Visual Culture and Outer Space Futures

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Throughout human history, people's relationship to the night sky, and what lies beyond, has influenced culture (Stieve, 2013: 165). The mid-20th century brought an important turning point in these relationships, as the first artefacts, animals and humans were sent into orbit and further out (Scott, 2009: n.p.). Through these milestones many of the prophecies contained within the fiction and art of the past became reality. With the Apollo programme, the visions of early science fiction stories, like Jules Verne's *From Earth to the Moon* (1965), H.G Well's *The First Men in the Moon* (1900) and Georges Méliès film *A Trip to the Moon* (1902), were realised. Since then, outer space has become a central aspect of contemporary society, with satellites playing a key role in communications for instance (MacDonald, 2007: 593), and popular understandings of outer space continue to be shaped by art and media. Of interest in this article is visual art, an important strand within popular culture that contributes to "developing and expanding our social imaginary of outer space" (Triscott, 2016: 414). With this in mind, and by critically engaging with three different examples, this article unpacks the influential role of visual culture in imagining outer space futures. Firstly, the influential space art of Chesley Bonstell is discussed; before attention is turned to the science fiction blockbuster *Interstellar* (2014), and finally, the YouTube documentary *Timelapse of the Future: A Journey to the End of Time* (2019) is analysed.

Chesley Bonestell's Space Art

During the mid-20th century, space art was a notable part of the broader cultural imagination, helping to shape popular visions of human futures in outer space (King, 2022: 60). One of the most notable creative figures associated with outer space in the 20th century was the space artist Chesley Bonestell (1888–1986), whose experience in architecture, illustration and special effects was greatly reflected in his artwork. Bonestell's breakout onto the astronomical art scene came via work for *Life* magazine in the 1940s, and later, in his work with rocket scientist Werner von Braun in 1952, wherein Bonestell provided illustrations for a *Colliear's* magazine series called *Conquest of Space* (Sage, 2008: 34). Bonestell's depictions of spacecraft and unearthly landscapes made digestible von Braun's more scientific views regarding American space exploration, and the series went on to inspire many figures within, and outside of, America's astronomical art community (Sage, 2008: 34). Such an affiliation is emblematic of the broader relationship between space art and science, united by an interest in making known the distant and diverse milieus of outer space (King, 2022: 53). Building upon his earlier successes, Bonestell's convincing space art would go on to be featured across all manner of media, including magazines, books, television and film (King, 2022: 57).

Of course, Bonestell was not the first artist to try and depict space exploration in a realistic fashion; early pioneers like Lucian Rudaux had already produced that kind of work, however, Bonestell was arguably the first to truly attain widespread popularity. The style of Bonestell's artwork is often compared to that of earlier American landscape paintings from the sublime tradition, with his lunar art in particular drawing comparisons to depictions of the Rocky Mountains (Sage, 2008: 35). In a similar way to the art of that era, Bonestell imbued his landscapes with an aura of natural wonder and vastness, such as by carefully integrating small human figures to help convey a sense of awe-inspiring, and captivating, scale (Sage, 2008: 38). Furthermore, in contrast to the science fiction films of the era, which tended to portray outer space as a realm of extra-terrestrial monstrosity (including films he worked on), Bonestell's depictions of outer space were instilled with a sense of romanticism, technological progress and utopian futurity (Sage, 2008: 37). By situating human beings amid alien landscapes, Bonestell's artwork countered

mainstream anxieties involving outer space, instead producing an alternative imaginary symbolic of human, and crucially American, flourishing beyond Earth. Additionally, against the backdrop of the Cold War and the emerging technoscientific concerns that accompanied it, Bonestell's art conveyed technology in a progressive light, such as demonstrating that rockets could be used for exploration as opposed to warfare (Sage, 2008: 37). At a time when outer space was not a priority in American politics, his visions pushed for it as a national priority, imagining a future wherein space exploration was possible (King, 2022: 57).

The successful launch of Sputnik 1 by the USSR in October of 1957 abruptly thrust outer space to the forefront of American geopolitics, furthering Cold War tensions and igniting the space race (Sage, 2008: 40). With the onset of the space race, motivations for exploring outer space shifted, no longer driven by romantic notions of technology and science, but instead subsumed by political necessity. Space art, and Bonestell's artwork in particular, became even more important, influencing popular understandings of outer space as it became an arena of geopolitical conflict, and supporting efforts by demonstrating the ways in which outer space could be colonised. Much like the European colonisation of North America, outer space became imbued with a similar sense of manifest destiny, "where national achievement in human space exploration became conflated with the claiming of a universal destiny for humankind" (Sage, 2008: 48). As Sage argues, "Bonestell's images of outer space implicitly coordinated outer space as the 'high' or 'new' frontier in a purportedly unified American imagination so as to help familiarise an otherwise ominous environment around a nationalistic mythology" (Sage, 2008: 39). Overtime then, Bonestell's artwork became influential in "locating outer space within American popular geopolitical imaginations" (Sage, 2008: 29), with his contributions eventually earning him the title "Father of Modern Astronomical Art" (King, 2022: 57). Such an example well illustrates the significant cultural impact that artistic representations of outer space can have and how their imaginative portrayal of the future can influence present endeavours.

Christopher Nolan's Interstellar

I now turn to one of the most notable science fiction films of the 21st century, *Interstellar*, which was directed by Christopher Nolan and grossed close to $700 million at the box office (McGinley, 2020: n.p.). The film is set in 2067 amid an Earth that is crippled by blight. Cooper (Matthew McConaughey) is enlisted by NASA to pilot a spaceship, the Endurance, on an intergalactic voyage, in order to find a habitable planet that humankind can relocate to. The project is overseen by Professor Brand (Micheal Caine), whose daughter, Dr. Amelia Brand (Anne Hathaway) is the mission's lead scientist and accompanies Cooper alongside more minor characters, Romilly and Doyle, as well as two artificial intelligences, CASE and TARS. The film centres around the lead-up to the mission and the mission itself, as the crew explore planets on the other side of a wormhole, following in the footsteps of an initial survey team. Throughout the movie, the crew's experiences in outer space are contrasted with those of Cooper's daughter, Murph, back on Earth. The Earth portrayed in *Interstellar* is a rural one, omitting any trace of city life, which Boyle and Mrozowski argue produces an "abstract nostalgia for a romanticised golden age of American empire" (Boyle and Mrozowski, 2019: 349). Through its existential and technoscientific themes, outer space becomes the outlet for this nostalgia, as the common trope of outer space as the 'final frontier' is mobilised.

More than this though, and much like Bonestell's artwork, *Interstellar* also produces a sense of the cosmic sublime. The film, which won an Oscar for best visuals, is committed to realistically portraying cosmic phenomena and its exo-planetary environments. There is also an effort to situate human existence amid the enormity of unearthly nature. For example, some shots portray the Endurance passing in front of Saturn, the spaceship reduced to a barely perceivable speck drift across the screen. This motif is repeated throughout the film, including at a far greater scale when the Enduranceskirts the boundary of a black hole, overwhelmed by its power and scale. The inhuman scope and strength of the universe is further exhibited in other ways. After emerging from the wormhole, the first exoplanet the crew decide to explore is Miller's planet. Covered by a shallow ocean, the world is deemed promising due to an abundance of liquid water. Upon seeing the surface Doyle exclaims "it's just water!" to which Amelia replies "the stuff of life". Shots of the landing craft touching down emphasise its smallness against the endless ocean.

Shortly after landing, the scattered wreckage of the previous mission is discovered. While searching the shallows, Amelia remarks "towards the mountains" as Cooper comes to the realisation that "those aren't mountains, they're waves". As the towering wave closes in, the crew scramble back to the landing craft, however, Doyle is swept away

before making it inside. Drawing upon Kant, one of the most prominent contributors to the sublime as a concept, Bould explains that "for Kant, the sublime is found in formlessness (e.g., a storm at sea) or in things that so exceed our ability to perceive their form that they are effectively formless (e.g., a mountain range)" (Bould, 2012: 82). In this scene these two elements combine, chimaera-like, in the form of a moving mountain of water, abruptly shifting our perception of water from something hopeful to deadly. The scene also sets the bar for the rest of the film: outer space is dangerous and survival, both at the individual and collective level, is not guaranteed.

Alongside conveying a sense of the inhuman state and rhythms of the planet, the scene exemplifies how science fiction films often turn the familiar into the unfamiliar (Sobchack, 1987: 108). Another clear example of this occurs during a sequence on Mann's planet. As the landing craft navigates down to the planet's surface, white clouds, indistinguishable from those on Earth, appear. The craft suddenly clips the edge of a cloud, fragmenting it, and leading a cautious Cooper to remark "frozen cloud," before the planet's stark frozen wilderness is revealed. Like in the first example, the initial exposure to the world is promising and familiar, however, it once again quickly becomes clear that not everything is as it first seems. Whilst the film has far more complex examples of this, including themes that complicate conventional understandings of time, these more material elements well illustrate how "science fiction film often imagines and establishes the existence of *Other Worlds* that can and do challenge, unsettle, and undermine the known logic of the human world" (Redmond and Marvell, 2015: 3). In this way, *Interstellar* works to infuse the character's, and the audience's, experiences of outer space with a sense of isolation, vulnerability and unearthliness, as the narrative unfolds in volatile and violent environments far from the safety of Earth.

Interstellar's chaotic and inhuman portrayal of outer space is especially interesting in light of its environmental themes because, as De Bruyn states (2016: 4), "there is something troubling about the film's environmental politics". Instead of trying to save the Earth, humankind should focus on finding a new home. This sentiment is exemplified by Cooper's statement that "mankind was born on Earth; it was never meant to die here," as well as Prof. Brand's assertion that "we're not meant to save the world, we're meant to leave it". If *Interstella*r is to be considered in relation to the ongoing struggles of the Anthropocene, such sentiments seem to suggest that rather than combating environmental issues, humankind should instead find a new world to call home, even suggesting that we are destined to do so. Oddly then, the film frames outer space as unpredictable and dangerous, whilst also establishing it as humankind's only chance at survival. By espousing this framing, the film feeds into an emergent popular imagination, a la Elon Musk: of outer space as an escape from planetary crisis, and technoscience as the conviction that will carry us there.

In *Interstellar* it is an underground NASA programme that funds the Endurance'sotherworldly voyage, whereby manned spaceflight becomes the medium through which human survival is realised. Arguably then, *Interstellar* intends to reinvigorate an interest in manned space exploration and trust in the governmental associations responsible for past successes, in an attempt to reignite dreams of American manifest destiny. Like many films in the genre, *Interstellar's* future carries with it an "America-centric focus" (Redmond and Marvell, 2015: 2), with little hint as to what has become of the rest of humanity. By the end of the film, Amelia has successfully landed on Edmund's planet. The initial shot of this mysterious world reveals a flagpole with a tattered U.S. flag blowing in the wind. The message is clear – this future is purely American. Once again, the "popular cosmographical imagination" of the past emerges (Sage, 2008: 40), wherein a distinctively American destiny is framed through the construction of an off-Earth future. Moreover, and on a broader note, at a time when the utopian visions of space exploration from the mid-20th century have become increasingly inconceivable (Canavan, 2021: 267), *Interstellar*, much like earlier space art, works to inspire a belief in human technology and a confidence in science; justified by the assertion that human survival is predicated on transcending earthly being. *Interstellar* is just one example of a trend in popular culture that "indicates that the US may be heading back to the future" (Boyle and Mrozowski, 2019: 343).

John Boswell's Timelapse of the Future

The aforementioned examples represent some of the more influential visual depictions of outer space futures, especially in relation to the U.S. However, over the last couple of decades, other forms of influential media have emerged, including content that is shared on the internet. As a consequence, popular understandings of outer space and the future are now routinely shaped through the consumption of online content, a trend that has received little

scholarly attention. A key example of this is the video-sharing site YouTube, which hosts an array of channels and videos committed to depicting outer space futures, wherein content can be purely fictional or informed by science. For context, some popular examples include Aperture's *The Future of Human Spaceflight* (2020) and Venture City's *Timelapse of Future Spacecraft: 2025-3000+* (2022). There are even whole channels dedicated to discussing outer space and the future, such as Isaac Arthur, which features hundreds of popular videos, including*Civilizations at the End of Time: Iron Stars* (2017), *Surviving in the Expanse of Space* (2018) and *Interstellar Colonization Strategies* (2023). One of the most viewed videos of the genre is a short film created by John D. Boswell and published on his channel melodysheep, titled *Timelapse of the Future: A Journey to the End of Time* , the film explores the cosmos' future, spanning from the present to the end of the universe, and has, at the time of writing, amassed over 93 million views. *Timelapse of the Future* utilises its own effects alongside pulling visual and audio inputs from other sources, including repurposing audio narration from science communicators like Brian Cox and using on-screen text to emphasise timescales and tipping points. On the whole, the film constructs a scientifically informed vision of the near and far future, revealing the predicted fate of the Earth and the wider universe.

Whilst the global blight of *Interstellar* represents a threat that may never come to pass, the planetary crisis portrayed in *Timelapse of the Future* is one that science has predicted with relative certainty. The film reveals that over the course of several billion years, the Sun will metamorphose into a red giant star, increasing in luminosity and warming the Earth. During this process, the Sun will expand in its size and it is possible that eventually the Earth will be absorbed into the Sun, converting geological strata to stardust. Despite debate over whether the Earth will be consumed by the expanding Sun or survive as a burnt-out wasteland, it is clear that planet Earth will become uninhabitable (Schröder and Smith, 2008: 159). For the philosopher Jean-Francois Lyotard this event – which he refers to as a solar catastrophe – stresses that "the narrative of the end of the Earth is not in itself fictitious, but rather realistic" (Lyotard, 1993: 237).

By conveying this event, *Timelapse of the Future* disseminates to a broad audience the unsettling truth that the Earth will not exist forever, in turn exposing humankind's vulnerability to cosmic affairs. Solar catastrophe is in many ways the ultimate planetary calamity, an upheaval that threatens the literal erasure of our shared homeworld. The reality of such a future means that the long-term survival of Earth's life will depend on leaving the planet behind and overcoming the challenges of outer space. Failure to do so will seemingly result in extinction. Thus, in a different way to Bonestell's art or *Interstellar*, *Timelapse of the Future* provides another justification for space exploration through the scientific prophecy of solar catastrophe. Arguably, such an event provides a far more compelling motivation for taking outer space endeavours seriously, one that positions the end of the Earth as a calculatable inevitability. In the absence of the Earth, outer space becomes the only alternative.

This focus on the far future well encapsulates how "in the last several decades science has opened up vast vistas of previously unimagined time, the 'deep' or 'cosmic' time of earth's archaic past and of the universe's future" (Woodward, 2016: 11). As the film ventures farther and farther into the future, it is revealed that while Earth's future is one of mounting brightness and heat, the universe's is far darker and colder. Eventually, the audience is brought to the end of the universe. It is suggested that any existing life by this stage will have to utilise extremely advanced technology in order to harness increasingly scarce energy resources, such as from dim white dwarf stars or the rotational energy of black holes. Whilst predictions at such timescales are complicated by the limits of contemporary physics, including uncertainties around the decay of atoms and protons, the *Timelapse of the Future* nonetheless reveals that even matter itself will begin to break down. The film speculates about escaping to other universes, however, failure to do so will leave any remaining life in a decayed and empty universe.

After the breakdown of the last black hole, the film reveals to the audience that "time becomes meaningless, forever" because the universe is now unchanging. In such a future even spatiality and temporality itself cease to exist, amid a permanent and empty void, an eternal immateriality. There will no longer be any energy available to power biology or technology, and no ground left to stand on. Through the final extension of entropy comes the ultimate manifestation of the cosmic sublime, of an extinction that is inevitable and inescapable. By travelling to the end of time, the*Timelapse of the Future* conveys the inhumanness of the universe's future, where life itself becomes not only extremely difficult but an impossibility. Such a future resonates with Thacker's (2016: 20) argument regarding "the unhuman as an attractor, a horizon towards which the human is fatally drawn". With this in mind, and in relation to the texts discussed

earlier, *Timelapse of the Future* cautions against any belief that outer space can be controlled and remade in our image. Earlier optimism gives way to reality.

Conclusion

Overall, by focusing on visual culture, it becomes possible to unpack a variety of narratives at the juncture of outer space and the future. The space art of Chesley Bonestell provides an insightful window into earlier framings of outer space, at a time when geopolitical tensions were heightened and society' relationship with outer space was changing rapidly. Through *Interstellar*,a more contemporary story is told, working to convey the alienness of outer space, whilst at the same time insinuating that planetary problems are not to be solved but fled. *Timelapse of the Future* also considers the impact of planetary crises, but it also probes far further into the future, eventually ending up at the end of time, and the universe, itself. Arguably, Bonestelland *Interstellar* both speak to a wider tradition of the American sublime; frame futures that revive the idea of American manifest destiny and fuel a popular optimism in technological progress. In contrast, and despite also elucidating a faith in science, *Timelapse of the Future* counters such narratives and optimism by articulating the boundaries of technoscience, both regarding our present struggles to fully comprehend the universe and the future limits of technology: exposing the long-term difficulties of survival in an entropic universe. Arguably, there is ultimately a growing awareness of humanity's precarious place in the universe, an emergent sense that the universe cannot be controlled; the heavens cannot be conquered, and the future cannot be guaranteed.

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