



Astrosociological Insights

Newsletter of the Astrosociology Research Institute

Volume 7, Issue 1 (Winter-Spring 2019)

Notes from the CEO

This issue focuses on the “impact of the space arts on societies.” Space art possesses a number of characteristics for societies and their cultures. As examples, they document space missions, show us known and recently discovered space phenomena, speculate with depictions of yet not seen planets and other phenomena, depict utopian and dystopic societies of the possible future, entertain, and provide artwork for pure enjoyment while still reminding viewers of their wonders. With this in mind, the submissions received provide an interesting look at space art projects by the authors, why artists focus on space themes, and in what ways they believe their work benefits societies. Undeniably, space art is an important part of the exploration of space. For this reason, and because space art deserves greater attention, I elected to expand my notes section beyond its usual length. On another matter, I apologize for the delay in preparing this issue, which was caused by a number of unforeseen complications. Despite the setback, this issue has turned out quite well!

The International Association of Astronomical Artists (IAAA) defines space art, or what it also calls astronomical art, as “the genre of modern artistic expression emerging from knowledge and ideas associated with outer space, both as a source of inspiration and as a means for visualizing and promoting space travel” (<https://iaaa.org/what-is-space-art/>). Beyond promoting space travel, it is also of scientific use for communicating new and complex ideas. Humans directly create space art, of course, but it is also created by space probes such as the Voyager, Pioneer, Galileo, and Juno spacecraft as well as telescopes such as the Hubble and Spitzer space telescopes. Interestingly, a growing percentage of space art is not anticipated before it is created by discoveries of scientific instruments, which results in new discoveries that include answers to existing questions as well as the prompting of new questions. In this sense, space art can possess a high degree of scientific value as well as exist for its artistic value; that is, science and enjoyment.

Thus, space art includes a number of characteristics that impact on societies on a number of levels. They include documenting for others what our universe has to offer visually, demonstrating the potential uses of space resources and adventures that could occur in space, and simply inspiring people to both admire cosmic treasures and seek to take part in space exploration in some way while still on Earth. Culturally, this type of art is foreign to many in the sense that it seems apart from their everyday lives; though for countless many, it provides a sense of wonder and awe even if it resides in their unconscious minds. The subject of space exploration has disseminated throughout the cultures of modern societies at increased levels through the growing number of artists and their works as well as the different forms it takes. Social media has intensified their exposure significantly.

The impact of space art is growing in its production and impact on others. The actual effects of the work of space artists is really incalculable due to its apparent upsurge and the limited research conducted. In fact, the IAAA views space art as being in its infancy in terms of “having begun only when humanity gained the ability to look off our world and artistically depicted what we see out there.” Nevertheless, it is safe to state that the volume of space art is already enormous and seems to be growing at a very fast rate, so while it is not possible to include even a small fraction of it here, the

Impact of the Space Arts on Societies



Jim Pass, PhD

Chief Executive Officer

Astrosociology Research Institute

reader can easily find it on the web with a simple search.

Ancient Space Art

Arguably, the IAAA’s statement is true with what may be regarded as “modern space art,” but human cultures have depicted astronomical phenomena and conducted space science from the time that they began their attempts to explain what they viewed in the night sky, which strongly influenced their cultures including their religious belief systems. Interestingly, then, before astronomy became a science with a great understanding of causations – and long before the STEAM movement added the arts to the hard sciences, technology, engineering, and mathematics in the STEM acronym – ancient cultures depicted what they saw in their dark skies without a scientific understanding about what they witnessed. Nevertheless, some cultures took surprisingly accurate measurements of space phenomena. They did recognize correlations even without accurate scientific theories to explain them. Thus, space art has impacted on human cultures for eons and continues to do so especially while interacting with the space sciences. This is important to astrosociologists because the sociocultural effects and the resulting behaviors represent key areas of study, which is similar to – and related to – the impact of science fiction.

Many of these explanations resulted in depictions of what some individuals deem to be visiting “ancient astronauts.” Without delving too far into this controversial arena, it is safe to state that mainstream science views alien visitation as pseudoscience. The point here is that space-related art in various forms depicting a variety of observations and beliefs, which is easy to find on the web, existed in ancient times. Ancient space art exists regardless of the purposes for its creation, and it continues as a focus of study among archeologists, anthropologists, sociologists, and others.



Figure 1: Examples of “Ancient Space” Art

1. Mayan “ancient astronaut”; 2. Carving on Salamanca cathedral wall; 3. Mayan “Sky People” carving; 4. Petroglyph at Valcamonica, Italy; 5. El Caracol – Mayan observatory at Chichen Itza; 6. Machu-Picchu Sun Temple; 7. Aztec Calendar Stone; 8. Stonehenge, England.

Figure 1 provides a sampling of ancient space art in the forms of paintings, sculptures, and architectural wonders, which includes controversial examples in the top row and science-related constructions in the bottom row. While pseudoscientific in nature, many of the examples included in this category of ancient space art does remind one of astronauts, though their “spacesuits” are highly likely to be actual or abstract religious ceremonial attire. Today, many humans recognize space-related themes, but it may be akin to imagining a rabbit in a cloud formation. Figure 1b provides an example of a cosmic version of this phenomenon alongside the model of Star Trek’s USS Enterprise. Both examples are different forms of space art. The first photograph depicts a restored model of the USS Enterprise used during the filming of the original Star Trek television series while the second photograph shows a “cloud” in space that somewhat resembles it.

Consequently, questions arise. Are the examples in the categories of “ancient astronauts” actually “space” art? Arguably, it may be categorized as ancient space art to the extent that some people,

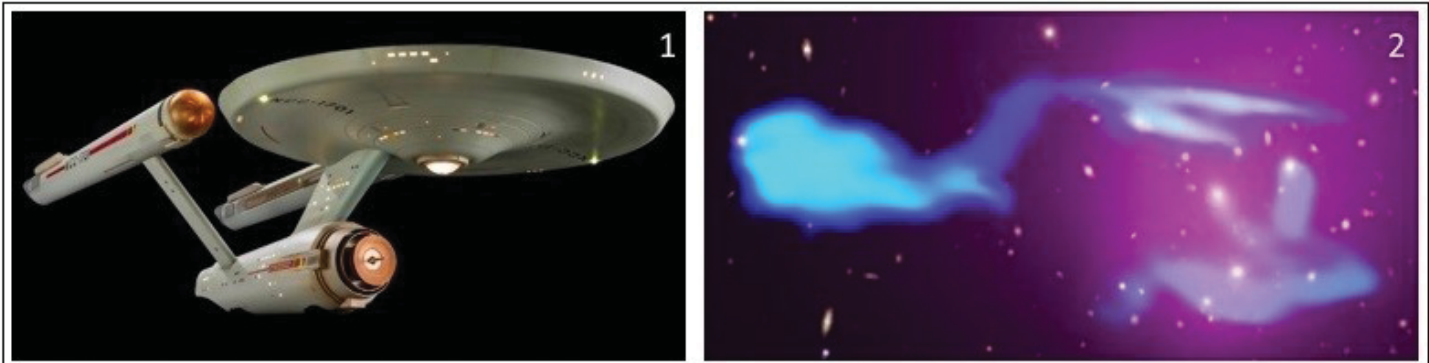


Figure 1b: Starship Enterprise Model and Wisps of Gas

1. USS Enterprise Model Restored at the National Air and Space Museum; 2. USS Enterprise as Wisps of Gas Hidden in Distant Galaxy Cluster (NASA).

including some scholars, believe that, contrary to mainstream science, ancient astronauts have visited Earth and these types of art resulted in what those in ancient societies witnessed. For the astrosociologist, the very fact that these types of interpretations exist is worthy of study, much like those of contemporary UFOs and alien encounters. Without accepting such unscientific notions, the fact that they exist demonstrates that they are sociocultural (astrosocial) phenomena in themselves. In contrast, architectural examples are more science based because they are tied to a combination of religious practice (a temple, for example) and astronomical observation (an observatory or science-related monument).

Modern Space Art

Returning to modern space art, the increasing examples of it can be easy to overlook in part because the number of mediums depicting space art has increased as new and more creative formats have become available, and, for example, as more space artists will have access to 3-D printers as the costs continue to drop. Space art is part of our daily lives to the extent that people often fail to recognize its value to society, which is changing rapidly. The sharing of space art has grown due to its availability in the social media. Artists continue to display their works of art on a daily basis. Thus, the trend over the last twenty years or so has shifted as space has become increasingly influential, with the last ten years really making an impact with the rise of NewSpace, which is the current trend of an increasing number of private companies taking leading roles in space exploration along with, and in concert with, traditional space agencies such as NASA.

Moreover, what many may not realize is that space art comes in a multitude of different forms including paintings, photographs, artwork in books (including comic books) and magazines, movie posters, sculptures, toys and figurines, architecture, performances of different types in 1g and in microgravity, poetry with space as the subject matter, space themed music and recorded sounds from space, fashions (including clothes, fingernail art, hats, and shoes), tattoos, logos, and other forms of material culture and ideas. Modern space art can portray existing reality, something imaginary or futuristic as with science fiction; and it can depict a utopian or dystopian situation, or one that is somewhere in between. Cosplay at science fiction conventions is another common manifestation of the impact of space art. Space exploration is also a popular Halloween costume theme, all of which increase space art's recognizability.

Three examples types of space art that relate to music shown in Figure 1c include musical performances involving David Bowie's original rendition of *Space Oddity* and Chris Hadfield's modernized version of the song from the International Space Station. The second example of space art related to music is the *Out of the Blue* album cover art by the Electric Light Orchestra. The album covers from the rock group Boston also depict space-related themes. The third type of example is the concept album recorded by the rock group Styx called *The Mission* about humankind's first mission to



Figure 1c: Space Art as a Musical Form

1. David Bowie Singing *Space Oddity* (scene from video); 2. Chris Hadfield singing *Space Oddity* from the International Space Station (scene from video); 3. Elton John singing *Rocket Man* (scene from Video); 4. New Horizons Probe from scene in Brian May's *New Horizons (Ultima Thule Mix)* video; 5. The Police performing *Walking on the Moon* (scene from video); 6. Grace Potter performing *Look What We've Become* (scene from video); 7. Styx's *The Mission* album cover; 8. Boston's *Don't Look Back* album cover art; 9. Electric Light Orchestra's *Out of the Blue* album cover art. (Note: the links to these performances are found in the footnote below).

Mars. These are just a few examples of space art related to music.

Links to music videos are included here.¹ These examples are from the rock genre of which there are many more, which is my favorite type of music. I encourage you to locate other examples from your favorite music categories.

Nature also provides its own form of melody. Is this astronomical space art? An example of this is the music of the planets, which involves sounds generated by electromagnetic fields of planets and moons as well as charged particles and other natural phenomena. While not exactly music as most of us are accustomed to hearing, these sounds do have an inspirational component to them as if our universe is somehow communicating with us lowly humans.

Though extremely limited, Figure 2 provides a sampling of other forms of modern space art. They include sketches, photographs, a painting, fashion, and scenes from science fiction. Space art can take the form of science fiction stories as movies, TV series, books, comics/graphic novels, and any other form of visual or performance art. On one level, these examples of space art simply enhance a story and the overall product often provides social commentary along the way. *Star Trek* and *Star Wars* are good examples of the latter influence, franchises that impact on generations of science fiction fans, many of whom become scientists due to being influenced by them. Whether one enjoys a science fiction movie strictly for its entertainment value or becomes inspired by it to the extent that he or she pursues the study of some aspect of space science, the impact is there and it is difficult for anyone to

[1] Videos of David Bowie's and Chris Hadfield's *Space Oddity* performances are available on YouTube. The original song by Bowie: <https://www.youtube.com/watch?v=iYYRH4apXDo>. Hadfield's updated version is available here:

<https://www.youtube.com/watch?v=KaOC9danxNo>. Natalie Merchant also did a cover. In rock and other music genres, the space theme is surprisingly common. See *Rocket Man* by Elton John: <https://www.youtube.com/watch?v=DtVBCG6ThDk>. Also, see Brian May's *New Horizons (Ultima Thule Mix)*, which praises the actual mission to Pluto and beyond: <https://www.youtube.com/watch?v=j3Im5POCAj8> and Grace Potter's *Look What We've Become*: <https://www.youtube.com/watch?v=FviATYWelx0>, which focuses forcefully on the impressive contributions of women in the space program. Finally, The Police's song titled *Walking on the Moon* is found here:



Figure 2: Examples of Modern Space Art.

1. Saturn V Pencil Point Artwork by Doug Forrest; 2. Gene Cernan walking on the Moon; 3. Nebula Galaxy Hoodie by Galaxy Teez; 4. The International Space Station (ISS); 5. "Le Voyage Dans la Lune (A Trip to the Moon)," 6. "Saturn as Seen from Titan" by Chesley Bonestell; 7. Last scene from the movie, "Planet of the Apes"; 8. Star Trek Starbase Indy by Subspace Communique.

avoid examples of space art in their lives.

The examples in Figure 2 exemplify only a few possibilities. When one considers all of the possibilities mentioned earlier, it is quite clear that space art is ubiquitous in American culture. Its many forms allow it to reach its extensive audience whether or not individuals seek it out. Moreover, space art is becoming more common in other cultures probably as space exploration increases in popularity and becomes increasingly important to national governments. Additionally, most modern examples of space art are also astronomical art, as shown in Figure 6. Space art can take many forms, as mentioned, including depictions of space phenomena that can be both of scientific value or simply that of eliciting pleasure, or both.

Artists include those who have never traveled beyond Earth's atmosphere as well as those who have done so. Figure 7 below includes space artworks from the authors featured in this issue of

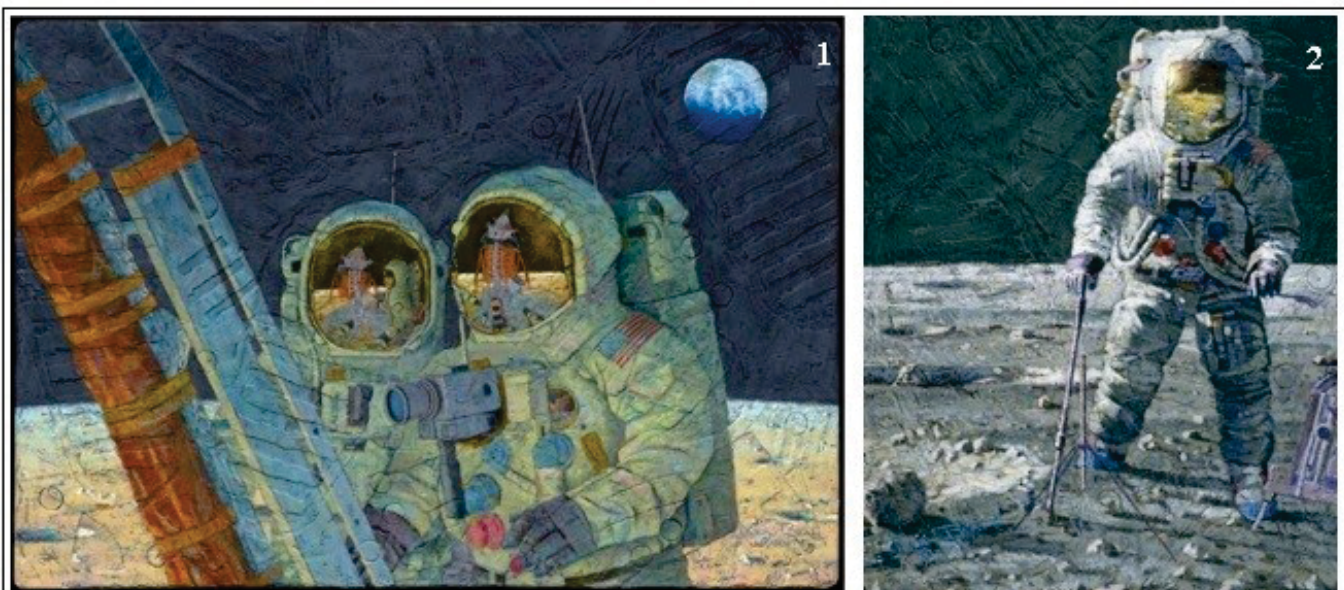


Figure 3: Two Examples of Space Art by Astronaut Alan Bean

1. "Here Men from Planet Earth"; 2. "Astronauta Optimus Maximus"

Astrosociological Insights. These are artists inspired by space who have not (yet) traveled beyond Earth's atmosphere. Supporters of space exploration and settlement create space art based on their imaginations. Scientists and engineers produce renditions of actual space phenomena, as do amateur astronomers and others.

A good example of the art of an astronaut is the work of Alan Bean. Below are two examples of his inspirational work that depict his decent from the lunar module along with Pete Conrad titled "Here Men from Planet Earth" (left) and a portrait of his shipmate Pete Conrad titled "Astronauta Optimus Maximus" (right), which are found in Figure 3. This type of artwork documents actual events that occurred and simultaneously inspires other astronauts and non-astronauts alike. Arguably, this type of art – like those of other formats – make space exploration more concrete and relatable.

Postage Stamps, Banknotes and Coins, and Logos

Figure 4 provides another good example of the historical impact of space art relates to the space themes common on postage stamps from nations around the world. Purposes for the depiction of space themes on postage stamps document achievements of space exploration, as is expected. However, they also include more controversial political purposes. This latter type of reason was probably most evident during the Cold War between the United States and the Soviet Union. Each nation touted its achievements as "proof" that it was a superior system compared to the other, which reflects a political agenda. The achievements depicted have included commemorating technological progress and individual success.

In any case, the space exploration theme has been popular even among nations with little or no space capabilities historically speaking. This is a very interesting example of how space art can influence individuals, in this case every time they mail a letter or package. These examples in Figures 4, 4a, and 5 illustrate the proliferation of media that space art has achieved since the dawn of the Space Age. The



Figure 4: Examples of Space Themed Postage Stamps

1. Total Eclipse of the Sun (USA); 2. Views of Our Planets (USA); 3. Star Trek Space...The Final Frontier (USA); 4. Pluto - Explored (USA); 5. Millennium 2000 - National Space Centre (Great Britain); 6. Orbiting Astronomical Observatory - Scientific Space Research (Sharjah & Dependencies); 7. Apollo 11-Moon Mission - Neil Armstrong (Qatar); 8. Mars 2 (Cuba); 9. Apollo-Soyuz (USA); 10. Space, Rainbow, and Canadian Flag (Canada); 11. Yuri Gagarin - The First Cosmonaut (Moldova).



Figure 4a: Banknotes and Coins Commemorating Space Exploration

1. Canadarm2 Featured on Canada's Five Dollar Bill; 2. 100 Yuan Banknote Celebrating China's Space Exploration;
3. USA One Dollar Coin with Eagle Landing on the Moon; 4. Cook Islands Ten Dollar Coin Remembering Space Exploration of the Universe;
5. Solomon Islands Ten Dollar Silver Proof Coin Commemorating First Lunar Vehicle;
6. USSR One Ruble Coin Celebrating 20th Anniversary of Valentina Tereshkova's Flight as First Woman in Space.



Figure 5: Examples of Space-Related Logos

1. AstroSociology Research Institute; 2. National Aeronautics and Space Administration (NASA); 3. Canadian Space Agency (CSA-ASC); 4. Roscosmos State Corporation for Space Activities (i.e., Russian Space Agency)
5. European Space Agency; 6. National Space Society; 7. SETI Institute; 8. Space Exploration Technologies (SpaceX); 9. Planetary Society; 10. Virgin Galactic; 11. Space Frontier Foundation; 12. Planetary Resources.

concept of “space exploration” has become ubiquitous in the cultures of societies due to the space art that exists on these various media utilized every day as forms of currency and organizational identity.

Similarly, nations have commemorated space exploration on banknotes and coins, a few examples of which are shown below in Figure 4a. In this case, space art can influence a person every time he or she purchases a product or service with money that commemorates space. Additionally, strictly commemorative coins also exist as space art for its own sake and as investments. As with postage stamps, they can become collector’s items that never see circulation. In some cases, the coins were flown on missions to provide impart coins with added value and inspiration for recipients. Many collectors seek out the connection between the art itself and its historical context.

Organizational logos are another important example of space art. They promote space companies and organizations, making their space art synonymous with their brand. Figure 5 includes several examples of logos from space agencies, companies, and nonprofit organizations focusing on education and research as well as advocacy for space exploration. While we tend to think of logos as simply part of a space organization’s promotional agenda, it is also a form of space art that enhances their name with a graphical style. This promotes the existence of the space sector in addition to the organization itself.

Astronomical Art

Astronomical art, defined here as photographs or artistic renderings of discovered or hypothesized space phenomena, is also a very popular form of space art. I do not define astronomical art as synonymous with space art, as many seem to do, but rather as subcategory due to the fact that there are so many different forms of the latter. As one can see in Figure 6, popular themes include nebulas, solar planets and exoplanets, exomoons, and stars. Additionally, they also include images of humans and human-related space material culture including people, rockets, and space shuttles. Photos and videos of spacecraft launches continue to excite a large number of people even today. One can also include Earth-based scenes photographed together with celestial objects such as the Moon (see Figure 6) in the art piece called “Sailing by Lunar Power.” There is also space art, as shown in Figure 6a, that combines the reality of Earth-based objects with those from space such as showing the Moon shining near or through a rock formation or human-made structure. These forms of astronomical art are especially pleasing because they bring space down to Earth in a metaphorical sense.

As mentioned earlier, astronomical art in the modern sense began at the dawn of the space age, but this was not the beginning of space art by any means. For example, Moon petroglyphs are related to numerous cultures, so ancient astronomical art also exists. The existence of Saturn was known in prehistoric times as well, as another example. However, Figure 6 includes a small sampling of astronomical art from after the dawn of the space age, defined by the launch of Sputnik 1 in 1957. As indicated in the top row of Figure 6, photographs of space pioneers reflect space art that documents historical events, which is also true of space-related material culture such as the Space Shuttle. There are too many well-known examples of space art to include here, but I urge you to seek out other examples on the web and in the social media and to think about how they affect you as well as their impact on your society.

There is also space art that combines astronomical phenomena with objects on Earth such as between rock formations or human material culture and celestial bodies as well as landscapes and the Milky Way, as shown in Figure 6a. These photographs are sometimes rather comical and sometimes visually appealing, and they can be both. In one sense, it provides a way to connect humanity with the cosmos by juxtapositioning objects into one scene to make them seem more closely related. Of course, it is sometimes simply an interesting picture for personal enjoyment.

Nature creates its own art in the form of the phenomena discovered in space. There are countless examples of astronomical art, or “nature’s space art,” some of which are depicted in Figure 6.



Figure 6: Examples of Astronomical Art

1. Cosmonaut Yuri Gagarin; 2. Astronaut Sally Ride; 3. Apollo 11 Crew: Neil Armstrong, Buzz Aldrin, and Jim Lovell; 4. "Sailing by Lunar Power" by Astronomy Club Albania - Egidio Danesi; 5. Voyager Spacecraft Golden Record; 6. NASA Earthrise Photograph; 7. Pillars of Creation Image; 8. Maiden Launch of Space Shuttle Endeavour; 9. Horsehead Nebula; 10. Cat's Eye Nebula; 11. Jupiter's Cloud Formations via NASA Juno Spacecraft; 12. Black Hole Illustration; 13. Apollo 17 Blue Marble Photograph; 14. Saturn's Hexagon Feature via NASA Cassini Spacecraft; 15. Trappist-1 System Illustration.



Figure 6a – Astronomical Art Combining Earth and Space Objects

1. *Eye in the Sky Utah* by Lynn Sessions; 2. *Pac-Man Eating Moon* by OligochaetesInYourApple; 3. *Meteor in the Milky Way* by NASA Astronomy Picture of the Day (APOD); 4. *Super Moon Over Spanish Castle* by NASA APOD.

Photographs and artists renderings are both common, and the latter have increased, focusing on the possible characteristics of exoplanets based on the best scientific data following the announcement of new discoveries. These artistic depictions are not the fanciful possibilities that existed primarily before the discovery of planets beyond our solar system even while their exact details remain conjectural (at the moment). In any case, astronomical art provides viewers with both pleasures as artistic expression and information as part of the scientific process.

Space Art by Contributing Authors

For those few space artists who elected to submit articles for this issue, they provided us with good examples of space art, which are shown in Figure 7. I am happy that these particular space artists were inclined to share their passions and relate why they believe their work is important for space exploration and what impact it has on society. One example involves a project aimed directly at inspiring people about space exploration and the possibility of life on other planets while providing introspective elements as well. Others included space art that is speculative and focuses on possible human futures beyond Earth or depictions of possible space phenomena. All of space art, in fact, inspires people, as does space exploration itself, especially the young ones, to at least appreciate the wonders of the universe and humankind's place in it.

In the context of this particular subject matter, namely the impact and value of space art, it is important to mention that we need to hear from more of the artists; not simply in terms of their works, but also hearing from them as people. Why do they create their art? What impact does it have on them? On others? On society? The proliferation of space art as material culture indicates its popularity as having value both as a scientific tool and as an artistic expression meant to exact pleasure. In many ways, space art increasingly links humanity more closely with the cosmos by depicting what actually exists out there and by fueling its imagination, both of which tend to increase the level of curiosity about its place in this vast medium called outer space. With this in mind, I expect that we will publish another issue focusing on space art sooner rather than later.

Dear Moon Project



I cannot end this essay without mentioning the announced agreement between SpaceX and fashion billionaire Yusaku Maezawa. On September 17, 2018, Elon Musk announced that Mr. Maezawa purchased every seat on the Big Falcon Rocket's (BFR's) – just recently renamed as “Starship” – first flight around the Moon currently scheduled for 2023 and the inception of his *Dear Moon* project. The interesting part of this plan, and that which is pertinent to this issue of *Astrosociological Insights*, is that Maezawa stated that

he will select six or more artists to travel with him. Does this planned mission advance the current status of space art or worsen its reputation as a publicity stunt? The answer to this question most likely depends on the outcome of the journey around the Moon including the possible cancellation of this project, the successful return of the Starship and health status of the occupants, who he selects to travel with him, and the impact their artistic works have on the populations and cultures of societies around the world. The plan does, in fact, place a concentrated focus on the value of space art, though a mission failure of some type and/or a poor quality of the artists' creative expressions



Figure 7: Examples of Contributing Authors' Artwork

1. *A Version of the Cosmos Welcome Mat* by Jonathan Keats and Alice Gorman; **2.** *Swirling Clouds of Jupiter* taken by NASA's JunoCam and enhanced by Gerald Liebstädt and contributor Seán Doran; **3.** *Spectroscopical Nebula No. 3* by Cathrin Machin; **4.** *Relay Station 1* by Don White.

could potentially harm its status as a positive force for space exploration. At this early juncture, only time will tell whether or not this project becomes a reality. Nevertheless, the artistic aspect of it is intriguing and this astrosociologist will be sure to keep tabs on its developments. [I invited Mr. Maezawa to contribute to this issue through his <https://dearmoon.earth> website, but I did not receive a reply].

The Role of Astrosociologists

My certainty that the impact of space on society is significant revolves around the idea that the space arts are important both to astrosociologists and to the daily lives of people in society, as my tweet below from back in November 30, 2017 reflects:

The #SpaceArts are vital for inspiring and documenting human efforts and discoveries associated with #space exploration. They represent important areas of interest to #astrosociologists.

The last sentence is important to consider. Astrosociologists who study the influences of space art in a given society can formulate and test reasonable hypotheses regarding the impact of this type of material culture and extrapolate trends about the impact of space exploration itself. The space arts are another important indicator along with opinion polls about the public's perceptions about outer space. The difference, as related in this essay, is that outer space art is ubiquitous in societies around the world and it exists in all facets of their cultures. People continue to produce this type of art in a large variety of forms to the extent that it has become a cultural universal. Artists work on their art across the globe, documenting and predicting space-related phenomena as they go. Their inspirational effects regarding the wonders of our universe are certainly worthy of study by astrosociologists. How can they resist?

As with the depictions of other forms of scientific and technological discovery, theoretical possibilities, and even whimsical and satiric expressions, space can represent future possibilities that expand from past accomplishments. Astrosociologists view space art as an important part of culture. In fact, they are present in societies with potentials for astrocultural change, which often affects social change in other parts of society. Space art can inspire artists to create their own forms of material culture and it can inspire others from different backgrounds – including social and behavioral scientists and humanists – to become involved in space exploration; and it can also inspire the public to support space efforts on a more generalized level.

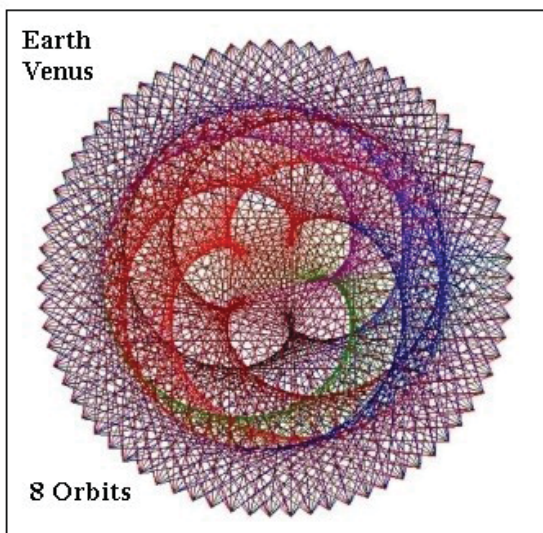


Figure 8: Space Art from Scientific Data

humans to produce artistic outcomes and serves as another reminder that space art is intertwined into the fabric of outer space.

The role of astrosociologists is to study astrosocial phenomena. Space art represents a treasure trove of social and cultural data from which to choose to investigate. Even supporters of space exploration tend to admire the space arts without analyzing its impact. It is my hope that this issue will contribute to a change of attitude that increases an accompanying investigative approach.

Conclusion

In conclusion, then, space art is more than something beautiful to admire visually in its many different forms, though that in itself is a powerful source of influence. Change in the non-astrosocial



Figure 9 – Wormhole Time Travel by Aaron Stone via Shutterstock

sector, which does not directly involve space activities (i.e., astrosocial phenomena) can be influenced to support traditional space, as well as NewSpace, efforts and proposals. Space art is just one more social force that can impact on a society's involvement in space exploration, along with many other forces and interests that contribute to the shaping of the astrosocial sector. For this reason, much more research about the impact of the space arts is needed, which is a very important subfield for astrosociologists.

One must not underestimate the impact of the space arts on societies, including their contributions to the space sciences, documentation of past knowledge and accomplishments, and planning of future exploration of space. Whether artists' creations portray existing phenomena, exist in more fanciful forms, or derive from their imaginations as shown in Figure 9, space art – like science fictional art and scientific art in general – provide images that can inspire the human heart, and that can, in turn, inspire young people to pursue STEM, STEAM, or astrosociology (and related careers). And since art is the material manifestation of ideas that are part of a society's larger culture and subcultures, it is indeed a fertile ground for astrosociological research, which employs a social-scientific perspective.

Art of all types, covering a myriad of subjects and forms, chronicles a society's past, present, and visions of the future. It reflects and projects ideas from the larger culture as well as subcultural ideas, which are often in conflict. Space art generally, and astronomical art specifically, holds a special place in the art world because it can provide onlookers with ideas that can point out threats (e.g., asteroid impacts), encourage following the present course (e.g., exploring our Solar System), or offer insights to move in a new direction (e.g., focusing on interstellar missions). It can do all these things often without a spoken or written word. On the other hand, performance art (e.g., acting, dancing, playing an instrument, singing) can delve into the human psyche in even more detail. This can result in inspired actions supportive of space exploration that result from exposure to its various forms.

This essay could only scarcely touch on the types of space art or its impact on the cultures and various institutions of societies. It cannot fully cover the influences on individuals, either. Nevertheless, it does provide the reader with a sense of the sociocultural and psychological value of space art and its impact on society as an omnipresent social force. In a sense, the growth curve of space art may be viewed as an increase of the impact of space exploration on society as a parallel reflection of it that, in turn, influences its continuation and potential expansion.

To emphasize a previous point, I encourage readers to make an effort to seek out other examples of space art.^[2] It will enhance your already existing love for space. If you do not currently support the exploration of outer space, it may at least contribute to your newfound appreciation of it. And if you are intrigued, conduct a scientific inquiry into some aspect of space art. It is certainly worthy of study as is any other aspect of the human dimension of outer space, and you will undoubtedly be inspired and have an enhanced appreciation for humanity's place in the cosmos. In the interim, the following articles in this issue expand on what is expressed here.

Enjoy this issue of *Astrosociological Insights*!

Best Regards,

Jim

[2] See, for example, an article by Attila Nagy via Gizmodo called "27 Paintings From the Most Famous Space Artist[s] On Earth (And Off)": <https://gizmodo.com/27-paintings-from-the-most-famous-space-artist-on-earth-1658853307>. Additionally, see the Wikipedia article that provides a list of space art and artists: https://en.wikipedia.org/wiki/Space_art#Individual_space_artists. And, of course, I encourage you to look up the space artists and authors in this issue.



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Call for Papers

1. ARI Newsletter *Astrosociological Insights*. Topic: "Space Architecture" including space settlements and spacecraft on the surface or in orbit, as well as space vehicles.

Submission Deadline: December 31, 2019. Call for Articles: tinyurl.com/ya7kbp4m.

2. Volume 3 of *Journal of Astrosociology*. Open topics. Submissions Due December 31, 2019. More Information: <http://tinyurl.com/yau7rc3u> (Articles are refereed).

We encourage student submissions, and our Virtual Library at astrosociology.org is available to you at no cost. Our philosophy in developing astrosociology remains dedicated to involving the next generation of astrosociologists in our efforts well into the future.

Notes from the Editor



**Michael Dodge,
J.D., LL.M.**

Editor in Chief,
Journal of
Astrosociology

Deputy Chief
Executive Officer,
Academic Affairs,

Astrosociology
Research Institute

This issue of *Astrosociological Insights* exposes us to the wonders of “Space Art”. Dr. Jim Pass began this issue with an insightful and broad-spectrum approach to discovering and analyzing what could be called space art—and for good reason. There are so many things that fall under the category of art—visual media, poetry and other literature, music, and more. Each of these realms have considered space as their theme from time to time, attempting to capture the swell of emotion one feels in contemplating the grandeur of outer space. Whether one is a technician or engineer, astrophysicist, schoolteacher, or simply a space enthusiast, we often find ourselves interacting with the art of space in order to connect to themes and ideas that are truly celestial in nature.

There are many means by which art may be conveyed to the witness. How this is done, and what the art solicits in the observer implicates deep and abiding qualities of human nature. Ourselves, our cultures, and even our governments can be, and have been, moved by art in both positive and negative directions. During the days of the Space Race, it was not uncommon to see space art propaganda from both major powers conveying what each side felt was their technological or ideological supremacy, or to celebrate exceptional achievements of humankind from either side. Indeed, the philosopher Marshall McLuhan noted that “the techniques of the arts provide the most valuable means of insights into the real direction of our own

collective purposes” (McLuhan, *Mechanical Bride*, 1951) Whatever space art means to us as individuals, perhaps one of its most notable aspects is in the collective urge of humanity to do more – to explore, to see for ourselves, and to imagine worlds where our societies can flourish and grow outside of the cradle of Earth.

At my University (the University of North Dakota, Department of Space Studies), one of the courses I teach is in the History of Astronomy and Cosmology, and the subject is replete with the images, drawings, sculptures, and even poems of many civilizations through time, all of which felt connected to space, the stars, and the planets in unique ways. From the Upper Paleolithic cave drawings at Lascaux, which show a bull under the light of several stars (perhaps the Pleiades), to the stunning Nebra disk (~1600 B.C.E.) discovered in Germany during the late 20th century, depicting what appears to be the sun, the Moon, and several stars, it is clear early societies placed great importance on space and what it had to offer. Many of these images seem intimately bound to religious or ritualistic purposes, which can tell us a great deal about civilizations, some of which did not leave us with written records. Even the art of architecture can tell us much about our past. Certain early structures, such as Stonehenge, Woodhenge, or the temples in Malta, reveal a stunning amount of astronomical skill in ancient cultures.

For more modern instances of art, I find myself drawn often to the visual media and their representations of space. As an enthusiast of science fiction, both the Hollywood and publication elements have serviceable, and sometimes not-so-serviceable—representations of how humanity will interact with space in the near to long term. However, I would be remiss if I did not mention Gustav Holst in this discussion, the composer of the ever-popular piece, “The Planets” (1916). His work excels at getting you in the celestial frame of mind, doing so with gorgeous instrumentation and brilliant composition. If you have not had a chance to listen to it, I would wholeheartedly recommend doing so when you have the chance. He was not the only musician to consider space as a theme (one thinks of John Williams and *Star Wars* for a more pop-cultural treatment), and many other musical artists have contributed to the field as well.

I have a confession here. I have always considered myself shamefully art-deficient. My brain is much more logical than it is creative, although as with anyone I feel I possess elements of both “houses” of the brain. Of course, I use the familiar—if not completely sound—dichotomy of left brain/right brain here to illustrate a point. I jokingly tell people my “right brain” is shriveled, though I do what I can to rehydrate it when I have the chance to visit art museums, or attend musical performances of classical and modern works alike. Even I, in all of my can-barely-draw-a-stick-figure-glory, experience a frisson of joy when watching an artistic rendition of a proposed SpaceX point to point rocket service (a video they released in late 2017), or when mesmerically staring at one of Chesley Bonestell’s unforgettably beautiful renditions of stellar imagination. Such is the power of Space Art. Such is the beauty and meaningful message that can be conveyed to anyone willing to stop, for a moment, to contemplate our universe, and our place within it. For these reasons I am grateful to the contributors to this edition, who worked hard to share with us their own views, and sometimes their own special artistic visions. I hope you enjoy what they have in store.

- Michael S. Dodge

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Like the Heavenly Canopy Stretched Out Over the Angels: Celestial Objects in Jewish Liturgy

What it means for something to “be” art is a complicated question. Whatever else it does, the experience of art arouses emotion. [2] Lindbeck’s experiential-expressive phenomenology of religion is centered around the subjective, emotive experience. [3] His emphasis on personal experiences creates an intriguing possibility: within this model, if liturgy inspires emotions, it might reasonably be called art. Jewish liturgy is supposed to inspire emotion, [4] so for the purposes of this article, it is art. How do depictions of celestial objects in Jewish liturgy influence emotions during prayer?

Jewish liturgy pulls frequently from the Hebrew Bible, which contains the oldest references to space in Jewish prayer. I translate Psalm 136:7-9: “To the one who made great lights, His lovingkindness endures forever. The Sun to shine in the day, His lovingkindness endures forever. The Moon and the stars to shine at night, His lovingkindness endures forever.” [5] The literal meaning of this is clear. Creation, especially creation of light, is an act of lovingkindness. Creating light through celestial objects, particularly the Sun, Moon, and stars, is a praiseworthy manifestation of this divine emotion. The primary location in which Jews today recite this Psalm, the introductory service on holidays, supports this. This portion of the morning service emphasizes praising God, and showing divine kindness and strength. Creating the celestial bodies that sustain humankind demonstrates this on a universal level.

Psalm 148:2-3, in stark contrast, commands the Sun, Moon, and the stars with light to praise God. It personifies celestial bodies, and commands them to act like angels. [6] This parallel establishes that celestial bodies were created by God, and also suggests a belief of the psalmist that they are sentient. This complements Psalm 136 in weekday liturgy; Psalm 148 is read daily in the same part of the service in which Psalm 136 appears on holidays. The emphasis is just a bit heavier on the subject to God’s rule than subject of God’s creation, which is fitting; weekday and holiday liturgies emphasize different things.

Post-Biblical Jewish liturgy frequently uses a creation, revelation, redemption paradigm. [7] The evening service is often understood as reflecting themes of creation. This is apparent in the first benediction before the Shema. [8] It discusses natural transitions, particularly from day to night, the seasons, and the placement in the sky of the stars. [9] Interestingly, natural cycles here include both celestial and terrestrial cycles, identifying a commonality between Earth and the stars. This is a theological development; Earth and other celestial bodies are created on different days in Genesis 1:1-19. [10] This suggests, though not conclusively, that cosmological ideas may have evolved in ancient Jewish communities. Certainly the celestial objects in this benediction highlight the cyclical nature of natural time.

Cyclical natural time is also emphasized once every twenty-eight years during Birkat HaChamah. This ritual, marking the return of the Sun to its position upon its creation, is centered around blessing God “who makes the work of creation.” [11] According to J. D. Bleich, the Talmud [12] and Mishneh Torah [13] show Rabbinic support for the study of astronomy to better understand the Jewish calendar. [14] Bleich shows that sunrise evokes the understanding that creation in Judaism is a continuous process. [15] Again, the Sun exemplifies this. However, unlike the the evening service, we do not just acknowledge the transitions of



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cyclical creation – we internalize them at the start of the cycle.

The holiest day of the Jewish year is Yom Kippur. [16] A portion of its liturgy recalls the holiday service of the High Priest in the Temple. He risked death if he made an error, and his success so important that the Mishnah says to appoint a deputy for him in case he was unable to perform the ritual. [17] [18] Upon finishing recalling the rites, an acrostic [19] describes the High Priest as he departs “from the Holy of Holies in peace, without harm.” [20] Several lines mention celestial phenomena. His countenance is described as “Like the heavenly canopy stretched out over the angels”, “Like those watching the sun rise over the land”, “Like the Venus star on the eastern horizon”, and “Like the appearance of Orion and the Pleiades, seen in the South.” [21] The idea of a “heavenly canopy” recalls Psalm 148. It contextualizes the planets as not as transcendent as God, but also not at all immanent to the poet. The rising sun recalls earlier ideas of creation, like Birkat HaChamah. The quote about what the translator believes to mean Venus is interesting, because he suggests that it may have roots in wisdom literature, in Ben Sira 50:6. [22] Together, it and the line about Orion and the Pleiades, constellations, show increasing knowledge about the heavens. These things relate to each other, and to non-space subjects of other lines, through their awe-inspiring beauty. This notion of celestial objects as subliminally beautiful shows that the liturgical understanding of the sky has developed beyond exemplifying the non-immanent, or recalling creation. Space is appreciated for its beauty. The context of the poem suggests, further, that the beauty of the sky is a cause for joy; the poem strives to share how radiant the High Priest looked. Celestial objects are appreciated here as objects of immense beauty, which is not entirely dissimilar to the divine.

The celestial references examined serve one broad function in Jewish liturgy. They provide a concrete example of transcendence that is visible to the world, even as they are not of it. As such, they both have closer relationships with God than humanity is capable of, and are evidence of divine work. However, references to the sky fulfill different roles. The Sun is a default for liturgical references to creation. Likewise, celestial light justifies universalistic human praise of God. Certain objects in the sky have been used as examples of extreme natural beauty; it is unclear whether this is a normative decision among paytanim [23] or not. These references to outer space in Jewish liturgy dissimilarly create awe. In so doing, they inspire both a deeper love and fear of God. [24]

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6. *Tanakh: The Holy Scriptures*. JPS, 1985.

7. Rosenzweig, Franz. “Part II The Course or The Always–Renewed Cosmos.” *The Star of Redemption*. Translated by William Hallo, University of Notre Dame, 1985, pp. 93–264.

8. The Jewish declaration of faith, Deut. [6:4–9](#), [11:13–21](#), and Num. [15:37–41](#).

9. Rabbinical Assembly. “Evening Service After the Holy Day.” *Mahzor Lev Shalem*. Rabbinical Assembly, 2010, pp. 444–459.

10. *Tanakh: The Holy Scriptures*. JPS, 1985.

11. Bleich, J. David. “Survey of Recent Halakhic Periodical Literature: In the Wake of Birkat Ha–Hammah 5769.” *Tradition: A Journal of Orthodox Jewish Thought*, vol. 42, no. 2, 2009. pp. 71–98, www.jstor.org/stable/23263725. Accessed 10 October 2018.

12 The Talmud is a collection of two commentaries, the Mishnah and the Gemara, on the laws of the Pentateuch; though central to Rabbinic

Judaism, it is often inconclusive in its legal positions, and is typically dated as having been sealed around the fifth century CE.

13. Mishneh Torah literally translates to “The Second to the Torah”; it is a comprehensive code of Jewish laws, and was written by Maimonides (12th century CE Spain).
14. Bleich, J. David. “Survey of Recent Halakhic Periodical Literature: In the Wake of Birkat Ha-Hammah 5769.” *Tradition: A Journal of Orthodox Jewish Thought*, vol. 42, no. 2, 2009. pp. 71-98, www.jstor.org/stable/23263725. Accessed 10 October 2018.
15. Bleich, J. David. “Survey of Recent Halakhic Periodical Literature: In the Wake of Birkat Ha-Hammah 5769.” *Tradition: A Journal of Orthodox Jewish Thought*, vol. 42, no. 2, 2009. pp. 71-98, www.jstor.org/stable/23263725. Accessed 10 October 2018.
16. Which translates literally to “The day of atonement.”
17. *m. Yoma. 1:1*. The Mishna with Obadiah Bartenura, Shraga Silverstein.
18. To cite apocryphal and early rabbinic religious sources in the absence of more precise guidance from MLA, I followed the source naming conventions from Yeshiva University (<https://cardozo.yu.edu/sites/default/files/instructions%20for%20contributors.pdf>) and merged it with the MLA sacred texts citation format.
19. Known either by the first phrase in the refrain of the poem, “Emet Mah Nehedar,” or by the response of the congregation to each analogy, “Mareh Kohen,” this liturgical poem and its translation is found on pages 900-902 of the Koren Yom Kippur Mahzor, the holiday prayer book most commonly referenced here.
20. “The Order of the Temple Service.” *Koren Yom Kippur Mahzor*. Translated by Jonathan Sacks. Rohr Family ed., Koren Jerusalem, 2012, pp. 878-902.
21. “The Order of the Temple Service.” *Koren Yom Kippur Mahzor*. Translated by Jonathan Sacks. Rohr Family ed., Koren Jerusalem, 2012, pp. 878-902.
22. *Sir. 50:6*. The Wisdom of Ben Sira, Cambridge UP, 1899.
23. The technical term for those who wrote Jewish liturgical poems.
24. Schorsch, Ismar. “Core Values of Conservative Judaism.” *Jewish Virtual Library*, www.jewishvirtuallibrary.org/the-core-values-of-conservative-judaism. Accessed 10 October 2018.

The Infinity of Space Photographs

The relationship between art and science is old and complex, in particular when art has to do with the observation of Space. The human desire to expand its knowledge as well as its questions about life have always resulted in endless attempts at studying the universe, for religious and divinatory reasons, or just for more practical ones, since understanding the sky meant knowledge and power at the same time. After the advent of scientific methods and instruments, the universe ceased to be just the place where humanity can live and work: on one side, it became an entity to be studied and observed up to its deepest spaces, at unimaginable distances; and, on the other, it turned into a new possible destination for humanity's journey through life.

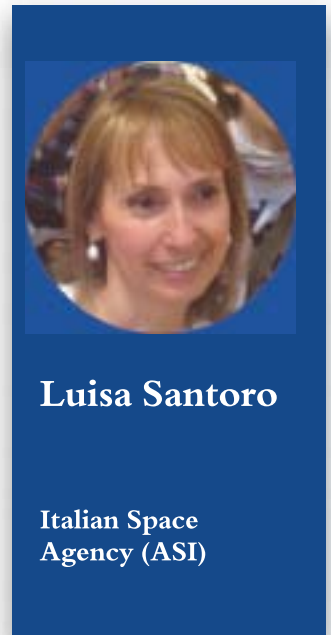
Binoculars first and telescopes later, have become the



Figure 1, Newton by W. Blake

symbol of humanity's progress in the rational observation of the universe. They are the instruments that enable us to reach deep Space and receive photographs of galaxies, nebulas, stars, planets, and even black holes. But, if, on one side, they confirm humanity's powerfulness, on the other telescopes have also reshaped its ambition to impose itself as a universal measurement unit[1]. This means that, from William Blake's (28 November 1757-12 August 1827) "Newton"[2], where the scientist (a symbol, in Blake's opinion, of science and materialism) is portrayed in the act of reducing the world to a finite entity, today the representation of that same world takes place in totally different ways and forms. One example is given by Valentina Rech, whose artistic production takes inspiration from the marvelous images provided by those powerful instruments, and that, by using different materials and combining the art of painting with astronomy, obtains fantastic results[3].

Art and astrophotography, after all, share one ultimate goal, that is the reproduction of the beauty and intensity of subjects carrying profound, fascinating, surprising or simply moving truths. As Roman Catholic priest and college teacher of History of Religions Thomas Berry (1914-1999) said in 1999, during an interview (see *Parabola*, Vol. 24, No. 1, 1999), "*The outer world is necessary for the inner world; they're not two worlds but a single world with two aspects: the outer and the inner. If we don't have certain outer experiences, we don't have certain inner experiences, or at least we don't have them in a profound way. We need the sun, the moon, the stars, the rivers, the mountains and the trees, the flowers, the birds, the song of the birds, the fish of the sea, to evoke a world of mystery, to evoke the sacred. It gives us a sense of awe. This is a response to the cosmic liturgy, since the*



Luisa Santoro

Italian Space Agency (ASI)

[1] Francesco Brancato, *Il futuro dell'universo* (pg. 102) – Jaca Book, June 2017

[2] "Newton is a monotype by the English poet, painter and printmaker William Blake first completed in 1795,[1] but reworked and reprinted in 1805" (https://en.wikipedia.org/wiki/Newton_Blake).

[3] Barbara Bubbi, *Arte e Astronomia* – June 2017 (<http://www.universoastronomia.com/2017/06/25/arte-e-astronomia/>).



Figure 2 *The Horsehead Nebula*, by V. Rech, as inspired by images from the Hubble telescope

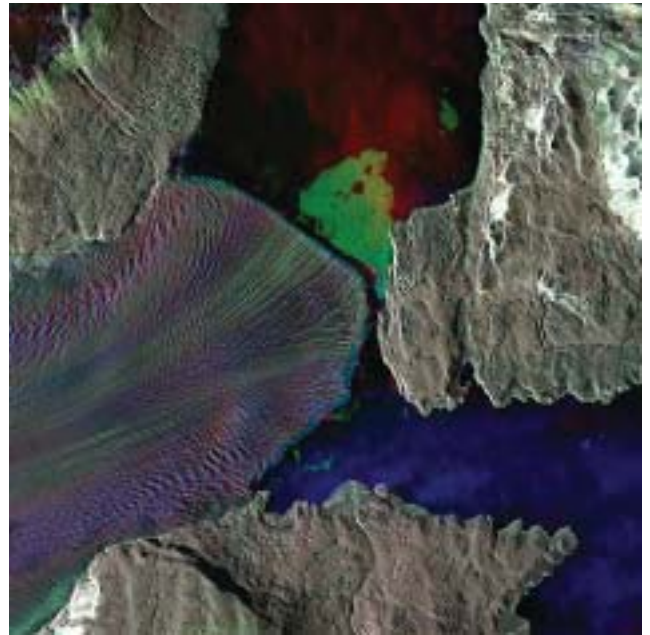


Figure 3, The Perito Moreno Glacier (Patagonia - Argentina) - Cosmo Sky Med - courtesy of ASL, processed by e-GEOS S.p.A.

universe itself is a sacred liturgy. Humans become religious by joining the religion of the universe... The experience of the beauty and grandeur of the outer world is totally necessary."

So, it is not by chance, then, that in the astro-images taken by the satellites orbiting around the Earth, we are inspired to recognize (see fig. 3) *"the landscapes of cubist painter Braque, who saw an hypnotic, geometrically fragmented and brightly colored nature"*[4] (the translation is mine).

Or, if entire expositions lasting months are or were based on images, pictures, and illustrations of the "lights and particles" (see fig. 4 and 5[5]) that constantly "speak" to us.

Artists and scientists in all disciplines go to nature not to copy it but to find something new, as *"Nature is the eternal creator where each art comes to be renewed, where the eye of every thinker and artist reads a different poem."*[6]

Finally, Space Art is represented also by the shots shown in recent (2017) itinerant exhibitions like *Space Girls, Space Women* (see, for ex., fig. 6). Conceived with the broad objective of showing women's



Figure 4 "Astri e particelle" exhibition: wallpaper for one of the showrooms

[resident of the Italian Space Agency (in "CosmoSkyMed compie 10 anni", La Stampa, interview on June 7 2017)

[5] Courtesy of Prof. R. Battiston, Scientific Director of the "Astri e Particelle - Le Parole dell'Universo" exhibition (Rome, Palazzo delle Esposizioni, October 27 2009 - February 14 2010)

[6] Emile Gallé (quoted in *Masterworks of Louis Comfort Tiffany*, by A. Duncan, M. Eidelberg and N. Harris - Thamesand Hudson, 1998)4] Roberto Battiston, P



Figure 5 "*Astri e particelle*" exhibition backstage: rendering of the scenes

approach and art in the conquest of Space, the exhibition has turned into the expression of a particular universe - the female universe - composed of women who are proving to be increasingly determined to achieve their own "space", not only in the fourth environment but also on the Earth. "*Hence nature is sublime in those of its appearances whose intuition carries with it the idea of their infinity*", wrote Immanuel Kant [7]; and the infinite and moving beauty revealed by the images coming from Space - in the form of photographs, reproductions or of any other work of art - simply confirm that.



Figure 6

[7] I.Kant, *Critique of Aesthetic Judgement* - Hackett Publishing Company Indianapolis Cambridge, 1987 - p. 256

Jonathon Keats
and
Alice Gorman



The Cosmic Welcome Mat: an experiment in public and alien engagement

Introduction

What if aliens are keeping their distance because we haven't made them feel welcome? This was the premise behind the authors' Cosmic Welcome Mat project, which was designed to coincide with the International Astronautical Congress in Adelaide, September 2017. The aim of the project was to adapt a familiar material object used to communicate the meaning of 'welcome' in terrestrial homes, with the additional purpose of removing dust and dirt from visitors' feet before they enter the building, to perform that function for alien visitors from anywhere in the universe.

The mats were imprinted with graphics designed to represent welcomeness to all beings regardless of their background, including members of our own species. The welcome was communicated through a universal visual language derived from physics, chemistry, and biology. The designs were additionally informed by archaeological research into symbolic communication through deep time, as well as astronomical and SETI/METI research. Using the same basic design elements, four variations were generated to test which design was most effective at

'welcoming'.

Designing the concept of 'you are welcome here'

The starting point for designing the mats was to articulate a set of principles about the aliens we wished to attract, and translate these into design concepts, which are discussed below. The basic message to be conveyed, using both form and colour, was *you are welcome here*.

The Concept of *You*: The alien is depicted as an amorphous red blob to communicate otherness, since the blobbiness departs as far as geometrically possible from the shape of identifiable beings and objects on our planet (especially on the macroscopic scale of the welcome mat). Furthermore, the color is as spectrally distant as possible from the violet background – within the gamut of welcome mat pigments – providing another signifier of otherness. The red form was generated in several variations, in order to evaluate which is most effective.

The Concept of *Being Welcome*: Welcomeness is communicated in terms of receptiveness, showing the potential of the blob to fit into its terrestrial surroundings. This is conveyed through complementary positive and negative spaces oriented on the mat to match the orientation of the mat at the building entrance. The mats enlist the biochemical receptor as a metaphor, representing the alien as an agonist (Figures 1–4). Interaction between agonists and receptors is one of the most commonplace biochemical mechanisms, with a fair likelihood of operating in some form within any complex life.

The Concept of *Here/Inside*: The place into which the alien is welcomed is surrounded in black, evoking the expanse of space already traveled. The entry (where the alien would be situated at the moment that the message is seen) is shown as sky blue, referencing the typically blue sky of the outdoors here on Earth. The geometry of the rectangular shape suggests the built environment. The color gradient shifts from sky blue to violet, referencing the distance to be traversed to reach the interior. The interior is shown as violet also because it conveys the shift from the natural outdoor light into an artificial interior, and because it represents the foreignness of the space into which the deep red alien is welcomed.

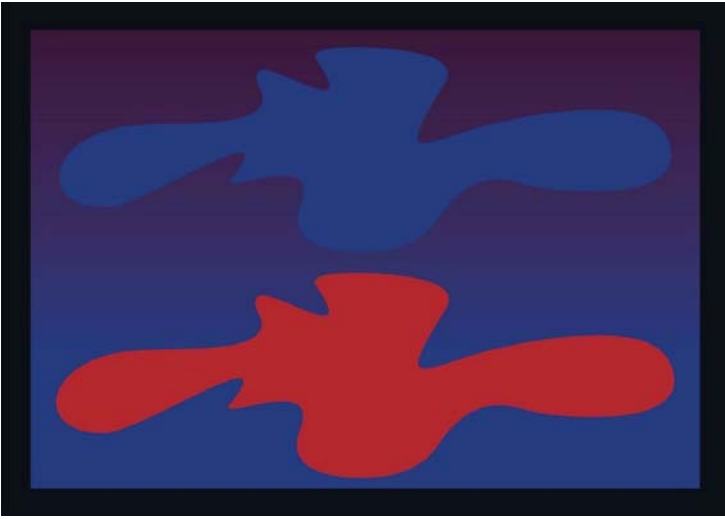


Figure 1: Fitting. This welcome mat variation shows the alien agonist opposite the biochemical receptor.

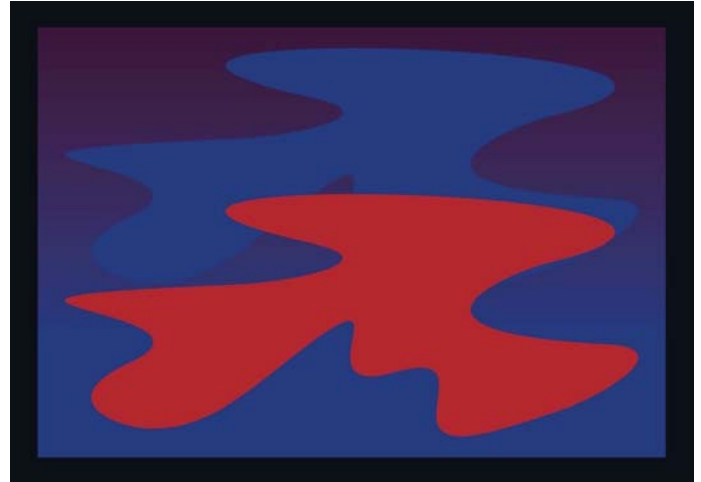


Figure 2: Shifting. The alien agonist and receptor begin to merge.

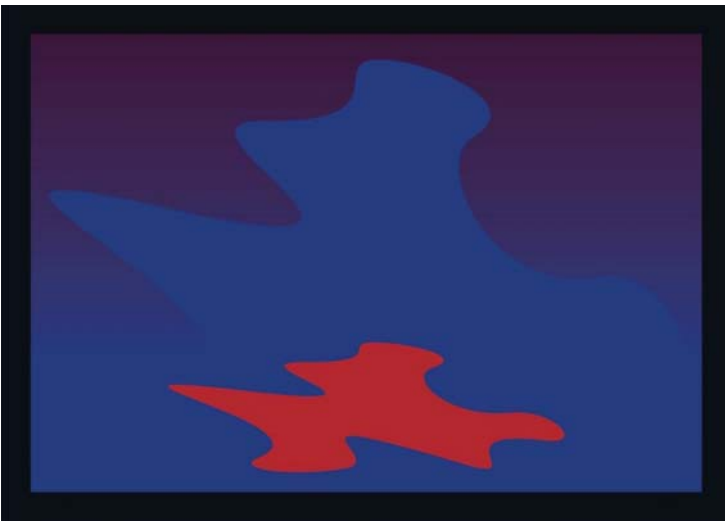


Figure 3: Growing. This mat enlists the phenomenon of growing, with a negative space shaped to accommodate growth of the blob. Since growth typically happens in time, this mat has the added advantage of evoking a temporal sequence.



Figure 4: Stretching. The fourth mat enlists the phenomenon of stretching, a standard mode of locomotion, with the negative space elongated to accommodate movement deep into the interior space. This mat is also distinctive because it shows multiple blobs, potentially communicating that all aliens are equally welcome.

Deployment

One large mat (90 cm x 115 cm) was placed inside the foyer of the central entrance at the Adelaide Convention Centre (the location of the International Astronautical Congress 2017 in Australia, attended by over 4500 people). Four smaller mats (60 cm x 90 cm) were placed at the entrances to public buildings and facilities on the Flinders University campus. Each of the small mats had a different design; the large mat at the Convention Centre was an enlarged version of one of these designs, providing a baseline for assessing the ratio of human and extraterrestrial traffic. Figure 5



**INSPIRING
ACHIEVEMENT**

COSMIC WELCOME MAT

The Cosmic Welcome Mat is designed to welcome visitors from anywhere in the universe, including member of our own species.

The welcome is communicated through a universal visual language derived from physics, chemistry and biology. The designs are additionally informed by archaeological research into symbolic communication through deep time.

Material deposits on the mats will be collected daily by Flinders archaeology students. The samples will be processed in the Archaeology Technical Laboratory to distinguish between terrestrial and extraterrestrial detritus.

Please cross the mat and feel welcome!

Artists: Jonathon Keats and Alice Gorman
For more information email Alice.Gorman@flinders.edu.au



Space: Unlocking Imagination, Fostering Innovation and Strengthening Security

Figure 5: Interpretation sign at the Adelaide Convention Centre

shows the accompanying sign, which explained the mat to people entering the foyer.

Locations on the Flinders campus were the entrance to the main student Hub area, the entrance to the Laneway, where a popular coffee cart is located, the entrance to the Alere Restaurant in the Hub building (Figure 6), and the Central Library foyer. Consultations with Buildings and Property were held to ensure workplace health and safety considerations were met, and the mat fabric was also a



factor in this, as the mat was labelled, so that people who were curious could discover that they were part of an experiment.

The archaeological experiment

Material deposits on the mats at Flinders University were collected daily by graduate archaeology students who were undertaking a field school in archaeological geophysics that week. The sample collection procedure was determined in consultation with the students and the Archaeology Technical Officer, with the resulting protocol being a compromise between accuracy, practicality, and the limits of the equipment (see recording form in Figure 7).

A team of four students visited each mat once a day. Their equipment was one dustpan and one nylon bristle brush; lab coat, dust mask and latex gloves; and a glass specimen jar (Figure 8). The mat was brushed vigorously and the residues collected in the dustpan, which was then emptied into the glass sample jars. The week's deposits were stored in one jar, thus producing an average of the week's traffic. Deposits from the large mat at the Adelaide Convention Centre were collected once during the week.

In the next phase of the project the samples (which may represent human or alien traces) will be sorted and processed in the Archaeology Technical Laboratory using standard archaeological protocols and geological techniques to distinguish between terrestrial and extraterrestrial detritus. The data will be analyzed to determine which mat design has welcomed the most visitors (both terrestrial and extraterrestrial), and these data will be used to inform refinement of the visual language used on future iterations of the Cosmic Welcome Mat.

A preliminary result, however, when adjusted for traffic level, show that the design used at the

COSMIC WELCOME MAT

25-29 SEPTEMBER 2017

FLINDERS UNIVERSITY

NAME of recorder: _____

DATE: _____ TIME: _____

MAT NUMBER: _____

LOCATION OF MAT: _____

WEATHER: _

Overcast Raining Sunny Wind speed: None Low Medium High Prevailing direction of wind: N S E W

Temperature (C): _____

MACRODEPOSITS ON SURFACE (above 1 mm):

ANY OTHER OBSERVATIONS:

WEIGHT (cumulative in g) of sample jar with deposit: _____

Figure 7: Archaeological recording form



Figure 8: Archaeological sample collection kits.

Laneway attracted the most residue by weight, suggesting that this design may have been the most effective at conveying the message. This can only be confirmed, however, when the full analysis is completed.

Conclusions and next steps

An estimated 40,000 tons of cosmic materials fall to Earth every day. Normally, such materials are analyzed by geologists and chemists in the context of natural environments; and no previous study has sought to analyze them as part of a human environment. The challenges of doing so not only extend the gamut of astronomical research into the realm of archaeology and the social sciences – with potential repercussions for future archaeological research on the surfaces of the Moon and Mars – but also elucidate methodological problems faced by the archaeologist analyzing a contemporary site and interacting with those whose activities produce the trace materials under study.

While intended to be timeless and universal, the cosmic welcome mat also has the potential to be extremely timely and relevant to conditions on our own planet, given how xenophobic we've become toward fellow humans. A welcome mat for aliens might become the ultimate symbol of cultural and political openness, expressed on every doorstep, onboard the International Space Station, and in the entry hall to the United Nations.

The welcoming effort must be ongoing, but we must start with something.

Acknowledgements: This project was funded by a Flinders University Faculty of Humanities, Education, Law and Theology research grant. We thank the following Flinders University people without whom the project could not have happened: Kerry Ludwig for project management support, Michelle Szep who took the photographs, Tania Bawden for media support, Chantal Wight for arranging equipment, Dr Ian Moffat who co-ordinated the sample collection, all the students in ARCH8808 Introductory Archaeological Geophysics, Felicity Jukes from Buildings and Property at Flinders for her extensive support, the Flinders University Library, particularly Veronica Ghee and Sian Woolcock, and Alere Restaurant. We also thank Rachael McLaren at Adoremats, for her enthusiastic co-operation, and Amy Christie at the Adelaide Convention Centre for facilitating the entrance display during the IAC 2017.

Reaching the Unreachable Sky: Art as a Scientific Instrument

A practice-based observation

In a recent series of events, ostensibly under the banner of outreach and public engagement, myself and colleagues, either science and technology studies (STS) scholars or artists with a keen interest in science and technology, have been exploring the role of arts in the techno-scientific discourse. In particular, how are arts actually contributing to the development of (modern) science?

The case in point was, perhaps predictably, space science, exploration (and industry), looking in part at past achievements, most notably human spaceflight and corresponding fictionalisation of space travel, as well as future challenges, again somewhat predictably revolving around travelling to Mars and potentially colonising someplace in our vicinity.

Reflecting on those events, my colleagues and I were struck by an inverted mirage: interestingly, we have found ourselves in an situation of our public facing events *formatively* combining elements of performance art in of themselves, whilst we were busy debating the *substantive* interlinking of imagination and creativity with technological advancement.

Let's take those two "functions" in turn.

On one hand, visual imagery, often artistic, seems to be a medium of choice to communicate any challenging topic to a lay audience. If nothing else, metaphorical and allegorical representations of scientific phenomena, amply illustrated with images (artistic, artificially generated or sourced from elsewhere), punctuate practically any scientific talk I have seen in a long while.

It is often anecdotally said that humans are very "visual beings", after all, language is a relatively recent invention, and perhaps a somewhat limited one. Music and many other performance-led forms of expression bring across emotional contexts hardly achievable by the means of "mere" language. If nothing else, one must "read between the lines". This "experiential" understanding of the world, which is at the core of art practice, but goes explicitly against the grain of the rational scientific methodology, is a critical part of approaching new environments, ideas, and connections, and it is this "gut-feeling" that drives our "natural" curiosity.



The creative process behind making a "postcard" based on my research work of innovation networks in the Space Industry in Scotland, working with textile artist Madeleine Shepherd. Part of Science on a Postcard 2.0 project by InterSci Society and ASCUS Art and Science Laboratory (Edinburgh, 26th January 2019).



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Me and a musician and neuroscientist, Lewis Hou, during a workshop in a primary school, comparing brain scans and Universe's early structure, and dancing to Kepler's planet movement notation from Harmonices Mundi.

In this respect, our performative expression of joy, passion, care, concern, even scepticism, were instrumental in transcending the barrier between the factual *knowledge* and contextual *understanding*. As a (literal!) example, Pippa Goldschmid, an acclaimed author and my willing “accomplice” in this series of events, wrote this passage in a short story about the first exploration crew travelling to Mars:

“The spacecraft is named Uhuru. Uhuru means peace and Mars is the planet of war. This wasn't mentioned in any of our training and I suppose it isn't a scientific fact.”

This short excerpt neatly illustrates on one hand the need to translate the science into a contextualised world as well as the limitations of this translation. In order to surpass those limitations, we might turn to art to fill in (some of) the gaps.

This brings me to our second observation, that the art is *needed* in order to transcend our scientific and technological limitations in of themselves. Here, I relate in particular to literary work, i.e. the various branches of science fiction, though other media, in particularly design and film, is extensively used here as well. For instance the role of design in early Moon exploration has been brilliantly described by William Macauley in “Crafting the Future: Envisioning Space Exploration in Post-war Britain” (History and Technology, 28(3), 281-309, 2012).

Hence, an imaginary future in which any or all of the current limitations are overcome is essential for the development of contemporary science, on one hand to drive it and on the other to keep it in check.

In the context of the former, it is the imagining of the possibilities and opportunities available in a future world/society that excites people and our various social groupings to invest resources to try to reaching for such futures. In opening of spaces for transitioning from present reality into an (abstract) vision, it enables individual creativity and collective plurality to experiment in constructing a recombination of existing knowledge into a new internally-coherent paradigm.

Not all change is change for the better, though. In the latter function, art-driven imaginaries can illuminate social and ethical intuitions about the cohesion or discord between the current state of collective understanding and the effects of any disruption to it by scientific and technological “progress”. These intuitions are not immutable (nor should they be), but their evolution is gradual and the overall direction of travel merits significant care and consideration.



Me and author Pippa Goldschmid in a promotional photo for our “Outer Space – The Next Empire” event series.

These two functions of art within a scientific context are often sidelined to the position of art as either

Double / Parallel / Split *Vision*

position statement to *KOSMICA Parliament* from

Matjaz Vidmar

University of Edinburgh / Royal Observatory Edinburgh / GEDG / ARI / SGAC

- *citizen* -

Title image of my video contribution to KOSMICA : parliament installation at Ars Electronica in Graz in September 2018, echoing in part the split between the use of art as illustration of scientific work and its application to the development of future imaginaries.

glorifying socio-technical advancement or as a means to critique it. I would advocate for deploying art in a mode when it is neither, where it creates a new shared space of exploration and innovation, in which future narratives are constructed and examined with a view for them to be *developed*.

As such, the role of arts engagement with science and technology, as well as its social impact, should be moving away from that of an observer, analyst or critic, but rather towards that of a maker. If we are adding an arts “A” to our STEM research and outreach agenda, I think it better be on those meaningful, discursive terms.

Why do we need to send artists into space?

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Lauren Fuge

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The SpaceX mission to send painters and poets to the moon could have world-changing ramifications

Reprinted article (with permission) from *Cosmos Magazine*
<https://cosmosmagazine.com/space/why-we-need-to-send-artists-into-space>



"Here Men From Planet Earth", by Apollo 12 crew member, now full-time artist, Alan Bean.
Credit: alanbeangallery.com

Mid-September 2018 brought big news for science and art alike: as its first private lunar mission, Elon Musk's company Space Exploration Technologies ([SpaceX](#)) plans to send artists to orbit the moon. Slated for launch in 2023 aboard the company's Big Falcon Rocket (BFR), the "[Dear Moon](#)" project is being backed by Japanese entrepreneur and billionaire Yusaku Maezawa, who [intends to take](#) six to eight artists with a range of backgrounds, from literature to dancing to architecture.

Each artist will be asked to create a work upon return, making it the first time that art will be produced by non-astronauts who have travelled into space. The participants will undoubtedly have a vastly different way of seeing the world than the scientists and engineers who have so far made the journey, and it's thrilling to imagine the artwork that may eventuate and how it may strengthen the link between humans, our own planet, and the grander universe.

Over the past half century, only about 550 humans have experienced the planet from beyond the thin blue line of its atmosphere. These astronauts have repeatedly reported that seeing the Earth from above seems to flip a switch in their brains, transforming their perspective of our planet and our place in the universe — a phenomenon termed "[The Overview Effect](#)".

They realise that humanity is living on a tiny speck, like an organic spaceship travelling through the darkness of the universe, and that the planet and its inhabitants must be conserved and protected. They return to Earth with a profound understanding of life's connectedness — and a sense of responsibility to share these revelations with those left down below.

Edgar Mitchell, lunar module pilot on Apollo 14 and the sixth man to walk on the moon, [explained to People](#) magazine in 1974: "You develop an instant global consciousness, a people orientation, an intense dissatisfaction with the state of the world, and a compulsion to do something about it. From out there on the moon, international politics look so petty. You want to grab a politician by the scruff of the neck and drag

him a quarter of a million miles out and say, ‘Look at that, you son of a bitch.’”

Since we can’t just ship all the world’s politicians — or regular citizens, for that matter — up into orbit, we rely on the astronauts themselves to communicate these feelings of wonder and transcendence. But this has always been a profoundly difficult task.

In speeches, interviews and writing, astronauts throughout history have struggled to convey their feelings of global connectedness and awe. Since poetry isn’t high on the lists of prerequisites for them, these otherwise highly-talented explorers often found themselves the subject of ridicule, because their attempts fell back onto bland, empty adjectives such as “beautiful” and “fantastic”.

In his memoir *Carrying the Fire: An Astronaut’s Journey*, Michael Collins of Apollo 11 laments: “We weren’t trained to emote, we were trained to repress our emotions, lest they interfere with our complicated, delicate and one-chance-only duties. If they wanted an emotional press conference ... they should have put together an Apollo crew of a philosopher, a priest, and a poet.”

Of course, no space agency would have dreamed of that.

NASA did, however, have the foresight to equip astronauts with cameras, which sometimes resulted in photographs that step up where words fail. Consider the iconic *Earthrise* and *Blue Marble* images, taken by the Apollo 8 and 17 missions respectively. Both capture the entirety of our blue planet, hanging delicate and alone in the vast, dark emptiness of space.



'Earthrise at Christmas, December 1968', taken by astronaut William Anders: beautiful, but opportunist rather than considered art.
Credit: William Anders/NASA

These humbling images are considered among the most influential of all time, and some — such as historian Robert Poole in his 2008 book *Earthrise: How Man First Saw the Earth* — even argue that they kickstarted the environmental movement.

But neither image was carefully composed for its artistic influence: both were completely unplanned, resulting from instinctive human reactions to the beauty and awe of the moment. The transcript of the Apollo 8 mission even shows that as the crew members fumbled to take the photograph, they were joking around about the fact they had not been scheduled to do so. It has never been the priority of space agencies for astronauts to create art in space.

These days, space can be shared in real-time with the Earth-bound public below. Modern astronauts often use social media to reveal a little of the almost-spiritual wonder, but while ground-dwellers might be awed by glossy pictures of our deserts and mountains and oceans from above, the powerful, profound shift in awareness is much more difficult to duplicate.

Despite the incredible volume and quality of images and videos being created in space, there has been no huge shift in the public's behaviours in terms of valuing and protecting our planet — perhaps partly because much of the population isn't tuned into the latest space news, and partly because these images are only representative, and thus inadequate to express the emotional crux of the experience.

The key to succeeding here may simply be to create art.

By nature, art aims to transcend its form, conveying the core emotional experience rather than just providing a representation. This is exactly what astronauts need: a method of expression that reaches beyond limited language and technology, just as their experiences reach beyond anything that people down on Earth find familiar or relatable.

Many astronauts have turned to art for this very reason. Russian cosmonaut Alexey Leonov and Apollo 12 crew member Alan Bean both painted and drew on their return from space, and Bean even became a full-time artist after retiring from NASA. More recently, NASA astronaut Nicole Stott painted the first watercolour in space and has now retired to spend more time on exploring space travel [through her art](#).

Others have tried poetry. Alfred Worden of Apollo 15 [wrote a book of pieces](#) based on his experiences in space, called *Hello Earth; Greetings from Endeavour*. Here's a sample from "July Launch":

*On we soar
Engines roar
Smoother ride
Vacuum outside
Horizon in view
Launch phase is through.*

The poem's intent is commendable but, with the best will in the world, its literary merit is dubious. It does not convey the kind of world-changing awe that a more skilled writer might kindle.

The first poem written in space was by Japanese astronaut Koichi Wakata, on the International Space Station (ISS) in 2009. Translated into English by Janine Beichman of Daito Bunka University in Tokyo, [it reads](#) a little more wondrously:

Afloat in the darkness before my eyes, the watery planet bluely glows

*How strong is my affection for that ancient home of ours,
 how deep my gratitude for the gift of life
 Tomorrow, I will dare the blue sky and open up worlds unknown
 for there we have our dreams*

This poem is part of a project called Ucyu Renshi, or “space poem chain”, a collaborative program started by the Japan Aerospace Exploration Agency ([JAXA](#)) in 2006. The poems within it are an open-ended string of stanzas, developed from the traditional Japanese renga and renku forms by the poet Makoto Ooka.

Contributing poet Wakako Kaku [sums up](#) the project’s drive succinctly: “It cannot be only poets who believe that we must not entrust our inquiry into the nature of the universe exclusively to science.”

But only some poems are contributed by JAXA astronauts on the ISS; the rest come from the general public, professional poets, and cultural figures on the ground.

To more authentically and skilfully portray the experience of space travel, there is an obvious next step: send trained artists.

SpaceX’s intent to fly a group to the moon within the next five years is an electrifying proposition. Though candidates have not yet been approached, project lead Maezawa says he will select artists from a range of disciplines, including a painter, a director, a musician, a novelist, a dancer and a fashion designer. This will hopefully be in addition to ensuring cultural and geographical diversity, which will all be important in ensuring this project has the furthest possible reach, tapping into the interests and emotions of large swathes of the population.

The practical details of the endeavour are still under discussion, and there is doubt that it will ever get off the ground – but if it does, then what a world-shaking journey it will be. A handful of trained artists will experience the terrifying thrill of wrenching free of the atmosphere and hurtling hundreds of thousands of kilometres through seemingly unending darkness, and then will watch ancient volcanic moonscapes spin gently before their eyes, with our own fragile planet rising in the background, more in need of protection than ever before.

What will these artists feel? How different will it be to the experiences of scientifically-trained astronauts? What beauty will they be moved to create, and how will we react to it, us with our feet planted so firmly on the ground? Will we finally be driven to take seriously our role as stewards of our one and only planet?

By changing the way we see our Earth, their art could literally change the world.

Sean Doran

Space Artist



Visualizing the Cosmos



Reprinted article (with permission) from *Filling Space*

Art that depicts space drives us to explore it. Well before astronauts left Earth, the work of the “father of modern space art” Chesley Bonestell depicted alien landscapes. His thousands of paintings made viewers question if life only exists on earth. He inspired a generation of astronomers and science fiction writers, including the likes of Carl Sagan and Robert A. Heinlein.

Nowadays, artists continue to play a role in generating public interest in space travel. Of course, we can now see photos of other bodies in our solar system, and we are even beginning to gather images of exoplanets in distant constellations. But artists still help bring data to life. NASA’s art program, for instance, creates still and moving images to inform the public about dramatic mission moments, such as the Cassini spacecraft’s “grand finale” when it plunged into Saturn.

One space artist is Seán Doran. Over the years, he has synthesized photos and videos of the planets and our sun. A recent project is creating footage of Mars using data from the High Resolution Imaging Science Experiment (HiRISE) on the Mars Reconnaissance Orbiter, and also using data from the High Resolution Stereo Camera (HRSC) on the Mars Express spacecraft.

Filling Space spoke with Seán to learn more about his work.

How did you decide to combine your interest in art and astronomy?

I am self-taught so learning new things is an ongoing process for me. I’ve always been interested in space since I remember seeing Carl Sagan’s *Cosmos* as a kid, around the same time as seeing *Star Wars* (about 1981). I frequent the Unmanned Spaceflight forums and it was there I discovered the plethora of missions and datasets that afforded me the opportunity to create something new from data collected for scientific purpose.

What work are you most proud of?

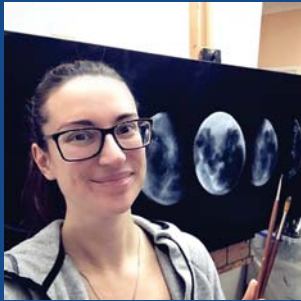
I wouldn’t say that I am particularly proud of anything I have made since I am still very much “chasing the dragon”. My abilities are quite limited compared to what I would like to realize. If pushed I would choose Orbit – A Journey Around Earth in Real Time. I really enjoyed the challenge of putting this together once the idea emerged. Through it, I discovered Phaeleh’s music which quickly became intrinsic to its completion.

Who do you find is most interested in your creations and what happens to them after they enter the public domain?

I can only guess that the people who are interested in what I make share the same curiosity and wonder of the cosmos as it is revealed through our telescopes, satellites, and robotic emissaries. Most of the feedback I receive through social media and the media in general is favorable, although there are still a good few people upset with reality and the notion that the cosmos might be more interesting than they can imagine.

**Catherin
Machin**

Space Artist



Pictures, visions, and moments in our life, are what create inspiration and drive us towards our goals.

It's the reason why I feel astronomical based art is so important.

It's hard to miss the growing pressure on the Earth's resources from the ever expanding human population. In the future, successfully becoming a multi-planetary and thereby, spacefaring race, could be the difference between the survival of the human race and its destruction.

The subconscious mind is driven by by two things, the words we use to describe a situation, and the visions we hold in our heads. And it's these images that we take in, that can build our passion and interest that may stay with us our entire lives.

If you ask about the seed of people's inspiration, they will always go back to a moment in time and explain their vision of a situation that was impactful.

My brother, Charles Machin, is no exception to that. His long-standing 3D development career emerged from when he was a teen, looking through a computer magazine, He saw a beautiful picture of a glass that had the footnote that stated: "computer generated."

A deep pang of curiosity struck him, as he wondered how it was made and his life's direction was set into





play, the goal - to understand everything about how it was made; from learning how to produce items digitally in 3-D, to learning how to write code to produce the shaders.

He is now a successful director of a video games company and it all started from single picture.

As technology advances, people have slowly been migrating to live in the cities and city life is ever more prevalent. Unfortunately, with that, so too is light pollution.

We stay up all night under the fluorescent lights rarely venturing out for the fear of what may lurk in the darkness and it's rare even when outside to be able to see a sky full of stars.

I remember watching an interview from Neil de Grasse Tyson about his inspiration. Living in a densely populated city, he had never seen the stars fully before. And it wasn't until he went into the planetarium that he could see the universe and all its majesty. It was that projected picture of the stars that started his lifelong career in astronomy.

Like Tyson, most people live in cities and are never exposed to the stars. It's the reason that I feel astronomical art it is so essential; without being able to communicate via the medium of images, we may never be able to inspire enough people to dedicate their lives to the development of Astro sciences; and the survival of the human race may very well depend on this.



**Don
White**
Space Artist



Comments on my artwork and its effect on society

My work is dedicated to those who are fascinated with the possibilities and vastness of space and the adventure ahead for humans as we enter the galactic playing field.

I have no pretensions about my art, I'm not even a real artist: I use art as a way of getting thoughts out of my head and out in the open where I can "see" them.

I have space doodles my Mom saved from the third grade. I failed my art classes in grade-school, so I kept my drawing to myself, and it has taken me 60 years to learn to express what I see in my mind and make it into an image.

My work is inspired by an idea left to us by a hero of mine, Carl Sagan, who gave us this amazing perspective:



“Since, in the long run, every planetary civilization will be endangered by impacts from space, every surviving civilization is obliged to become spacefaring--not because of exploratory or romantic zeal, but for the most practical reason imaginable: staying alive... If our long-term survival is at stake, we have a basic responsibility to our species to venture to other worlds.”

— Carl Sagan



Because of that idea, I somehow plugged into an endless stream of ideas and images that I feel compelled to get out there. It's taken me until now to learn how to express myself through art. My art is imaginary, but reality is not what I'm after -- I'm not trying to show you something "real" -- I want to show you something pleasantly unexpected -- something that gives you a new idea, or makes you smile a little bit on the inside each time you notice it. My art is a reminder to make ourselves open to larger thoughts and wider perspectives. Mostly, I want to remind everyone how important it is for the survival of Humanity as a species, which depends on becoming a spacefaring as Carl Sagan says. I believe we humans are blessed with the almost magical ability of taking an idea and bringing it from the world of nothingness into our world of three dimensional reality - amazing when you think about it! But first, we need to think the thoughts that will make us want to get there -- in some tiny way, I hope my art will start some conversations in that direction.

I will leave you with one more thought from Carl Sagan, that has inspired my work:

"Imagination will often carry us to worlds that never were, but without it we go nowhere." —
Carl Sagan





Sarah Cruddas

**Astrophysicist
and Science
Communicator**

The Power of Art from Space

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<https://www.spaceforhumanity.org/the-power-of-art-from-space/>

When we think of space exploration, what comes to mind for many is science. Science and technology and making new discoveries. All of these things are vital. The findings we are making in space are helping us to answer some of the most extraordinary questions of all time, such as: Where did life come from? And are we alone? And What else is ‘out there’?

The science being conducted from space is also significant for life on Earth, astronauts are conducting experiments on the space station which can bring real life benefits to areas such as medicine and material science, to name but a few. And, of course, it goes without saying that space technology advances the speed of technology here on Earth. Simply put we live in a better world because of space.

Yet one aspect which is sometimes overlooked is art. The world we live on would be a rather dull place with no art. Art brings beauty to our surroundings and helps stimulate both emotional and intellectual thoughts. The value of art cannot be measured in the same way as other advances, but throughout human history art has been used to tell a story of the time. From the

early cave paintings in prehistoric times to the art of Ancient Egypt, Leonardo DaVinci and the war paintings of great battles. You can almost think of it as a time capsule for what life was like.

Today we live in a Space Age. A world transformed by space, from the space receiver in your pocket – yes, that means your smart phone – and the digital technology and satellite TV we use. To the schools and offices decorated by images from space which were once seen as stranger than fiction. Today, space is defining our art. Even the clothes people choose to wear have been influenced by the Space Age, from the metallic futuristic visions showcased by Vogue during the 1960s, to the NASA sweatshirts worn by celebrities and Space Nerds alike. There is a definitive shift in our art because of space.

This matters because not only does it show historically how exploring space started to influence our society, but it helps to inspire people about space. Everyone would have at some point seen an image from the Hubble Space Telescope, or the Apollo missions to the Moon, or the Earth as seen from the International Space Station. These images, like all pieces of art spark curiosity, intellectual thoughts and they often create emotional responses – such as seeing a human being standing on the surface of the Moon and then being able to go outside and look at the Moon with the knowledge that people have been there. To be able to view an image of your home country, taken by your nation’s astronaut from space, with the visceral knowledge that these nation-state boundaries define us less as human beings than the fact that we can all call the same planet home.



Image Credit: Soviet Cosmonaut Aleksei Leonov’s Painting – *Near the Moon* (1967)

Even astronauts have turned to art to express what they see. From the first spacewalker Alexie Leonov, who took coloring pencils to space to create the world's first art FROM space. To Apollo 12 Moonwalker Al Bean, who turned to art to answer the often difficult-to-answer question of 'what was it like on the Moon?'. And modern astronaut artists such as Nicola Stott and Chris Hadfield who beside from his music playing in space, worked on a Japanese experiment to recreate ancient traditional art from orbit. Art helps us tell our story.

Space for Humanity's goal is to send global citizens to space. Not just scientists and engineers – of course if you are one that's still ok, but people from all over the globe who may not necessarily have had an opportunity to be involved in space. People from all walks of life who are able to help tell a powerful story to their community, be that through using the art of literature or simply telling their story to inspire their community for the better.

To date fewer than 600 humans have voyaged to space. Almost all of them were scientists, engineers or test pilots first. Imagine what would happen when we are able to send painters, writers and musicians, or sales assistants, carers, office managers, sports players, accountants, lawyers or those whose life path was defined simply by the country they were born into. They might not be a typical space enthusiast, but their lives have already in some way been touched by space. How will these citizen astronauts' experiences of space travel help them to play a part in recording the story of our time?

As a species we have largely – with the exception of the oceans – explored the Earth. Space is now our next journey. Following a process, no different to what we have seen on Earth – governments have gone in first and now private industry is following (compare this with Christopher Columbus and then later the Mayflowers). But going to space makes sense, curiosity is what defines us as a species and the furthest people have ever traveled is a mere 250,000 miles. When you really think about it, we have barely left our front porch.

If just 600 hundred humans in space, along with a series of incredible robotic missions has inspired and influenced the world in such a profound way, what will happen when that number is double? Triple? Or even ten times? At Space for Humanity, our goal is to be instrumental in increasing that number. Our legacy will be the way that Space for Humanity citizen astronauts communicate their experience to influence the world around them.

In exploring and understanding our universe, we have only just scratched the surface. In order to dig a little deeper we need to work with people across the globe to inspire them about the possibilities and inspiration that comes from space. It is only through working together, as one species, that we will truly move forward in the greatest story that is yet to be told. And it will be these stories and the art created by the next generation of citizens in space – including Space for Humanity astronauts, that will help us to do this.

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- Jim Pass

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