

Chapter 2

Visions of Not-Earth: Space Arts

Dreams of space – of not-Earth – have inspired humanity over the ages. Dream-inspired humans made space travel a reality. Without our dreams, there would be no space programs anywhere. Artistic, religious, philosophical, and ethical perspectives are not frills or mere add-ons to space activities. They are absolutely essential parts of all aspects of all space endeavors. At the same time, without the science and technology that enables humans to loose the bonds of Earth, humans would still only be dreaming of space while never going to the Moon and beyond. But science and technology are themselves the products of human dreams and desires. Dreams, beliefs, science, and technology – along with natural and human resources harnessed by human will and labor – are all required to attain and maintain space activities.

Stories of Not-Earth

Every culture on Earth has some kind of foundational explanation for the creation of Earth and of humans. Many of these stories say that humans, other life, and Earth were created either by nonhumans or by super humans who came down from the sky. There are virtually no creation stories that clearly follow the perspective of Darwinian evolution although sometimes people try to show that they do. Some, such as the Abrahamic tradition, may have God creating heaven and Earth in 7 days, which some try to interpret now in evolutionary terms. However, the message is not one of natural selection with unguided evolutionary development over eons of time, but of creation by an external sentient being.

Many cultures also tell of voyages between Earth and not-Earth. The idea that there are worlds and beings not of this Earth that interact with humans and Earth is very widespread across the globe and has persisted for a very long time. Modern space fiction is just one current way by which very old stories are being told and retold dressed up with contemporary ideas and technologies. These old stories influence the way we think about current space exploration.

For example, one of the best-known Japanese folktales is about Kaguya Hime. A bamboo cutter discovered a baby girl inside a bamboo shoot. He took the baby home, where he and his wife reared the baby as their own. When she grew up, she revealed that she was not from Earth and was transported back to the Moon from which she came. Her story, and her return to the Moon, is repeatedly told in Japan. In the summer of 2007, JAXA (the Japanese space agency) launched a lunar orbiter. JAXA asked the Japanese public what the name of the orbiter should be, and Kaguya Hime was the overwhelming choice.

Another popular folktale from China, Korea, and Japan is told every summer on the seventh night of the seventh month. It celebrates what appears to be the annual meeting of the stars Vega and Altair that are otherwise separated by the Milky Way. According to the folk story, Vega is a seamstress and Altair is an ox-herder. They love each other but are separated from one another and only allowed to meet briefly once a year, and then must part once again.

The Japanese space agency named a pair of satellites *Orihime* (the seamstress) and *Hikoboshi* (the ox-herder). The two were launched together as ETS7 and then separated before coming together again in 1999. It was the first time automated docking had ever been carried out in space. Most of the vehicles that Japan has sent into space have names from folktales, or are named such things as *Kibo* (Hope), *Kizuna* (Wind), *Kiku* (Chrysanthemum, the national flower), *Hinode* (Sunrise), and *Kodama* (Spirit).

Compare them to the names NASA has given to some of its space vehicles: Mercury, Apollo, Gemini, Saturn, Jupiter, Orion, Titan. They are all named after mighty Greek or Roman gods with fearful powers, conveying a very different impression in comparison with the Japanese terms from nature or folktales.

However, probably the iconic figure for flight in Western cultures is Icarus, the Greek who, with his father, Daedalus, fashioned wings so that he and his father could fly like the birds, something they were totally unable to do with their wingless, flightless natural bodies. So, as is always the case, humans first imagine doing something impossible – flying – and then develop the technologies that enable their dreams to come true. However, Icarus also received a warning from his father before he took off. According to Ovid, in one English translation, Daedalus said:

My Icarus, I vow thee fly
Always the middle track; nor low, nor high;
If low, thy plumes may flag with ocean's spray
If high, the sun may dart his fiery ray.

Of course Icarus, being a typical son – and a typical human – disregarded his father's warning. He did fly. But then he sailed too close to the Sun, which melted the wax on his wings and cast Icarus to his death in the ocean below. The daring and hubris of Icarus has been an extremely popular theme in Western art and literature, warning us of the eternal tension between what we *want* to do and then *can* do because we develop technological capabilities, on the one hand, in contrast with what we *ought* to do, given our ethical limitations and frailties, on the other. The Icarus story has had enormous impact on Western consciousness and is depicted in many works of art and poetry as an example of humanity's daring spirit, as well as our hubris and limitations.

Voyages of Discovery

Space fiction, almost by definition, involves voyages of discovery. However, well before the modern era, certain cultures had stories about voyages of discovery, while other cultures had no such stories at all. In the former, heroes leave home, travel through strange times and places, overcome many adversities and have many exceptional experiences before returning home again, enlightened by the process. The basic archetypal stories for Western cultures are the *Iliad* and the *Odyssey*, first composed between 800 and 600 BCE. The *Odyssey*, recounting 20 years of travel by Odysseus (Ulysses, in Latin), is a prime example.

In the Abrahamic Bible, the first book, Genesis, is immediately followed by Exodus: departure happens soon after Creation. The story of Moses leading the Jewish people to the Promised Land – and the belief in the existence of a Promised Land that is rightfully theirs – is an unfinished narrative of travel and travail in Western cultures. In Christian belief, the Wise Men traveled far to find the Messiah. The Muslim faithful must travel to Mecca. There appears to be an almost irresistible urge in certain cultures for humans Boldly To Go – or at least for some people, usually men, to go. In each of the stories above there are those who warn against the journey, and/or who patiently stay at home waiting for the hero's eventual return, such as Ulysses' Penelope.

The stories and actual experiences of the people who left what is now south China perhaps 4,000 years ago and spread across the vast Pacific Ocean from island to island, creating the very diverse cultural groups known as Melanesia, Micronesia and Polynesia, and stopping only when they finally landed in Hawaii 3,000 years later is an extraordinary episode of actual human voyaging. They went on their dangerous voyages in part perhaps because they were forced to move by population pressure and resource scarcity, but perhaps mainly because of their cultural stories that compelled them to travel, and the unique technologies they developed that enabled them to navigate by the stars, winds, clouds, tides, and fish movements in order to go where no one had ever gone before.

Stories and examples of heroic travel to unknown places do not exist in some cultures. They instead are told in effect to stay home, to get along with their neighbors, and to mind their own business. The urge boldly to go is found in some humans and cultures, but by no means in all. In those cultures where exploring is deeply rooted in myths, "going boldly" is almost irresistible, while in others with no such stories, it seems almost impossible to ignite.

Emerging Science Fiction and a Sense of the Future

Around A.D. 150, the Greek philosopher Lucian of Samosata wrote what might be the first two Western works of space fiction, *Icaromenippus* and *The True History*. In the first, Menippus (specifically wanting to avoid the failure of Icarus) took one wing from an eagle and another from a vulture and fashioned them so he could fly

from Mount Olympus to the Moon. In Lucian's second story, a ship exploring the Atlantic was carried by a waterspout to the Moon.

Lucian's stories are more than mere fanciful tales. In them, Lucian ridiculed humanity, its tired old philosophies and pagan beliefs, and the emptiness of the intellectual life of the time – all themes that we find repeatedly in space fiction.

Though written as theological works, St. Augustine's *De Civitate Dei* in the fifth century, and Joachim of Fiore's *Liber Concordiae Novi ac Veteris Testamenti* and *Expositio in Apocalipsim* in the early thirteenth century, each exhibited futures-oriented utopian thinking. The great Muslim scholar, Ibn Kahldun, writing in the fourteenth century, is considered one of the fathers of sociology and of futures studies, presenting a sophisticated philosophy of history and society in his *Muqaddimah* – not a work of fantasy or fiction, but rather exhibiting, perhaps for the first time, a way of thinking about humans and their past and future that greatly influenced the emergence of modern attitudes towards social change, and hence, modern space fiction.

Early Science Fiction

Science fiction is seldom fiction about science. Rather, it is stories that arise when some people become aware of the fact and possibility of continuous social change. Thus, science fiction *per se* (and hence space fiction) is a product of the scientific, technological, and industrial revolution that was made possible in Europe by the Black Plague, the Reformation, and the Renaissance between the fourteenth and seventeenth centuries, and then bloomed during the late eighteenth, nineteenth, and twentieth centuries. In the mid nineteenth century, space fiction proper emerged first in mainland Europe, then in the UK, then simultaneously in the United States, Japan, China, India (and perhaps elsewhere) as the social and environmental consequences of the scientific, technological and industrial revolution spread across the globe.

Most science fiction is more about technology than it is about science. It is about how humans might behave and how society might change if/as new technologies come along. Often the “science” in science fiction is quite unscientific, though the behavior said to result from new technologies is sometimes more plausible. But much science fiction is bad social science as well as bad natural science – and not very good fiction either. Science fiction and space fiction thus exhibit a tension between two modes of knowing – one scientific, the other fictional. Some science fiction is closer to science than to fiction, and thus often boring though factual. Most science fiction is closer to fiction than to science, thus exciting but misleading. The best science fiction finds a balance between both.

Modern Science Fiction and Actual Spaceflight

The literature of science fiction and space fiction dealing with new technologies and technological change has generally been of one of two kinds. Jules Verne and many others were basically optimists, believing in inevitable progress through technological change.

This optimistic view of the future permeated much early science fiction and space fiction. But from the beginning, other science fiction writers had more of a love-hate relation with technology and often wrote of that relationship critically and sardonically.

Without a doubt, the most important single figure in the origins of science fiction and space fiction is the French author, Jules Verne. Verne's book, *De la Terre à la Lune* (From the Earth to Moon, 1865), and many others of his books were translated into every major language of the world. During his lifetime Verne was perhaps the most widely read author in the world, and his books are still popular. Almost all early pioneers in space reality and space fiction said that they were inspired by Verne.

The importance of space fiction in creating space reality – and vice versa – cannot be overstated.

The extraordinary pioneer of Russian spaceflight and space fiction, Konstantin Tsiolkovsky, said his enthusiasm for space came from reading Jules Verne. In addition to his vital role in envisioning and enabling actual spaceflight, Tsiolkovsky himself wrote classics of Russian science fiction including one that the world's first cosmonaut, Yuri Gagarin, said was his favorite: *Vne Zemli* (*Beyond the Earth*, 1896). An enormous amount of space fiction produced in the Soviet Union was intended to inspire that nation towards new futures.

Although the earliest science and space fiction originated in Europe, there were clear precursors in other countries. Science and space fiction *per se* emerged rapidly wherever industrialization and technologically induced social change spread in the world.

The roots of science fiction in India may stem from 1500 BCE in the ancient Vedic literature. In these texts there are descriptions of what some say are unidentified flying objects, referred to as *vimanas*. However, science fiction proper emerged in India when, as one author says, "the effects of the industrial revolution were being felt in urban India in the nineteenth century just as keenly as they were in Europe and the U.S." The earliest notable Bengali space fiction was Jagadananda Roy's *Shukra Bhraman* ("Travels to Jupiter"), written in 1857. This story is of particular interest as it described a journey to another planet, while the existence of the creatures seen there was explained using evolutionary concepts. It should be noted that this story was published well before H. G. Wells's *The War of the Worlds* (1898) in which Wells described an invasion from Mars.

The Indian space agencies first space satellite, in 1975, was named *Aryabhata*, after the revered fourth-century mathematician. India's first satellite for Earth observation, launched in 1979, was named *Bhaskara*, after the famous twelfth-century mathematician and astronomer.

Chinese creation stories typically have themes involving space, the cosmos, and chaos, such as Pan Gu, who separated the heavens from Earth, and Nu Wa, who patched up the falling heavens. Similar themes are found in the earliest Chinese literature, such as *Chang E benyue* (Chang E Goes to the Moon) by Lu An (197-122BCE), which is about Chang E, who was able to fly to and live on the Moon. The first Chinese lunar orbiter, launched in October 2007, was named *Chang'e-1*.

Henry Zhao states that "prior to the concept of modernity being imported into China there had been no fiction about the future. In traditional China, history did not have directionality." The introduction first of ideas about "progress" and "development"

and then of Marxism changed that. The young intellectuals of the late nineteenth century in China sought to bring their “backward” country into a modern nation-state. To do that – they learned from Japan and the West – science and technology was necessary. So to stimulate people’s interest in science and technology, Lu Xun introduced science fiction to China with his 1903 translation of Jules Verne’s novel *From the Earth to the Moon*. His translation is posted on the official website devoted to the *Chang’e-1* lunar orbiter.

The mission of Chinese science fiction has always been to encourage people to appreciate the power of science and technology in enabling their country to develop into a modern nation. Chinese science fiction is optimistic and utilitarian rather than simply aesthetic.

We have seen that some Japanese folktales were explicitly about creatures who came to the Earth from not-Earth and eventually returned. Translations of Verne and other writers were extremely popular in Japan from the 1880s onward, and there was an explosion of science and space fiction after the Second World War. Nowhere has space fiction been more popular than in Japan.

H. G. Wells is to English science and space fiction what Jules Verne was to European – and the world’s – science fiction. Among Wells’ best-known stories are *The Time Machine* (1895), *The War of the Worlds* (1898), and *The First Men in the Moon* (1901).

In the United States, science’s and space fiction’s heyday is found in the “pulp” magazine, *Amazing Stories*, that began publication in 1926, and *Astounding Stories* that went through many name changes, ending up as *Analog* today. Many other pulp magazines devoted to science and space fiction existed from the 1930s to 1950s, and almost all the great and not so great names of science fiction history published in them, defining the genre from that point onward.

Not-Earth in Movies, Television, and Games

Movies, and later, television, have almost always featured some kind of “space opera,” from *Le Voyage dans la Lune*, (“A Trip to the Moon,” 1902) through *Buck Rogers* and *Flash Gordon* in the 1930s and 1940s, to *Tetsuwan Atomu* after the Second World War, and many others onward. Even though most of these films were “B” grade movies at best, they and the pulp science fiction books of the era created themes that defined and have persisted in almost all space fiction everywhere in the world.

Stanley Kubrick’s co-production with Arthur C. Clarke of *2001: A Space Odyssey* (1968) brought space fiction in films to a high level, while Roger Vadim’s adaptation of the French comic strip character *Barbarella* (1968) was a magnificent high camp film in the ironic mode. There is no more striking contrast in space films than between *2001*’s cold, barren, functional spaceship (with the onboard intelligent computer, HAL, and the human Dave locked in a gripping battle of wits to the death) and the naïve, nubile, and naked Jane Fonda slithering across her fur-lined spaceship.

On television, the quirky British space fiction show *Dr. Who* (1963 onward even to the present!) influenced many viewers' ideas about space. But for Americans, good space fiction on television began with the extremely popular TV series *Star Trek* in 1966, which dealt with current social, political, and ethical issues in the guise of exploring the universe. After the blockbuster movie *Star Wars* in 1977 (and its successors), space fiction on television for some time was dominated by triumphal voyages of international, intercultural, and interdisciplinary members of a united Earth federation boldly exploring the cosmos, doing good (or at least not doing evil) while trying to obey "the prime directive" of not interfering in the lives of other cultures.

One of the most important developments in science fiction was the emergence of cyberpunk literature spearheaded by William Gibson's *Neuromancer* (1984). It was inspired by contemporary and emerging advances in electronic communication technologies, biotechnology, and nanotechnology, combined with deep anxiety about the environmental and social consequences of these and other developments. Cyberpunk treats science and technology critically and ironically. A rather Gothic form of cyberpunk pervades most interactive electronic games, a form of science and space fiction that may replace not only written literature but also cinema and television. Contemporary Japanese science fiction, especially in its *anime* and *manga* forms, is heavily cyberpunkish.

So far, we have concentrated entirely on space stories in print and modern media. But space has inspired many works of poetry, drawing, painting, sculpture, pottery, weaving, music, and dance.

Poetry About Not-Earth

There are countless poems and stories that humans have told upon looking up at the dark sky at night. But as scientific ways of thinking were beginning to challenge earlier cultural modes, art in all its forms was also influenced by the new ideas, technologies, and discoveries. For example, William Drummond wrote *The Shadow of the Judgment* at a time (1630) when the discovery of new stars was viewed as an omen of the end of the world, since (according to the philosophical and religious thought of the time) the heavens should be fixed and unchanging. The telescope also led to much speculation about life elsewhere in the universe – and the insignificance of the petty squabbles of humans on Earth in comparison.

By the twentieth century, Einstein, Heisenberg, Schrodinger, Plank and others in physics, and Eddington, Wheeler, Bell, Penrose and others in astronomy were putting the earlier physics of Newton and the astronomy of Brahe, Galileo, et al into a different light. Alfred Noyes expresses this very well:

"In the time to come,"/Said Tycho Brahe, "perhaps a hundred years, / Perhaps a thousand, when
our own poor names / Are quite forgotten, and our kingdoms dust, / On one sure certain day, the
torch-bearers / Will, at some point of contact, see a light / Moving upon this chaos. Though our
eyes / Be shut forever in an iron sleep, / Their eyes shall see the kingdom of the law, / Our undis-
covered cosmos. They shall see it, – / A new creation rising from the deep, / Beautiful, whole.

We are like men that hear / Disjointed notes of some supernal choir. / Year after year, we patiently record / All we can gather. In that far-off time, / A people that we have not known shall hear them, / Moving like music to a single end.” [From *Watchers of the Sky*, II. *Tycho Brahe*, by Alfred Noyes (1922)]

Until 1957, no one had actually been in space (except on spaceship Earth!) and so all poets were writing from imagination, not from their own direct experience. But there have been poems written by astronauts and cosmonauts. During the nearly 67 h his fellow astronauts, Scott and Irwin, were on the moon during the *Apollo 15* mission, Al Worden was in complete solitude, floating in space. He said the overwhelming experience of being alone in the universe gave him a profound feeling of rejuvenation. In 1974 Worden wrote a book of poems entitled, *Hello Earth: Greetings from Endeavor*. As for so many others, Worden’s experience in space changed his view of reality on Earth:

Quietly, like a night bird, floating, soaring, wingless / We glide from shore to shore, curving and falling / but not quite touching; / Earth: a distant memory seen in an instant of repose, / crescent shaped, ethereal, beautiful, / I wonder which part is home, but I know it doesn’t matter ... / the bond is there in my mind and memory; / Earth: a small, bubbly balloon hanging delicately / in the nothingness of space.

Another American astronaut, Story Musgrave, has written a great deal of poetry based on his own experiences.

Floating in a spaceship,
Falling through my heaven,
Through epic altitudes,
And higher latitudes
Falling into sleep,
Drifting into dreams,
Cosmic crashes in my eye,
Cosmic flashes in my brain
Cosmic rays and Wilson clouds,
Clear my consciousness.
Memories of infinity,
Particles of eternity
Starlettes pierce my eyes,
In my brain fire flies.
Periods of light,
Punctuate my night
Cosmic Fireflies
by Story Musgrave (2000)

Japan was the first country to bring poetry officially into its space program. Japanese astronaut Chiaki Mukai (STS-95) began a *tanka* while she was in space on the shuttle. Thousands of Japanese on Earth completed it. *Renshi* is a form developed from traditional Japanese linked verse. Many people contribute to a *renshi*. JAXA sponsored a *renshi* project from 2006, and the resulting poem written by many people on Earth was recorded on DVD and sent to the International Space Station in the Japanese Experimental Module *Kibo* (“Hope”).

Space Art and Illustrations

Humans have made pictures of what we see in the night sky for tens of thousands of years. We have also made pictures of what we imagine to be above us but cannot actually see. Fundamental beliefs about humans and not-humans, and about Earth and not-Earth, are illustrated in both such pictures.

The objects above us in the sky seem to move constantly, but often in some kind of a repeating pattern. Knowing what formation the stars take just before the seasons change is important information for any successful agricultural community. This might have been one of the earliest practical uses of astronomical information. Clearly the apparent rising and setting of the Sun and Moon affected humans and Earth. So also might the stars generally, it was often reasoned. Hence, in some cultures – perhaps first in Mesopotamia – there developed a method of predicting the future – of entire societies as well as of individuals in them – based on the movement of the stars, now known as astrology, but an important prelude to modern-day astronomy as well.

Eclipses of the Sun and Moon were especially perplexing since they seemed so out of the ordinary. Eventually careful observers and recorders of heavenly movements noted their regularity and began predicting them with great accuracy.



Partial solar eclipse over the ocean (Graphic courtesy of NASA)

Comets, meteors, and other “falling stars” played a special role in human history, since they exhibit extraordinary astral behavior. In medieval and early modern Europe, and perhaps elsewhere, comets were typically seen as omens of bad things. Comets have been depicted in several surviving visualizations, such as the amazing *Bayeux Tapestry*, which includes Halley’s Comet of 1066.

With the invention and spreading use of the telescope, more accurate observations of not-Earth became possible, and their depictions often became more “accurate” as well from the sixteenth and especially seventeenth centuries onward, particularly following the invention of chemical photography in the nineteenth century and electronic imaging in the twentieth century.

Space illustrations, as a self-conscious genre, began at the same time as written space fiction, and many early illustrations were created to accompany and make visual the ideas in written texts. Depictions of space environments, some intending to be factually while others were fantastically presented, flourished throughout the late nineteenth and early twentieth centuries, reaching their heights on the covers and sometimes pages of the pulp fiction magazines. But it was probably the depictions in the large-sized popular picture magazines in the United States, such as *Life*, *Colliers*, and *Coronet* in the 1950s and early 1960s, that really brought space illustrations to the eye of the public and ignited popular support for space exploration as it became technologically possible for the first time.

Astrophotographs – photographs of the sky, or, more recently of space through telescopes – are often treated as works of art. Indeed, as presented to the general public, astrophotographs, such as those taken via the Hubble Space Telescope, must be viewed *primarily* as works of art since they are framed and color-enhanced for maximum aesthetic effect.

Perhaps the first bit of conscious “art” in space was a small ceramic tile about the size of a postage stamp grandly titled, *Moon Museum*. It was carried on *Apollo 12* (1969). American artists Robert Rauschenberg, Andy Warhol, Claus Oldenberg, John Chamberlain, Forrest Myers and David Novros all contributed to it. In 1971, a small figurine, titled *The Fallen Astronaut* (to commemorate all cosmonauts and astronauts who had died so far) by Belgian Artist Paul Van Hoeydonk was left on the Moon by *Apollo 15* astronauts. A sculpture by Joseph McShane, titled S.P.A.C.E., flew as Payload G38 on the second mission of the Challenger (1984). *Ars Ad Astra: The first Art Exhibition in Earth Orbit* was organized by Arthur Woods and the OURS Foundation in cooperation with the European Space Agency during their EUROMIR’95 mission. This was the most comprehensive exhibit of art in space so far.

As with poetry, there have been a few astronauts and cosmonauts who made illustrations in space. Alexi Leonov, co-commander of the *Apollo-Soyuz* Test Flight of 1975, was one. He also worked closely with Andrei Sokolov, “the dean of Soviet space art.” Alan Bean, who flew to the Moon on *Apollo 12*, has described in some detail his aesthetic reactions to the experience, including how he chose the colors, values, shading and other features of his space paintings.

Dancing in Space

If “dance is the only art where we ourselves are the stuff from which it is made,” there has arguably been a lot of dancing in space. Few astronauts or cosmonauts have been able to resist the freedom that zero, or substantially reduced, gravity affords. Whether it is Buzz Aldrin bunny-hopping on the Moon or almost everyone turning somersaults in shuttles and spaceships, spacefarers are clearly blessed with Happy Feet.

This is one instance where life has influenced art: Earthbound dancers envy the spacefarers’ freedom. Dancers are gravity haters by definition. To dance free of the

bonds of gravity would be heaven to them all. But so far no dancers have gone into space. Consequently, more and more dancers have done the next best thing: they have danced momentarily during parabolic airplane flights.

Music of the Spheres

In the West the interrelation between science and music goes back at least to the sixth century BCE philosopher, Pythagoras. His interest in geometry (namely, in the numerical value of lengths, angles, and other properties of lines and spheres), on the one hand, and music (actually, the comparative length of vibrating strings that make differing sounds), on the other, coupled with the assumption that the universe is harmonious, balanced, and perfect, led him to develop a scheme of geometrical and tonal harmony that pervaded the universe: the “music of the spheres.” A century later, Plato elaborated the perspective of Pythagoras. Several hundred years after Plato, the Alexandrian astronomer, Ptolemy, modified these ideas into a form that remained dominant in the West until Johannes Kepler revisited the issue in the sixteenth century, almost 1,500 years later.

The story of music is the same as that of space fiction, poetry, and art. As science and technology changed and deepened human understanding of the universe, so also it provoked and enabled new aesthetic expressions in sound. Franz Joseph Haydn wrote *Il Mondo Della Luna* (The World in the Moon, 1777), an opera buffo. Jacques Offenbach’s opera, *Le Voyage dans la Lune* (1875), was inspired by Jules Verne’s story, *De la Terra a la lune* (1872). Though Verne’s story was fictional, both it and Offenbach’s opera were meant to reflect and inspire yearnings for real space travel.

As better telescopes and more powerful theories began to tell us newer stories about not-Earth, so also more musicians began to reflect these ideas in their compositions. Frank Fraknoi lists over a 100 pieces of music that make use of serious astronomy. Probably the best-known piece of classical space music – *The Planets* (1916) by Gustav Holst – is often excluded from lists of serious space music because it sought to exhibit the essence of each planet according to how astrology described them, and not according to features understood by current astronomical observation or scientific theory. Paul Hindemith wrote an opera (1947) and then a symphonic suite (1951) called *Die Harmonie der Welt*, based on the life of Kepler.

During the twentieth and early twenty-first centuries, many serious post-classical composers have written space-related music incorporating contemporary as well as traditional instruments and sounds. Typically, these composers use tones, chords, tempi, and intervals not based on the classical ideas of harmony of the eighteenth and nineteenth centuries. Indeed, many of these composers were influenced not only by astronomy and space but also especially by quantum physics, with its emphasis on randomness and complementarity. Their music is “post-Newtonian” in conception and execution.

Some of the pieces above combine sounds recorded from space or spaceships with more or less conventional instruments and modes. But there are a few compositions derived entirely from instruments that recorded various sounds from space.

Popular Space Music

Some popular music has been inspired by a specific space event, beginning perhaps with *Sputnik (Satellite Girl)*, by Jerry Engler and the Four Ekkos (1957). Yuri Gagarin's pioneering flight in the *Vostok* provoked at least two songs in the Soviet Union, *The Constellation of Gagarin* (1961) and *Motherland Knows Her Son is Flying in Orbit* (1961). Similarly, *Happy Blues For John Glenn* (1962) by Sam "Lightning" Hopkins and *The Ballad of John Glenn* (1962) by Roy West commemorated the flight of America's first man in space.

When first Neil Armstrong and then Buzz Aldrin walked on the Moon, the Byrds produced *Armstrong, Aldrin and Collins* (1969) celebrating it, while Jethro Tull wrote *For Michael Collins, Jeffrey and Me* (1970), commenting on three people who "almost made it," including Collins, who was left on the command module circling the Moon and did not get to walk on it. However it was *Armstrong*, (1969) by John Stewart of the Kingston Trio that caused the greatest stir because his lyrics wondered whether a starving black boy in Chicago or a poor girl in Calcutta knew or cared about the feat since poverty, pollution, war, and hate continued on Earth.

There are two particularly poignant songs about space tragedies. One, *Flying for Me* (1986) by John Denver, was about the *Challenger* explosion. Denver had tried very hard to get on that flight, which was featured as being one of the first to include "ordinary people" among the crew. Jean Michel Jarre's *Last Rendezvous* (1986) was written to be played on a saxophone by astronaut Ron McNair on the *Challenger*.

There has been far too much popular music on space themes to begin to do justice to them here. *Space Cowboy* (1969) by the Steve Miller Band, *Space Oddity* (1969), *Ashes to Ashes* (1980), and *I Took a Trip on a Gemini Spacecraft* (2002), by David Bowie; *Moondance* (1970); *Dark Side of the Moon* (1973) [one of the most popular albums of any kind ever produced] by Pink Floyd, and many, many more. This music is basically "rock and roll" of a specific generation. But the dominant pop music of the present is rap, hip-hop, or indie. These forms, too, have music with space themes. Their roots are partly in rock, but mainly in soul, funk, and to some extent punk – that is to say, primarily in black urban culture.

Filk music is inspired by science fiction and fantasy, and is primarily intended for science fiction fan communities, originating at science fiction meetings in the 1930s. Attendees gathering for socializing might sing familiar folk songs. Some participants began setting words relating to science fiction to traditional folk tunes, while new works were also composed and sung. Apparently, when a typo in a magazine article about the practice written by Lee Jacobs referred to "filk music" instead of "folk music," a name for the new genre was born.

However, as said before about other art forms, the only true space music is that which has been composed or performed in not-Earth itself. It seems that the first person to sing in space was the very first person in space: Yuri Gagarin. He is quoted as saying that “When I was going down, I sang the song, ‘The Motherland Hears, the Motherland Knows.’” However, apparently the first music to be performed in space was “Jingle Bells,” sung and “played” by Walter Schirra and Thomas Stafford on the *Gemini 6* mission, during a radio broadcast to Earth on Christmas Day, 1965.

Astronaut Ron McNair is believed to have been the first person to take a musical instrument – a saxophone – into space and play it, on shuttle flight STS-41B in 1984. As noted above, McNair later died in the *Challenger* explosion in 1986. He had planned to play a work during that flight that had been composed for him by Jean-Michel Jarre. Many other astronauts and cosmonauts have sung and played music in space.

We will see in our chapter on SETI (Search for Extra-Terrestrial Intelligence) that humans have tried to send messages to extraterrestrials in various forms. Often these messages included artistic artifacts (or are consciously art objects in and of themselves).

It is clear from this very superficial overview of space art – written, painted, danced, sung, and performed – that aesthetic expression in many forms is fundamental to the human spirit. It will motivate or “de-motivate” us to leave our cradle. Although some space agencies or companies may or may not encourage or support aesthetic expressions in space, from now on it must be seen as an integral aspect of all space activities, and celebrated – and supported – as such.

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Dator, J.A.

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