

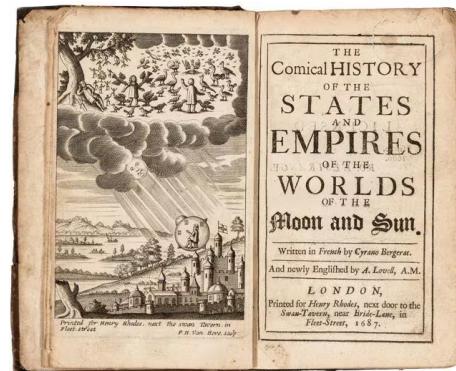
Science Fiction and the Doom of Humanity:
From *A Trip to the Moon* to *Ex Machina*

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In 1996, a sheep named Dolly¹ was first cloned from an adult cell. The subsequent stem cell research aimed at “farming” and shaping cellular materials for medical purposes developed quickly during the following decade. In 2005, Kazuo Ishiguro published his novel *Never Let Me Go*, with its “great emotional force”² sounding the alarm for the ethical ramifications of human cloning. As science and technology develop, societies are driven to embrace transformative changes. While these advancements hold the promise of progress, they also evoke apprehensions of detrimental effects on humanity. Thus, science fiction, which “deals principally with the impact of actual or imagined science upon society or individuals”³, emerged as a powerful medium for articulating these anxieties about the fate of mankind, allowing filmmakers to project societal fears onto the screen and engage audiences in a thought-provoking discourse on the consequences of scientific and technological evolution.

Origins of Technology Within the Literary Canon

The earliest description of rocket-powered space flight is credited to French novelist Cyrano de Bergerac. The idea of space travel had been explored as early as the 2nd century AD, but it seemed to be Cyrano who theorized the technology behind it. In his posthumous 1657 novel series *Comical History of the States and Empires of the Moon*, Cyrano imagined visits to the moon and sun. He described seven methods of space travel, one of which was perhaps the inception of the ramjet (a jet engine used for high-speed atmospheric flight)⁴. Although written to satirize French politics, Cyrano’s ideas were the sign of an era dominated by scientific discovery made during the Scientific Revolution that began in astronomy. Earlier in the 17th century, Galileo Galilei first “used the telescope to look



¹ Fridovich-Keil, Judith L. 2023. “Dolly | History, Impact & Legacy.” Encyclopedia Britannica. September 11, 2023. <https://www.britannica.com/topic/Dolly-cloned-sheep>.

² “The Nobel Prize in Literature 2017.” n.d. NobelPrize.Org. <https://www.nobelprize.org/prizes/literature/2017/press-release/>.

³ Sterling, Bruce. 1998. “Science Fiction | Definition, Characteristics, Books, Movies, Authors, Examples, & Facts.” Encyclopedia Britannica. July 20, 1998. <https://www.britannica.com/art/science-fiction>.

⁴ Liukkonen, Petri. “Cyrano de Bergerac.” Books and Writers, n.d. <http://authorscalendar.info/bergerac.htm>.

towards heaven”, observing the Moon, and the phases of Venus, a “proof of heliocentrism”, presenting the Sun as the center.⁵ However, Cyrano’s main takeaway from his trip to the “World of the Sun” was a disenchanted extraterrestrial view of the soulless humans–“...[corporeal images] penetrate into the Soul, where because of the Delicateness of its Substance, they imprint themselves, and so represent to it Objects very remote, which the Senses cannot perceive. It’s a thing that commonly happens here, where the mind is not shut up in a Body, made of gross Matter, as in thy [human] World.”⁶

The fictional trips to the moon and sun ushered in an age of protoscience⁷-fiction (early literature that would later develop into sci-fi) during the Enlightenment of the 17th-18th centuries, led by names such as Kepler and Voltaire. Johannes Kepler’s *Somnium* describes a voyage to the moon and has been labeled by experts Carl Sagan and Isaac Asimov as the first work of science fiction⁸. As a leading astronomer of the time, Kepler included detailed scientific descriptions of “how the earth might look when viewed from the moon”, and the book is considered the “first serious scientific treatise on lunar astronomy”⁹, besides its literary values. Voltaire’s *Micromégas* details an alien being’s visit to Earth, during which he was disappointed with the “arrogance of mankind”.¹⁰

The further development of the genre was marked by Mary Shelley’s 1818 novel *Frankenstein*. Shelly originated the mad scientist archetype, specifically describing his foray into advanced galvanic technology. From a modern perspective, Shelley’s story deals with themes of artificial intelligence (AI): the creator has responsibility for his creation, and there is a societal fear of the creation itself. Inspired by 19th-century advances in chemistry and electricity, Shelley

⁵ Osler, Margaret J., J. Brookes Spencer, and Stephen G. Brush. 2019. “Scientific Revolution | Definition, History, Scientists, Inventions, & Facts.” Encyclopedia Britannica. May 3, 2019. <https://www.britannica.com/science/Scientific-Revolution>.

⁶ Cyrano De Bergerac, *Comical History of the States and Empires of the Moon*, 1657.

⁷ Undeveloped or pseudoscientific study

⁸ Josh Jones, “When Astronomer Johannes Kepler Wrote the First Work of Science Fiction, The Dream (1609),” *Open Culture*, July 22, 2020, https://www.openculture.com/2020/07/when-astronomer-johannes-kepler-wrote-the-first-work-of-science-fiction-the-dream-1609.html#google_vignette.

⁹ “Somnium: The Dream, or Posthumous Work on Lunar Astrono...” n.d. <https://www.goodreads.com/book/show/5984974-somnium>.

¹⁰ Voltaire. 1752. *Micromégas*.

allowed a human to play God, highlighting a fascination with scientific innovation, while also exploring the potential consequences it placed on humanity. Her extraordinary storytelling created such a deep fear of the alienated man-made man that it foreshadowed the modern-day dystopian genre.

Science in fiction had become more prevalent by the 1830s. Notably, Edgar Allan Poe wrote *The Unparalleled Adventure of One Hans Pfaall* in 1835, which revolved around a balloon flight to the moon by a man who made himself a superhero by publicly announcing his successful space travel, for a dark purpose. “...all of those dark and hideous mysteries which lie in the outer regions of the moon...[which] by God’s mercy, never shall be turned, to the scrutiny of the telescopes of man... would I most willingly detail. But, to be brief, I must have my reward.”¹¹ The space explorer tried to withhold the exclusive information that he gathered about the moon to bargain for pardon for a series of murders committed by him upon his leaving the earth. This explains the origin of one archetypal sci-fi antihero, who is usually enabled by advanced sciences to be invincible and out of control by human society.

Far before space travel was made technically possible, or the concept of artificial intelligence began to form, authors created literature in response to the popular scientific ideas of their time and explored their impact on humans both socially and individually.

Film in the Atomic Age (Present and 1945-)

One of the most significant technological developments in history, the nuclear bomb, and its profound and complex impacts on humanity are continuously explored by today’s filmmakers. Released in July 2023, *Oppenheimer* attempted to reveal the conflicting inner world of the tormented scientific leader of the *Manhattan Project*, which produced the first atomic bombs that were used to end World War II. Upon watching the film, Dieter Gruen, one of the



¹¹ “Edgar Allan Poe Society of Baltimore - Works - Tales - The Unparalleled Adventure of One Hans Pfaall (Text-04b),” n.d. <https://www.eapoe.org/works/tales/unphlle.htm>.

last surviving Manhattan Project scientists, said, “I think the chief accomplishment of [Oppenheimer] was to get people to think about those days and what they mean in the present situation that the world finds itself in, and to the extent that people become aware, they must pay attention to a world filled with nuclear weapons. Do something about it, avert a nuclear holocaust. That, I think, is the value that I see in this movie.”¹²

“[Oppenheimer’s] triumph was his successful leadership bringing the bomb project to completion in time to be used during the war,” said Martin J. Sherwin, late co-author of the Pulitzer-winning book the film was based on, *American Prometheus: The Triumph and Tragedy of J. Robert Oppenheimer*. “And that was also his tragedy. He came to realize that the bombings were not necessary to end the war in August.”¹³

Although never regretting his role in bringing the Manhattan Project to “open public fruition” at a time when “all over the world men craved peace as never before”, Oppenheimer was tormented by his ethical dilemma. “We have made a thing,” Oppenheimer said, “a most terrible weapon that has altered abruptly and profoundly the nature of the world...a thing that by all the standards of the world we grew up in is an evil thing.”¹⁴

That was the focus of the film—the moral struggle—which Christopher Nolan highlighted with a symbol, the poisoned apple in the beginning part of the film. There’s a scene in the film depicting Oppenheimer reading from the Hindu scripture, the Bhagavad Gita: “Now I am become Death, the destroyer of worlds.” In real life, Oppenheimer was quoted reciting this line when reflecting on his response to the initial success of the Trinity Test.¹⁵ Sherwin’s interpretation was, “[Oppenheimer’s] quoting it was definitely a recognition that the world would never be the same.” This is the dark side of Oppenheimer’s legacy that the film set out to

¹² Gruen, Dieter. Interview. Conducted by Capri Wayne. 21 October 2023.

¹³ Sherwin, Martin J. Interview. Conducted by Capri Wayne. 27 September 2018.

¹⁴ Kai Bird and Martin J. Sherwin, *American Prometheus: The Triumph and Tragedy of J. Robert Oppenheimer* (Alfred A. Knopf, 2005).

¹⁵ NBC News, “OPPENHEIMER: The Decision to Drop the Bomb (1965),” July 15, 2023, <https://www.youtube.com/watch?v=-JWxIVVeV98>.

explore—the scientific force of “harnessing the basic power of the universe”¹⁶ alongside its capability of immense destruction.

The 1945 nuclear bombings of Hiroshima and Nagasaki killed at least 225,000 people, of which “more than 95 percent were civilians”.¹⁷ In 1953, Japanese anti-war director Hideo Sekigawa created *Hiroshima*, a docudrama showing the real-life horror of the nuclear explosion based on eyewitness accounts. More famously, in 1954, *Godzilla* launched the *kaiju* (“strange beast”) movie genre. Godzilla represented the atomic bomb—a nuclear radiation-powered, city-destroying monster. “[Godzilla’s] heavily furrowed skin or scales were imagined to resemble the keloid scars of survivors of the two atomic bombs that the U.S. dropped on Japan nine years earlier to end World War II”.¹⁸ The film understandably resonated differently with Japanese versus American audiences; whereas it was a cathartic experience for the Japanese, it was a cheesy monster movie for the Americans.

In the years immediately following the bombings, the United States also took the docudrama approach. The first film made about the event was *The Beginning or the End* (1947), an MGM docudrama about the Manhattan Project and Hiroshima bombing. The film was criticized for its historical inaccuracies (some due to the Project’s classified nature) and was a box office failure. However, when the world fell full-force into the Cold War Era, there came films like Stanley Kubrick’s black comedy *Dr. Strangelove or: How I Learned to Stop Worrying and Love the Bomb* (1964). As is the trend with many films about technology, *Dr. Strangelove* took a satirical approach to the Cold War crisis, specifically focusing its ridicule on the idea of mutually assured destruction (MAD).¹⁹ Ultimately, at the end of the movie, all the nuclear anxiety was justified through a montage of nuclear explosions that destroyed the world.

¹⁶ “Truman Statement on Hiroshima,” Nuclear Museum, August 6, 1945, <https://ahf.nuclearmuseum.org/ahf/key-documents/truman-statement-hiroshima/>.

¹⁷ Bird and Sherwin, *American Prometheus: The Triumph and Tragedy of J. Robert Oppenheimer*.

¹⁸ Yam, Kimmy. “‘Godzilla’ Was a Metaphor for Hiroshima, and Hollywood Whitewashed It.” NBC News, August 7, 2020. <https://www.nbcnews.com/news/asian-america/godzilla-was-metaphor-hiroshima-hollywood-whitewashed-it-n1236165>.

¹⁹ Madsen, Olivia. “Doctor StrangeLove: A Cold War Satire - | College of Humanities.” | College of Humanities, April 3, 2017. <https://humanities.byu.edu/doctor-strangelove-a-cold-war-satire/>.

Outer Space: A Fascination with the Unknown (1950s-present)

A Trip to the Moon (1902) by French director George Méliès, inspired by Jules Verne's sci-fi novel, *From the Earth to the Moon*²⁰, made science fiction a reality in cinema. Méliès' film was a landmark in cinema, spurring the sci-fi genre, pioneering visual effects, and pushing forward filmmaking as a whole. The moon landing portrayed as a crashing of the “capsule”



(spaceship) into the eye of the “man in the moon” became one of the most iconic in the history of cinematography. According to film researchers, Stanley Kubrick, America's epic sci-fi filmmaker, was largely influenced by *A Trip to the Moon*. “Stanley Kubrick is comparing himself as a filmmaker to Georges Méliès. His knowledge of the Apollo program is a parallel to

The Trip to the Moon.”²¹

In 1903, Soviet rocket scientist Konstantin Tsiolkovsky published his rocket equation, proving that space exploration was theoretically possible. By 1955, the Space Race between the United States and the Soviet Union had begun. Due to heavy media coverage, and the sheer achievement of the task, space travel permeated artistic outlets in this period. The MGM film *Forbidden Planet* (1956) was the first to depict humans traveling to space in a “starship”. A decade later, Stanley Kubrick's *2001: A Space Odyssey* (1968) brought a new sense of realism to the space movie, while also establishing the serious sci-fi blockbuster as a staple in Hollywood.

As of 2023, over 600 people have traveled to space.²² In light of the detrimental effects of climate change, films about the habitability of other planets, or outer space itself, have become popularized, including *Interstellar* (2014), *The Martian* (2015), and *Wall-E* (2008). Danny Boyle's *Sunshine* (2007) also deals with a similar idea—the Sun dying and the ensuing

²⁰ “Science Fiction Meets Science Fact: How Film Inspired the Moon Landing,” Royal Museums Greenwich, n.d., <https://www.rmg.co.uk/stories/topics/science-fiction-meets-science-fact-how-film-inspired-moon-landing>.

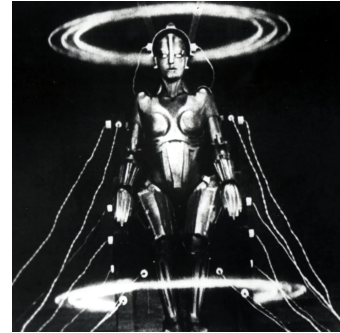
²¹ “After the Ball: Kubrick and Georges Méliès,” AULIS Online, May 2019, https://www.aulis.com/after_the_ball.htm.

²² Who Is in Space? - How Many Astronauts Are on the Space Station. “SPACEFLIGHT STATS — Who Is In Space? - How Many Astronauts Are on the Space Station,” n.d. <https://whoisinspace.com/spaceflight-stats>.

environmental catastrophe on Earth. This idea of existentialism and worry for the future of the human race has often looked to outer space as the solution.

The Phenomenon of Today: Artificial Intelligence

The most prevalent and oft-discussed technological development of the 2010s and 2020s is easily artificial intelligence. The 21st century has seen the creation of many cinematic works about AI, however, arguably the first movie related to AI was the German expressionist silent film *Metropolis* (1927). Directed by the groundbreaking Fritz Lang, *Metropolis* features a man-made humanoid robot called the Maschinenmensch (German for ‘machine-human’) that wreaks havoc on the eponymous city. Though this film was mostly a reaction to 20th-century industrialization, the Maschinenmensch is one of the earliest depictions of robots in film and was hugely influential to future films in the science fiction genre; for example, it heavily influenced the design of *Star Wars*’ C-3PO.



Since *Metropolis*, the idea of antagonistic robots has been explored many times. However, it was Stanley Kubrick’s *2001: A Space Odyssey* that first explicitly captured the idea of AI sentience. In making *2001*, Kubrick was very invested in the realism of the technology and met with computer theorists to create the character of HAL 9000, the sentient computer that controlled the film’s Discovery One spacecraft. The character of HAL was hugely influential to later space travel movies, introducing the trope of an AI captain, thus subverting the traditional concept of a villain using a surprising twist in events: the machine has control over the human. This trope is replicated in the films *Sunshine* (2007) and *WALL-E*, where the AI controlling the ship knows more than the humans and serves as an antagonistic force.

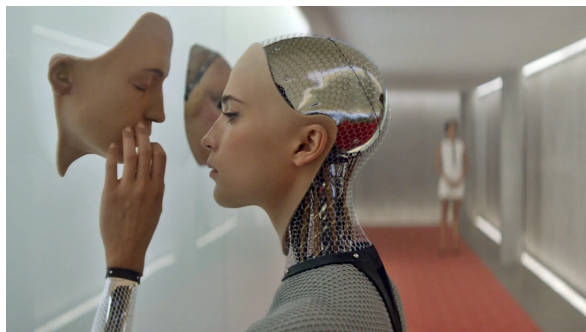
For a brief history of AI, there was a period of disappointment and thus reduced interest and funding in AI from 1974-1980, which was coined the first “AI Winter”. However, the 1980s saw its revival: the “AI Boom”, and one main reason was because of Yann LeCun, a French computer scientist, and one of the key brains behind AI/deep learning. LeCun was inspired by none other than the “Hal 9000 and other machines of the future depicted in Stanley Kubrick’s

2001: A Space Odyssey.”²³ LeCun explored neural networks at one of the world’s leading labs, which he helped to build, with its walls decorated with “framed stills from the film”.

Consequently, AI dominated 80s blockbusters. In *Tron* (1982), the antagonist was a rogue AI computer called the Master Control Program. The overarching antagonist of the entire *Terminator* franchise (1984-) is an AGI²⁴ superintelligence system called Skynet, which overthrew the humans when it gained sentience. Wes Craven’s 1986 sci-fi horror film *Deadly Friend* (originally titled *Artificial Intelligence*) featured inserting a robot processor into a brain-dead teenager. *Robocop* (1987) dealt with a human becoming a cyborg and returning to a sense of real human intelligence. Many of these films were highly acclaimed and are heralded as some of the greatest science fiction films of all time.

Steven Spielberg’s *A.I. Artificial Intelligence* (2000) tackles this technology head-on. The film projects a dystopian future in which a significantly reduced human population has created artificial beings to replace the lost. In the film’s conclusion, set 2000 years later, humanity went totally extinct and was buried under glacier ice while the artificial beings survived, advanced, and decided, quite ironically, to learn about humanity.

Despite being so prominent in popular media, the portrayal of AI in film has overwhelmingly been in a negative light. This is due to the wider public opinion of AI, which largely consists of fear of job safety and loss of control. Even when most experts are not keen on the possibility of AI sentience, the idea is pervasive in the human mind. There is a cycle: immediate fear of the machine, media and art created to illustrate these fears, and the subsequent lingering of a perceived threat to humanity in our consciousness. Since 2011, we have been in



the age of “big data” and large machine learning systems. It is since the 2010s that AI has transformed into a cultural phenomenon, with the idea of artificial general intelligence—AI that “can solve any cognitive or human task in ways that are not limited to how they are

²³ Cade Metz, *Genius Makers: The Mavericks Who Brought AI to Google, Facebook, and the World* (Dutton, 2021).

²⁴ AI that can learn to accomplish any human task.

trained”²⁵—driving most of today’s innovations and social anxiety. Films like *Ex Machina* (2014) portray AI not only as an immediate threat but as an ethical and moral dilemma, reflecting the same anxieties that Mary Shelley introduced in *Frankenstein* 200 years ago. *Ex Machina* also reflects humanity’s hubris in relation to its “greatest invention”.²⁶

These worries and anxieties are not unfounded. “I have suddenly switched my views on whether these things are going to be more intelligent than us,” said Geoffrey Hinton, the “godfather of AI” and Turing Award co-winner with LeCun, in an interview with MIT Technology Review.²⁷ “I think they’re very close to it now and they will be much more intelligent than us in the future...How do we survive that?” Hinton resigned from Google in May 2023 so that he could openly sound the alarm on the danger of AI. Hinton was deeply concerned that bad people could “harness the tools he himself helped breathe life into to tilt the scales of some of the most consequential human experiences, especially elections and wars”.²⁸

Threat or Asset to Humanity: The Treatment of Technology in Film

The aforementioned technologies such as nuclear power and AI often tie into each other—both are perceived as detrimental to humanity. Films such as *The Matrix* (1999), *The Terminator* franchise, and the *Mad Max* series establish their respective dystopian societies as the results of all-out nuclear war. Even Spielberg’s *AI* predicts a future in which nuclear war kills all biological life, leaving cities buried under ice. However, *Sunshine* (2007) takes a unique approach: scientists plan to reignite the dying Sun with a massive nuclear bomb.

Over the years, there have been few movies that portray these technologies in a positive manner. One example is the Disney animated film *Big Hero 6* (2014), which centers around a kind-hearted healthcare robot named Baymax. Despite being a robot, Baymax grows attached to the protagonist Hiro, even sacrificing his own “life” to save the human boy. A much earlier

²⁵ Mok, Aaron. “What Is AGI? How Artificial General Intelligence Could Make Humans Obsolete.” *Business Insider*, May 27, 2023. <https://www.businessinsider.com/what-is-agi-artificial-general-intelligence-explained-2023-5>.

²⁶ Bilton, Nick. 2023. “Artificial Intelligence May Be Humanity’s Most Ingenious Invention—And Its Last?” *Vanity Fair*, September 13, 2023. <https://www.vanityfair.com/news/2023/09/artificial-intelligence-industry-future>.

²⁷ Will Douglas Heaven, “Geoffrey Hinton Tells Us Why He’s Now Scared of the Tech He Helped Build,” *MIT Technology Review*, October 17, 2023, <https://www.technologyreview.com/2023/05/02/1072528/geoffrey-hinton-google-why-scared-ai/>.

²⁸ Heaven, “Geoffrey Hinton Tells Us Why He’s Now Scared of the Tech He Helped Build.”

example is *Things to Come* (1936), based on the H.G. Wells novel. Whereas many H.G. Wells stories describe technology negatively, *Things to Come* champions it. This film describes brilliant scientists trying to travel to the moon, while the people trying to thwart the effort and return to simpler times are painted as the antagonists. However, there has also been media that deliberately blurs the line between human “goodness” and perceived robot “badness”. By humanizing robotic characters, and giving them human dreams and aspirations, audiences are more sympathetic. In the Apple TV series *Foundation*, a robot character named Demerzel navigates the gray area between her human morals and her programming. Additionally, Kazuo Ishiguro’s 2021 novel *Klara and the Sun* features a solar-powered “artificial friend” named Klara. Klara displays human traits like curiosity and deeply cares for the human girl she accompanies, even sacrificing her own abilities to help her.

Thus, many positive interpretations of new technology rely on humanizing the technology itself or placing the technology in a position second to the human (often as an assistant or helper). This way, much of the fear about AI and other advancements can be mitigated, reassuring a human audience that we are, in actuality, in control of these machines.

This optimism about AI was shared by LeCun. Although never doubting that the machines will be “smarter than humans”, LeCun believes that AI will bring forward a “new renaissance for humanity, a new era of enlightenment”. Consequently, he disagrees with the view that machines will “dominate humans simply because they are smarter, let alone destroy humans”.²⁹

Conclusion

From the beginning of cinema, when George Méliès exposed audiences to the fantasy of space travel, to the search for human identity amidst an AI takeover, film has continuously evolved to capture the procession and deal with the impacts of scientific discoveries and technological advancement. Films about outer space have transitioned from fantastical adventures to a reflection of our environmental concerns and the search for solutions to save mankind. Artificial intelligence has transitioned from killer robots into deep ethical and existential discourses for the screens. The treatment of technology in film is a reflection of our own complex relationship with these new advances.

²⁹ Heaven, “Geoffrey Hinton Tells Us Why He’s Now Scared of the Tech He Helped Build.”

Towards the end of *Never Let Me Go*, Miss Emily, the head guardian of Hailsham, reveals the purpose of art: “We didn’t have the Gallery in order to look into your souls. We had the Gallery in order to see if you had souls at all.”³⁰ Art was used as the ultimate symbol of soul and humanity. Today, our world has literally entered the quantum realm following the Entanglement breakthrough. What does it mean to be human, co-existing with AI in the new realm? Science fiction as an art form continues to quest for the answer and rekindle humanity.

³⁰ Kazuo Ishiguro, *Never Let Me Go* (Faber and Faber, 2005).

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