

Science Fiction as an Integrative and Holistic Approach to the Future

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Abstract

In this article I examine science fiction (hereafter SF) as an integrative and holistic approach to the future. To begin, I describe my early fascination with SF and how I initially incorporated SF into futures education. I explain the integrative and holistic dimensions of SF and provide a general definition of SF. Next, I explain why SF is the “evolutionary mythology of the future.” Then I provide a compressed evolutionary history of SF from ancient to contemporary times, highlighting important texts and authors. I describe how different writers understood the connection between SF and approaching and thinking about the future. To convey the extensive breadth and depth of SF, I next outline the main topics and themes found in SF. Throughout these consecutive sections, I identify my various publications, courses, and webinars on SF. I conclude the article with a review of the values and purposes of SF, especially with respect to understanding and approaching the future.

Science Fiction as a Psychologically Holistic Approach to the Future

I first developed a deep fascination with SF in my childhood, watching such classic movies as *The War of the Worlds* (1953), *Journey to the Center of the Earth* (1959), and *The Time Machine* (1960). Such exciting and personally engaging movies, filled with drama and adventure, and fantastic sights and sounds, and provoking in me a sense of wonder and mystery, stimulated all the different dimensions of my consciousness, including my thinking and imagination, and my emotions and senses. Watching SF movies produced *psychologically holistic experiences*, affecting all spheres of my consciousness.

As part of its psychologically holistic impact, SF can generate a “total person immersion.” An important feature of the power of SF—particularly as an approach to the future—is that it engages us and draws us into its visions at a personal level. Through SF, we vicariously can “live and feel” the future. In fact, for many SF enthusiasts, SF can become a “way of life,” an all-encompassing paradigm for personally living and understanding reality and the future.¹

Essential to the holistic psychological impact and popularity of SF is that SF is *narrative* in its structure. Visions of reality, and in particular the future, are presented as stories, filled with drama and adventure, and populated with various memorable characters, both heroic and villainous. The human mind strongly resonates with the narrative as a form of understanding reality. Throughout history, narratives have provided humans with personal models, and with meaning, value, and purpose in life. Stories have an inspirational and psychologically holistic impact. As an approach to the future, stories are more psychologically engaging and memorable than statistics, projective trends, or abstract theories.²

Although throughout my young adult years I continued to watch SF movies and started to read the literature, my primary academic focus as a college student and teacher was psychology and philosophy. Generally, SF was a stimulating diversion from the 1960s through the 1980s. Yet in the early 1990s I saw a way to combine together my academic pursuits with SF, when I devel-

oped an introductory course on the future, and realized that SF was a rich source of diverse visions of the future, providing students with personally engaging assignments that stimulated their imagination, thinking, and emotions. Although SF frequently contains prescient futures predictions and consciousness-expanding visions, SF importantly also provides students with vivid and colorful, and psychological memorable hypothetical scenarios about the possibilities of the future.

Over the last thirty years I have taught numerous classes, workshops, and entire courses on the future, in which I have incorporated SF into the curriculum. Concurrently I have steadily developed a separate and distinctive educational offering that focuses exclusively on SF, growing from an initial two-hour presentation into a webinar series with over sixty hours of videos covering in great depth the history and nature of science fiction.³ In conjunction with these presentations and webinars, I have published numerous articles⁴, as well as a series of books on the history of SF (with more planned volumes to come).⁵ As educational resources for my SF courses and webinars, I have also progressively evolved reading and viewing lists of the “All-Time Best SF Novels” and “All-Time Best SF Movies,” both of which are available on my website.⁶ Recently I also published a short article “Must-Read Science Fiction Authors and Books for Futurists.”⁷

The Multi-Dimensional Integrative Nature of Science Fiction

To delve deeper into the nature of SF, let’s start with a general definition of SF. There have been many different definitions of SF offered by both fans and writers. Still, over the time that I have taught and wrote about SF, I have refined the following definition, which I believe accurately captures many of its essential qualities. I have already introduced above some of the essential elements in this definition; other key features are explained later in the article.

“SF is a narrative approach that is primarily, although not exclusively, about the future, involving dramatic plots, action sequences, specific settings, and varied and unique characters, human and otherwise. Although having mythic origins and thematic features, it is, to a significant degree, inspired and informed by modern science, technology, and contemporary thought. Involving imaginative and often detailed scenario building and thought experiments about the future, set in the form of stories, SF stimulates and engages holistic consciousness about the future of everything, and more.”

Aside from the above definition, a second important starting point to introduce and note is that SF is a *multi-dimensional* reality. There are many different dimensions and features of SF that contribute to its psychologically holistic impact, including:

- At its core, SF is *literature*, a narrative mode of expression and understanding.
- Equally significant is SF cinema and TV, both *multi-media sensory* modes of experience and understanding.
- Another important dimension is SF *art* (and to a lesser degree SF music). SF is deeply visual and filled with iconic imagery.
- Combining text and visualization, another dimension of SF is *comics* and graphic novels.

- Another popular and steadily growing dimension of SF is gaming and interactive video, which synthesizes multi-media experience with *behavioral engagement*.
- Of immense commercial impact, and greatly contributing to SF as a “way of life,” there is the whole realm of SF *collectibles, paraphernalia, toys, and even clothing*. SF movie series, such as *Star Wars* and *Star Trek*, have generated multi-million dollar businesses; our children play with SF toy characters and space ships.
- There is the *social* dimension of SF. SF *fandom* is a colossal global phenomenon; there are SF communities all over the world, and SF conventions, of which there are hundreds everywhere, draw millions of attendees. One participates in SF, not only through its ideas and visions, but also as part of social communities.
- At a *social-technological* level, mediated by information and communication technologies, SF is a ubiquitous reality across the Internet and social media. There is a vast and ever-growing number of SF websites, videos, and podcasts.
- As one final dimension of SF, there is the whole arena of SF histories, academic articles and books, and encyclopedias and reference works all devoted to *the study of SF*. SF is a highly *self-conscious enterprise*, with numerous authors, fans, and scholars pondering the nature of SF.⁸
- All in all, through these diverse forms of expression, experience, and participation, SF is a multi-faceted, multi-media reality that engages human consciousness along many different dimensions of human life—the cognitive, emotional, social, artistic, technological, economic, and recreational. Understanding the full holistic impact and nature of SF involves taking into account all these dimensions.⁹

One individual who greatly impacted the early growth of SF fandom, historical and intellectual reflections on the genre, and the emergence of the first SF magazines was Hugo Gernsback, the person who first popularized the expression “science fiction.” Gernsback saw the function of SF as to *educate* and *entertain*, and he viewed SF as a literary medium for making predictions on the future, and stimulating scientific and technological invention. Gernsback thought SF was a vehicle for the creation of the future. (Other SF advocates, such as John Campbell—see below—expressed similar views.) But Gernsback stated that SF was primarily about the future of science and technology, and in this regard, Gernsback was clearly mistaken. As a historian of SF, he should have realized and acknowledged that SF was about much more than just the future of science and technology. Contrary to Gernsback’s restrictive stated view—a stereotype of SF that continues until today—SF clearly appears throughout its history to be about the “*future of everything*” (and more besides).¹⁰

Just as SF stimulates psychologically holistic future consciousness, engaging all the different major dimensions of the human mind, SF has addressed all major dimensions of human reality and the future, speculating not only about the future possibilities of science and technology, but also society, culture, the environment, psychology, gender, ethics, politics, economics, and even religion. Moreover, SF does not just delve into each of these dimensions of the future as separate individuated topics, but frequently, especially in full-length novels, SF synthesizes numerous dimensions creating *integrative* visions of the future, in which all these various dimensions of human reality interact with each other.

In my teaching and writing I highlight a number of outstanding examples in SF that offer *multi-faceted integrative visions* of the future, covering social-cultural, environmental, psychological, and technological features of the future. Such “world-building” SF include, as exemplar cases, Stapledon’s *Last and First Men* (1930); Wells’ *The Shape of Things to Come* (1933); Herbert’s *Dune* (1965); Heinlein’s *The Past through Tomorrow* (1967); Brunner’s *Stand on Zanzibar* (1968); Simmons’ *Hyperion Cantos* (1989-1997); Robinson’s *Mars Trilogy* (1992-1994); Stephenson’s *The Diamond Age* (1995); and McDonald’s *River of Gods* (2004) and *The Dervish House* (2010).¹¹

Hence, as a resource in futures education, SF provides a wealth of material and modes of personal engagement, along many different dimensions, for both stimulating holistic future consciousness and offering complex integrative visions of the future.

Science Fiction as the Evolutionary Mythology of the Future

A theory I developed in my teaching and writing is that SF is the “evolutionary mythology of the future.” SF evolved from ancient mythology and I believe shares a number of fundamental commonalities with mythology. In my view, SF is myth informed by modern science and contemporary thought.¹²

Consider: SF and ancient myth share the following features: Both have a narrative and dramatic form; both involve personification (individual characters in their tales); both provoke participatory experiential immersion; both often have cosmological themes and settings; both are inspirational, engaging human emotion, offering ethical directives and messages, and providing personal meaning in life; both have numerous iconic images; both delve into the fantastical and transcendent (beyond the commonplace here and now); both generate awe and wonder; and finally both engage psychologically holistic consciousness.

Further, although SF, informed by the modern scientific view of reality, developed in opposition to the views of reality assumed in ancient mythologies, SF incorporated into its narratives many of the archetypal themes embodied in ancient mythology, such as wondrous discoveries and the search for enlightenment; personal challenge and the heroes’ journey; the conflict of good and evil; adventures into the unknown; and contact (and confrontation) with the fantastical and bizarre. Indeed, many SF stories involve the reworking and retelling of classic myths; for example, see Zelazny’s *Lord of Light* (1967), Silverberg’s “Breckenridge and the Continuum” (1973), Ellison’s “The Deathbird” (1974), and Simmons’ *Ilium* (2003).

But also, SF is *evolutionary myth*. SF possesses a deep cumulative history, where later stories build upon the ideas of previous eras; SF progressively evolves. Moreover, at any given time, SF reflects the beliefs and values, and hopes and fears, of the period in which it was written. As society and human knowledge evolve, in resonance so does SF. Further, SF has been powerfully influenced by the scientific theory of evolution; the fantastic realities postulated in SF exist within a universe seen through the “eyes of evolutionary science.” And perhaps most importantly, with its freedom to explore the possibilities of reality and the future, SF facilitates the future evolution of humanity, stimulating and enriching our consciousness of the future, expanding our sense of the desirable and the undesirable, and provoking scientific, technological, and social creativity and invention. “SF is myths about the future, for the future.”

The Historical Evolution of Science Fiction

Two alternative approaches to gaining a systematic and in-depth understanding of SF are: 1) To examine its historical development and 2) To identify and describe its main topics and themes. In the next two sections I provide highly abbreviated overviews for each of these two approaches. Due to space limitations, my coverage below includes primarily SF literature, and not much SF cinema and TV. My online webinars on SF, though, cover SF literature, movies/TV, art, and comics.

As a dynamic evolving reality, it is essential to an understanding of SF to gain an informed sense of how SF developed from ancient to contemporary times. I highlight in the history below a number of key texts and influential authors, and describe how some important writers understood the connection between SF and imagining and thinking about the future.¹³

Ancient Origins

The historical and psychological roots of SF can be found in the distinctive human capacity, which extends back at least to the beginnings of recorded history, to transcend in imagination and speculative thought, the commonplace and the immediate here and now.

The recorded origins of SF can be found in ancient myths, especially in those tales involving “extraordinary adventures” into strange and unknown realms, in which the protagonists encountered fantastical realms and astonishing beings, who often possessed super-human attributes and powers (for example, *The Epic of Gilgamesh*, the *Odyssey*, and *Jason and the Argonauts*). Such mythic tales transcended the commonplace “here and now.” Often ancient myths were cosmic in scope and included supernatural deities, addressing the creation of humanity, the earth, and the universe, or presenting “end of the world” prophecies about the future.

Moreover, in such mythic tales we find early visions of extraordinary technologies, such as automata, fantastic weaponry, and flying devices, which transcended current human abilities. An illustrative example, including many of the above elements, is Lucian’s *True History* (ca. 150 CE), involving traveling to the moon, aliens, battles in outer space, interplanetary colonization, and an early vision of a telescope. Although fantastic and cosmic in scope, ancient myths were at the time often viewed as plausible and credible, since such stories were informed by the prevalent theories of reality and the accepted belief systems of ancient cultures.

On the social-humanistic end, another important ancient origin of contemporary SF is classical philosophical utopian visions of ideal societies, such as Plato’s *Republic* (ca. 380 BCE), which has served as an inspirational starting point for many later utopian narratives, such as Wells’ *A Modern Utopia* (1905). Contemporary SF frequently envisions both utopian and, its opposite, dystopian societies, which are situated in possible futures, as well as in imagined far-away lands, including alien and other-worldly settings.¹⁴

The Rise of Modernity and the Scientific Revolution - Early Utopias

The modern “Scientific Revolution” (ca. 1600 -1700) challenged the world views of ancient myths and classical religions, rendering fantastic tales grounded in such earlier visions of reality as increasingly implausible. Ancient myths were no longer viewed as expressions of the “credible transcendent.”¹⁵ Still, the many narratives of trips to the moon in the seventeenth century, beginning with Kepler’s *Somnium* (“The Dream”) (1600), invariably combined scientifically informed astronomical descriptions with mystical, magical, and supernatural ideas. This recurrent combination of modern and pre-modern thinking would continue to various degrees throughout the subsequent history of SF, to a degree blurring the distinction between SF and “fantasy.”

The mixing together of the scientific-secular and pre-modern religious thinking is very apparent in the famous early modern utopian narratives of More, Campanella, and Francis Bacon (ca. 1515 to 1627). Bacon envisioned in his *New Atlantis* (1627) a society dedicated to human progress through scientific research and technological invention. Including numerous prescient predictions of possible future technologies, Bacon expressed in this fictional tale the belief in the progressive transformation of all aspects of human life in the future empowered through science. Yet his imaginary utopian society was framed and inspired by a Christian philosophy, including moral ideals, and his imaginary *New Atlantis* was dedicated to serving God.¹⁶

Enlightenment and the Theory of Progress

The Western Enlightenment (ca. 1750-1800) embraced a philosophy of individual self-determination, and through the writings of such authors as Turgot and Condorcet, presented a comprehensive theory of secular human progress: Empowered through reason, science, industry, and technology, humanity could (and would in the future) transform and dramatically improve the world and the human condition. It was this hopeful secular vision of self-empowered, rational, technological progress that provided a plausible framework of imagination for modern SF narratives of a *transformed* future—a new vision of the “credible transcendent.” As an exemplar case of the new Enlightenment mindset, Mercier’s *The Year 2440: A Dream If Ever There Was One* (1771) both critiqued contemporary world affairs and offered a comprehensive vision of an ideal future based on Enlightenment philosophy, encompassing politics, social norms, technology, education, and religion.

Eighteenth-century imaginative fiction also delved into outer space travel, aliens and other worlds, and extraordinary adventures into unknown and mysterious realms. Highly advanced aliens visit the earth in Voltaire’s *Micromegas* (1750), providing a satire on human hubris; Mars and other planets are visited in various types of “space ships,” including giant balloons, in Roumier’s *The Voyage of Lord Ceton to the Seven Planets* (1765); and the interior of the earth is explored, revealing assorted fantastical sights and bizarre creatures, in *Niels Klim’s Underground Travels* (1741) by Holberg. Advanced powers of the mind, including psychic abilities and mental time travel, also were examined during this period in Brettonne’s *The Posthumous Ones* (1802).¹⁷

Romanticism and the Gothic

Fear and apprehension over a techno-industrial, rational future; a reassertion of the central importance of emotion, intuition, art, subjectivity, and the senses; and a desire to “return to nature” and an idealized past, all fueled the Romantic and Gothic counter-reactions (1775 to 1850) to the Western Enlightenment.¹⁸ Reflective of this reactionary mindset, there emerged numerous dark and fearful visions of the future. For example, Grainville’s *The Last Man* (1805) describes the collapse of human civilization and the “death of man,” in part due to the anticipated eventual depletion of Earth’s natural resources.

Gothic literature delved into insanity, horror, mystery, magic, and evil. The themes of horror and fear, and evil and hideous characters, of mysterious settings and forms of madness, would all have a strong impact on the future evolution of SF. Later writers, such as Poe, Hodgson, and Lovecraft, would weave horrific Gothic themes into their SF, a trend that continues into current times (especially in SF cinema). Shelley’s *Frankenstein* (1818), often identified as the first modern SF novel, shows the strong influence of both Romantic and Gothic mindsets. Frankenstein is the archetypal “mad scientist,” and the story is very apprehensive over the potential powers of science and technology in the hands of foolhardy, egocentric humans. We should not “play God” with the forces of nature. This general storyline and philosophical message would be repeated innumerable times in later SF literature and cinema. As a result of the influence of Enlightenment, Romantic, and Gothic perspectives, SF in the coming centuries would approach the future through the dual and competing emotional mindsets of hope and wonder versus fear and terror.¹⁹

Verne and the Scientific Romance

In the nineteenth century, science, technology, and industry progressed along many fronts, stimulating the ongoing evolution of SF. Inspired by both speculations and actual mechanical constructions of automata and robots, numerous narratives involving intelligent robots, mechanical automata, and cyborgs appeared in the nineteenth century. Notable examples included Hoffman’s nightmarish *The Sandman* (1816), and the hundreds of American “Edisonade” “dime novels” (ca. 1870 to 1900), involving both mechanical men and animals. In l’Isle-Adam’s *The Future Eve* (1886), a fictionalized Thomas Edison is envisioned as an archetypal “wizard,” using his amazing and somewhat mysterious powers, involving scientific and technological know-how, to achieve positive and romantic ends in the creation of an idealized female robot.

Robots, electrical technologies, advanced communication and transportation systems, technology-empowered fashion, and the scientific control of the environment, are all imagined in Loudon’s *The Mummy! A Tale of the 22nd Century* (1827). Loudon’s novel presents the first detailed extrapolation and personalized narrative of the future, integrating ethical-psychological-social themes with potential future developments in science and technology. Comprehensive in its scope, her novel attempts to reconcile science and God.

Jules Verne wrote over fifty immensely popular novels and stories between 1863 and 1905. The basic story-line for many of his tales involved a heroic and admirable scientist/explorer who sets off on extraordinary adventures, encounters dangers, and overcomes challenges amidst the fantastic wonders of nature and the universe, all described in great scientific-naturalistic detail. Verne included numerous inventive and cutting-edge technological devices and vehicles in many

of his stories, such as the submarine *Nautilus* in *20,000 Leagues Under the Sea* (1869). Frequently, Verne is highly optimistic about the potential benefits of science and technology; his *From the Earth to the Moon* (1865) contains an extensive and inspirational discussion of the scientific and technological possibilities of journeying into outer space. Verne, though, was not always optimistic about science and technology, or about scientists and inventors. *Robur the Conqueror* (1886) features a megalomaniac genius who uses his technological creations for war and destruction. When Verne specifically focused on the future, such as in *Paris in the Twentieth Century* (1863), he was decidedly pessimistic about the quality of future human life in a world of technological wonders. All in all, Verne's writings constituted a colossal jump in sophistication and complex technological detail over anything written before. His "scientific romances" synthesized emotionally engaging and thrilling narrative adventures—the "romantic" element—with an incredible wealth of naturalistic, scientific, and technological knowledge, as well as various extrapolations into the future.²⁰

The Theory of Evolution

The scientific theory of evolution had a great influence on SF. Replacing Western religious "static creationism" and Newton's "clockwork universe," evolution offered a transformative vision of reality. Since the time of Darwin's seminal publications on evolution, scientifically credible SF narratives are usually conceptualized within an evolutionary and transforming universe.

Coincident with the publication of Darwin's *Descent of Man* in 1871, the number of published SF stories greatly accelerated. Bulwer-Lytton published the immensely influential *Vril, The Power of the Coming Race* (1871), a utopian novel involving the evolution of a superior human race under the surface of the earth, realized through selective breeding, advanced technologies, a collectivist social order, and "cyborg" enhancements. Inspired by Darwin's thinking, Butler, in his *Erewhon* (1872), presents a prescient warning regarding the future rapid evolution of machines and the eventual enslavement of humanity to our machines. The popular science writer, astronomer, and mystic Flammarion applied evolutionary theory to alien environments and the cosmic diversity of alien life forms in *Lumen* (1872). In his *Omega* (1893-1894) he applied evolutionary theory to the far distant future of humanity. Also cosmic in scope and highly influenced by evolution and the theory of progress, Astor's *A Journey in Other Worlds* (1894) presents a highly comprehensive and optimistic vision of the future, covering all features of human society, from the technological to the political and economic. Filled with numerous predictions—social, technological, political, and economic—Astor, like Flammarion, attempted to synthesize the scientific and spiritual in his evolutionary cosmology.

Many other visions of future human societies were written in the latter nineteenth century. Influenced by socialist philosophy, Bellamy wrote the most popular utopian novel of the period, *Looking Backward (2000-1887)* (1887). A critique of Western individualism, competitive capitalism, and economic greed, Bellamy envisioned a future human society with advanced technologies that focused on mental well-being, rather than the acquisition of wealth. *Looking Backward* presented a strong critique of the present, as well as a utopian vision of a preferable future. Perhaps the most prescient futures narrative during this time was Robida's *The Twentieth Century*

(1882), a satirical and comical slice of normal human life in Paris in 1952. Informed by both technological and social trends of his time, Robida presented an ambiguous utopia, filled with technological wonders, and yet also frenzied, stressed, and oversaturated with theatrics and ubiquitous frivolous modes of entertainment.

The growing apprehension over an impending great European war instigated a deluge of future war novels, estimated at roughly 400 published novels between 1871 and 1914, including Griffith's hi-tech colossal global war in *The Angel of the Revolution* (1893). This torrent of literature heightened public concern and anxiety, as well as nationalistic military competition, undoubtedly contributing to the breakout of the "Great War" of 1914. SF can generate self-fulfilling prophecies.

Growing fascination with outer space and the planets of our solar system, especially Mars, strongly influenced SF. Humans visited Mars in *Across the Zodiac* (1880) and advanced Martians visited the earth in Lasswitz's *Two Planets* (1897), the latter novel the most scientifically and technologically informed and imaginative description of an alien civilization up to that point in time. Lasswitz's novel also highlighted the theme of "mental evolution," speculating on how hypothetical conscious minds—in this case alien minds—could transcend current human capacities. The most famous novel to imagine contact with the Martians during this time was Wells' *The War of the Worlds* (1898). Wells' novel was the inspirational modern starting point for the numerous SF stories and movies to come involving alien invasions and wars with aliens.²¹

Wells and Modern Science Fiction

Strongly influenced by the theory of evolution, H. G. Wells has been identified as both the father of modern SF and the father of modern futures studies, frequently synthesizing both futurist modes of thinking in his writings.²² His publications on the future, both fiction and non-fiction, reflected a level of erudition surpassing anything before. He considered all aspects of the future: social, political, educational, economic, scientific-technological, ethical, psychological, environmental, and religious. Wells' SF addressed the future of everything. He not only offered an immense number of predictions about the future, but persistently attempted to influence the future direction of world affairs through his writing and speaking.

The following are selected highlights of Wells' key futurist SF novels:

- *The Time Machine* (1895)—based on current trends, a social-biological extrapolation on human evolution millions of years into the future. A critique on current social stratification.
- *The Island of Dr. Moreau* (1896)—a warning regarding the potential dangers of biological engineering and the megalomaniac use of science, as well as a critique of God-centered authoritarian religion.
- *The War of the Worlds* (1898)—presented a "bolt out of the blue" disaster scenario, in which humanity's complacent sense of superiority is shaken to the core. A metaphorical critique on Western imperialism.
- *The First Men in the Moon* (1901)—an imaginative and scientifically-philosophical informed vision of an alien ecology and an alternative society.

- *The Food of the Gods* (1904)—describes future human evolution, with current humanity resisting evolutionary advancement in favor of defending the status quo.
- *A Modern Utopia* (1905)—inspired by Plato’s *Republic*, envisions a global utopian society in a perpetual state of purposeful evolutionary transformation.
- *The War in the Air* (1908)—presents a viscerally intense narrative filled with great carnage, warning us that unless we dramatically change our ways of thinking and behavior we are headed toward global disaster.
- *The Sleeper Awakes* (1910)—significantly informed by his non-fiction futurist publication *Anticipations* (1901), this novel presents a huge wealth of predictions of amazing future technologies, but as eventually revealed in the story, this wondrous future civilization is a social and ethical dystopia.
- *The World Set Free* (1914)—envisions humanity destroying modern civilization with atomic bombs, and then rebuilding itself based on a new philosophy of life. Wells repeatedly proposed that fundamental human progress in the future required a great global war (the ancient theme of “Armageddon”), in order to dismantle our current mindset and form of civilization.
- *Men Like Gods* (1923)—a utopian society of telepathic, selectively bred humans, who embrace continuous change and invention, the central importance of education, and the ongoing pursuit of knowledge in human life.
- *The Shape of Things to Come* (1933)—presents an extensive global analysis of human society, past and present, and extrapolating on this critical assessment, posits an impending new world war that decimates modern civilization. Involving the theme of destruction and rebirth, Wells chronicles the emergence of a “World State” that focuses on psychological evolution and universal transformative education. The emergence of a “collective brain” and world “Encyclopedia” are envisioned. Embodying his most comprehensive synthesis of SF and non-fiction futures studies, the novel, decidedly optimistic in tone, represents the apex of Wells’ SF futurist thinking.²³

The Early Twentieth Century

While Wells was writing his many books early in the twentieth century, numerous other SF and speculative writers published a wealth of stories covering all major dimensions of human reality in the future.

Addressing the future of human society, a number of famous dystopias were written, including London’s critique of capitalism in *The Iron Heel* (1908); Forster’s prescient warning of technological dependency in “The Machine Stops” (1909); and Rousseau’s anti-scientific Christian-inspired *The Messiah of the Cylinder* (1917).

Narratives of global disaster and the end of human civilization included Serviss’ *The Second Deluge* (1911); Rosny’s “The Death of Earth” (1910) (the inorganic transcending the organic); and England’s uplifting *Darkness and Dawn* trilogy (1912-1913).

Offering preferable pathways into the future, various utopian novels were published, including Mantegazza’s scientifically inspired *The Year 3000* (1897) and Gilman’s psychologically informed feminist vision *Herland* (1915).

Narratives emphasizing diverse future technological innovations included Mantegazza's cited book above and Gernsback's *Ralph 124C 41+* (1911) (which is filled with hundreds of technological predictions).

Among those stories involving future alien contact, including alien invasion and conquest-of-the-earth scenarios, were Mader's upbeat interstellar saga *Distant Worlds* (1911); Merritt's *The Metal Monster* (1920), a tale of a highly evolved collective technological intelligence and one of the most imaginative and incredible aliens ever imagined; Burrough's *The Moon Maid* trilogy (1923/1925) and his extensive *Barsoom* (Martian) series (1912 to 1927); and Rosny's alien-human love story "The Navigators of Infinity" (1925).

Stories of future human evolution—biological, psychological, ethical, and philosophical-spiritual—included Rosny's "Another World" (1895); Beresford's *The Hampdenshire Wonder* (1911); and highlighting the potential future integration of body and mind, Wright's time travel tale *The Amphibians* (1924).

Stories envisioning far distant futures, extending millions of years in the future, included Hodgson's bizarre and fantastical tale of telepathy across time, *The Night Land* (1912), and Leinster's bio-ecologically transformed earth in *The Mad Planet* (1920), in which humans are no longer the dominant species on the planet.²⁴

Gernsback, Stapledon, and the 1920s and 1930s

Gernsback is usually credited with publishing the first magazine (*Amazing Stories*, beginning in April, 1926) exclusively devoted to SF. It was in the first issue of his subsequent magazine, *Science Wonder Stories*, in June, 1929, that he began using the expression "science fiction." Gernsback conceptualized SF as involving personally engaging narratives, incorporating scientific information, and serving an educational purpose, and containing predictions, frequently technological, about the future.²⁵ Included below is a selected list of noteworthy SF authors and famous stories of the 1920s and 1930s; a number of these tales appeared in Gernsback's various magazines.

Dystopias included: Hasting's bio-engineered *City of Endless Night* (1920); as a critique on communism, Zamyatin's hypnotic and highly influential *We* (1920); Čapek's satirical *The Absolute at Large* (1922) and *War with the Newts* (1937); Lang and von Harbou's sensationalistic *Metropolis* (book and movie) (1926/1927); and Huxley's classic and highly prescient vision of a superficial, technologically orchestrated society of "bread and circuses" *Brave New World* (1932). These tales involved extrapolations on various trends and excesses in current society, including competitive nationalism, social collectivism, religiosity, big business, social stratification, and hedonistic consumerism, and often served as "warnings" regarding the destructive paths humanity was currently taking.

Notable global disaster stories, natural or man-made, included Balmer and Wylie's religiously inspired *When Worlds Collide* (1932) (the future may be out of our control) and Schachner's ecologically-informed tale of egocentric narrow minded humanity in "Sterile Planet" (1937).

New utopian visions included Stone's "Men with Wings" (1929) and "Women with Wings" (1930) (a vision of gender equality) and Schachner's "The Revolt of the Scientists" (1933) (scientists should take control of the world).

Among the many famous stories on future science and technology were Wertenbaker's "The Chamber of Life" (1929), the first total-immersive virtual reality story; Schachner's "Orb of Probability" (1935), a tale involving the far future human ability to manipulate the laws of nature; highlighting robots and androids, Čapek's comical end of humanity tale *R.U.R.* (1921); Campbell's "The Last Evolution" (1932); and Williams' "Robot's Return" (1938), these last two tales speculating on the replacement of humans by robots. Involving numerous prescient predictions on the technology of space travel, Lang and von Harbou's *Woman in the Moon* (1929) highlighted a central woman heroine in humanity's first journey into outer space.

Important time travel tales included Taine's *The Time Stream* (1931-1932) and Williamson's "The Legion of Time" (1938), both stories involving human efforts to control the future through manipulating the past.

Notable stories on aliens and alien contact included Lovecraft's *At the Mountains of Madness* (1931) and "The Shadow Out of Time" (1936), blending graphic horror and mind-boggling visions of super-advanced aliens; C. A. Smith's "The Monster of the Prophecy" (1932), another alien-human love story; Weinbaum's famous non-anthropomorphic vision of multiple aliens in "A Martian Odyssey" (1934); and Gallun's heart-moving "Old Faithful" (1934) and his "Seeds of the Dusk" (1938), the latter speculating on a life form that lives in outer space and reproductively spreads across planetary systems.

Famous future human evolution tales included Flagg's story of a technologically-dependent human "The Machine Man of Ardathia" (1927); Wylie's *Gladiator* (1930), one key inspiration for *Superman*; and Schachner's techno-psychological narratives "Ecco Homo" (1936) and "Crystallized Thought" (1937). Although not about the future, but rather the immediate present, in one of the most famous SF novels about advanced humans ever written, Stapledon in *Odd John* (1935) describes in great psychological detail a character, who transcends (and generally ignores) the ethical and social norms of our current species.

Stories about the far distant futures included Wertenbaker's "The Coming of the Ice" (1926) (a new ice age); Campbell's melancholic visions of the eventual cosmic triumph of entropy and decay, "Twilight" (1934) and "Night" (1935); and Manning's popular *The Man Who Awoke* (1933), an ecologically prescient, philosophically inspired, and multi-faceted integrative vision of the cosmic journey of human evolution into the far future toward enlightenment and wisdom.²⁶

Over a period of roughly two decades, beginning in the late 1920s, Hamilton, Campbell, and, most influentially, "Doc" Smith wrote colossal "space operas" involving galactic civilizations and war and conflict on a trans-galactic level. (The originative seeds of *Star Wars* and *Star Trek*.) Catering to young male readers, Campbell's *Invaders from the Infinite* (1932), Hamilton's stories of the "Interstellar Patrol" (1928 to 1930), and Smith's *Skylark of Space* (1928 to 1935) and *Lensman* (1934 to 1948) series, while repeatedly pushing the limits of scientific credibility and technological plausibility, presented tales of mammoth inter-stellar battles, involving an incredible array of high-tech, gigantic weaponry and spaceships, and both human and numerous alien species and civilizations. In these stories, envisioned future wars moved into outer space. In

Smith's *Lensman* series, trans-galactic cosmic forces of good and evil, in the form of super-evolved ancient aliens, fight it out to control the destiny of humanity. Although overflowing with highly speculative technological predictions, in the *Lensman* series—the ultimate cosmic conspiracy story—it is the powers of the mind, in super-evolved future humans, which defeat the technological powers of trans-galactic evil forces. The future is a battle, in which good triumphs over evil, and the mind triumphs over physical technologies.²⁷

Probably the most expansive cosmic visionary in the history of SF, the philosopher Olaf Stapledon (mentioned above) wrote a series of novels in the 1930s, culminating in *Star Maker* (1937), which articulated a mind-boggling, mythic-like narrative of the future of the entire universe stretching into the far, far future. Deeply informed and inspired by the theory of cosmic evolution, Stapledon speculated on the future evolution of humanity two billion years into the future, and the evolution of all intelligence in the universe fifty billion years into the future, culminating in a cosmic mind and trans-galactic civilization. Stapledon integrated ideas on future science, technology, and the far-out possibilities of the future evolution of life with psychology, ethics, aesthetics, social-cultural thought, and philosophical reflection. In *Star Maker*, Stapledon presents a grand theory of existence and ethics in the form of a SF story. In *Last and First Men* (1930) and *Last Men in London* (1932) Stapledon ponders the ultimate meaning of life for humanity.

Envisioning at least as many, if not more, forms of aliens, alternate civilizations (human and otherwise), and planetary and interstellar technologies, as any other SF writer up to that time, Stapledon saw the great cosmic narrative as a journey toward enlightenment and the evolution of consciousness, rather than an ongoing, ever-escalating military conflict. He transcended the mythic futures narrative of an Armageddon-like battle of good versus evil.²⁸

Campbell and the Golden Age

Ushering in what is generally referred to as the “Golden Age” of SF (ca. 1938 to 1950), after achieving great success as a SF writer, Campbell became editor of *Astounding Science Fiction* magazine in the late 1930s. In this role he attempted to shape the future direction of SF toward specific purposes and goals. Campbell envisioned SF as narrative and realistic “thought experiments” about the future, in which hypothetical future scientific-technological developments impact humanity, creating problems and challenges that need to be solved by the central protagonists in the stories. For Campbell, SF was a “laboratory” for ideas on the future, a literary and imaginative medium through which the future could be intelligently envisioned and proactively created. Campbell believed that SF was highly relevant to understanding modern times, and that it could be immensely influential in creating a positive and desirable future. SF was the literature of change. Moreover, even though Campbell was highly knowledgeable about the physical sciences and technology, he increasingly saw the central importance of future human psychological evolution. Campbell drew together a whole new set of SF writers, among the most popular were Asimov, van Vogt, Heinlein, De Camp, and the husband and wife team, Kuttner and Moore.

Originally published as a series of short stories in *Astounding* between 1942 and 1950, Asimov's *Foundation* trilogy envisions the emergence, decline, and re-ascension of a human galactic-level civilization in the far future. In this trilogy Asimov introduces the concept of “psy-

cho-history,” a hypothetical scientific-statistical methodology for predicting general patterns of change in the future. In the character of the arch-villain, “The Mule,” Asimov introduces the idea of the “wild card” in history.

During this period, Asimov also wrote his famous *I, Robot* stories (1940-1950), in which the “Three Laws of Robotics,” as guiding ethical standards for the future development of robots and artificial intelligence, are first formulated (co-created with Campbell) and “tested out” in fictional narrative scenarios. On the theme of robots in the future, though, another well-known Golden Age writer, Williamson, wrote perhaps the all-time best robot stories, “With Folded Hands” (1947) and *The Humanoids* (1948), describing how robots, designed to serve and protect humanity, instigate disastrous consequences in the quality of human life.

Van Vogt wrote one of the most influential SF novels of the 1940s, his tale of future evolved “superior humans,” titled *Slan* (1940). Describing the various challenges a group of mutant super-intelligent and telepathic humans might face, *Slan* is a “thought experiment” on how normal humans might react to the emergence of a new species that challenges our sense of superiority.

The highly literary C. L. Moore was the most popular woman SF writer in the first half of the twentieth century, bringing romantic, sexual, and gender themes into her lyrical and poetical writings, including “Shambleau” (1933) and “Judgment Night” (1943). Her husband, Kuttner, wrote about psychologically evolved humans in his *Mutant* series (1945 to 1953). Highly prolific as a team, they wrote about travel tourists from the future in “Vintage Season” (1946) and crime and a quasi-omniscient law enforcement system in the future in “Private Eye” (1949).

A historical and archaeological scholar, De Camp wrote one of the most famous time travel novels ever, *Lest Darkness Fall* (1941), which delves into the question of whether history can be redirected and changed.

The most popular and influential SF writer of the 1940s and 1950s, though, was Heinlein. Among his many famous stories, he wrote about: travel to the moon in “The Man Who Sold the Moon” (1950); a dystopian Christian fundamentalist takeover of the USA in “If This Goes On...” (1940); outer space travel and “generation ships” in “Universe” (1941); a foreign invasion of the USA in *The Day After Tomorrow* (1941); a techno-enhanced human cyborg in *Waldo* (1942); time travel into the past and the future in “By His Bootstraps” (1941) and “All You Zombies” (1959); future hi-tech war in his controversial *Starship Troopers* (1960); and free love, psychic powers, and mystical religion in *Stranger in a Strange Land* (1961). During the Golden Age, Heinlein created a “Future History” of humanity, a series of stories which extended outward thousands of years into the future. All Heinlein’s “Future History” stories were collected in *The Past Through Tomorrow* (1967).

Originally published as a series of stories in *Astounding* in the 1940s, Simak’s *City* (1952) was a highly imaginative example of a “future of everything” SF tale, involving the emergence of intelligent robots; the collapse of urban centers; human migration into outer space; genetically redesigned talking animals; and a multiverse of alternate earths. All in all, *City* was a poignant novel on the ephemeral nature of humanity.

Outside Campbell’s sphere of influence, a number of important dystopian and future disaster novels appeared during the Golden Age. Burdekin published her prescient *Swastika Night* in 1937, foretelling the military and cultural ascension of Hitler’s envisioned “Thousand Year Reich.” Lewis created a Christian-inspired dystopian space opera in his Space trilogy: *Out of the*

Silent Planet (1938), *Perelandra* (1943), and *That Hideous Strength* (1945). Orwell's *1984* (1948) envisioned a near future totalitarian nightmare, in which human thought and behavior are controlled by the techno-omnipresence and surveillance of "Big Brother" and the "Thought Police," and history is perpetually rewritten to serve political ideology. And Stewart published his ecologically inspired *Earth Abides* (1949), a novel describing the fall of human civilization and its aftermath, due to a deadly plague and the environmentally disruptive excesses of human society.²⁹

The Silver Age

In 1950s and early 1960s—the "Silver Age" of SF—many new SF magazines appeared; paperback SF novels exponentially multiplied; SF movies became extremely popular; the SF fanbase greatly expanded; and SF awards, such as the *Hugo* and *Nebula*, first appeared. A plethora of new popular SF writers emerged.

The "Cold War," "The Space Race," the "Flying Saucer Craze," and the threat of a world nuclear war impacted global social consciousness. During this time SF became increasingly social, psychological, and ethical in its major themes, and the imminent threat of nuclear war provoked numerous end-of-the-world scenarios.

Bester won the first *Hugo* award for his *The Demolished Man* (1953), a tale of murder, psychopathology, and telepathically empowered police and criminal investigation in the future. Bester repeatedly delved into madness, the human mind, and the future evolution of psychic abilities in other famous stories as well, such as "Fondly Fahrenheit" (1954) and *The Stars My Destination* (1956).

Also highlighting psychological themes, Sturgeon published *More than Human* (1953), speculating on the emergence in humans of collective group consciousness and personal identity ("Homo Gestalt"). Also with a strong psychological emphasis, Keyes published his highly introspective novel *Flowers for Algernon* (1959, 1966), which dealt with the future possibility of the techno-chemical enhancement of human intelligence.

Anderson, who also wrote numerous stories on space exploration and aliens throughout his long career, published a number of significant works on biological, cyborg, robotic, technological, and mental evolution in the future, including *Brain Wave* (1954), "Call Me Joe" (1957), and "Epilogue" (1962).

Leiber published his Hugo-winning "time war" novel *The Big Time* (1958). What if, in the future, humanity can move through time, backward and forward, and manipulate both history and the future? During this same period Asimov published a similar type of time travel novel, *The End of Eternity*, 1955.

Bradbury produced his classic novels: *The Martian Chronicles* (1954), depicting humans invading and settling Mars, while our earthly civilization self-destructs, and *Fahrenheit 451* (1953), in which, in the near future, books are outlawed and burned. C. Smith, in the 1950s and 1960s, wrote a "future history" of humanity from the present to 16,000 CE, delving into drugs, extended longevity, human-animal hybrids, computers and robots, and the pursuit of true love, all the tales eventually collected and published together in *Norstrilia* (1975) and *The Instrumentality of Man* (1979).

In a highly prescient forecast and satirical critique on capitalism, consumerism, and the power of advertising, Pohl and Kornbluth in *The Space Merchants* (1953) anticipated the growing conflict between big business and environmental conservationism in a near future world—in which giant corporations control the government, and the masses are manipulated through sensationalism and emotion, rather than through reason and common sense.

Expressing strong religious and moral themes, in *A Case of Conscience* (1958) Blish addressed the nature of good and evil, as he critiqued Christianity in his novel of morally superior atheist aliens, and Miller wrote one of the most highly regarded SF novels ever in *A Canticle for Leibowitz* (1959), his apocalyptic tale of a monastery enduring the catastrophes of both World War III and IV.

With an ominous and foreboding anxiety over a nuclear war haunting global consciousness, many other tales were written anticipating World War III and its devastating after-effects (as well as other civilization-destroying catastrophes), including Wyndham's *The Day of the Triffids* (1951); Wylie's *Tomorrow!* (1954); Brackett's *The Long Tomorrow* (1955); and Christopher's *No Blade of Grass* (1956). In *Make Room! Make Room!* (1966) H. Harrison wrote an exceedingly bleak vision of a future world suffering from over-population and malnutrition.

Looking outward into the cosmos, the Polish writer, Lem, in *Solaris* (1961), created a philosophically in-depth narrative on human anthropocentrism in his novel of contact with an alien sentient plane. But perhaps the most well-known tales of alien contact during this era were those written by Clarke. Weaving together mythic and religious themes with speculations on future (and past) human evolution, Clarke published *Childhood's End* (1953) and *2001: A Space Odyssey* (1968), in which incomprehensibly advanced alien minds facilitate colossal jumps in our future mental evolution. Clarke also examined contact with technologically evolved, enigmatic aliens in *Rendezvous with Rama* (1973).³⁰

The New Wave

Although SF has often attempted to anticipate the future, or provide a guiding light toward the future, in the mid-1960s the genre strongly responded to ongoing changes and emerging trends in human society, at least as much as it foresaw them. The liberal pop counterculture of the 1960s had a strong impact on SF, provoking a "New Wave" of revolutionary, even rebellious writers, who explored controversial, socially taboo narrative themes. Although SF is presumably visionary, challenging the status quo, its thematic content throughout its history had reflected many concurrent social-cultural constraints; the New Wave was an effort to break free from previous social-cultural inhibitions within SF. As in earlier periods, during the New Wave, SF attempted to reinvent itself. SF became increasingly concerned with "inner space," rather than outer space, and sexuality, gender, religion, spirituality, drugs, and altered states of consciousness became central themes of the New Wave. With an eye on a transformed future, SF writers strove to contribute to the new revolutionary culture. Reflecting the rise of contemporary feminism, women authors realized a much more visible presence in SF.

The emergence of New Wave SF can be strongly linked to the British SF magazine *New Worlds*, which, when Moorcock, a young iconoclastic and politically anarchistic writer, took over as editor in 1964, provided a sympathetic platform for numerous experimental SF authors.

Moorcock contributed many irreverent, freakish, pornographic, and even religiously blasphemous stories to the New Wave movement, including the classic time travel novel, *Behold the Man* (1969), in which a man goes in search of the historical Jesus.

Among the many other New Wave writers, the highly respected Ballard, having lost faith in modern Western society and rejecting the “Golden Age”/Space Opera visions of SF, repeatedly wrote about future human catastrophes, notably in *The Wind from Nowhere* (1962), *The Drowned World* (1962), *The Burning World* (1964), and *The Crystal World* (1966). Ballard focused on psycho-social reactions to a crumbling world decaying into dystopian disarray.

Another controversial New Wave author, Ellison, published stories of intense emotionality, often irreverent and violent in content, about the future, including “Repent, Harlequin!” Said the Ticktockman” (1965), “I Have No Mouth and I Must Scream” (1967), “A Boy and his Dog” (1969), and “The Deathbird” (1974). He edited two famous anthologies, *Dangerous Visions* (1967) and *Again, Dangerous Visions* (1972), which showcased New Wave stories, in which the intent was to viscerally and psychologically shock readers and break through conventional mind-sets and boundaries.

Provoked by his experiences in the Vietnam War and reflecting the anti-war, anti-big government movements of Hippie pop culture, Haldeman published perhaps the most highly regarded military SF novel of the future ever, *The Forever War* (1974). Filled with drugs and sex, and hi-tech futuristic weaponry, the novel chronicles a pointless war that lasts over a thousand years.

Repeatedly questioning in his writings the distinctions between fantasy and reality, and madness and sanity, Dick emerged as one of the most academically studied of all contemporary SF writers. All the basic principles of a rational and objective understanding of reality and the future are jettisoned in Dick’s novels. Among his many noteworthy futurist novels are *The Three Stigmata of Palmer Eldritch* (1965), *Do Androids Dream of Electric Sheep?* (1968), *Ubik* (1969), and *Valis* (1981), the last novel based on his own hallucinatory and psychotic personal experiences. Although not dealing with the future, Dick wrote one of the most famous alternate reality/history novels ever, *The Man in the High Castle* (1962), in which Germany and Japan won World War II.

Among the many other New Wave writers, along with some of their most well-known stories, were: Zelazny, who in *Lord of Light* (1967), synthesized in mythic form super-advanced future technologies with Hindu deities and the Buddha; Farmer, who in *The Lovers* (1961), *Strange Relations* (1960), and *Flesh* (1968), unabashedly and graphically dove into the erotic and the sexual; Vonnegut, who wrote a series of ironical, often nihilistic, and darkly humorous books on the future, including *Player Piano* (1952), *The Sirens of Titan* (1959), *Cat’s Cradle* (1963), and *Slapstick* (1976); and Silverberg, who wrote many highly regarded futurist novels, including *The Masks of Time* (1968), *Up the Line* (1969), *Tower of Glass* (1970), *The World Inside* (1971), *Son of Man* (1971), *Dying Inside* (1972), and *The Stochastic Man* (1975), in which he addressed through such novels the “future of everything,” from space travel, time travel, cyborgs, bio-engineering, androids, and future cities to over-population, religion, social conformity, bizarre forms of sexuality, telepathy, crime, politics, destiny, and the quest for immortality.

One famous example of a “future of everything” tale, synthesized in a single novel—covering culture, history, politics, war, religion/mysticism, mental evolution, and diverse strange technologies (but with no A.I. or robots)—was Herbert’s highly regarded *Dune* (1965). The story de-

scribes a far future interplanetary human empire of competing and warring factions, including the graphically portrayed, villainous and heinous Harkkonens. Greatly informed by contemporary ecological science and environmental issues, with the action centering on the desert planet of Arrakis, *Dune* is a tale of the coming of a foretold Messiah and the battle over control of a powerful mind-expanding drug.

But perhaps the most prescient and intellectually and artistically impressive novel of the period was Brunner's *Stand on Zanzibar* (1968). Brunner envisioned a near future world, suffering from over-population, stress and social-psychological frenzy, ubiquitous computer networking, and information overload. Brunner correctly foresees an immense assortment of future technological and social developments. Filled with futures news-bites and headlines, advertisements and classified ads, slogans and songs, and ongoing sociological commentaries, *Stand on Zanzibar* offers the reader an intense vicarious experience of living in this imaginary future.

As noted above, women SF writers achieved much greater prominence during the New Wave. A scholar of feminist SF, Russ published perhaps the most highly regarded feminist SF novel, *The Female Man* (1975), a blistering, multi-faceted critique of male dominance in contemporary society. The most highly regarded woman SF writer of the period was LeGuin. She believed in the positive transformative power of speculative fictional narratives, which could provide alternative future visions to combat the technologically obsessed and fearful nature of current human society. Among her best known publications were *The Left Hand of Darkness* (1969), which examined gender and sexual stereotypes; *The Lathe of Heaven* (1971), which explored alternative utopian visions of human society; "The Word for World is Forest" (1973), an ecologically informed critique of colonialism and imperialism; and *The Dispossessed* (1974), a multi-faceted, philosophically informed outer space drama on science and politics, authoritarianism and anarchism, capitalism and socialism, and the utopian quest for an interstellar civilization.³¹

Cyberpunk

After the New Wave, the next influential revolutionary movement in SF was cyberpunk. Informed and inspired by rapid contemporary developments in a multitude of "cutting edge" technologies, the cyberpunk movement transcended outer space and jumped into "cyberspace." Cyberpunk reflected social and technological trends in contemporary culture, especially our increasingly computerized and networked way of life, and our growing skepticism toward government, big business, and the promise of a positive future, and further intensified and influenced these trends.

Cyberpunk SF offered a highly unsettling general narrative of the future. Having its roots in an anti-establishment philosophy, cyberpunk central characters were often hackers, rebels, druggies, geeks, and street-wise individuals (hence the term "punk"). Whereas the New Wave tended to minimize technology, cyberpunk focused on the new computer-information technologies, and yet intimately connected such technologies with future psychology. Cyberpunk delved into technologically facilitated "inner space" and its characters moved into the new imagined universe of virtual reality. But in cyberpunk the new technologies enslave and delude, as much as empower and enlighten. From the cyberpunk perspective, the future is perplexing, mesmerizing, unnerv-

ing, information-dense, and dangerous, in which humanity and invasive technologies blur and meld together, and we live as much in fantasy (virtual simulations) as in everyday reality.

The cyberpunk movement emerged in the early 1980s when four writers—Gibson, Sterling, Shirley, and Rucker—bonded together in mutual friendship with the intent to create a new form of SF. Once again, SF attempted to re-invent itself. Influenced by Beat Generation literature, the drug culture, and postmodern philosophy, Gibson published his first and most famous novel, *Neuromancer* (1984), setting the benchmark for later cyberpunk fiction. The central character is a neurologically damaged, drug-addicted cyberspace hacker, who is coerced by a super A.I. to locate a second super A.I., with the intent to illegally merge into a unified, even more powerful artificial mind.

As some other important cyberpunk novels, Sterling's *Schismatrix* (1985) envisioned humanity centuries in the future, actively settling the solar system, in which humans have divided into competing factions, the "Shapers," who employ genetics, bioengineering, and psychology to further their evolution, and the "Mechanists," who, instead, favor computer enhancements and prosthetics.

Co-author of the avant-garde *Mondo 2000*,³² Rucker wrote the highly comedic and bizarre *The Ware Tetralogy* (1982-2000). These novels chronicled the invention and mass proliferation of intelligent, self-replicating robots, who possess free will and are able to transcend Asimov's "Laws of Robotics." Robots have sex with humans, human/robot hybrids emerge, and a new religion develops uniting humans and machines. Unabashedly crazy, flamboyant, and fantastical, one's imagination is decidedly expanded in encountering the outrageous and even perverse future possibilities considered in the storyline.

Stephenson, in two famous novels of the 1990s, *Snow Crash* (1992) and *The Diamond Age* (1995), established himself as one of the most highly regarded SF authors of contemporary times. In my view the best cyberpunk novel ever written, *Snowcrash* is an exciting, techno razzle-dazzle tale of near-future Los Angeles. Stephenson coined the term "metaverse" in the novel to refer to a vast virtual urban environment populated by avatars, in which a good deal of the action in the narrative takes place. The expression "snow crash" refers to both a hallucinatory drug and a computer virus, both of which are creating havoc in this imagined future reality.

The Diamond Age depicted a future pervasively transformed by advances in nanotechnology. The novel engages in complex, in-depth, speculative "world building," creating an integrative and realistically convincing comprehensive vision of a future society. *The Diamond Age* is essentially a "wisdom narrative" of the future, in which a young girl is educated by an interactive and intelligent book that tells her enlightening and entertaining fantasy stories, and guides her development into adulthood. Through trials and tribulations in this fantastic future reality, she acquires wisdom regarding the purpose and meaning of her life.

Not all SF during the heyday of cyberpunk aligned with this movement. Two of the most important novel series of this period were Card's *Ender* series and Wolfe's epochal saga of *The Book of the New Sun*. The first two volumes in Card's series, *Ender's Game* (1985) and *Speaker for the Dead* (1986), are set in the near future. *Ender's Game* is a highly introspective narrative on the psychological character development of a selectively bred young boy (Ender), who has been recruited into a military training program conducted through sophisticated virtual reality war games. The second novel follows Ender on a galactic journey of redemption to make moral

amends for the atrocity of murdering an entire species of intelligent aliens, as chronicled in the first novel. Delving into spiritual and religious themes, including death and resurrection and the coming of a Messiah, *Speaker for the Dead* continues the wisdom narrative begun in *Ender's Game*, in which Ender, through adversity and disillusionment, acquires humility, courage, and insight into himself.

Wolfe's mammoth, intricate, and highly literary *The Book of the New Sun*—consisting of four novels and a coda (1980-1987)—was also a wisdom narrative that follows the Messiah-like journey of the central character. The drama primarily takes place on a bizarre far-future earth (a “dying earth”) populated with robots, genetically redesigned humans, animal-human hybrids, aliens, and witches, among other fantastical sentient beings. The protagonist, who is transformed from human to post-human on his dangerous trek, achieves the wisdom and philosophical vision to lead humanity into a new era. *The Book of the New Sun* envisions a far future that is exceedingly different on all levels from the world of today.³³

The 1990s and the Farthest Reaches of Space, Time, and Mind

In general, New Wave and cyberpunk SF focused on earthbound futures, but during the 1970s and 1980s and continuing up to the present, SF authors also wrote numerous futurist narratives taking place in outer space. As SF novels in the last decades have become more intellectually intricate, lengthier, and more expansive in scope, a new wave of cosmic space operas have appeared that contain some of the most extensive and impressive examples of future “world building” (and “universe building”) ever produced. The “future of everything,” from “inner space” to “outer space,” and from head-spinning physical technologies and super AI's to the inner workings and passions of the mind is imagined and re-imagined multiple times as we journey to the end of time and beyond the reaches of our universe.

Integrating advanced biotechnology with imagined adventures into outer space, with an amazing variety of aliens thrown into the picture, Brin, in *Startide Rising* (1983) and *The Uplift War* (1987), envisioned the process of “uplifting,” in which intelligent life forms, using various advanced technologies, facilitate the evolution of other sentient species. In these novels, techno-enhanced dolphins, chimps, and gorillas partner with humanity in the exploration of outer space. Brin, who has been actively engaged over recent decades in non-fiction futurist writing as well, has also created some giant “world-building” novels of the near future earth. In *Earth* (1990), Brin addresses the nature of mind and intelligence and a host of environmental issues, and in *Existence* (2012), while again imagining a rich and complex world of the future, beset with ecological challenges and buffeted about by social-political turmoil, he extensively delves into “Fermi's Paradox” and the possibility of alien contact.

Simmons' *Hyperion Cantos* (1989-1997) covered a three-hundred-year period beginning in the twenty-eighth century. *Hyperion*, the first novel in the series, was modeled on Chaucer's *Canterbury Tales*. Imaginatively rich and colorful—ecologically, culturally, and technological—the four-volume saga envisioned future humanity having spread across numerous star systems and splitting into different competing species. Among the many incredible events described in the saga are: the rise to dominance of a technologically empowered Catholic Church (facilitat-

ed by super A.I.); the achievement of immortality; and the “Second Coming,” realized through time travel.

Credited with creating the first fully developed concept of virtual reality cyberspace in his story *True Names* (1981), and first popularizing the concept of the “technological singularity,”³⁴ Vinge wrote two grand space adventures spanning the Milky Way—*A Fire Upon the Deep* (1992) and *A Deepness in the Sky* (1999)—which involved a diverse, highly imaginative assortment of aliens (including intelligent wolf-dogs and spiders). In the first novel, set in the far future (tens of thousands of years ahead), Vinge vividly and comically depicted a galactic Internet of inter-species dialogue, gossip, and threat-filled badgering and innuendo. All hell breaks loose when a group of humans accidentally releases a highly intelligent computer virus that quickly spreads throughout the galactic Internet. In the second novel, Vinge described a faction of technologically enhanced and super-focused machine-like humans, who are controlled through nanotechnological implants in their brains.

Bear published many scientifically astute and popular novels in the 1980s and 1990s, including *Blood Music* (1985), *Eon* (1985), *Queen of Angels* (1990), *Moving Mars* (1993), and *Darwin's Radio* (1999). In sequence, these novels dealt with nano-tech microcomputers that merge with biological cellular life and rapidly evolve, enveloping and assimilating all life on earth; the discovery of alternate past and future histories of humanity; future psychotherapists journeying into the conscious psychotic mind of a mass murderer through advanced brain technologies, and an advanced AI becoming self-conscious; the future synthesis of human and computer intelligence, leading to the power to move physical matter with the mind; and the evolutionary emergence of a more bio-psychologically advanced species of humans, provoking a strongly defensive and fearful counter-reaction from normal humans. Evolution, applied to biological life, the conscious mind, and physical technologies, is a recurrent central theme in Bear's narratives of the future.

Robinson, in his *Mars* trilogy (1992-1994), wrote the best books ever on the settlement of Mars, creating comprehensive, highly complex utopian visions of the terraforming of another planet. Achieving a superb level of “world building” in these novels, including detailed geological, ecological, biological, psychological, social-cultural, technological, and political extrapolations, the novels chronicled how humans transform Mars and create a unique society, as well as a new biological form of humanity. The novels are so convincingly realistic and enthralling, the reader may forget that the narrative is SF.

Egan envisioned virtual minds, virtual universes, and virtual gods in his evolutionary epochs of the future, *Permutation City* (1994) and *Diaspora* (1997). Known for his challenging scientific expositions and abstract theorizing, in *Permutation City* Egan imagined humans achieving a quasi-immortal existence in virtual reality and creating artificial life and intelligence within a virtual universe. In *Diaspora*, future humanity divides into three forms: the biologically and technologically un-enhanced; conscious minds downloaded into robotic bodies; and virtual conscious minds that can flexibly materialize in diverse nano-tech-created bodies of their own choosing.

Perhaps at the zenith of contemporary cosmic speculation and scientific-technological extrapolation, Baxter chronicled the story of intelligence and humanity in the universe from the beginning to the end of time in his *Xeelee* saga (1991-1994) and *Vacuum Diagrams* (1997). Span-

ning billions of years, Baxter described in this gargantuan space opera “a war as long as the universe,” occurring between the forces of matter and anti-matter, and culminating in a cosmic Armageddon and escape to another universe. In his *The Time Ships* (1995), his sequel to Wells’ *The Time Machine*, Baxter created the ultimate time-travel story, in which humans, post-humans, and advanced techno-intelligences, circling back and forth through time, explore (and help to create) the evolution of all possible future universes.

During this period, not all SF was cosmic in scope. Coming down to earth and focused on the near future, Atwood wrote her famous and highly introspective dystopian novel *The Handmaid’s Tale* (1985), in which a patriarchal, totalitarian, and fundamentalist Christian government turns many women into enslaved breeders. Butler, the first African American woman to achieve fame and recognition in SF, wrote her highly regarded dystopian novels *Parable of the Sower* (1993) and *Parable of the Talents* (1999). A multi-generational tale of social collapse and personal survival in a dangerous and chaotic future United States with violent Christian fundamentalists attempting to seize control of the country, the novels culminate in the spiritual rebirth of one local group of individuals who aspire to journey to the stars. And finally, breaking many of the stereotypes of SF, in a superb feat of imaginative juxtaposition, Bishop in *Brittle Innings* (1994) retold, as a “wisdom narrative,” the story of Frankenstein’s creature, set in the deep south of the USA in the early twentieth century and involving a minor league baseball team.³⁵

The New Millennium

During the new millennium, the popularity of SF, both in English speaking countries as well as globally, has continued to grow. In the last few decades, SF has repeatedly delved into alternate reality and alternate history scenarios—such as in “Steampunk” and the “New Weird”—which blur the distinction between the scientifically realistic and fantasy. Jeter’s *Infernal Devices* (1987), Gibson and Sterling’s *The Difference Engine* (1990), and Meville’s fantastical and bizarre “world-building” novels, *Perdido Street Station* (2000) and *The Scar* (2002), are some noteworthy examples. Relevant to future-focused SF, post-singularity, ecological, and non-Western global perspectives have been significant recent trends as well.

Ongoing further developments in computer technology and A.I. inspired many new novels of hi-tech futures. Sawyer speculatively chronicled the emergence and evolution of self-consciousness in the *World Wide Web* in his trilogy *Wake/Watch/Wonder* trilogy (2009-2011). (Also, though, see Sawyer’s famous *The Neanderthal Parallax* series [2002-2003] about parallel universes—one containing an advanced Neanderthal civilization—which provided a powerful comparative critique of current human civilization.) Doctorow, in *Little Brother* (2007), envisioned a near future in which the government manipulates the news and ubiquitously monitors human behavior and personal communication, threatening our freedom and privacy. Cline’s *Ready Player One* (2011) imagined a near-future bleak dystopian world in which humanity, adopting ego-elevating techno-avatars, has retreated into a total body-immersive gaming virtual reality. Weaving outer space adventure together with super-intelligent post-singularity uploaded minds, the Finnish writer Raganiemi created a highly complex and dizzying mystery novel in *The Quantum Thief* (2010), in which, due to conscious minds moving into virtual reality, personal identity becomes much more complex, multi-faceted, and ambiguous. Stories on robots and cyborgs have

been re-energized in M. Wells' very popular and comical *Murderbot Diaries* (2017-2023) series, which involves a techno-enhanced central character, who looks in disdain and amusement on the emotional and foolish humans that he is employed to protect.

Perhaps the most highly regarded post-singularity novel, *Accelerando* (2005) by Stross, presented a highly realistic future history of the next hundred years, as super AI minds gain control of the earth and progressively move outward into space, turning the inner planets of the solar system into a giant technological brain. Incredibly imaginative, rambunctious, and filled with multifarious technological predictions, *Accelerando*, written in a highly energetic, almost frenzied style, powerfully and dramatically conveys a deep sense of how it would feel to live, function, and think in a world, in which rapidly evolving technological intelligence pervasively infuses itself into all aspects of human society and human consciousness.

Famous writers of previous decades continued to publish notable new novels in the new millennium. Stephenson envisioned in his mammoth world-building *Anathem* (2008) an alternate earth (existing in a speculative multiverse) that is populated with a techno-enhanced network of monasteries. Delving deeply into the nature of reality, *Anathem* is one of the most philosophically erudite SF novels ever written. Stephenson imagined an epochal saga of the near and far future in *Seveneves* (2015), in which humanity struggles to survive and rebuild civilization in outer space after the disintegration of the moon and consequent "extinction-level" worldwide disaster. Following on the success of his environmentally informed *Mars* trilogy, Robinson published a series of well-known ecological SF novels, *2312* (2012), *New York 2140* (2017), and *The Ministry of the Future* (2020). Delving into topics, such as ecological laboratories in outer space, climate change, global warming, world-wide environmental disaster, and the destructive effects of short-sighted, greed-motivated capitalism, Robinson not only attempted to realistically forecast numerous global social-environmental changes, but he also offered visionary prescriptions and rational guidelines in his novels for creating a transformed positive future.

SF that is international and global in scope has been an important development over the last couple of decades. In the new millennium, McDonald published three SF literary masterpieces: *River of Gods* (2004), examining the future of India; *Brasyl* (2007), dealing with both the past and future of Brazil; and *The Dervish House* (2010), set in a near-future Istanbul. All these novels are profoundly rich in cultural detail and synthesize history, religion, mythology, computer science, super AI, robotics, nanotech, and quantum science into intricate futurist narratives. Astonishingly comprehensive in its coverage of cutting-edge scientific theory and research and filled with an incredible array of bedazzling speculative technologies, the *Remembrance of Earth's Past* trilogy (*The Three-Body Problem*, 2014; *The Dark Forest*, 2015; and *Death's End*, 2016), written by the Chinese SF writer Liu Cixin, begins during the Cultural Revolution in China in the 1960s and clandestine government efforts to achieve contact with extraterrestrial intelligence. The narrative becomes international in scope, as humanity prepares for an invasion of the earth by an advanced alien civilization. The saga eventually extends out millions of years into the future and the creation of new universes. Tidhar, in *Central Station* (2016)—described as "... all of science fiction distilled into a single book"—imagined a future, multi-ethnic Tel-Aviv of robo-priests, data-vampires, crippled beggar-cyborgs, outer-space wanderers, and psychic children, the latter able to mentally access a globally-interconnected virtual "Conversation" that is monitored and controlled by enigmatic aliens. As an editor, Tidhar has spearheaded the decima-

tion of global SF with his anthologies *The Apex Books of World Science Fiction* (2009-2018) and *The Best of World SF* (2021-2023).

Space operas continued to be a very popular form of SF. Current space operas incorporate diverse and extensive technological extrapolations, including nanotechnology, artificial intelligence, robotics, and biotechnology, as well as social-cultural-political dimensions, creating “futures of everything” set in outer space. Banks envisioned a vast socialistic and technologically advanced space-faring galactic civilization in his *Culture* series (see for example the multi-leveled engineered world of his novel *Matter*, 2008). Set in the twenty-fifth century, Reynolds’ *Revelation Space* (2000) delved into the historical rise and fall of civilizations throughout the galaxy extending back over the last billion years, spinning a tale of interplanetary archaeology, mental clones, immense spaceships, and moon-size computers. In *House of Suns* (2008), Reynolds created an epochal tale of the future of humanity stretching from the thirty-first century to six million years ahead, in which humans have achieved relative immortality and, with robot companions, travel throughout the Milky Way and beyond. In her space opera trilogy set thousands of years in the future, involving a complex and rich “world-building” vision of space-faring interplanetary human civilization, Leckie imagined: Conscious space ships in mental resonance with human minds; multiple streams of consciousness within single individuals; and fundamental transformations in gender identity (see her *Ancillary Justice*, 2013; *Ancillary Sword*, 2014; and *Ancillary Mercy*, 2015). Involving the technological enhancement, as well as uncontrolled evolution of alien spider-like and bacterial creatures, and earth octopuses, and set in the context of outer space adventures, two of the most intellectually and scientifically impressive SF novels about non-human forms of intelligence, Tchaikovsky’s *Children of Time* (2015) and *Children of Ruin* (2019), were published during the last decade.

Many famous novels of the future written in recent decades defy simple classification. In *Spin* (2005), Wilson painted a deeply moving love story set amidst global disaster that extends billions of years into the future. In her enlightening and introspective novel *The Speed of Dark* (2003), Moon deftly described the conscious mind of an autistic man offered the medical opportunity to become “normal.” Strange and mysterious, and unnervingly horrific, Meville’s *Embassytown* (2011), which is set in a dream-like alternate universe, offered one of the best ever—linguistically sophisticated and psychological imaginative—stories on the challenges of human-alien communication. Both comical and introspective, and filled with imaginative techno and social extrapolations on the future, Anders’ *All the Birds in the Sky* (2016) described an imagined future conflict between science and quantum technology, and psychic witchcraft. Also by Anders, *The City in the Middle of the Night* (2019) synthesized speculations on alternate forms of society with humans merging biologically and psychologically with aliens. And to close this history, weaving together many SF themes and literary movements of the genre, M. J. Harrison, in his novel *Light* (2002), created a psychedelic and surrealistic retelling of Clarke’s *2001*. Combining features of New Wave, Cyberpunk, horror, and space opera, and including quantum philosophy, murder, virtual reality addiction, mysterious psychic cats, and human-spaceship cyborgs, *Light* is a highly creative and distinctively strange novel of the future in a literary genre already filled with strange realities.³⁶

Main Topics and Themes of Science Fiction

Besides the above history, an alternative way to gain a big picture of SF—to convey its breadth and depth—is to identify the major topics and themes of SF, listing key stories and authors for each identified category. In this section I outline the main topics and themes of SF, with a sampling of important relevant stories. As illustrated below, SF covers the future of everything. I have included in this compilation a number of significant novels and stories not mentioned in the previous history. Many of the cited narratives address multiple topics and could be appropriately placed in several categories.³⁷

- **Extraordinary Adventures into the Mysterious and Wondrous:** Topics and themes include: Journeys into the strange and fantastical, of distant lands and realms, and into the far reaches of both space and time; confronting danger and mystery; discovery of the astounding; and human courage and humility. Key texts include Verne’s *A Journey to the Center of the Earth* (1864) and *Off on a Comet* (1877); Wells’ *The First Men in the Moon* (1901); Hodgson’s *The Night Land* (1912); Burrough’s *Barsoom* (Mars) (1912-1927), *Pellucidar* (1914-1930), and *Amtor* (Venus) (1934-1938) series; Lovecraft’s *At the Mountains of Madness* (1931); Stapledon’s *Star Maker* (1937); Niven’s *Ringworld* (1970); Reynolds’ *Revelation Space* (2000); Mieville’s *The Scar* (2002); and Egan’s *Schild’s Ladder* (2002).
- **Scientific and Technological Discovery and Advancement:** Topics and themes include: All areas of science and technology, including physics, chemistry, and biology, and biotechnology, nanotechnology, and planetary-solar level engineering; amazing machines and technological creations of immense power and unlimited energy; and hope and fear and the double-edged sword of the relationship between humanity and technology. Key texts include Bacon’s *The New Atlantis* (1627); Shelley’s *Frankenstein* (1818); Astor’s *A Journey in Other Worlds* (1894); Wells’ *The Sleeper Awakes* (1910); Gernsback’s *Ralph 124C 41+* (1911); “Doc” Smith’s *Sky-lark of Space* (1928 to 1935) and *Lensmen* (1934 to 1948) series; Schachner’s “Stratosphere Towers” (1934) and “The Ultimate Metal” (1935); Campbell’s *The Mightiest Machine* (1934-1935); Del Rey’s “Nerves” (1942); Bear’s *Blood Music* (1985); Simmons’ *Hyperion Cantos* (1989-1997); Stephenson’s *The Diamond Age* (1995); Egan’s *Schild’s Ladder* (2002); and Cixin’s *Remembrance of Earth’s Past* trilogy (2014-2016).
- **Technological, Robotic, and Artificial Intelligence:** Topics and themes include: Robots, cyborgs, androids, “thinking machines,” virtual and cyberpunk realities, downloading minds, and the “singularity,” fear of robots and AI conquering, destroying, or usurping humanity; ambivalence over technological intelligence; and robots as the evolutionary children of humanity. Important texts include, I’sle-Adam’s *The Future Eve* (1886); Forster’s “The Machine Stops” (1909); Asimov’s *I, Robot* (1940) and *The Caves of Steel* (1953); Williamson’s “With Folded Hands” (1947) and *The Humanoids* (1948); Anderson’s “Epilogue” (1962); Gibson’s *Neuromancer* (1984); Sterling’s *Schismatrix* (1985); Rucker’s *The Ware Tetralogy* (1982-2000); Stephenson’s *Snow Crash* (1992); Egan’s *Permutation City* (1994) and *Diaspora* (1997); Stross’ *Accelerando* (2005); Sawyer’s *Wake/Watch/Wonder* trilogy (2009-2011); Raganiemi’s

The Quantum Thief (2010); Cline's *Ready Player One* (2011); and M. Wells' *Murderbot Diaries* (2017-2023).

- **The Evolution of Life, Ecology, and the Environment:** Topics and themes include: Natural and technologically augmented purposeful evolution of life in the future; the transformation of the earth and earth ecology; terraforming; the quest of extended longevity and potential immortality; the destruction and/or transformation of life on the earth; the control of nature; the potential diversification of life; and the loss of connection with nature. Significant texts include, Wells' *The Island of Dr. Moreau* (1896); Burrough's *The Land that Time Forgot* (1918); Capek's *The War with the Newts* (1937); Aldiss' *Hothouse* (1962); Le Guin "The Word for World is Forest" (1973); Brin's *Startide Rising* (1983), *The Uplift War* (1987), and *Earth* (1990); Baxter's *Manifold Space* (2000) and *Evolution* (2002); Robinson's *Mars* trilogy (1992-1994) and *The Ministry of the Future* (2020); and Tchaikovsky's *Children of Time* (2015) and *Children of Ruin* (2019).
- **Outer Space Exploration and Engineering:** Topics and themes include: Journeys to the planets and other star systems; the exploration and settlement of other worlds; the migration of humans to the stars; outer space technologies and solar and galactic engineering; the evolution of cosmic awareness and inter-stellar and galactic civilizations; adaptation to life in outer space and on other worlds; and journeys and adventures across the universe. Key texts include, Kepler's *Somium* (1600); Verne's *From the Earth to the Moon* (1865); Mader's *Distant Worlds* (1911); Lang and von Harbou's *Woman in the Moon* (1929); "Doc" Smith's *Skylark of Space* (1928 to 1935) and *Lensmen* (1934 to 1948) series; Stapledon's *Star Maker* (1937); Heinlein's "Universe" (1941) and "The Man Who Sold the Moon" (1950); Anderson's *Tau Zero* (1967); Baxter's *The Raft* (1991); Vinge's *A Fire Upon the Deep* (1992); Reynolds' *Revelation Space* (2000); Harrison's *Light* (2002); Corey's *Leviathan Wakes* (2011); and Stephenson's *Seveneves* (2015).
- **Alien Contact - Alien Intelligence and Civilizations:** Topics and themes include: Contact with aliens and the nature of alien life and intelligence; fear of the other; the challenges of communication with aliens; wars with aliens and alien conquest of the earth; horror as a sub-genre; and interspecies cooperation. Key texts include, Voltaire's *Micromegas* (1750); Lasswitz's *Two Planets* (1897); Wells' *The War of the Worlds* (1898) and *First Men in the Moon* (1901); Merritt's *The Metal Monster* (1920); Gallun's "Old Faithful" (1934); Weinbaum's "A Martian Odyssey" (1934); Stapledon's *Star Maker* (1937); Campbell's "Who Goes There?" (1938); De Camp's *Viagens* series (1949 to 1953); Bates' "Farewell to the Master" (1940); Leinster's "First Contact" (1945); Van Vogt's *The Voyage of the Space Beagle* (1950); Bradbury's *The Martian Chronicles* (1954); Lem's *Solaris* (1961); Clarke's *Rendezvous with Rama* (1973); Brin's *The Uplift War* (1987) and *Existence* (2012); Card's *Speaker for the Dead* (1986); Vinge's *A Fire Upon the Deep* (1992) and *A Deepness in the Sky* (1999); Banks' *The Alchemist* (2004); Meville's *Embassytown* (2011); VanderMeer's *Annihilation* (2014); Cixin's *Remembrance of Earth's Past* trilogy (2014-2016), and Anders' *The City in the Middle of the Night* (2019).

- **Time Travel:** Topics and themes include: The science and technology of time machines; traveling into the past or into the future; the manipulation of history and the flow of time; destiny versus free will; time paradoxes created through time travel; circular time and the causal relations of past, present, and future; transcending time; and the creation of multiple timelines and universes. Key texts include Wells' *The Time Machine* (1895); Williamson's *The Legion of Time* (1938); Lovecraft's "The Shadow Out of Time" (1936); De Camp's *Lest Darkness Fall* (1941); Heinlein's "By His Bootstraps" (1941) and "All You Zombies" (1959); Kuttner and Moore's "Vintage Season" (1946); Asimov's *The End of Eternity* (1955); Leiber's *The Big Time* (1958); W. Moore's *Bring the Jubilee* (1953) (what if the Confederacy won the Civil War?); Moorcock's *Behold the Man* (1969); Gerold's *The Man Who Folded Himself* (1973) (through time travel becoming one's parents and one's children); Bishop's *No Enemy But Time* (1982); Willis' highly historically researched *Doomsday Book* (1992), *To Say Nothing of the Dog* (1997), and *Blackout/All Clear* (2010); and Baxter's *The Time Ships* (1995).
- **Future Societies and World Building (Utopias and Dystopias):** Topics and themes include: Positive and negative visions of future human societies; complex multi-faceted descriptions of future societies; treatments of social evolution; cities of the future; extrapolations on present social-civilizational trends; inspirational visions (to generate hope and constructive actions) and warnings (to provoke corrective actions); and unusual societies to provoke reflection and comparison with current human society. Important texts include Mercier's *The Year 2440* (1771); Loudon's *The Mummy! A Tale of the 22nd Century* (1827); Verne's *Paris is the Twentieth Century* (1863); Robida's *The Twentieth Century* (1882); Bellamy's *Looking Backward* (1887); Astor's *A Journey in Other Worlds* (1894); Zamyatin's *We* (1920); Hasting's *City of Endless Night* (1920); Lang and Harbou's *Metropolis* (1926/1927); Wells' *The Sleeper Awakes* (1910) and *The Shape of Things to Come* (1933); Stapledon's *Last and First Men* (1930); Huxley's *Brave New World* (1932); Schachner's "The Revolt of the Scientists" (1933); Burdekin's *Swastika Night* (1937); Moore's "Judgment Night" (1943); Orwell's *1984* (1948); Asimov's *Foundation Trilogy* (1942 to 1950); Pohl and Kornbluth's *The Space Merchants* (1953); Bradbury's *Fahrenheit 451* (1953); Herbert's *Dune* (1965); Harrison's *Make Room! Make Room!* (1966); Brunner's *Stand on Zanzibar* (1968); C. Smith's *Norstrilia* (1975) and *The Instrumentality of Man* (1979) series; Le Guin's *The Lathe of Heaven* (1971) and *The Dispossessed* (1974); Atwood's *The Handmaid's Tale* (1985); Simmons' *Hyperion Cantos* (1989-1997); Robinson's *Mars* trilogy (1992-1994); Butler's *Parable of the Sower* (1993) and *Parable of the Talents* (1999); Stephenson's *The Diamond Age* (1995); McDonald's *River of Gods* (2004), *Brasyl* (2007), and *The Dervish House* (2010); Banks' *Matter* (2008); Tidhar's *Central Station* (2016); Martine's *A Memory Called Empire* (2019); and Anders' *The City in the Middle of the Night* (2019).
- **The Future of Crime and War:** Topics and themes include: Global and interplanetary wars (variations on the Armageddon theme); future weaponry; the end of civilization; psychopathology and evil in the future; future crime prevention; and human aggression and violence. Important texts include Stevenson's *The Strange Case of Dr. Jekyll and Mr. Hyde*

(1886); Griffith's *Angel of the Revolution* (1893); Serviss' *Edison's Conquest of Mars* (1898); Wells' *The Invisible Man* (1897), *The War in the Air* (1908), and *The World Set Free* (1914); Campbell, Hamilton, and "Doc" Smith's space operas of the 1920s through 1940s; Heinlein's *The Day After Tomorrow* (1941) and *Starship Troopers* (1960); Kuttner and Moore's "Private Eye" (1949); Bester's *The Demolished Man* (1953) and *The Stars, My Destination* (1956); Haldeman's *The Forever War* (1974) and *Forever Peace* (1997); Bear's *Queen of Angels* (1990); Baxter's *Xeelee* saga (1991-1994); and Scalzi's *Old Man's War* (2005).

- **The Future Evolution of Humanity, Mind, and Consciousness:** Topics and themes include: The future development of human intelligence, morality, wisdom, and other mental capacities; the future biological evolution of humans; the emergence of psychic powers; the technological enhancement of the mind; humans becoming God or god-like (the quest for omniscience or omnipotence); super-humans and super-heroes (as a sub-genre); reactions of current humans to "superior" humans; and visions of human diversification in the future. Important texts include, Bulwer-Lytton's *Vril, The Power of the Coming Race* (1871); Wells' *The Time Machine* (1895), *The Food of the Gods* (1904), and *Men Like Gods* (1923); Wright's *The Amphibians* (1924); Stapledon's *Last and First Men* (1930) and *Odd John* (1935); Schachner's "The Isotope Men" (1936), "Eco Homo" (1936) and "Crystalized Thought" (1937); Van Vogt's *Slan* (1940); Heinlein's *Methuselah's Children* (1941/1958) and *Waldo* (1942); Kuttner's *Mutant* series (1953); Sturgeon's *More than Human* (1953); Anderson's *Brain Wave* (1954) and "Call Me Joe" (1957); Keyes' *Flowers for Algernon* (1959, 1966); Clarke's *Childhood's End* (1953) and *2001* (1968); Silverberg's *Son of Man* (1971); Card's *Ender's Game* (1985); Moore and Gibbon's highly influential graphic novel *Watchmen* (1987); Bear's *Queen of Angels* (1990) and *Darwin's Radio* (1999); Chiang's "Understand" (1991); Kress' *Beggars in Spain* (1993); Sawyer's *The Terminal Experiment* (1995); Egan's *Diaspora* (1997); Stross' *Accelerando* (2005); and Stephenson's *Seveneves* (2015).
- **Gender, Love, and Sex:** Topics and themes include: Love and sex in the future; love and sex with robots and aliens; technologically facilitated sex; matriarchies versus patriarchies; and transcending current sexual and gender constraints. Important texts included Gilman's *Herland* (1915); Stone's "Women with Wings" (1929) and "The Conquest of Gola" (1931); Stapledon's *Last Men in London* (1932) and *Sirius* (1944); numerous stories by Moore in the 1930s collected in *The Best of C. L. Moore* (1975); Farmer's *Strange Relations* (1960), *The Lovers* (1961), and *Flesh* (1968); Le Guin's *The Left Hand of Darkness* (1969); Tiptree's "The Women Men Don't See" (1973) and "The Girl Who Was Plugged In" (1974); Russ' *The Female Man* (1975); Rucker's *The Ware Tetralogy* (1982-2000); and Kowal's *The Calculating Stars* (2018).
- **Disasters and the End of Civilization:** Topics and themes include: Natural and human-made disasters; the Apocalypse and after the Apocalypse; the end of civilization and humanity; coping with disaster and the re-emergence of civilization; chaos and destruction in the universe; and the ephemeral nature of humanity. Important texts include Grainville's *The Last Man* (1805); Flammarion's *Omega* (1893-1894); Rosny's "The Death of Earth" (1910); England's *Darkness and Dawn* trilogy (1912-1913); Capek's *The Absolute at Large* (1922); Wylie and

Balmer's *When Worlds Collide* (1932); Stewart's *Earth Abides* (1949); Wyndham's *The Day of the Triffids* (1951); Simak's *City* (1952); Frank's *Alas, Babylon* (1959); Leiber's *The Wanderer* (1964); Miller's *A Canticle of Leibowitz* (1959); Ballard's *The Drowned World* (1962) and *The Crystal World* (1966); Niven and Pournelle's *Lucifer's Hammer* (1977); Vinge's *A Fire Upon the Deep* (1992); and Stephenson's *Seveneves* (2015).

- **Future Histories and the Far Future:** Topics and themes include: The far future of humanity and the universe, and strange and bizarre realities of the far future; the “dying earth,” and cosmic evolution and the big picture of things. Important texts include Hodgson's *The Night Land* (1912); Manning's *The Man Who Awoke* (1933); Campbell's “Twilight” (1934) and “Night” (1935); Stapledon's *Last and First Men* (1930) and *Star Maker* (1937); Asimov's *Foundation Series* (1942 to 1950); Vance's *The Dying Earth* (1950); Heinlein's *The Past through Tomorrow* (1967); Wolfe's *The Book of the New Sun* series (1980-1987); Baxter's *Vacuum Diagrams* (1997) and *Evolution* (2002); and Cixin's *Remembrance of Earth's Past* trilogy (2014-2016).
- **Religion and God:** Topics and themes include: The discovery or evolution of God; the future of religion; repressive religion-based societies; and the conflict of religion and science. Important texts include, Astor's *A Journey in Other Worlds* (1894); Rousseau's *The Messiah of the Cylinder* (1917); Capek's *The Absolute at Large* (1922); Stapledon's *Star Maker* (1937); Manning's *The Man Who Awoke* (1933); Lewis' *Out of the Silent Planet* (1938), *Perelandra* (1943), and *That Hideous Strength* (1945); Heinlein's “If This Goes On...” (1940) and *Stranger in a Strange Land* (1961); Miller's *A Canticle of Leibowitz* (1959); Blish's *A Case of Conscience* (1958); Herbert's *Dune* (1965); Zelazny's *Lord of Light* (1967); Moorcock's *Behold the Man* (1969); Ellison's “The Deathbird” (1974); Atwood's *The Handmaid's Tale* (1985); Simmons' *Hyperion Cantos* (1989-1997); and McDonald's *River of Gods* (2004).
- **Quest for Wisdom and Enlightenment:** Topics and themes include: Narratives of self-discovery and self-development; purposeful pursuit of wisdom; the desire versus fear of enlightenment; tradition and close-mindedness versus liberation of mind and expansion of understanding; and determining the meaning of life. Important texts include Stapledon's *Last and First Men* (1930), *Star Maker* (1937) and *Sirius* (1944); Manning's *The Man Who Awoke* (1933); Stewart's *Earth Abides* (1949); Vonnegut's *Slaughterhouse Five* (1969); Wolfe's *Book of the New Sun* series (1980-1987); Card's *Ender's Game* (1985) and *Speaker for the Dead* (1986); Bishop's *Brittle Innings* (1994); Stephenson's *The Diamond Age* (1995) and *Anathem* (2008); and Anders' *All the Birds in the Sky* (2016) and *The City in the Middle of the Night* (2019).
- **Alternate Realities and Histories and The Nature of Reality:** Topics and themes include: “What If” scenarios of different historical timelines; journeys into other dimensions (or higher dimensions) of reality; multiple timelines; rewriting history; the multiverse; Steampunk and “New Weird” scenarios; the ambiguity of reality; the blurring of fact and fiction; changing the laws of the universe; and thought experiments on ontological possibilities. Important texts include Hodgson's *The House on the Borderland* (1908); Schachner's “The Living Equation”

(1934), “Orb of Probability” (1935), and “Lost in Dimensions” (1937); C.A. Smith’s “The Dimension of Chance” (1932); Leinster’s “Sidewise in Time” (1934); Williamson’s *Darker than You Think* (1940); Borges’ “The Library of Babel” (1941); Kuttner and Moore’s “Mimsy Were the Borogroves” (1943); Brown’s *What Mad Universe* (1949); Simak’s *City* (1952); Dick’s *The Man in the High Castle* (1962), *The Three Stigmata of Palmer Eldritch* (1965), *Counter-Clock World* (1967), *Ubik* (1969), and *Valis* (1981); Jeter’s *Infernal Devices* (1987); Moore and Gibbons’ *Watchmen* (1987); Gibson and Sterling’s *The Difference Engine* (1990); Mieville’s *Perdido Street Station* (2000) and *The Scar* (2002); Sawyer’s *The Neanderthal Parallax* (2002-2003); Egan’s *Schild’s Ladder* (2002); McDonald’s *Brasyl* (2007); Chabon’s *The Yiddish Policeman’s Union* (2007); Stephenson’s *Anathem* (2008); and Scalzi’s *Redshirts* (2012).

The Values and Purposes of Science Fiction

Serving as a conclusion for this article, and based on the above historical and topical reviews of science fiction, I summarize in this section the values and purposes of science fiction, especially with respect to approaching, understanding, and creating the future.

- SF generates and stimulates, and heightens and evolves *holistic future consciousness*, synthesizing cognition, emotion, ethics/values, aesthetics, sensory/perceptual, social/communal, personal, and the purposeful-action dimensions of our consciousness of the future. SF involves the ongoing *purposeful evolution* of holistic future consciousness, motivated and informed by the imagined narrative-framed possibilities of the future and existence.
- SF provides a *comprehensive and integrative* mode of understanding all major dimensions of the future, covering and pulling together in “world building” synthetic narratives, science, technology, ecology, society, ethics and values, religion, and psychology.
- SF offers *pluralistic* and diverse scenarios and perspectives of the future and reality as a whole, reflective of the multiple points of view of its writers.
- SF is an *evolutionary* enterprise, helping to transform and evolve human reality. SF is also evolutionary in so far its ongoing development is both built upon the past (past writings and ideas) and yet transcending its past heritage. To maintain current relevance, SF has repeatedly re-invented itself.
- SF is a medium for both *entertainment* and *artistic-aesthetic* creation.
- SF is a *synthesis* of *science*—our factual and theoretical understanding of reality—and *art*—the pursuit and expression of beauty.
- SF is a *synthesis* of “*factual*” and “*fictional*” modes of understanding, grounding its fictional narratives in scientific-technological facts and our contemporary understanding of reality.
- SF is a *synthesis* of the *scientifically credible* and plausible and the *imaginative transcendent*. SF is the contemporary “credible transcendent.”
- SF both *educates* and *entertains* (Gernsback’s thesis)
- Reflecting the dual influences of Western Enlightenment and Romanticist philosophies, SF provides a *synthesis* of *thought* and *emotion* as modes of understanding and experience.

- Reflective of its emotional dimension, SF provokes hope, fear, excitement, and a motivational sense of personal power. SF provides both *inspirational* messages and *apprehension*-generating warnings.
- Reflective of its cognitive dimension, SF stimulates both *thinking* and *imagination*. SF provides an expansive, flexible, and self-reflective *cognitive space* for envisioning the future. SF is “idea” literature, pushing the boundaries of scientific, technological, and philosophical thinking. Through narratives of alternate histories and alternate realities, SF expands the *possibility space* of thinking and imagination regarding the nature and limits of reality and the future.
- Through its characters and their dramatic challenges and experiences, SF affords the opportunity for *personal* identification and personal reaction in its imagined scenarios of the future.
- SF offers a *narrative* form of understanding and *vicarious experience* of the future, providing a psychologically resonant medium for the expression and reflection upon ideas about the future.
- Through its narrative form, its stimulation of holistic future consciousness, its comprehensive and detailed descriptions of future scenarios, and its personalized perspectives on future realities, SF makes the future *feel real*.
- Although SF can be viewed as an escape from reality, it can also be viewed as providing the deepest revelations into *reality*. (Clarke’s argument) SF stands back from the narrow perspective of the “here and now” and views reality deeply and expansively through the “eyes of the cosmos.” According to Robinson, SF is the *realism* of our time.
- In standing back from the present, SF provides a unique mirror and *reflection* on the *present*. SF expands our consciousness of the present, providing critiques of the present.
- SF offers predictions, possibilities, plausibilities, and a thinking space (as “what if” thought experiments) for the future. SF is the narrative testing ground for varied futures. As Campbell argued, SF is a *laboratory* for the future, and should take a leadership role in guiding human society forward.
- For LeGuin, SF offers *freedom-provoking* innovative images of the future to transcend contemporary pessimism and the entrapment of the present. In general, SF facilitates *freedom of consciousness*. SF stretches and breaks free of the constraints of authority, tradition, normalcy, habit, and the here and now.
- In general, SF provokes the *expansion of consciousness*, of both our awareness and wonder of the physical universe and our inner mental evolution towards enlightenment and wisdom.
- SF is *self-conscious*. SF fandom and SF academic studies are social, self-reflective *think tanks* for the ongoing evaluation and further creation and evolution of SF.
- Through its warnings (e.g., dystopias and disasters) and its inspirations (e.g. utopias)—generating both fears and hopes about possible futures—SF narratives are *provocations* to action. (Wells’ philosophy) SF offers educated anticipations informing future preparedness and the perception of opportunities.
- SF creates new *symbols, icons, images, and archetypes* of the future and for the future.
- SF offers a scientifically informed and imaginative mindset that addresses the long-standing human needs for the “*credible transcendent*” and a cosmic framework in which to find meaning and purpose in life. Replacing (or enveloping) classical mythic/religious cosmic

mindsets, SF offers an *evolutionary mythology* of and for the future, which is informed by contemporary thinking and relevant to contemporary issues and challenges.

- In general, SF both motivates and facilitates the *creative evolution* of the future, inclusive of the future of mind and consciousness, society, the environment, and technology. Although SF can stimulate techno-scientific invention and imagination, it can also stimulate creative social ideas. SF both provokes and reflects ongoing human evolution.

Endnotes

¹ Lombardo, T. (2018) *Science Fiction: The Evolutionary Mythology of the Future - Volume One: Prometheus to the Martians*. London: Changemakers Books. 1-7.

² Lombardo, T. (2018). 7-9.

³ Lombardo, T. (2021-2024) *The Evolution of Science Fiction Webinar Series*. Retrieved June 15, 2025. <https://www.youtube.com/playlist?list=PLIvBA8u8-18QzwxllJrzh6OAKVAUYfNmS>.

⁴ Lombardo, T. (2015) "Science Fiction: The Evolutionary Mythology of the Future," *Journal of Futures Studies*, Vol.20, No. 2, December, 2015; Lombardo, T. (2019) "Science Fiction: Cosmic Consciousness and the Future of Everything" *Human Futures*, July; Lombardo, T. (2021c) "Teaching Science Fiction as a Lens on the Future" *Human Futures*, August; Lombardo, T. (2024b) "Must-Read Science Fiction Authors and Books for Futurists" *Compass*, May, 2024. Retrieved June 15, 2025. <https://centerforfutureconsciousness.com/wp-content/uploads/2024/06/sf-authorsbooks-compass-final.pdf>; Lombardo, T. (2024c) "Science Fiction Futures: Historical Foundations" in Roberto Poli (ed.) *Handbook of Futures Studies*. Cheltenham and Camberley, UK: Edward Elgar Publishing, Inc. Retrieved June 15, 2025. <https://centerforfutureconsciousness.com/wp-content/uploads/2024/07/sf-futures-historical-foundations-final-copy-inset-references.pdf>; and Lombardo, T. (2024d) "Science Fiction Futures: Contemporary Developments" in Roberto Poli (ed.) *Handbook of Futures Studies*. Cheltenham and Camberley, UK: Edward Elgar Publishing, Inc. Retrieved June 15, 2025. <https://centerforfutureconsciousness.com/wp-content/uploads/2024/07/sf-futures-contemporary-developments-final-copy-inset-references.pdf>.

⁵ Lombardo, T. (2018); Lombardo, T. (2021a) *Science Fiction: The Evolutionary Mythology of the Future - Volume Two: The Time Machine to Metropolis*. Bloomington, IN: AuthorHouse; and Lombardo, T. (2021b) *Science Fiction: The Evolutionary Mythology of the Future - Volume Three: Superman to Star Maker*. Bloomington, IN: AuthorHouse.

⁶ Lombardo, T. (2024e) "Evolving List of All-Time Best Science Fiction Novels" *Center for Future Consciousness*. Retrieved June 15, 2025. <https://centerforfutureconsciousness.com/evolving-list-of-all-time-best-science-fiction-novels/>; and Lombardo, T. (2024f) "Evolving List of All-Time Best Science Fiction Movies" *Center for Future Consciousness*. Retrieved June 15, 2025. <https://centerforfutureconsciousness.com/evolving-list-of-all-time-best-science-fiction-movies/>.

⁷ Lombardo, T. (2024b).

⁸ See Lombardo, 2018, 28-29 for an extended list of books, both popular and more scholarly, that provide studies and overviews of the nature of SF. And see Lombardo, 2018, 579-593 for a sampling of websites, as well as further resources, on SF.

⁹ See Clute, J. (1995) *Science Fiction: The Illustrated Encyclopedia*. London: Doarling Kindersley, and *Encyclopedia of Science Fiction*. Retrieved June 15, 2025. <https://sf-encyclopedia.com>. for extensive treatments of the multi-dimensional features of SF.

¹⁰ Lombardo, T. (2021a) 475-502.

¹¹ In citing SF novels and stories, I include original publication dates, but do not include in the bibliography complete citations for the many novels and stories I reference in this article. For each of these works there are usually multiple publishers, who have printed or reprinted such texts. The titles of SF novels are italicized; the titles of shorter SF stories are placed in quotation marks.

¹² Lombardo, 2018, 32-102.

- ¹³ The following history of SF includes edited sections from Lombardo, T. (2024c) and Lombardo, (2024d), but a much more detailed history of SF from ancient to contemporary times, including both SF literature and cinema/TV, can be found in my video series Lombardo, T. (2021-2024). Also see Lombardo, T. (2024g) “An Accelerative Evolutionary History of Science Fiction from Ancient Times to the Present” Retrieved June 15, 2025. <https://www.youtube.com/watch?v=8Dqu4YJvXrA&list=PLIvBA8u8-18QzwxllJrzh6OAKVAUYfNmS&index=29> for an “Accelerative History of SF” in a single video; and Lombardo, T. (2018), Lombardo, T. (2021a), and Lombardo, T. (2021b) for in-depth books covering the history of SF from ancient times to the 1930s. Other informative histories of science fiction include Aldiss, B. and Wingrove, D. (1986) *Trillion Year Spree: The History of Science Fiction*. North Yorkshire, UK: House of Stratus; Panshin, A. and Panshin, C. (1989) *The World Beyond the Hill: Science Fiction and the Quest for Transcendence*. Los Angeles: Jeremy Tarcher, Inc.; Disch, T. (1998) *The Dreams Our Stuff is Made of: How Science Fiction Conquered the World*. New York: The Free Press; and Roberts, A. (2016) *The History of Science Fiction*, 2nd Edition. New York: Palgrave Macmillan.
- ¹⁴ Lombardo, T. (2018) 103-183.
- ¹⁵ Panshin, A. and Panshin, C. (1989).
- ¹⁶ Lombardo, T. (2018) 184-221.
- ¹⁷ Lombardo, T. (2018) 222-258.
- ¹⁸ See a more complex and nuanced view of Romanticism in Lombardo, T. (2018) 267-286.
- ¹⁹ Lombardo, T. (2018) 259-323.
- ²⁰ Lombardo, T. (2018) 324-389.
- ²¹ Lombardo, T. (2018) Chapters 8, 9, and 10.
- ²² Wagar, W. W. (2004) *H. G. Wells: Traversing Time*. Middletown, CT: Wesleyan University Press.
- ²³ Lombardo, T. (2021a) Chapters 1 and 2.
- ²⁴ Lombardo, T. (2021a) Chapters 4 to 7.
- ²⁵ Lombardo, T. (2021a) Chapter 8.
- ²⁶ Lombardo, T. (2021b) Chapters 2 to 6.
- ²⁷ Lombardo, T. (2021b) Chapters 3, 4, and 7.
- ²⁸ Lombardo, T. (2021b) Chapters 8 and 9.
- ²⁹ Lombardo, T. (2021-2024) Module 12.
- ³⁰ Lombardo, T. (2021-2024) Module 13.
- ³¹ Lombardo, T. (2021-2024) Module 14.
- ³² Rucker, R., Sirius, R. U., and Queen Mu (1992) *Mondo 2000: A User's Guide to the New Edge—Cyberpunk, Virtual Reality, Wetware, Designer Aphrodisiacs, Artificial Life, Techno-Erotic Paganism, and More*. New York: HarperCollins.
- ³³ Lombardo, T. (2021-2024) Module 15.

³⁴ Vinge, V. (1993). "The Coming Technological Singularity: How to Survive in the Posthuman Era." Retrieved June 15, 2025. <https://edoras.sdsu.edu/~vinge/misc/singularity.html> .

³⁵ Lombardo, T. (2021-2024) Module 16.

³⁶ Lombardo, T. (2021-2024) Modules 17 and 18.

³⁷ More extensive lists of significant texts for each topic and theme are provided in Lombardo, T. (2024a) "Summary, Conclusions, and Prospectus on the Evolution of Science Fiction". Retrieved June 15, 2025. <https://www.youtube.com/watch?v=3m-oRO6VXC4&list=PLIvBA8u8-18QzwxllJrzh6OAKVAUYfNmS&index=33&t=603s> .