

## **Expanding the Heart: A 21st Century Artronaut Contemplates Spaceflight**

**By Frank Pietronigro**

When I extend myself as a sentient being, a 21st Century *Artronaut*, I will expand my heart, soul, creativity, imagination, joy, and fear and I will face all the challenges of space flight that have been faced by pioneers in every field throughout time. I wish and wonder about the meaning of human expansion off planet Earth as I contemplate my heartfelt excitement imagining the possibilities of living a portion of my life in suborbital flight.

I see a new hope for the future of our world, commensurate with that experienced in 1969, by those millions of people who watched awestruck as our species landed on the Moon for the very first time. We remember it as a significant step for man, in contrast to the amazing adventures we who are privileged can now experience.

As I contemplate the economics of space flight and who shall own the planets, I wonder how that ownership will come about. How will cultural expression unfold off our home planet? Of course the profits from mining the resources on asteroids can bring great wealth and improve the standards of living for larger numbers of people in ways that benefit the labor necessary to produce this new wealth. How will global economies support vast numbers of people going on space adventures? On Earth, we have seen previous human expansions of culture, power, and technology and an incessant pursuit to acquire control of resources. Currently, the United Nations has a space treaty that narrates the collective possession of outer space by all nations for the benefit of humankind.<sup>1</sup> As we approach potential space colonization and appropriation of space resources, hopefully for the betterment of the greatest common good, I wonder, will the expansion be peaceful and egalitarian? I posit that artistic expansion to outer space might lead to an enhanced use, expansion, and capitalization not only of new planets and space, but also of our own planet, Earth. Indeed, I envision space flight as a transformative experience artistically and spiritually.

For artists, parabolic flight and space flight technology offer situations where scientific and artistic methodologies, ritual, economics, and politics can be sculpted as performance. This locale of exchange is as exotic for artists as it is for space scientists and engineers: space presents challenges and opportunities unlike those that artists find in their gravity-bound studios. While scientists and engineers have been able to expand the understanding of natural law and physics, the scientific space experience has kindled a new fire in the human spirit and sparked an artistic yearning: how might artists harness such experiences to create new works of art that respond and contribute to the evolution of cultural activities and creative expression. What crown of creation might exist as artists work alongside the scientists and engineers? How might scientific

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<sup>1</sup> See [en.wikipedia.org/wiki/United\\_Nations\\_Office\\_for\\_Outer\\_Space\\_Affairs](http://en.wikipedia.org/wiki/United_Nations_Office_for_Outer_Space_Affairs).

engineering benefit from the artistic perspective? What will the collaboration of astronaut and artronaut enable?

Everyone has seen the exponential benefits of scientific and technological achievements during the 20th century. The 21st century promises even more articulation between art and science. Digital media, genetics, robotics, nanotechnology, and regenerative medicine have transformed the arts as artists are now transforming their creative processes using new media and technology. Space science and engineering have helped our world directly and that value can be capitalized upon with the renewal of the conception of human expansion into space and its larger meaning for our shared lives here on planet Earth. Just as Venetian nautical science, military development, and economic development led to an artistically enriched and aesthetically sublime Venice, the fusion of art and science in space will enhance all human life here on Earth, given the wealth of mutually developing, say, a planet like Mars. But what will this collaboration and expansion into space look like? How will my essence as a human being, my feelings and my emotions, fare during this expansion and what care do we need to take in order to nurture the heart and human spirit as we move away from home?

I know in my heart that sexism, racism, homophobia, and other forms of bias and prejudice need to be left here on Earth. In accepting these imperfections of our species, in our current genetic manifestation, I anticipate that space scientists, engineers, and artists will work together in the spirit of mutual cooperation by replacing hatred, bigotry, and self-centeredness with cross-cultural generosity, gift giving, a sharing of ideas and shared property, mutual support and mentoring, and cooperative international education in support of a space expansion potlatch. Of course there is always the chance that the reality will be much different. So, how do we guide the conceptualization of the expansion of space today? I must ask: who really owns the sky, the planets, the stars and the universe?

The thought of moving off planet Earth only to do scientific experimentation leaves me needing more; I am already wondering about the expansion of my human heart as I move away from this beautiful home planet Earth. I know I will experience a separation anxiety because I am part of Mother Earth and I am not a child of Mars or other planets; so how can one's heart and body be part of outer space? Is my connection based in the fact I am made of star dust? There is literally no *terra firma*, just the vehicle in which I will be flying through space! How will I feel disconnected from ubiquitous gravity and from my home planet?

I wonder how my thriving heart would last on Mars, being disconnected from Earth. I know that our technologies of the future will recreate the atmosphere and geology of Earth on a planet such as Mars so that distant planets will feel as close as home to those humans who will live there someday. The environment that feels similar and comfortable will encourage artistic creativity; but the frontier, the unknown will obviously inspire and challenge the imagination. There is an exciting cognitive and emotional

disequilibrium that stimulates growth; I invite the dissonance from the harmony of my Earth shell spaceship.

The arts have given so many gifts to our humanity that they must be a part of this pioneering venture. As I venture off-planet, I cannot leave my heart, my soul, or my creativity behind; I cannot separate that from my mind, my intellect, and my analytic characteristics. As a human being striving for expansion and full integration of all my capacities, I do not wish to cut off from my full awakening any aspect of self, despite the fact that during long-distance space exploration I will face perils, as have all pioneers. In my heart I feel courage while not denying the risks.

As a culturally expressive human being, I must honor my essence, express myself freely, and feel the many sensations this quest evokes, knowing today what it feels like to float and create in zero gravity. Such creative expression blossomed in the scientists who constructed and directed the Hubble Space Telescope.<sup>2</sup> Those artists have provided breathtaking visual images and refinement of data regarding the nature of space and the composition of planets and they have inched us closer to understanding the greatest of mysteries of space, including black holes. More importantly, the creative centers of those Hubble scientists have been equally enlivened. Artists who have always dreamed, as da Vinci did, of travel in the heavens now are realizing the moment. Art has flown before in the mind and soul of creative genesis; now artists will join in realized space achievement to complete the vision.

The development of real space vehicles is making space exploration and plans to take our populations into space a reality! Can I go too? Everyone wonders. The creativity employed by a new breed of space exploration entrepreneurs has inspired both the arts and science, making the actualization of the shared dreams of both achievable realities. World citizenship is expanding to become space citizenship, realized by planetary pilgrims. The territories of "Outer Space" are open to enterprise, awakening a new era and hope for humanity. Global politics will point these enterprises towards either private profitable endeavors or collectively beneficial public enterprises that benefit the many. Perhaps there will be a mutually beneficial hybrid that transcends the binary nature of the present competitive nature of earthbound research and development.

The course of history is about to change forever. People around the globe are watching in anticipation, as our planet Earth becomes an entity within a greater planetary system collective and eventually a component of a galactic construct of unimaginable and boundless structure. We have seen the impact of the Overview Effect by looking back at Earth; but what new understanding will come about relative to our relationship to our place in space when we articulate an innate capacity and shift our perceptions in order to see a larger overview effect and see our whole universe as we look back upon the one we currently conceive? Never before has so much depended on our global community successfully developing our capabilities of entering space and seeding culture and civilization on distant celestial bodies, including the Moon and Mars. What

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<sup>2</sup> See [www.nasa.gov/mission\\_pages/hubble/main/index.html](http://www.nasa.gov/mission_pages/hubble/main/index.html).

are the plans for humanity in space over the next ten years and beyond and how will international cultural expression impact this incredible human journey into the cosmos?

Until recent times, our cosmology of self could not be conceived beyond the confines of gravity. Today, however, it is obvious that mankind's imagination, creativity, and technologies have fostered our ability to move outside those confines. I am honored to be one of the initial members of human species liberated and inspired by the phenomenology of space exploration and the sensations of zero gravity. In 1998, I experienced parabolic flight for the first time as a part of the NASA Reduced Gravity Student Flight Program, a project of the Texas Space Grant Program and the California Space Grant Consortium that was flown in conjunction with a team from the San Francisco Art Institute. I am grateful for having access to the technology extended to us artists, who were working in part as scientists, in order to create Research Project Number 33: Investigating the Creative Process in a Microgravity Environment.<sup>3</sup>

My responsibility is to accept the gift of my next opportunity for flight and optimize my creative gifts to the benefit of the continuing process, inspiring and educating others. As an artist I hope to see, feel, and love all the experiences inherent in spaceflight; to feel and assimilate them in my heart, mind, and soul as I bring with me the sense of wonder and the desire to create and act out my own dreams and visions while listening to the "space wishes" and dreams of others whose spirit and desire will travel with me during flight.

Space exploration and the necessary technologies for human beings to move off planet Earth are gifts extended to our species because of the special relationship between our individual and collective imaginations and the larger unfolding of the self-creating universe. At the heart of the matter, there appear to be promptings for such adventures that come from some special place beyond our analytical intellect, one that venerates quantified results celebrated within our scientific systems. Granted, the study of such results remains meritorious. Obviously, we see the benefits surrounding us today, especially in this enterprise of exploration, but they are only a portion of our species' vast, complex history and cultural story. We have to remember that the magic produced by the Sorcerer's Apprentice can and has gotten out of hand as we are also experiencing in our world today. Our unbridled collective unconscious can be the caldron of sublime wonder or chaotic devastation. What appears to be a benefit may at some point turn out to be a detriment. For our species to express mutual intellectual and emotional capacities requires not only tapping into our collective unconscious, but also stimulating our collective conscience.

It took 5.7 million years for our species to evolve to the point of expressed functional technology and artistic expression that changed us from a predominantly reactive species to a reflective tribe creating language, technology, mythologies, history, religion, and abstract expression visually in the form of painting on cave walls.<sup>4</sup> It is no

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<sup>3</sup> See [pietronigro.com/space/overview.htm](http://pietronigro.com/space/overview.htm).

<sup>4</sup> See [en.wikipedia.org/wiki/Human\\_evolution](http://en.wikipedia.org/wiki/Human_evolution).

coincidence that those paintings eventually pointed to imaginary journeys in the heavens. Even one of man's co-existent hominids, Neanderthal, developed cave painting in Spain's Costa del Sol, some 42,000 years ago. Scholars now place the oldest paintings of *homo sapiens* in Australia, dating from perhaps 42,000 years ago as well. All expression before these earliest paintings was in the form of petroglyphs or was carved and was functional technology: seed-grinding indentations in stone, arrow flints, and weapons for hunting and protection, some of which date back to 330,000 BC. Since the era of cave paintings – 42,000-10,000 BC – our species has imagined and created the technologies necessary to move us into that sky upon which our species has gazed for six million years. It appears to me that we are a slow-moving species, but there may be some benefit in the slowness our process. At what stage of modern man will these nascent flights to space and other planets be categorized? Will all of what humankind has experienced thus far be considered part of our primitive stage eventually? Where will we be in 42,000 years? Certainly, we are advancing exponentially towards some greater context through space exploration and colonization.

The act of space exploration started when the first primordial cell moved from its place of birth to another location. Space exploration was happening when our species first stood erect on the savannah and we took our first steps to move beyond home to new spaces. Space exploration today offers us similar journeys to new spaces and places, journeys that are inherent in our essence and in the emotional heart of our species. Inner space is equally as challenging.... We may find solutions in such investigations rather than relying solely on our current-day technologies whose roots reside in alchemy and the Industrial Revolution.

In my heart, I know intuitively that an open sharing and cooperation among scientists, space artists, space arts organizations, supporting institutions, and space exploration agencies will foster great outcomes that will inform, amaze, delight, and inspire people of all generations. Images of artists flying in space will provide a new icon for the global community to contemplate. As an artist looking back down to Earth, I will conjure the images published in Frank White's book, *The Overview Effect: a retrospective of the impact of space travel on astronauts and earthbound observers*. The images compiled in his work are from astronauts' experiences and satellite-generated snapshots of the Earth, the Moon and space. Specifically he describes how the physical change of perspective creates a new way of looking and thinking about planet Earth, the planetary system, space, the universe, and ultimately us and our purpose and collective destiny – physically, spiritually, socially, and intellectually. Amazon.com describes his book as follows:

Using interviews with and writings by 29 astronauts and cosmonauts, Frank White shows how experiences such as circling the Earth every 90 minutes and viewing it from the Moon have profoundly affected our space travellers' perceptions of themselves, their world and the future. He shows how they have also affected the rest of us, who have participated in these great adventures, psychologically. He provides a rationale for space

exploration and settlement, describing them as the inevitable next steps in the evolution of human society and human consciousness, as the activities most likely to bring a new perspective to the problems of life on Earth. This text considers the possible consequences of a human presence in space, both for the pioneers who settle there and for those who remain on Earth. White imagines how having a permanent perspective from outer space will affect our politics, our religion, our social relations, our psychology, our economics and our hard sciences. He confronts the possibility of rebellion by a space colony and of contact with extraterrestrial beings. And, finally, he makes it clear that our fate is in our own hands, that we will shape our future in space effectively only by fashioning a human space program, free of excessive nationalism and dedicated to the peaceful exploration of the space frontier.<sup>5</sup>

The Overview Effect impacts today's global environmental conservation movements towards supporting the heart of our home planet Earth and all her life. Artistic expression that reflects the Overview Effect creates new cultural artifacts and icons which will be produced by a technological system that redefines fine art as both aesthetically appealing and practical in effecting a new world order. Such order might be called the first *cosmic order*. The perspective of the new art is one whose overview provides a new context for humankind. The cave paintings and museum galleries give way to "drift paintings" and holographic sculpts of the imagination as an artronaut flies, spies, and creates hundreds or thousands of miles above Earth.<sup>6</sup> His new perspective provides hope and inspires a canvas that depicts a renewed world, refreshed by a boundless, new frontier. Those space scientists and engineers who created the technology that afforded us the Overview Effect were indeed artists like Leonardo. They are scientists, looking to the stars to wondering and wish about life, letting their hearts guide their minds, letting their imaginations filter their present knowledge, providing icons that inspire, inform, entertain, and educate.

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<sup>5</sup> See [www.amazon.com/dp/1563472600](http://www.amazon.com/dp/1563472600).

<sup>6</sup> Carl Gustav Jung, *On Death and Immortality*, ed. Jenny Yates (Princeton, NJ: Princeton University Press, 1999).



Earthrise, NASA Apollo 8 Mission, December 24, 1968 (Image Courtesy of NASA)

Greater international, multicultural, interactive, intergenerational achievement in the arts and humanities and culture will result when we see artists fly into space alongside space scientists. Artists, arguably, should have the same rights to access extant space technology as scientists; however, the access realities of 2013 do not reflect parity of opportunity between the arts and scientific communities. Perhaps this is because, unlike the space adventures of the Venetian culture, art is not valued for its intrinsic, emotive, and creative capacity. Art in 2013 has been commoditized, colonized, and capitalized upon despite its irony. Why is that artworks are offered at auction houses at astronomical sums, while the value placed on artists themselves is negligible? Art

connoisseurs collect trophies in lieu of promoting and preserving spiritual, philosophical, and aesthetic process. Artist must fly into space, leading with their hearts and souls; this is the bridge to creating a systemic adoption of an overview effect.

Since the dawn of history, people have looked to the sky and outer space with wonder while considering where we came from, while contemplating who we are as a species. Humankind has expanded its knowledge of space and the heavens, through artistic expression for thousands of years. We marvel at ancient cities aligned to the starry heavens and to cave paintings and stone carvings depicting our night sky. The celestial sky has been a source of inspiration for artists since the beginning of time and consequently has inspired the creation of new forms of art that reflect our universal fascination with extraterrestrial phenomena. Artists in our distant past painted gods and mysterious beings in flying chariots and flying machines taking flight above our Earth. Our ancestors remind us of how they used their knowledge of space and time to harmonize with the rhythms of the changing seasons and life cycles that benefit the quality of life, even as they articulate our human spirit in relation to the cosmos.

Now more than ever we need a reinvigoration of our global collective imagination and the creation of new archetypes, derivatives of artists, scientists, and engineers working on the Moon and in space together that will foster new creative and communal solutions to the environmental, social, political, and ethical challenges earthlings face today. Why not paint the first asteroid we land upon lavender?

Today, a new breed of contemporary artists has initiated projects to explore outer space on its own terms by creating art beyond our home planet Earth with various media, including artists' own bodies in weightlessness. An incredible adventure has commenced and the symbolic freedom of artists moving into space symbolizes a new release of our imagination as we contemplate a new genre: the Arts, Humanities, and Culture in Space Exploration. As we free the arts from gravity and artists begin to adventure into outer space, the historical perceptions of our own world will drift and change under the charge of our artists, who help us see our living on and beyond our world in a new light. Like the technologies that have created the Overview Effect, our living artronauts will see the world and cosmos in a new way, using the lenses of their artistic histories to inform a new way of seeing our relationship to the universe. The new foci will transcend the older forms of traditional art, but will close the circle on the orbit of artistic experience, reaching back to the awe of cave dwelling painters and projecting forward to the limitless canvass of our universe, more than likely using fractals in their expression of the infinite.

How will new cultures, mythologies, and creative methodologies unfold as our species learns to fly free of gravity? After sharing many dinners with Albert Einstein, Carl Jung contemplated that the human psyche exists outside of time and space, while our bodies reside within this corporeal substance, contained in time and space.<sup>7</sup> He also proposed a "parabola of a projectile" as a metaphor of life's energy process that is focused on our

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<sup>7</sup> Ibid.



body's ultimate transformation. Our bodies are bound to our planet Earth by gravity, but what will become of our art making, our culture, and our species once we are released from gravity's confines?

Our sights are set on new horizons and those horizons are up where *once upon a time* aerial perspective guided our conceptions of space. These perspectives changed into a vision of a linear perspective, envisioned by our Renaissance-era understanding of space, which is being transformed once again, with our linear perspective being turned upside down and inside out, as was the case with kinetic microgravity-based works of art that are expressed in full 360° spheres. How will this creative metamorphosis evolve, given that time and space curve in upon themselves? For artronauts, what will become of our place in and movement through time and space, given the drift and kinetic movement of zero gravity and advanced theories in physics?

A new way of seeing our world conception of space will enhance our art and culture, creating new practices as we articulate a new archetype that relates to new spaces that our future hearts shall inhabit, noting again that psyches and unconsciousness exist outside the confines of time and space, according to Carl Jung and his dinner guest, Albert Einstein.

I believe that renewed creative imagination can be rekindled by the image of our species returning to the Moon once again, but our mission at this time is to ensure that the visit is infused with artistic as well as scientific purpose and achievement. Both shall be celebrated; both shall accomplish giant steps for people kind in outer space. These steps will not be accomplished without difficulties. Our tenaciousness will serve to overcome them.

Imagine the trials and tribulations of painters, dancers, performers, and other artists who are forging ahead into the new creative territory of space exploration. What outcomes and educational learning experiences might be created by adventuresome artists' collaborations with space agency administrators, who as a result, in part, of the political and advocacy work of the artists themselves, help, support, and welcome these artists as they gain access to the International Space Station's operational systems, to astronauts and their research technologies?

What historical evolution will result from this contemporary fusion of interdisciplinary media and the visual arts, whose practitioners will utilize, in part, zero gravity environments, naturally occurring phenomena in outer space, and space exploration technologies? Such ventures can form partnerships with space exploration agencies such as the NASA, ESA, JAXA, the Russian Space Agency, and contemporary space entrepreneurs and companies including SpaceX, Bigelow Aerospace, Virgin Galactic, XCOR Aerospace, and others to create new human potential.

The unprecedented global attention and focus on historical scientific and artistic accomplishments in space has already created an excitement and anticipation that our

communities need today. Just as the Overview Effect began to transform the consciousness of past space explorers and the earthbound observers and beneficiaries of their missions, the journey upon which I am about to engage will catalyze new solutions to our global challenges. NASA's past missions inadvertently made possible the creation of a piece of art, mythic and archetypal in stature: the image of our world as seen from space. By itself it is only an image; as a resonant icon its value and use has become priceless. This iconographic image of our home planet Earth suspended as a single unified entity floating in the vastness of space created a new archetypal concept that catalyzed the global environmental movement and anchored itself in our collective unconscious forever.

I believe that human communities unconsciously yearn to rearticulate old archetypes and recuperate the power of such imagination-empowering imagery. This new mission to space will consciously embrace the quest to expand the effect created by this new space perspective. Conscious creation derived from that new perspective will guide the astronaut and his earthbound audiences' wishes, hopes, and dreams so that our species' future is shared. Together we will co-create more than a physical piece of performance art; we will responsibly baptize ourselves in the salve of imagination and inspiration and experiential meditation that space travel evokes. Together we will find new solutions to obstacles that have stymied our willingness to form a conscious global awareness in the past. This mission nurtures that willingness and renews hope that we can solve these challenges together. We can transform our space wishes into living solutions that will activate a renewed global vigor necessary to the expansion of space exploration. The word art is partially derivative of the Greek word *artzien*, which means *to prepare*. This space venture will prepare us to face our world refreshed with a new perspective, inspired with creative force.

The iconic image of one planet, one people, encoded in that unforgettable first image of the Earth as viewed from the Moon in 1969, will act as a muse to this mission. I believe that art and creative practices in space are the not only the *next* step in space exploration, but also that their presence and purpose are a *necessary* step to erase the artifice that separates science from art. Just as the Earth viewed from the Moon reveals no political boundaries or separation of its people from one another or any other living things, this new gestalt dissolves the separation of mind and soul, mind and heart. Things physical lead us to our metaphysical peace. That center creates our new point of view in which we are no longer only citizens of this or that country but live as a global family.

*Free Enterprise: The Art of Citizen Space Exploration*, an exhibit at the University of California, Riverside (UCR ARTSblock from January 19 to May 18, 2013), is, according to Tyler Stallings, co-curator of the exhibit who worked with Marko Pelejan, "the first contemporary art exhibition in the U.S. to present an international array of artists and organizations who are exploring the potential democratization of space exploration and the intersection between artistic production and civilian space travel."<sup>8</sup>

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<sup>8</sup> See [sites.artsblock.ucr.edu/free-enterprise/](http://sites.artsblock.ucr.edu/free-enterprise/).

Visitors to the exhibit can read fascinating stories about this new breed of artists who are working side by side with the scientists and engineers in the exotic environments of outer space. The artists' works includes narratives and videos that recall their feelings and sensations experienced while engaged in the ups and downs of parabolic flights. Each artist posits the future of spaceflight and its relevance to the artistic nature of humans. Each artist looks forward to artistic endeavors in space within our planetary system and beyond.

This artist looks forward to Space Wishes, a journey of the heart, mind, and soul. The flight will take place in 2014.

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**About the Author:** Frank Pietronigro has achieved international recognition for his work in the Arts, Humanities, and Culture of Space Exploration. He is the co-founder and project director of the Zero Gravity Arts Consortium ([zgac.org](http://zgac.org)) and his website is at [pietronigro.com](http://pietronigro.com). The locus of Frank Pietronigro's work resides at the confluence of fine art practices and space flight technology. As a contemporary fine artist, his concerns, themes, and focus include ephemerality, interactivity, levitation, and biomorphic form. Mood is amplified by color and luminance that evoke the mystical unseen world of interior spaces. Frank Pietronigro moves between painting and digital media, between the tangible and the illusive, between matter and energy, and between transparency and opacity in support of heterogeneity. Created in the spirit of pluralism, the artist executes his work and expresses his creativity using multiple and varied media and styles. Frank Pietronigro has also applied queer theory to promote diversity among future space travelers.



(Photograph: Joe Szymanski)

**Editor's Notes:** Kepler Space Institute (KSI) is proud to publish the thoughts of Frank Pietronigro, a prominent professional artist who has created his art both in and about Space. See [pietronigro.com](http://pietronigro.com) for his current exhibition at the University of California, Riverside, titled "*Free Enterprise: The Art of Citizen Space Exploration*." He is planning a major Space Art Exhibition for 2014 with Professor Lowry Burgess, a participant in most of Kepler Space Institute's events over the past five years and author in the Fall

2012 issue of the *Journal of Space Philosophy*. Readers can find my chapter, “*Music and Arts for Humans in Space*,” in *Beyond Earth: The Future of Humans in Space*, (Toronto, ON: Apogee Space Press, 2006). KSI will retain Space Arts in its future work.  
*Bob Krone, PhD.*