Spirituality and Spaceflight

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ABSTRACT: While the advent of space flight is relatively new, humankind has always had a fascination with the heavens. Ancient religions across numerous civilizations had spiritual and/or religious beliefs as to what lay in the heavens, or what is now referred to as outer space. Humans constantly searched for answers among the stars and believed space to be a place of the Gods. As astronomy developed at the dawn of the Scientific Revolution, so too did these beliefs. Astronomers, from Copernicus and Galileo to present day have used faith and a desire to become closer to the heavens/God as a driving force for their scientific pursuits. Many modern-day astronomical terms derive from Muslim astronomers and almost all our Solar System's planets are named after Grecian-Roman Gods. Though religious institutions, such as the Catholic Church, were often at odds with them, the astronomers did not let that dampen their spirits. This overlap between spirituality and space science progressed into the onset of achievable space flight technology. Important engineers, such as Werner von Braun, were driven by faith and their belief that it was humankind's destiny to unravel the mysteries of the heavens. Almost all NASA astronauts and engineers during the *Gemini* and *Apollo* programs held strong spiritual beliefs. And beyond that, many more recent astronauts have described a transformative experience during their time in space, something that several prominent psychologists have begun to explore. With the recent beginning of humankind's next manned moon missions, *Artemis*, well under way, it is time to examine the very obvious and powerful connection that exists in humans between spirituality and spaceflight. This paper seeks to examine this connection, with a slant towards NASA and the West and how spirituality and space will continue to interact into the foreseeable future.

KEYWORDS: Spaceflight, Spritiuality, Astronomy, NASA, Catholic Church, Christianity, Religion

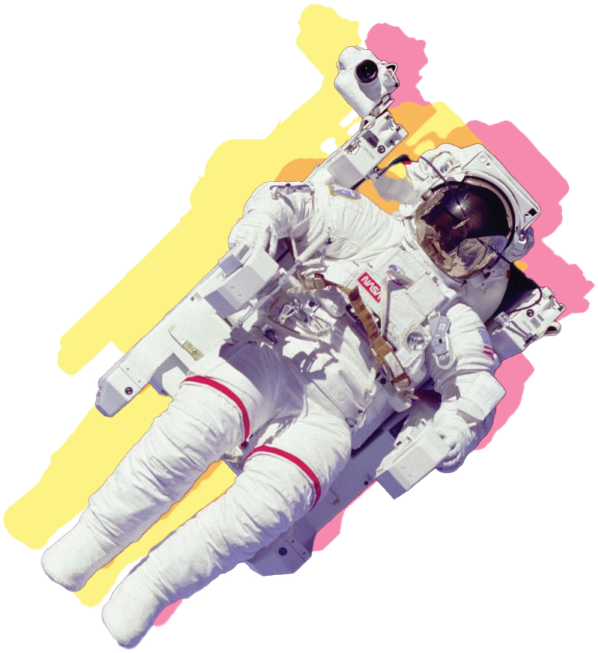
For nearly all of humanity's existence, space and the heavens have existed as one. Beyond the obvious limitations imposed by technology before the 20th century, many humans considered space to be beyond all limitations and the realm of the Gods. This belief can be found throughout history and across most civilizations. From the Christian God and the Nordic Gods to Hindu deities and Allah in Islam, civilizations and religions place the Gods among the starts. This is evident in religion, astrology, astronomy, and many more sectors of life that exist within modern society. Space was seen as the heavens, a place for the Gods, and a venue for the immortal. Religion bore this out in both text and practice and the very thought of exploring space was frequently seen as an assault on the faith. Astronomers, such as Galileo and Copernicus, were often at odds with the church when their theories, such as heliocentrism[1], clashed with religious ideology. Martin Luther wrote "There is talk of a new astrologer who wants to prove that the earth moves and goes around instead of the sky, the sun, the moon…however as Holy Scripture tells us, so did Joshua bid the sun to stand still and not the earth."[2] Thinking like this, combined with a lack of sufficient propulsion confined the human race, and their thoughts, to the Earth in all but faith. This changed rapidly with the dawning of the 20th century.

Scientists from many fields made incremental progress, even if without intent, towards space through the last few centuries of the millennium. As the 19th century drew to a close, works such as Jules Verne's *From Earth to the Moon* and H.G. Wells' *War of the Worlds* began to expand public imagination towards the unexplored, bringing it closer to reality. It was a development that would force mankind to rethink the concept of space, the universe, and the heavens. Though still few have reached outer space, there are numerous accounts of astronauts having what they consider a religious experience in space, from which different meanings have been drawn. Some speak of an encounter as out-of-body, while others are simply left in awe of the experience being somewhere so few have been and seeing the universe in a different light. Whatever the reasons, space and spirituality have been intrinsically linked for many centuries. This paper will explore the evolution of how humanity views the links between space and spiritual events and beliefs.

It will show both the clash and the overlap between space science and faith, utilizing first-hand accounts from astronauts, scientists, and religious and historical figures. Though they are often at odds, this paper will show that space and spirituality are on a trajectory together and will go hand-in-hand, at least for the foreseeable future.

Space in Religion

Space and the heavens have been an integral part of human life since time immemorial. To fully grasp the length to which they are intertwined, one must first look into the past. History is full of Gods, science, and other beliefs that derive from human beings staring up at the night sky in awe. These beliefs manifested themselves differently from culture to culture, but the core principle remained roughly the same. The night sky, and space by extension, was the realm of the Gods, something well beyond the reach of mortal human beings. The Nordic Gods, many of whom persist today in mythology and pop culture, came from nine worlds in the cosmos, flanking Yggdrasil, the tree of life. Many of the Gods lived in Asgard, the world most closely resembling the Christian version of heaven. Whether referring to Odin and his wisdom, Thor with his thunder and strength, Freyr and her control of the weather, or one of the many others, these Gods played and lived within the heavens, though occasionally they would manifest themselves on Earth.



[1] Heliocentrism refers to the solar system and/or universe centered around the Sun, rather than the Earth as it was originally believed.
[2] Lehmann and Tappert, "Luther's Works," 358-9.

Similar to Christianity, the Nordic beliefs included creation myths deriving from these Gods and the cosmos. Greek and Roman Gods also call space their realm. So attached are these Gods to space that they are ingrained into space culture and astronomy today. The Greek Gods Apollo and Artemis are the given names for the first and second American moon programs respectively, while most planets are named after Grecian-Roman Gods, such as Mars, Jupiter, and Neptune. It is no accident that the Greeks and Romans are among the forefathers of astronomy and they named these heavenly bodies after the most important members of their pantheons. Religions that exist to this day continue this connection in a similar ilk.

Christianity, Hinduism, and Islam all have beliefs in the heavens existing in the area seen in science as space. Hindus consider their gods to live in the heavens and even have one god, Varuna, who is the God of Space, ruler of the sky and the upholder of cosmic law. In Islam, Earth and the heavens are seen as one after Allah brought them together in creation. While they certainly have the most conservative views on space and the heavens, Muslims do carry the beliefs of the heavens being in space. Though Muhammad is thought to have said "Whoever seeks knowledge from the stars is seeking one of the branches of witchcraft," there was no shortage of Muslim astronomers. There are numerous terms in astronomy, including *alidade* and *azimuth*[3], that are derived from ancient Arabic. Many early Christian astronomers were taught the field by Muslim contemporaries.

One can find any number of references in the Bible and Christian literature as to what lay in the heavens. Many astronauts and NASA engineers have discussed their beliefs as a driving force behind their work to explore space including Werner von Braun, Buzz Aldrin, and Edgar Mitchell. Von Braun, NASA's chief engineer, discovered his fascination with space after being given a telescope upon completing his confirmation in the Catholic church[4]. Later in his life, after his faith had strengthened, von Braun put out powerful words as to why humans should explore space and eventually colonize it, spreading the word of God –, "If man is Alpha and Omega, then it is profoundly important for religious reasons that he travel to other worlds, other galaxies; for it may be Man's destiny to assure immortality, not only of his race, but even of the life spark itself."[5] It was a sense of duty and destiny that was commonplace among many of those involved in the space program, a theme this paper will further explore. To understand this relationship it is necessary to briefly explore the history of space science, not limited merely to space flight, and how it was received by the different religions at the time.

Space Science In History

Spaceflight is a relatively infantile field of science. It would not be entirely inaccurate to say the history of spaceflight began with the dawning of the 20th century. There were precursors in theory and literature that had influence on spaceflight, such as The War of the Worlds and From the Earth to the Moon, but the true development, with tangible scientific progress, is relatively new. However, space sciences, especially astronomy, have a long and extensive past. There is not enough time, nor is it the point of this paper, to take a deep dive into this history, but it is important to discuss a few key persons; what drove them in their studies; and how they were received by the religions at the time. To keep this concise we will focus on three key figures: Copernicus, Kepler, and Galileo.

Nicolaus Copernicus (1473-1543) was a Prussian mathematician and astronomer who was most well-known for pioneering the heliocentric model that placed the Sun, rather than Earth, at the center of the universe. He was also religious and respected as a canon within the Catholic church. Among his many famous quotes is "Of all things visible, the highest is the heaven of the fixed stars." Copernicus was clearly driven in his studies to pursue as much knowledge as God would allow him. Heliocentrism was groundbreaking thinking and would eventually lead to serious conflict with the church, albeit not for some time. The initial reaction from the Catholic church was actually positive. When Johann Widmastetter presented the Copernican system to Pope Clement VII, the Pope was so pleased he presented Johann with a valuable gift.[6] Indeed, strong opposition to this heliocentric idea did not come until sometime after Copernicus' death. This is due, in part, to the fact that his work was not published until the year he died. The criticism also didn't come until after the Protestant movement, led by Martin Luther, had swept through much of Europe. Ironically, it was Galileo who might have borne the largest brunt of the delayed backlash against Copernicus's heliocentrism, something we will explore shortly.

[3] Azimuth refers to the direction of a celestial object in relation to the observer, expressed in degrees. An alidade is an instrument used for measuring angles, including in astronomy.
[4] Neufeld, "Von Braun," 21.
[5] Noble, "The Religion of Technology," 127.
[6] Repcheck, "Copernicus' Secret, How the Scientific Revolution Began," 79.

Before Galileo however, we must briefly discuss Johannes Kepler (1571-1630). Kepler was a devout Christian who dedicated much of his study to the bible and who identified astronomers as "priests of the highest God."[7] Originally, he studied theology, with intent to join the clergy, before pivoting to science with religion as a key motivator.[8] Kepler subscribed to Copernicanism and developed several laws in support of heliocentrism. One of these laws stated each planet in the solar system revolved in an elliptical orbit around the Sun.[9] In his desire to reach space and get closer to God, Kepler imagined humans being sent to the moon as if they were shot from a cannon[10], a means of propulsion later replicated in prose by Jules Verne. There is little doubt of Kepler's faith, perhaps the deepest of any of the famed astronomers, as it was evident in his writings. To Galileo, with whom he frequently corresponded, he wrote "Let us create vessels and sails adapted to the heavenly ether."[11] And now it is time to discuss Galileo who was perhaps the most influential, and most persecuted, of the three famed astronomers.

Galileo di Vincenzo Bonaiuti de' Galilei (1564-1642), henceforth referred to as Galileo, was an Italian astronomer and physicist who has been referred to as the father of observational astronomy. He further developed and advocated for Copernicus' theories, but unlike his predecessor, quickly found himself embroiled in controversy with the Church. Galileo, like Kepler, initially seriously considered joining the priesthood before turning to science.[12] It was to his dismay that he found himself at odds with the Church due to his scientific beliefs. In fact he tried to use religious beliefs and his knowledge of them and their logic against those who tried to disprove him with scripture by saying, "...if it is impossible for a conclusion to be declared heretical while we remain in doubt as to its truth, then these men are wasting their time clamoring for the condemnation of the motion of the earth and the stability of the sun, which has not yet demonstrated to be impossible or false."[13]

Despite all this, Galileo faced more persecution than any other astronomer for his beliefs and teachings. When the Church stated Copernicus' heliocentric model could only be treated as a hypothesis, Galileo pushed back to his own cost. When he tried to push the Church to accept a heliocentric universe as fact in February, 1616, going as far as having Cardinal Orsini appeal directly to the Pope on his behalf, Galileo was met with official censure. He was told to abandon his teachings and research on heliocentrism and that failure to do so would result in action taken against him by the Holy Office.[14] For a while Galileo stayed in the good graces of the Church, but in 1632, upon publication of his book *Dialogue Concerning the Two Chief World Systems*, he once again found himself in hot water. He was summoned to Rome where he underwent an official Inquisition which went as far as threatening torture, albeit only verbally.[15] Eventually Galileo was sentenced to house arrest where he would spend the remainder of his life.[16] In the end the Church's findings against Galileo would be disproven and the Church would even recant, though not in time to benefit the astronomer. As these three extraordinary men – from three separate regions – demonstrate, spirituality and space were intertwined together, even if they were simultaneously at odds. Now moving back to a more modern era, as spaceflight became a reality, the quest and the experiences of the very men who would explore the heavens would continue to bear out this link.

Spirituality in Religion and the Space Program

Werner von Braun was not alone in his strong religious beliefs in NASA during the Mercury, Gemini, and Apollo eras. Nor was it limited to a single community, such as engineers or astronauts. Among the ground crew notable names included William R. Lucas, Jerry Klumas, and Rodney Johnson. Their ranks included scientists, engineers, directors, and administrators. Lucas had worked with von Braun since 1952 and eventually followed in his footsteps, taking over as director of the Marshall Space Flight Center in 1974. He was active in his church (Baptist) and even took part in the evangelist Billy Graham's crusade, while also advocating for religion and science to become integrated.[17] Lucas believed humans were expected to learn as much about creation as they could and space technology was one avenue towards achieving that.[18]

[7] Noble, "The Religion of Technology," 116.
[8] Noble, "The Religion of Technology," 116
[9] Brown, "Engaging the Cosmos: Astronomy, Philosophy and Faith," 53.
[10] Noble, "The Religion of Technology," 117.
[11] Noble, "The Religion of Technology," 117.
[12] Reston, "Galileo: A Life," 3-14.
[13] Langford, "Galileo, Science and the Church," 77.
[14] Langford, "Galileo, Science and the Church," 90-92.
[15] Langford, "Galileo, Science and the Church," 151.
[16] Langford, "Galileo, Science and the Church," 158.
[17] Noble, "The Religion of Technology," 130.
[18] Noble, "The Religion of Technology," 130.

Furthermore, he saw the community at Marshall as spiritual and very Christian. "The vast majority of people at Marshall, and before that at the ABMA and the Redstone Arsenal, were Christian people," "The oddity was not the believer, but the nonbeliever."[19] Johnson, a NASA scientist in Huntsville, Alabama stated, "My contacts indicate that a surprising number of scientists, engineers, and technicians associated with the space program have a deep and vital faith. More, proportionately, than in any other fields and professions."[20]

Jerry Klumas, a systems engineer, co-founded the NASA Church of the Nazarene[21] and echoed the sentiments of Lucas and Johnson. It was also his view that they were following the prophecy of Daniel and the knowledge increase as a result of space flight signaled the end of time was near.[22] Additionally, NASA's only 2-time administrator James Fletcher, a devout Mormon, used his vision for space exploration as "an intellectual frontier of expanding knowledge and the progress of understanding about nature and, by extension, about divinity."[23] In 1958 a religious object literally became part of the space program. After several failures, Vanguard rocket engineers attached a St. Christopher medal to their guidance system and even noted on the engineering change request that the addition was for Divine Guidance![24] Most noteworthy though, were the beliefs and experiences of the astronauts, the very men who would reach the heavens.

Like the men who sent them there, the majority of the first NASA astronauts were religious men. Many carried religious relics or a bible with them into space. Others went a bit further. One of the most well-known, and somewhat controversial, instances took place with Apollo 8. On Christmas Eve, 1968 the crew of Apollo 8 read from the Book of *Genesis* as they circled the moon. The reading was heard by an estimated one billion people spread across 64 countries during a live television broadcast.[25] It came at a time when there was significant turmoil in America, it was just after Martin Luther King Jr. was assassinated, and had been pre-planned to deliver a unifying message around the holidays. Each of the three astronauts: Bill Anders, Jim Lovell, and Frank Borman, took a turn reading a passage. As the commander for the mission Borman signed off the broadcast, "And God said, Let the waters under the heaven be gathered together unto one place, and let the dry land appear: and it was so. And God called the dry land Earth; and the gathering together of the waters called the Seas: and God saw that it was good. And from the crew of Apollo 8, we close with good night, good luck, a Merry Christmas – and God bless all of you, all of you on the good Earth."[26]

The reception to the *Genesis* reading back on Earth, particularly America, was well-received, but with a vocal backlash. The Apollo 8 crew weren't the first to recite a prayer in space, that honor belonged to Gordon Cooper,[27] but were the first to do so to a large audience. Every stage of the Apollo 8, from launch to recovery, was covered by the media, available in six different languages around the world.[28] The reading sparked a debate between the separation of Church and State and the role religion should play, if any, in the space program. A lawsuit was soon filed by Madalyn Mary O'Hair, a noted atheist, accusing the United States government of violating its citizens First Amendment Rights.[29] The suit made it to the Supreme Court, where it was denied, and failed further appeals, but the message had been sent. NASA took significantly more caution in the immediate future when concerning religious matters. Perhaps that was why Buzz Aldrin, the second man to walk on the Moon, kept his religious ceremony on the surface of the moon significantly quieter.

While Neil Armstrong and Buzz Aldrin waited inside the Apollo 11 Lunar Module *Eagle* to make history as the first men to walk on the moon, a small communion ceremony took place. Though both men considered themselves Protestant, only Aldrin partook with Armstrong observing respectfully. Aldrin stated the ceremony was intended to express gratitude and hope. It took place off-air, a request of NASA following Apollo 8. Aldrin also requested radio silence during this time.[30] His communion also posed the first question of how to practice religion in space, something this paper will explore further shortly. The bread and wine consumed in Communion is traditionally not self-served, presenting a hurdle for Aldrin. However, the Church, recognizing the significance of the occasion, granted special permission to Aldrin to bring along bread and wine and to serve himself when the time came.

[19] Noble, "The Religion of Technology," 130.
[20] Noble, "The Religion of Technology," 130.
[21] Noble, "The Religion of Technology," 130.
[22] Noble, "The Religion of Technology," 131.
[23] Noble, "The Religion of Technology," 131.
[24] Noble, "The Religion of Technology," 134.
[25] The New York Times, "St. Christopher Medal Affixed to Vanguard Rocket."
[26] Muir-Harmony, "How Apollo 8 Delivered Christmas Eve Peace and Understanding to the World."
[27] Woods and O'Brien, "Apollo 8 Flight Journal," Day 4, Lunar Orbit 7, 8, 9.
[28] Noble, "The Religion of Technology," 138.
[29] Muir-Harmony, "How Apollo 8 Delivered Christmas Eve Peace and Understanding to the World."
[30] Chaikin, "Man on the Moon," 623.

So, it came to be that before a human took their first steps upon the surface of the Moon, they first took Communion on it. Aldrin later stated he might have done things differently, but not because he was ashamed to have undertaken a personal religious ceremony directly prior to such a momentous occasion. Instead he reflected that he [and Neil] "had come to the moon in the name of all mankind – be they Christians, Jews, Muslims, animists, agnostics, or atheists."[31]

As Apollo 11 paved the way for future moon landings and space exploration, so too did Buzz Aldrin's set the tone, or at least began the conversation, of the practice of religion in space. In the following decades many more nations would send men and women into space. This meant that other religions would soon be represented in plumbing the depths of the heavens, a great achievement, but one that came with questions. Communion for Catholics would be more complicated than for Aldrin and his fellow Protestants, as the sacrament requires the blessing of a priest, traditionally just before consumption. This would eventually be handled in a similar ilk to Aldrin, as priests were allowed to perform the blessing before the astronauts launched into space, with the astronauts able to serve themselves Communion. Many Jewish people observe every seventh day as the sabbath, a day of rest. This practice becomes significantly more difficult in space where the International Space Station (ISS) circles the Earth in roughly 90 minutes, meaning a seventh day would occur every 11 hours. Much like the Christian solution to Aldrin's Communion, Jewish rabbis allowed an exception. Ilan Ramon, the first Israeli astronaut, would follow Cape Canaveral time, allowing for a much steadier and traditional schedule. As the son of a Holocaust survivor, it was exceptionally important for Ramon be able to practice his faith. "I'm kind of the proof for my parents and their generation that whatever we've been fighting for in the last century is becoming true." [32]

Many Muslim astronauts face a similar challenge because of the high speed of travel in orbit. Most Muslims are required to pray five times daily, though some Shi'a Muslims sometimes combine prayers and pray three times a day. These prayers take place while facing in the direction of Mecca, something that becomes exceptionally difficult when traveling at speeds of kilometers per second. Even more challenging is observing Ramadan, where Muslims are required to fast from sunup to sundown. Similar to Jewish astronauts, such as Ramon trying to observe the sabbath, this becomes exceedingly complicated while experiencing roughly 15 sunrises and 15 sunsets every 24 hours. On top of that, fasting in a living environment where peak health is paramount creates its own complications. When Sheikh Muszaphar Shukor, the first Malaysian astronaut and a practicing Muslim, was in space during Ramadan it was decided he could only do as best he could but would not be held to the usually rigid Muslim standards that he practiced on Earth.[33] Though not all religions, or sects of religions, have been represented in space, there have been many. Despite there being obstacles that need addressing, all the religions saw the value of supporting astronauts in their faith while in space and helped tailor practices to support the men and women in space.

As of this writing there have been hundreds of men and women who have reached space, some religious, others not. What is nearly universal for astronauts, one might even say a rite of passage, is having an experience they would refer to as spiritual, if not necessarily religious. These experiences reformed these astronauts' perspectives on the universe, their own lives, and much more.

Spirituality Outside Religion in Space

Voyaging into space is still an experience reserved for the smallest of minorities of humanity. Getting a chance to go involves an incredible amount of talent, determination, experience, and some luck. Performing a spacewalk is privileged to less than half of astronauts to date and those who have either orbited or landed on the moon significantly smaller still. However virtually all who have gone to space speak of an experience that is spiritual, perhaps out-of-body. Getting to view the world from above, seeing the network of lights that compose cities, watching auroras and the constant sunrises and sunsets has a profound effect on all. This feeling of awe and self-transcendence can result in a phenomenon known as The Overview Effect. Psychologist David B. Yaden explored this and its connection to space exploration in his excellent paper *The Overview Effect: Awe and Self-Transcendent Experience in Space Flight*. Yaden posits that seeing Earth from a distance is equally important to merely being in space.[34] It is an experience that is so important to astronauts that some members of the Skylab IV mission refused to work when denied the opportunity to do so. Their flight director stated they were asserting "their needs to reflect, to observe, to find their place amid these baffling, fascinating, unprecedented experiences."[35]

[31] Rosen, "Communion on the Moon: The Religious Experience in Space," 8.
[32] Rosen, "Communion on the Moon: The Religious Experience in Space," 8-9.
[33] Rosen, "Communion on the Moon: The Religious Experience in Space," 10.
[34] Yaden, "The Overview Effect: Awe and Self-Transcendent Experience in Space Flight," 3.
[35] Yaden, "The Overview Effect: Awe and Self-Transcendent Experience in Space Flight," 7.

Yaden concludes that space flight is one of the few things that can truly inspire humans through awe and self-transcendence.[36] This effect manifests itself in numerous ways, but is nearly universal to all who experience time in space. British astronaut Tim Peake said his time on the ISS led him to consider the universe was of intelligent design,[37] while others such as American astronaut Jim Irwin strengthened their existing faith.[38]

American astronaut Edgar Mitchell is one of the best examples of someone who is not necessarily religious but experienced a profound spiritual impact in space. The Lunar Module pilot for Apollo 14, Mitchell became the 6th person to walk on the Moon, alongside Alan Shephard. He also engaged in research in extrasensory perception (ESP) and paranormal phenomena both during and after his career. He published his experiences in space in his autobiography *Earthrise* providing the public with a stirring, first-hand account of his time in space. As he stood on the surface of the moon at the beginning of his second moonwalk Mitchell felt an intense connection towards Earth, even at such a great distance.[39] It was on the trip back home however that Mitchell had an even more powerful experience. As he sat in his seat in the Command Module, watching the Earth, Sun, Moon, and other objects in space rotate through his view he felt what he describes as a moment of "deep insight." Feeling an intimate connection with the cosmos he became keenly aware of every molecule in his body, the molecules of his fellow Apollo 12 astronauts, and even the molecules of the spaceship itself, realizing they were all created in ancient star systems.[40] Mitchell described the experience as wonderful and gave validation to the ESP experiments he was performing during the journey. He would go on to be the founding chairman for the Institute of Noetic Sciences, which researched consciousness and related phenomena.[41] In another of his books, T*he Way of the Explorer*, Mitchell wrote that, "There was a sense that our presence as space travelers, and the existence of the universe itself, was not accidental but that there was an intelligent process at work."[42]

Mitchell's experience has frequently been echoed by subsequent astronauts, regardless if they were religious or not. British astronaut Tim Peake said the views of Earth inspired wonder.[43] Eugene Cernan, an Apollo 17 crew member, stated "There was too much purpose, too much logic. It was too beautiful to happen by accident. There has to be somebody bigger than you…,and I mean this in a spiritual sense, not a religious sense."[44] Barry "Butch" Wilmore, an American astronaut who was on the ISS in 2014, experienced The Overview Effect when he saw a reflection of himself during his third spacewalk. A religious man, when he asked himself how he had gotten there he concluded, "And the answer is very clear. I was there because the Lord in His planning purposes allowed me to be there and gave me that desire in my heart. That's why I was there."[45]

These astronauts, spanning different nationalities, faiths, religions, and time frames, were all struck by the sheer awesomeness of their experiences in space. Their encounters were not isolated, an entire book could be written solely on this phenomenon. What connects them, the scientists, engineers, astronomers, philosophers, mathematicians, and more is the belief in space as a transformative realm. Long before the technology existed humans stared at the night sky and told stories of great Gods playing and fighting amongst the stars. Human beings' desire to understand the heavens led them to discovering the Earth was round, revolved around the Sun, and so much more information vital to us today. It took thousands of years, but humans' belief in the heavens helped lead them to accessing them. In conclusion, this would not have been possible without many men and women of diverse faith and spirituality who used their belief to power their extraordinary lives in the pursuit of space. From the ancient Greeks, Romans, and Nordic people to Copernicus, Kepler, and Galileo, von Braun, Mitchell, Irwin, and so many more. Though their faiths and beliefs vary, all of them are connected in their spirituality, a connection that persists with today's astronauts and looks set to carry on into the foreseeable future.

[36] Yaden, "The Overview Effect: Awe and Self-Transcendent Experience in Space Flight," 8.
[37] The Week Staff, "Why Astronauts Have Spiritual Experiences in Space," 1.
[38] Weibel, Space Exploration as Religious Experience."
[39] Mitchell, "Earthrise: My Adventures as an Apollo 14 Astronaut," 120.
[40] Mitchell, "Earthrise: My Adventures as an Apollo 14 Astronaut," 138.
[41] Kluger, "The 40th Anniversary of the Moon Landing."
[42] Mitchell and Williams, "The Way of the Explorer: An Apollo Astronaut's Journey Through the Material and Mystical Worlds," 16.
[43] The Week Staff, "Why Astronauts Have Spiritual Experiences in Space," 2.
[44] The Week Staff, "Why Astronauts Have Spiritual Experiences in Space," 4.
[45] Jilton, "Tennessee's Current Astronaut is a Devout Christian."

Work Cited

Brown, Neville. *Engaging the Cosmos: Astronomy, Philosophy and Faith*. Sussex academic Press, 2006.

Burke, Andrei. "4 Astronauts Who Had Spiritual Experiences 'up There.'" Ultraculture, February 25, 2022. https://ultraculture.org/blog/2014/06/02/astronauts-spiritual-experiences/.

Chaikin, Andrew. *Man on the Moon: The Voyages of the Apollo Astronauts*. London, Great Britain: Penguin Books, 2019.

Jilton, Ned. "Tennessee's Current Astronaut Is a Devout Christian." News, September 7, 2022. https://www.timesnews.net/opinion/columns/tennessees-current-astronaut-is-a-devout-christian/article_3901d476-2cd7-11ed-938c-4fabd4db72ef.html.

Kluger, Jeffrey. "The 40th Anniversary of the Moon Landing." Time. Time Inc., July 16, 2009. https://content.time.com/time/specials/packages/article/0,28804,1910599_1910769_1910767,00.html.

Langford, Jerome J. *Galileo, Science and the Church*. Ann Arbor, MI: University of Michigan Press, 1971.

Lehmann, Helmut T., and Theodore G. Tappert. *Luther's Works: Table Talk*. Philadelphia, PA: Fortress Press, 1967.

Mitchell, Edgar D. *Earthrise: My Adventures as an Apollo 14 Astronaut*. Chicago, IL: Chicago Review Press, 2014.

Mitchell, Edgar D., and Dwight Arnan Williams. *The Way of the Explorer: An Apollo Astronaut's Journey through the Material and Mystical Worlds*. Franklin Lakes, NJ: New Page Books, 2008.

Muir-Harmony, Teasel. "How Apollo 8 Delivered Christmas Eve Peace and Understanding to the World." Smithsonian.com. Smithsonian Institution, December 11, 2020. https://www.smithsonianmag.com/smithsonian-institution/how-apollo-8-delivered-moment-christmas-eve-peace-and-understanding-world-180976431/.

Neufeld, Michael J. *Von Braun Dreamer of Space, Engineer of War*. Knopf, 2008.

Noble, David F. *The Religion of Technology the Divinity of Man and the Spirit of Invention*. New York, NY: Penguin Books, 1999.

None Listed. "St. Christopher Medal Affixed to Vanguard Rocket." *The New York Times*. March 18, 1958.

O'Hair v. Paine, 397 US 531 (1970) (U.S. Supreme Court April 6, 1970).

Repcheck, Jack. *Copernicus` Secret: How the Scientific Revolution Began*. New York, NY: Simon & Schuster, 2007.

Reston, James. *Galileo: A Life*. London, Great Britain: Cassell, 1995.

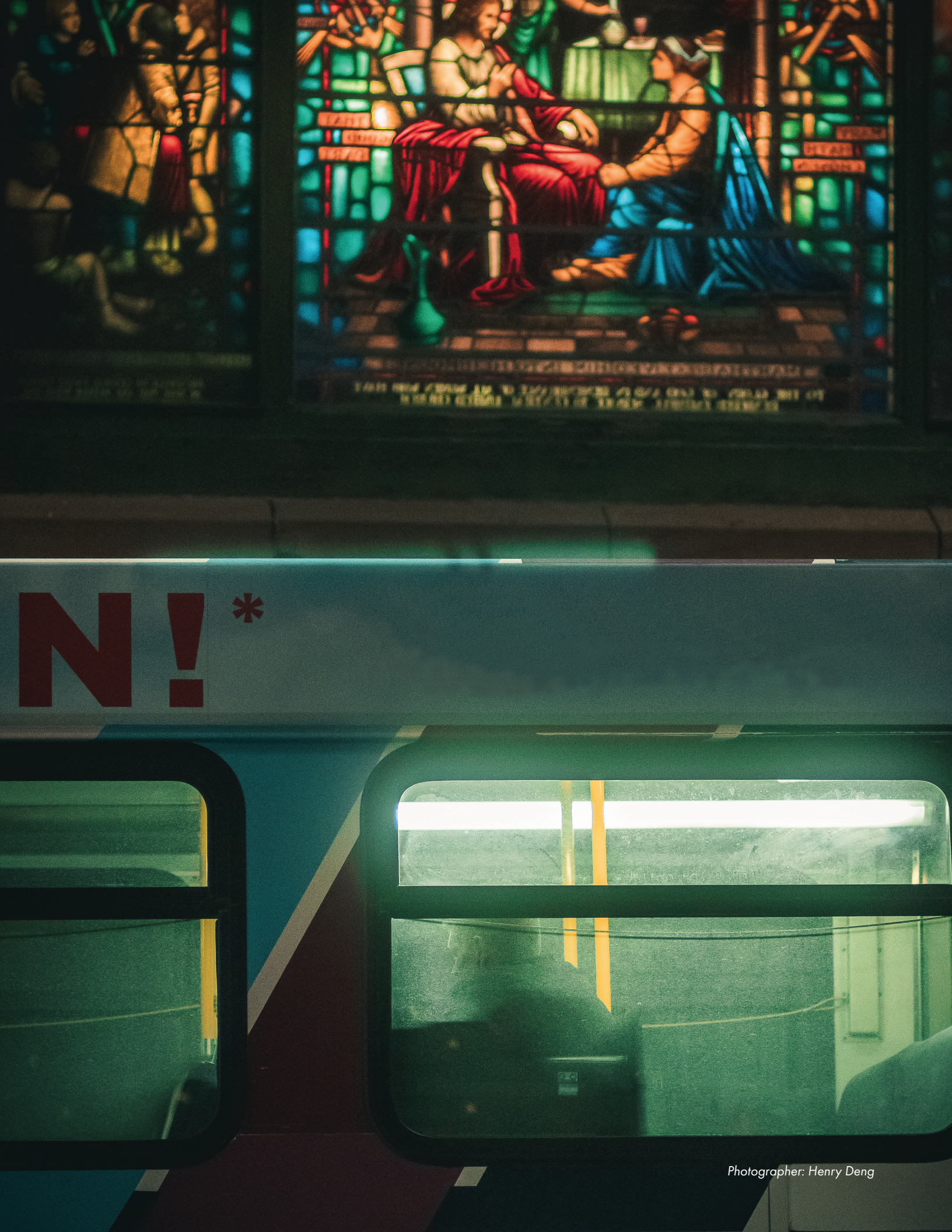
Rosen, Rebecca J. "Communion on the Moon: The Religious Experience in Space." *The Atlantic*, July 16, 2012.

Staff, The Week. "Why Astronauts Have Spiritual Experiences in Space." The Week UK. The Week, August 13, 2018. https://www.theweek.co.uk/95791/tim-peake-and-intelligent-design-why-do-astronauts-have-spiritual-experiences-in-space.

Weibel, Deana L. "Space Exploration as Religious Experience." The Space Review: Space exploration as religious experience: Evangelical astronauts and the perception of God's worldview, August 21, 2017. https://www.thespacereview.com/article/3310/1.

Woods, W. David, and Frank O'Brien. "Apollo 8 Flight Journal - Index Page." NASA. NASA, December 27, 2008. https://www.history.nasa.gov/afj/ap08fj/index.html.

Yaden, David B. ""The Overview Effect: Awe and Self-Transcendent Experience in Space Flight."" *Psychology of Consciousness: Theory, Research, and Practice* 3, no. 2 (2016). https://doi.org/https://doi.org/10.1037/cns0000086.



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