of *Space Wishes* flight conceptualization and the *Space Wishes: Spacecast Chorus* and *Space Wishes: Wish Link* concepts. [20] Conceptual and systems ramp-up will happen as these suborbital flights continue so that larger numbers of people can join in the collaborations as *Space Wishes* moves into the future.

In terms of Space Wishes initial suborbital flight experimentation is required in order to work out the necessary systems that can successfully accommodate the growth so that, in the future, these responsive, dynamic technical and communications systems can include ever increasing numbers of international collaborators. Further exploration in orbital and then interplanetary flights will expand these initial *Space Wishes* activities, as our species will inevitably experience such interplanetary flights in the future.

Suborbital flights will be used initially and the programs, processes and systems discussed in this paper are intended to provide the context in which our collaborators can discovery, then respond to those challenges discovered. Our team will create new solutions to address these creative and technological challenges as they arise. International collaboration will expand with each successive phase of *Space Wishes* project development - starting with one flight and one passenger each; then increasing to nine more flights with one passenger; then, future flights with six or more passengers - with an orbital flight service provider such as Virgin Galactic.

Another project goal is to create political, social media collaborations, so that nations around the world will be encouraged, by their citizens involved in such collaborations, via a global letter writing campaign, to help influence political will so that nations increase their support and financial contributions to entities such as the Global Fund to Fight AIDS, Tuberculosis and Malaria. [22]

The world witnessed China taking video conferencing one-step further when Wang Yaping, [21] in her capacity as educator and 'Taikonaut,' the name for an astronaut from China, facilitated a TeleEducation

physics lesson from space while aboard the Tiangong-1 space station. Her story was written about in a *Beijing Review* feature titled, "*Heavenly Palace Academy, Shenshou Astronauts Give Physics Lecture For Orbit,"* by Yuan Yuan. Wang became the second Chinese female cosmonaut as the mission commander of the Shenzhou 10. [23] Such collaboration and interaction creates allegiance among audience and artist, scientists, educator and engineer.

After these initial 4Q14 flights, it is the intention to continue chartering suborbital flights, possibly at a rate of one per year. Depending upon the project concept, flights will be targeted to fly with services providers such as Virgin Galactic or XCOR Aerospace when the project concept warrants flying between more than one to six artists. Virgin Galactic is intended as the targeted suborbital flight service provider, so that multiple artists can fly simultaneously on one flight together. It is our intention to charter full flights with such a service provider.

In Q4 2015, *Space Wishes* will launch additional chartered suborbital flights to create support for the next generation of human development goals, a sustainable world without poverty and disease - also known as the Beyond 2015 Development Goals. [24] This schedule corresponds with the UN General Assembly, the UN Economic and Social Council (ECOSOC) [25] annual conference of non-governmental organizations (NGOs), and the Beyond 2015 Summit [26] on a new development framework that will succeed the current UN Millennium Development Goals. [27] By that time, we anticipate approaching UNESCO.

These interdisciplinary, multicultural, intergenerational space arts projects will support ZGAC's Artist Into Space Program and XCOR Aerospace's mission to make space accessible to everyone. We plan to show people that space exploration is culturally and artistically important while demonstrating how artistic action and social media can contribute to the expansion of arts and humanities in space exploration. By weaving education and social media engagement it is our intention to create new solutions to address some of the humanitarian issues facing our home planet, Spaceship Earth.

SPACESHIP EARTH

Spaceship Earth is a world-view term that expresses awareness of limited, but naturally regenerating resources available on earth; and responsible behaviour, of citizens of earth, to act as harmonious spaceship crewmembers working toward the greater good of all humankind.

R. Buckminster Fuller in his book, Operating Manual For Spaceship Earth [28] popularized the idea for Spaceship Earth. In it he states, "Our little Spaceship Earth is only eight thousand miles in diameter, which is almost a negligible dimension in the great vastness of space. Spaceship Earth was so extraordinarily well invented and designed that to our knowledge humans have been on board it for two million years not even knowing that they were on board a ship."

STRATEGIC GOALS

The emerging private space flight industry sector and the government supported space industries face an on-going public relations challenge given that the average citizens question the money and resources dedicated to it. Critics posit that we have more pressing needs at home on earth. *Space Wishes* is an arts in space project using people and art to communicate humanity's potential so that space adventure becomes relevant and meaningful to all. This way people feel the hope that they too can go into outer space, an experience that will become a common everyday occurrence in the future.

Strategic goals of *Space Wishes* are to fly artists into space while simultaneously harnessing the world's most powerful technological and economic resources and channel them into the service of the worlds' most pressing human development goals. Humanity does have the ability to provide for the basic human needs of everyone in an environmentally sustainable way without disadvantaging anyone. Initially, a selected group of space arts colleagues, and then larger numbers of people from around the globe will join us in creating this 21st Century space arts performance collaboration.

Since artists are not constrained by scientific methodologies the subjective sides of knowledge become more balanced through such art and science collaborations. When asking why the artist's role may influence space exploration and the opportunities it has to create great wealth and how the presence of artists impacts various technologies and issues associated with human space travel, while also considering the questions as to why humans should go into space at all, when it is cheaper and easier to have space explored by robots; we began to see an answer emerging that inferences the imperative that to carry our human sensitivities out to space, is significant and necessary given this is something the robots of our time cannot do.

SPACE WISHES: SPACECAST CHORUS - 4Q14

Fig. 1: *Space Wishes: Spacecast Chorus* and *Space Wishes: Wish Link* Concept Image, Digital Design by Frank Pietronigro, 2013

It is ZGAC's intention to publicly launch *Space Wishes: Spacecast Chorus* and *Space Wishes: Wish Link* in Q4 of 2014. We plan to construct a concurrent international media campaign that will be surrounded by online and mass media promotional efforts, local events and concerts to create awareness of the Space Wishes flight and Wish Link program.

Space Wishes offers on-going multiple suborbital flight programs including: *Space Wishes: Spacecast Chorus* and *Space Wishes: Wish Link*. Space Wishes originates with an initial suborbital flight titled *Space Wishes: Spacecast Chorus*. This first flight will launch a long-term and on-going series *Space Wishes: Wish Link*.

Space Wishes: Spacecast Chorus will be orchestrated, like any choral or operatic work, as a space arts performance that will take place over a period of time. This project will be actualized in collaboration with multiple other artists, designers, professors, historians, curators, business partners, space scientists, and engineers. These collaborators impact and add to the interactive conceptualization of the work.

I will creatively guide the orchestration, like a conductor, of the first Space *Wishes: Spacecast Chorus* flight while simultaneously establishing the Space Wishes Foundation to support flight funding while also creating new space artworks during my first suborbital flight as an artronaut.

Future chartered suborbital flights will use intergenerational artistic ambassadors as its Flight Crew, and engage millions of people, 'The Ground Crew' around the world through social media, music, and cultural performances. The people enjoying the ground-based real and virtual events are each considered as the flight's Ground Crew. They too can collaborate in the creation of the space arts project and each project concept. An APP will be designed to support these interactive opportunities.

In addition to creating a new collaborative space arts chorus, this engaged Ground Crew will help support achieving global human development goals by communicating their wishes with both world and national political leaders through a social media campaign and international letter writing campaigns instigated as a part of a cause related marketing campaign to the *Space Wishes* concept.

Each flight will serve as the foundation for a brand new globally created 'Spacecast Chorus' and performance work whose theme and Flight Crew will continually change with each new theme created by each new artronaut. These ZGAC chartered suborbital flights will use intergenerational, interdisciplinary, artistic ambassadors as its Flight Crew and engage millions of people around the world through social media, music, and cultural performances as its Ground Crew on Spaceship Earth.

Initially, Flight Crew members will be over seventeen years in age, as that is lower age limit for people wishing to flying in sub-orbit. Others will be in their early twenties and thirties. They will represent a diverse spectrum of the arts, performance arts, sciences, and humanities communities. All will be accomplished activists and spokespeople for issues related to creating a world future without poverty and war.

The artronaut also plans to take a robot named BOTO along with a few precious stones including diamond dust, lapis, and rose quartz, [29] along with technologies such as: the Samsung Galaxy Camera, the Galaxy Note II [30], the Emotiv EEG user interface, [31] an in-flight high resolution, multi-channel, wireless portable electroencephalogram (EEG system) that the artronaut intends to wear and a MacBook Pro. The artronaut will take these materials and equipment with him into space to see if they work, first of all. I will also use them as a way of collaborating, documenting, and interacting during my anticipated space flight journey.

Space Wishes: Spacecast Chorus will synthesize content that is created as a result of the collaborative project, process, and suborbital flight. That content will be posted to the Internet as a part of a global international chorus. The derivative biometric data will then become a part of the space arts project in perpetuity with the *Space Wishes* website enhanced with each new

spaceflight. Video, audio, tweets, mp3s and the audiences' space wishes expressed on YouTube will, in combination, create this 21st Century Spacecast chorus. This content that includes spaceship flight data (speed, altitude, attitude), will be integrated into the social media web-based performance collaborations. A Space Wishes APP is in development to foster audience collaboration and participation during the Spacecast.

This data will be integrated into a one hour-long Spacecast. It is our intention that international choral concerts, arts installations and events happen in collaboration with the artronauts' flights. Pre-established events, such as Yuri's Night The World Space Party, [32] offer potential collaboration opportunities if flights are scheduled to take place on April 12.

SPACE WISHES: The Script

Symbolically, the *Space Wishes: Spacecast Chorus* storyline, as performance, speaks of the adventures of an artist who wishes to fly into outer space to become an artronaut.

Before my departure, friends on earth, who gave me gifts to carry with me on my journey into outer space, in the spirit of a potlatch, including precious stones and an ice sculpture. My friends also taught me Yoga practices as a way of preparing my spirit and body for the journey from home as all great adventures start with preparations, plans and visions.

I will carry with me precious stones to remind me of the beauty of our home planet earth. The stones carried will include: lapis, diamond dust and one rose quartz stone I found at The Pink Triangle Memorial site located in my local community. This stone was given to me as a gift, to be taken into space, flight from my local Eureka Valley Merchants Association and Eureka Valley Foundation. [33]

To ground myself part of the earth will be carried with me in the form of these three precious stones. These grounding materials will serve as tangible terrestrial anchors to commemorate the emotional experiences of flight once returned to earth. The stones will also function as energy conduits between the audience and me as a symbolic way of amplifying connection with all Ground Crew on earth.

Carrying the rose quartz also supports the actualization of an unfulfilled work titled 'This Is Not Heaviness' whose project is described within the context of the following narrative.

During flight, I will float in microgravity and do nothing but function as a feeling, sensing human being serving as an emotional receptor and energy conduit, as my part in the global Spacecast chorus, living life between the heavens and the earth. To inspire and spark audience imagination, collaboration and contemplation, I will function during flight as a point of space to earth interconnection, floating as a Flight Crew member.

Themes of containment and expansion, journey and transformation, will weave through *Space Wishes: Spacecast Chorus* while my friends on earth. The Ground Crew, add their voices to the Spacecast Chorus by contributing creative content to the performance, via the Internet and social media. During space travel, I will be confined to a life support system, the spaceship Lynx Mark 1. As a space adventurer, I will experience the confinement and release of spaceflight, in alternating gravity as the Ground Crew, contained within the confines of their life support system, Spaceship Earth, whose overview the artronaut will see and experience for the very first time in his life at the apogee of flight. The emotional, personal and creative exchanges between young and old alike will amplify the theme of intergenerational connection, while fostering community building, among all members of the Ground and Flight Crew. All Ground Crew members will have opportunities to add to the story, exchanging creative gifts in various digital and analogue formats, connecting with one another and, upon landing, with the artronaut.

It is my intention, rather than do anything during the suborbital flight, to do absolutely nothing except feel my feelings and experience the sensations of being fully alive during the flight. My intention is to recuperate the image of the alchemists' projected archetypes searching for the 'elixir vitae' at the exact moment of moving from gravity into microgravity. This space in time serves for me as a metaphor for our species' narratives moving from mortal to immortal life, and back again. This moment will also serve as a symbol for that transition from our weighted consciousness in the world of material substance into the weightless, timeless, and space less experience of our unconscious minds.

It is my intention that I shall float while confined within the passenger seat of the Lynx Mark 1, with the rose quartz stone, the lapis lazuli and the diamond dust as my body is moved by the natural flow of the force of gravity from one gravitation force, to microgravity, to four gravitational forces and then back into one gravitational force. In terms of physics, a gravitational force is a force of attraction between all masses in the universe; especially the attraction of the earth's mass for bodies near its surface.

It is also my intention to meditate and engage in yoga while floating in microgravity. I consider myself suspended in the 'agua permanens' [34] with microgravity serving as a catalytic portal to an expansion of consciousness given the nature of microgravity space. During my first parabolic flight with NASA in 1998, I experience this sensation in my body and I felt as if my consciousness extended beyond the confines of the edges of my body.

Can I travel more freely, disassociated from my body, possibly through time and space, via our shared collective unconscious? The corporeal lightness and intangibility of our shared collective unconscious creates new realities through the abundant weight of our 'prima materia' [35] with each new creation gifted to us through time and space. The weight of our world, in which our unconscious natures makes manifest the great works of culture and technology, fuses space in time and place tethering the expansiveness of the space time continuum to our material world.

The aura of the work of art is light and weightless yet its impact on culture is heavy and profound. The aura, created in the gift sphere, is coveted in the market economy; yet, it is the tangible work of art that is purchased in the market. This gift sphere, a place where art creation is not connected with income creation, is a contrast to the market sphere as expressed in Lewis Hyde's book, The Gift: Imagination and The Erotic Life of Property. [36]

The corporeal weight of art works created by artists, in all places and time has been used as spoils during times of war throughout the ages. Yet what's valued, the aura of those same works of art, can never be stolen by one culture from another. This aura is symbolized by the weightlessness of the stones, the art object, floating in microgravity. Thus, I will release the rose quartz stone at the apogee of flight as Lowry Burgess's *The Essential Seed* (See Below) is launched into space using XCOR Aerospace's small satellite launch capabilities. The globally shared weight of the negative psychic energy of cultural domination at times of war and hate will be symbolically transubstantiated to weightless presence, at the moment when the rose quartz stone, the lapis lazuli, the diamond dust, and the body of the artist and pilot become weightless.

As a subtext, it is my intention to amplify the foundational iconography of science and her technologies in their origins of alchemy while mystically ritualizing the dynamic tension between culturally produced objects of art, that have mass and weight, in contrast to the weightless value of the aura of the stones.

Fig. 2: This Is Not Heaviness: Precious Stones, Digital Design by Frank Pietronigro, 2013

Such is the case as our astronauts, scientists, engineers, and artronauts travel to distant spaces carrying the weight of our technologies and our cultural artefacts while being consciously aware of the great costs for both doing and not doing so.

The weight of the plastic art object transmutes into corporeal lightness, in the wake of our species technological advancements that foster parabolic, suborbital, orbital and interplanetary flight.

All such narratives shall one day be predicated, as has been the case throughout history, by the power of the imagination and the universe to transcend all narratives based on a reconstruction of language. It appears to me that what is proven to be fact today is, in many cases, further proven to be something other than the truth as our scientific understanding of the future constantly predicates past theories accepted as fact.

It is inevitable for such systems to be discarded. Such consideration begs us to question if gravity is that force which tethers our mortal weight to our timeless universe, as an all pervading, unconscious presence and aura. Our presence in the world beyond time and space are bounded, I believe, by gravity. A new way to see a world and human existence beyond gravity, time and space is now at hand.

The weight of my body, the rose quartz stone, the lapis lazuli and the diamond dust shall float within this symbolic context in order to remind us of the power and the weight our spirits inhabit which, unlike the alchemist who desired to turn lead into gold, we as a conscious presence on this planet earth can wish today to turn hatred into love, and disease and poverty into relics of the past.

The story unfolds during flight and reveals a robot named, BOTO, floating in zero gravity. BOTO is named after a pink Amazonian fresh-water river dolphin that, unlike the artronaut tethered to my rocket ship seat, floats within his environment, unrestrained.

The narrative of dolphin suspended in the flowing rivers will transform into the image of a seed made of ice whose frozen waters were gathered from the estuaries of earths' major rivers including the Amazon. At the apogee of flight, the seed will be released and crystals of the ice satellite will sparkle, like diamond dust, "subliming" into outer space circling the planet as a symbol of recycling and purification.

Space Wishes: Historical Development

I met Tania Fraga, [37] Gavin Starks [38] in Yverdon-les-Bains, Switzerland in 2005, during Space: Planetary Consciousness and the Arts, 9th Workshop and Symposium on Space and the Arts. [39] This international space arts conference was co-organized by Maison d'Ailleurs, [40] OURS Foundation, [41] Leonardo/Olats [42]. During the conference I discussed with Tania and Gavin the possibility of collaborating on a project that I introduced to them as *Space Wishes*. This original *Space Wishes* concept was given birth in Athens, Greece, and refined on the night of October 20, 2002, at the end of Sky Art Conference. [43]

The Sky Art Conference was organized by Otto Piene, and the Centre for Advanced Visual Studies at the Massachusetts Institute of Technology, in collaboration with the Ministry of Culture of Greece, the Foundation of Hellenic Culture and the European Cultural Centre that was hosted, in Delphi, Ikaria and Athens, Greece.

On that night in 2002, I was in conversation with various 'Sky Art' colleagues including Anna Hatziyiannaki, Dimitris Skoufis and Chrysostomos Maslatzidis of Art Topos [44]. The initial concept, at that time, was that a pair of robotic wings would be designed my use by Joe Davis, [45] Research Affiliate, Massachusetts Department of Biology, Laboratory of Molecular Structure, Cambridge, Massachusetts.

It was my intention to ware those wings during a parabolic flight during which *Space Wishes* was planned for production.

At that time, *Space Wishes* was originally conceived as a collaborative microgravity parabolic flight space arts project, whose harmony was intended to exist between the earth and the sky and whose goal was to create a situational 'topos' (a three dimensional and/or virtual space + a situation, an "etat d'esprit", a "*ba*" as defined by Kitaro Nishida) [46] based on trust, love and community. During this situation, people outside the weightless portion of this "topos" will be able to send, via various forms of technology, digital messages expressing their visions, hopes and wishes for what they hope life to be like in space to the microgravity flight artist who intended to float within this constructed microgravity "topos" responding in various ways to the wishes received from the ground during a live interactive parabolic flight.

It was intended that these wishes be sent to me prior to flight and we hoped during flight (pending the technical development of live interactive '*spacecasting*' capabilities. Artists needs, as service customers require

live space casting capabilities from the suborbital flight service providers, as will all entities flying. Everyone will want to text from space). The pair of flexible wings designed by Joe Davis would be designed to resemble the wings envisioned by Leonardo DaVinci for human flight. It was the intention that these flexible wings would dynamically and technically respond in someway to the incoming wish messages sent from the gravity-bound earth to the weightless portions of the "topos".

Within the "topos", after having been 'touched' in someway (inferring the Greek hero Epafos [47], king of Egypt and patriarch of Egyptians) by these 'space wishes', I would serve as an 'enabler' who would physically respond to, without any conscious intention, these wishes whose impact will be recorded using the Emotiv EEG system. Return messages will be sent back from the heavens to the wish makers living within the gravity portion of the "topos" in the form of text, video and audio files.

Anna Hatziyiannaki wished that her contributions to the work would address in part the relationships between utopia and myth infusing the collaboration with conventions that reflect ancient Greek mythology and contemporary art theory. It was also Anna's wish that the "topos" be infused with multi-sensory experiences.

Dimitris Skoufis wished to support the vision of "topos" by introducing that concept, currently used in modern Knowledge Management theory and practice, as outlined in some of the books by Ikujiro Nanaka [48] into the project and oversee the integration of technology to establish human feedback loops within this "topos". Dimitris wished to support the "topos" by building a virtual and real-world communication bridge between local communities and the larger world community through various forms of public presentations.

Chrysostomos wished to support the technological and communication efforts by contributing his expertise. Joe Davis wished to work on *Space Wishes* as a supporting artist creating the pair of wings that I intended to ware during the parabolic flight.

All of these initial collaborators will be invited to contribute to and participate in the iteration of the concept that was originally given birth in Greece at the end of the Sky Art Conference in 2002. Of course this initial concept has now evolved into this current project.

SPACE WISHES: PROJECT COLLABORATIONS

Space Wishes: Spacecast Chorus accommodates many projects, within the scope of this space arts collaboration that will be flown with me on the first flight, *Space Wishes: Spacecast Chorus*, including:

Space Wishes: Gravity Fluxions
Space Wishes: Moon Arts
Space Wishes: The Essential Seed
Space Wishes: Yoga For Space Health
Space Wishes: This Is Not Heaviness

Space Wishes: Gravity Fluxions

Interdisciplinary Space Arts Collaboration with:
Frank Pietronigro, Artronaut
Tania Fraga, BOTO Designer
Architect and Robotics Designer, Sao Paulo, Brazil
Gavin Starks, Music Composition
CEO, Open Data Institute, London, United Kingdom

Fig. 3: EMOTIV BOTO User Interface Concept Image, Digital Design by Frank Pietronigro, 2013

The artists intend to conduct, during suborbital flight, the testing of an experimental hypothesis on the spatial behaviour of a fluid rubber structure. This 'robotic sculpture' created in part with materials, currently being researched that will be produced by two Amazonian communities. The rubber production aims to support local sustainable development of such communities by adding value to their products, allowing them to live in the forest without destroying it.

It is intended that the artronauts' emotions will be monitored via the Emotiv EEG user interface that the artronaut intends to wear during flight. One test is to see if the biometric data collected will directly influence the movement of a neuron-responsive robot, named Boto. This robot will float in zero gravity behind the Lynx Mark 1 pilot seat. Our project sets up contrasts and a complimentary bridge between an 'artificial being' the BOTO. The audience will be afforded opportunities to reflect upon issues pertaining to human versus robotic space exploration while enjoying what I hope are aesthetically pleasing visuals and audio.

Space Wishes: MOON ARTS

Interdisciplinary Space Arts Collaboration with:
Lowry Burgess
Dean and Professor, Distinguished Fellow
Frank-Ratchye STUDIO For Creative Inquiry
College of Fine Arts, Carnegie Mellon University

"The concept of speaking to SPACE itself and its 'all-ness' has been essential to The Space Arts since as early as can be remembered – as iconic as "when you wish upon a star…" - as profound as the first 'space' poem etched upon a soaring satellite in 1959.
In all space arts deliberations on the ideas of utterance, speaking, singing to space and the stars, speaking to space is always there in all its various forms.

'Space Wishing' has been a thread evolving through numerous projects and proposals involving
Frank Pietronigro over the past decade from the ZGAC: *Gravity Pulse: DataFlux* concept [49] to this present complex *Space Wishes* project. Live interaction between the earth's surface and the high floating zero gravity womb is essential in understanding gravity-disengaged speech. It is necessary to comprehend that place where gravity casts no thrall – where words and sounds float free toward other disengaged meanings – not only this disengagement but also to understand the constraints of hyper-gravity speech where even words are held down and even crushed.

The Moon Arts Project [50] at Carnegie Mellon University whose goal is to place the arts on the Moon in 2015, has always contained similar threads of space communications - only in the Moon Arts Project case the reflections and presence of speaking and poetry on and with the Moon itself is seen as a particular focus of spoken and written communication.

It is in this that both Frank Pietronigro and I plan a convergence and collaboration between *Space Wishes* and the Moon Arts Project projects as they unfold their larger poetic missions into space and other gravities from zero-gravity to hyper-gravity and further in communicating those linguistic evolutions to earth"

Written by Lowry Burgess, 2013

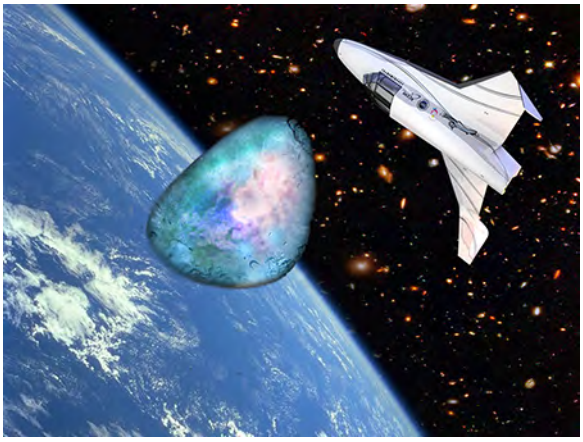

Fig. 4: The Essential Seed, by Professor Lowry Burgess, to be flown and launched into space via XCOR Aerospace's small satellite launch capabilities on the *Space Wishes: Spacecast Chorus* suborbital flight. Digital Design by Frank Pietronigro, 2013

The Essential Seed of the Gate into Aether:
The Purifications of the Infinities of the Absolute

Another space arts *Space Wishes* collaboration, scheduled for manifestation during the first suborbital flight, is a space arts project conceived by Professor Lowry Burgess. As a part of *Space Wishes* we intend to utilize XCOR Aerospace's small satellite launch capabilities and release an ice sculpture created by Professor Burgess into space. During Space Wishes: Spacecast Chorus, as the BOTO and artronaut reach the apogee of flight and are suspended in zero gravity weightless space, an ice seed, The Essential Seed, will be released into earth orbit as a purification ritual.

"This sculpture is an icy seed with a volumetric circumference of about three and a half inches at its widest point. It is the form of a hyper-tetrahedron rotating on itself. This floating form combines the distillations of the branching infinities: the waters of eighteen great rivers of planet earth combined with the waters of glaciers, geysers, wells and springs; various sap from forty-four trees from every geographic distribution; the aromas of fifty-two flowers blooming everywhere, one for each week of the year; thirty-three bloods of artists, distilled with the amalgam of the twelve royal metals all purified into one frozen fluid essence. This seed-form will be released in out space where it will instantly 'sublime' in the extreme cold of the void, forming an iridescent burst of tiny crystals raining toward earth in a cherubic chorus of the brightest sunlight of purist moisture."

Written by Lowry Burgess, 2013

Fig. 5: Vayu Mudra. The *vāyu mudrā* with index finger pressed down by the thumb, as shown, can prevent the nausea and vomiting.

Space Wishes: Yoga For Space Health

Interdisciplinary Space Arts Collaboration with yoga practitioners, psychologists, space scientists and engineers including:

Dr. Adarsh Deepak
Chair, Taksha University
Dr. Dilip Sarkar
Chair, School of Integrative Meditation (SIM), Taksha University
Dr. Joan Vernikos
Chair, Taksha Institute of Space Health and Aging (TISHA), Taksha University

The above collaborators contributed the following text.

From the beginning of the space program, the strategy used for maintaining astronaut health during space travel was designed to keep astronauts "earth-healthy" (i.e., equivalent to a healthy state in earth's 1G) during the mission, able to withstand re-entry, and requiring no or minimal re-adaptation measures upon returning to earth after space flight. Though it would be reassuring to have the ability to maintain an earth-healthy standard on indefinite stays in space, this does not seem to be achievable with currently available countermeasures, nor with any countermeasures likely to be developed in the next decade, without a change in thinking.

We offer the following novel practical approaches to the problem of maintaining the health of space travellers, known as the Taksha Yoga Therapy Protocol for Space Health (TYPS):

1) Pre-flight training and post-flight rehabilitation using a customized yoga practice routine [51]; and

2) In-flight countermeasure approaches (i.e., yoga practice) [52] that would complement or replace current traditional exercise.

Yoga practice techniques proposed under the TYPS include:

a) Yoga resistive inspiration breathing (*prānāyāma*, in Sanskrit) and other yoga-based techniques (e.g., *mudrā*_s, or finger-thumb gestures, and *āsana*_s, or body postures). [53]

Pre-, in- and post-flight yoga training involving *prānāyāma*_s (yogic resistive inspiration breathing techniques) in combination with *mudrā*_s (gestures) [54] and *āsana*_s (postures) is important for maintaining the space traveler's health during a suborbital flight, in which the body undergoes gravity-force changes from 1-G on the ground to 2-G (for 5 minutes during ascent), to micro-G at apogee (for 3 minutes at 61-km during the 2014 XCOR flight, and 5 minutes at 101-km during 2015 flights), and to 4-G (for the 10 minutes during spiral descent).

b) Meditation for reduction of the stress response, and for emotional, mental and physical well-being. (Note that evidence is accumulating of the morphological neural changes that can be brought on by meditation[3].)

There are two objectives of the proposed TYPS Project:

1) Health. Based on sound on-earth evidence that non-medicinal interventions such as specific resistive deep breathing techniques (*prānāyāma*'s), such as *anulom-vilom prānāyāma* (alternate-nostril breathing), accompanied by hand *mudrā*'s, such as the *vāyu mudrā* with index-finger pressed down by the thumb (as shown in Figure 1), can prevent the nausea and vomiting. It is proposed that similar symptoms that frequently accompany the acute changes in gravity -- 1G/hyper-gravity/microgravity/hypergravity and in gravity (1G) re-exposures -- should also be prevented. According to Ayurvedic teaching, nausea occurs when *vata* (catabolic energy caused by movement of the surrounding environment) becomes predominant in the body; the *vāyu mudrā* channels the life-force (*prānā*) during breathing, to counter the effect of an increase in *vata*

(catabolic energy) in the physical body. In addition, the pre-flight training will include the practicing of "grounding" poses (*āsana*_s), such as *sukh-āsana* (easy-pose), *siddh-āsana* (staff-pose), and/or *padma-āsana* (lotus-pose).

2) Research. To determine whether and how the physiological effects of the basic relevant Yoga techniques such as breathing are altered when the body is exposed to microgravity or hyper-gravity.

For example, apart from subjective sensations of the initial upward shift in abdominal organs, will the deep breathing reduce "moon face?" (Note: The Protocol will need to initially allow changes in micro-G to occur before initiating any intervention. For this reason, it is suggested that during the 3-4-minute microgravity exposure, 1.5 minutes should be at rest, and 1.5 to 2.5 minutes should consist of resistive breathing techniques.)

The suborbital flight micro-G duration of 3-4 minutes is an extension of the 20-seconds encountered in parabolic flight, with greater G acceleration encountered during ascent (i.e., 2G) and descent (i.e., 4G). It is assumed that these transitions in G will be experienced in the seated Gz-position rather than the lying down Gx-position. Whereas 2G can be experienced as a thrill, the "4G downward spiral" may induce sickness. (Even veteran Astronaut John Glenn) vomited after his Shuttle flight landing; this has little to do with whether one has a tendency to get sick. Also, in micro-G, there might be enough time to trigger space sickness (nausea and/or vomiting), even though excitement (and its accompanying adrenaline production) might prevent or delay it.

In both cases, preventing or reducing the experience of nausea and/or vomiting is the goal. The technique required of "Artronaut" Frank Pietronigro is slow resistive inspiration (deep breathing) to reduce vagal tone, as described in our paper published in the Journal of Space Biology (2012)[1].

No other countermeasure is necessary in-flight, or during launch or descent (stress).

Ideally, "Artronaut" Pietonigro would also test one selected *āsanā,* or posture, or even *prānāyāma,* during the 3-4-minute flight, to gauge its feasibility. It would be productive to learn how the subject experiences the difference between deep breathing on the ground, compared to deep breathing in micro-G, with the upward movement of the contents of his abdominal cavity.

For instance, if he does "yogic" breathing, wherein the exhalation time is twice the inhalation time, i.e., completes 5 counts of inhalation and 10 counts of exhalation, which is the normal pace of deep-breathing on the ground, is it different during his flight, and in micro-G, and if so, how does it feel? Is it possible to perform the *bhāstrikā-prānāyāma* (or bellows-breathing technique) in micro-G? Is it easier, or harder? While doing it, or afterwards, does he experience pain or discomfort in any part of his body?

TECHNICAL CHALLENGES PROMPTS TECHNICAL SOLUTIONS

Given we are about one year from a potential flight on going engineering challenges will continue to inform and modify artistic conception, evolution, production and implementation.

At this time, the *Space Wishes* project team will produce *Space Wishes: Spacecast Chorus* as a performance work for one hour that includes fifteen minutes prior of performance prior to take-off, thirty-minutes during flight, and fifteen minutes after flight; however, live interactivity between the reusable launch vehicle and the internet is not guaranteed during the flight, at this time, due to engineering constraints.

The Spacecast chorus will continue with interactivity during the full duration of the flight and the one-hour chorus. It is my hope to create the technical solutions so that live interactivity can optimally happen also during the flight. The third major design challenge to which we are developing solutions to support a potential, but not yet realized, live interactive webcasts from space that will work in harmony with the APP.

Solutions are currently being created to solve some of these technical challenges to support the project including: developing an APP that will be utilized to support the *Space Wishes* interactivity. It is our intent to initially experiment with IP Video streaming solutions to help support a portion of the interactivity.

A second design challenge that is currently being addressed is the design, construction and implementation of a user interface connecting the BOTO and EMOTIV EEG system.

The artistic concept has identified a need and an opportunity for suborbital flight service providers to offer live interactive spacecasting capabilities to customers such as ZGAC. The opportunities to create live interactive time-based performance works that can take place before, during and after the suborbital flight can only happen if live interactive space to ground

communications technologies evolve with these new forms of space transportation and project design. At this time, such technical support is not a suborbital flight service feature; but in the future, hopefully these needs of artists will become future flight services provided by suborbital flights.

We can see that such live interactive telecasts from space are possible as we saw with Wang Yaping who, as previously mentioned, facilitated a TeleEducation physics lesson from outer space.

We better plan on a new 'space-air traffic control' industry now given space flight will be a common everyday experience in the not too distant future.

Imagine suborbital, orbital and interplanetary flights taking off from all the corners of our planet, from Spaceport America to Dongfeng Aerospace City; Star City Moscow to the Guiana Space Centre; from Australia to Noordwijk, the Netherlands to Malidi, Kenya, Egypt, and Honolulu Spaceports yet to be conceived for our future.

SPACE WISHES: WISH LINK

ZGAC will solicit international teams of artists to work with us on future flights during ground-based concerts, events and productions. We plan to approach many international activists artists and performers, of all ages, to participate in these on-going series of flights. As 'Ground Crew Ambassadors' building bridges and enhancing mentoring between people of different ages in the spirit of intergenerational collaboration. These artists, in the spirit of the intergenerational theme of *Space Wishes*, will be younger than seventeen years old, the current minimum age limit for suborbital flights. In order to create a sphere of influence, excitement and engagement with younger people ZGAC will outreach and enrol such collaborators with the hope that when they pass the age of seventeen, that they too, will get to fly on suborbital flights.

GROUND CREW AMBASSADORS

The intention is to also create a sphere of influence among younger people providing them with the hope that their dreams of going into space may be realized to one day as global economics are enhanced by space entrepreneurial activities that will foster the necessary growth to manifest such expansion.

Fig. 6: *Space Wishes: Wish Link* showing Samsung technology the artronaut intends to carry into space on the XCOR Lynx Mark 1 spacecraft. Digital Design by Frank Pietronigro, 2013

SPACE WISHES WISH LINK: GLOBAL DEVELOPMENT FUND CONNECTION 4Q15 AND BEYOND

ZGAC through the Space Wishes project intends to partner with affiliates, service providers, collaborators and global citizens advocacy groups such as: RESULTS International and ONE Campaign, two of the most effective organizations active in the movement creating global political will to end poverty, to generate international community support in order to create political will so that national leaders are encouraged to support the Global Development Fund at increasing higher levels of funding.

Thus, some of the more visible earthbound community activities of *Space Wishes* will be organizing on-going chartered space flights, concerts, music videos, and cultural events, in perpetuity, to raise millions of dollars to help improve the quality of human life on earth.

Experts, scientists, politicians, activists, and journalists decry the lack of a global political will. But, few take the next step to understand how political will is created. And fewer still get involved in the long-term grassroots community organizing that is required to create it. *Space Wishes* is committed to addressing the whole spectrum required to create political will, from mass media and public education, to partnering with organizations like RESULTS International and ONE Campaign.

SPACE WISHES IMPACTS GLOBAL POVERTY AND DISEASE

In conclusion, by setting up the organizational structures to support on going flights for artists into outer space, ZGAC and the Space Wishes Foundation's wishes to respond to the public relations challenge to make space a reality for all and to use space flight as way to help meet pressing humanitarian needs at home on earth by going into space.

Extreme global poverty is at the root of the gravest challenges facing the world at present — from HIV/AIDS to terrorism, from environmental degradation to regional instability; their elimination makes possible the realization of a better future for our global world communities.

Space arts and the space sciences have a responsibility, as should all commercial enterprises to not only create profits; but, to also take direct action, as a part of formal business profit planning, to support those less fortunate who need economic empowerment so that they too can participate in these activities.

For the first time in history, at the 2000 UN Millennium Summit, [55] all world governments recognized that they share a responsibility for ending conditions of extreme poverty. As a result, a 15-year-long global campaign was launched focusing on achievement of eight Millennium Development Goals (MDGs) to improve the lives of the world's poorest people. In 2015, a second global summit will be held with world leaders gathering to access the progress achieved by the MDGs campaign and to commit to new "Beyond 2015 Development Goals." The Space Wishes Foundation will promote and support these goals for Spaceship Earth as goals for measuring and achieving success of this endeavour.

In the past 20 years, the world has made remarkable progress in coming to a global consensus on the causes of and solutions to extreme poverty. Political will has been consistently identified as the single most important thing required for ending extreme poverty. Relative poverty may always exist, but the abolition of extreme poverty is within our means to accomplish.

It requires a shift in the world-view of individuals and societies to drive the active exercise of political will for investing in more and better development funding, fairer trade and sustainable, people-focused, economic development on our home Spaceship Earth and beyond. Success will be achieved by capitalizing upon this unique interdisciplinary nexus of the arts and space exploration cultures.

I believe there is no sense in doing this work simply to create profits, as dictated by a market economy, especially if people on earth continue to suffer with poverty and disease. I believe we can co-create this vision in a spirit of generosity, love and support for those of us who are less fortunate.

ABOUT THE ZERO GRAVITY ARTS CONSORTIUM

Zero Gravity Arts Consortium (ZGAC) is an artists created international space arts organization dedicated to fostering greater access for artists to space flight technology and zero gravity space through the creation of international partnerships with space agencies, space industry entrepreneurs, arts and science organizations and leading universities.

ZGAC is the first organization of its kind, based in the United States, that is facilitating parabolic flight and future suborbital, orbital and interplanetary space flight projects. ZGAC organizes conferences that support the international effort to set the stage for teams of artists to have permanent access to work on space transportation systems including the International Space Station and interplanetary space transportation systems.

ZGAC supports arts, humanities and culture in space education, international outreach and conference programs that are organized as ways for artists, from all over the globe, to affiliate with ZGAC and experience the possibilities of collaborating with space flight technologists, engineers and scientists.

ZGAC was Co-Founded in 1999 by Laura Knott, Lorelei Lisowsky and Frank Pietronigro.

ZGAC PROGRAMS INCLUDE THE:

ZGAC: Artronauts Into Space Program

ZGAC: Parabolic Flight Program for Artists

ZGAC: International Conference Program

ZGAC: Building a Global Space Arts Community

ZGAC: Arts in Space Exploration Education Program

ZGAC: LEVITY LAB: Engaging Youth in Space Arts

ABOUT THE AUTHOR

Frank Pietronigro [56] is an interdisciplinary artist, educator and author. He has achieved international recognition as the first American artist to create "drift paintings" where his body floated within a three-dimensional painting that he created in zero gravity aboard NASA's KC135 turbojet. He is Co-Founder and Project Director of the Zero Gravity Arts Consortium, an international arts organization advocating for greater access, for artists, to space flight technology. Frank Pietronigro is Chair for the Space Arts Track for the 33rd International Space Development Conference of the International Space Society that will be held in Los Angeles in May 2014. He served as Co-Chair for the 4th International Space Arts Workshop (ISAW4) produced in collaboration with Taksha University, Frank-Ratchye STUDIO for Creative Inquiry, College of Fine Arts, Carnegie Mellon University and ZGAC. He is a member of the International Astronautical Federation's Technical Activities Committee for the Cultural Utilization of Space.

Frank recently wrote *"Expanding the Heart: A 21st Century Artronaut Contemplates Spaceflight,"* that was published in Kepler Space University's Journal of Space Philosophy in their Spring 2013 edition [57]. His writing was also featured in Ad Astra Magazine, the publication of the National Space Society in the United States, titled "*Arts, Humanities and Culture in Space Exploration*." [58]

Pietronigro is a Professor in the Web Design New Media School at the Academy of Art University [59] in San Francisco where he has taught New Media for the past fourteen years. In 1996, he received his Bachelor of Fine Arts, in Interdisciplinary Arts, from the San Francisco Art Institute. [60]

ABOUT THE CO-AUTHORS

Khaki Rodway

Khaki Rodway is XCOR's Director of Payload Sales and Operations. She joined XCOR in 2005 as the technical writer and program manager for government contracts, and has since taken on ever increasing responsibilities for working with scientists, engineers and educators who wish to fly projects on the Lynx suborbital launch vehicle. Khaki has been instrumental in the development of XCOR's *"Your Mission. Our Ship."* program for customized research and education payload flights in the fields of planetary science, earth observation, microgravity, atmospheric science, medical/biotech, and many other applications. She oversees XCOR's contract with NASA's Flight Opportunities Program and XCOR's commercial-focused Payload Sales Channel, which includes such global payload integration specialists as Southwest Research Institute, Spaceflight Services, Planetary Sciences Institute, Space Expedition Corporation of the Netherlands, and Cosmica Spacelines of Toulouse, France, to name a few. She has an MS from Columbia University's Graduate School of Architecture, Planning, and Preservation, and a BA from Rutgers University.

Brian Webster

Brian Webster is an organizer, producer, entrepreneur, and design scientist based in San Francisco. He works through his firm Brian Webster and Associates as a professional and civic community organizer specializing in strategic services and creative ideas that deliver results. Currently he is launching a new agency, called Better World Associates [61], focused on connecting world- class professionals and clients for building a better world. Brian is well known for organizing events such as the annual National Labor-Community Awards summit in San Francisco, the Green Labor-Capital Forum, 415TECH and the San Francisco Web Business Mixer. He also provides various hands on services for campaigns and projects. His personal philosophy is based on Buckminster Fuller's concept of using personal commitment and design science for global problem solving and the sustainable success of humanity. Brian is working on the *Space Wishes* development team fortifying its strategic link to Spaceship Earth and the Beyond 2015 human development agenda. Brian is active with several citizen sector groups working on global poverty and social problem solving, including the ONE Campaign, RESULTS and the Millennium Development Goals campaign.

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