



The Applied Sci-Fi Project, Center for Science and the Imagination,
Arizona State University, Tempe, Arizona, United States (online event),
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The Applied Sci-Fi Project at the Center for Science and the Imagination (CSI) is a one-time project funded by a grant from the Sloan Foundation. CSI's mission has been to envision more hopeful futures using science fiction (SF) stories and strategies through workshops and anthologies on topics ranging from space futures (with NASA), climate change and solar futures, to the future of music technology and the Metaverse. To that end, CSI held four events, with the goal of laying out “best practices” for envisioning more hopeful and just futures using the imaginative and narrative strategies of science fiction. Held throughout 2022 and 2023, the events outlined the history and explanations of how science fiction is used by government, corporate, academic, and non-profit organizations to conduct futures and foresight work. Each *Applied Sci-Fi* event assembled a variety of experts—researchers, consultants, designers, and SF writers—representing many subfields of futures work, such as: strategic foresight; scenario planning; design fiction; experiential futures; speculative futures; critical futures; and speculative journalism. Each event consisted of (1) a public panel of up to five speakers, streamed live, followed by (2) a private invitation-only workshop of up to twenty “experts” and “practitioners.”

While scholars recognize the mutual influence between SF narratives and technoscientific developments, the exact nature of that influence has remained murky.¹ Science fiction has inspired a number of well-known

technologies;² for example, the creators of the mobile phone (at Motorola) and QuickTime (at Apple) were inspired by episodes of *Star Trek* (1966–69) and *Star Trek: The Next Generation* (1987–94).³ Conversely, many SF works show the influence of real world technoscience: two well-known examples include the films *Interstellar* (2014) and *2001: A Space Odyssey* (1968), both of which employed scientific consultants to ensure accuracy.⁴

This bidirectional influence is informally referred to as the “Sci-Fi Feedback Loop,” a term that posits not only that science fiction influences technoscientific innovators, but that real-world innovations become inputs into the next wave of SF narratives.⁵ This was the starting point for the first of the four *Applied Sci-Fi* events. We can see this loop at work over many decades in both science fiction depictions of and the technical developments leading to space flight, rocketry, and the moon landings. Such travels were anticipated by Jules Verne and H. G. Wells, whose fiction inspired rocketry pioneers Robert Goddard, Hermann Oberth, and Werner von Braun. These innovators in turn inspired more realistic (and futuristic) SF representations of space travel, including the film *Destination Moon* (1950), with a rocket looking suspiciously like the V-2,⁶ and on to more futuristic spaceships in the film *2001: A Space Odyssey* (1968).

The relationship between utopian and SF narratives was seen as integral to the SF stories and techniques discussed, moving beyond whether or not science fiction is, as Glen Negly and J. Max Patrick suggested, “a bastard literary device” that arose from utopian stories;⁷ or whether one agrees with Darko Suvin’s statement that utopias are basically a “sociopolitical subgenre of science fiction.”⁸ Assumptions about techno-utopian or techno-dystopian futures are often built into specific SF genres and stories. In fact, the purpose of futures work covered in this project is often to help create more just, hopeful, and diverse stories through science fiction, in contrast with the often dystopic worlds depicted in successful commercial science fiction.

The public panel of the first event in May 2022, “The Sci-Fi Feedback Loop: Mapping Fiction’s Influence on Real-World Tech,” included SF writers Cory Doctorow (*Little Brother* [2008]; *Walkaway* [2017]) and Malka Older (*Null States* [2017]; . . . and *Other Disasters* [2022]); venture capitalist Tim Chang; media studies professor Sherryl Vint (University of California, Riverside); and policy and legal scholar Michael Bennett (University of Illinois). The event focused on the historical influence of science fiction on technoscientific innovation via examples in subgenres including space fiction (*Star Trek* franchise [1966-present], and *2001: A Space Odyssey* [1969]), military fiction (Robert

A. Heinlein's *Starship Troopers* [1959]), and cyberpunk (Neal Stephenson's *Snow Crash* [1992], and *The Diamond Age* [1995]).

The role of utopian and dystopian narrative arcs was traced through specific SF subgenres, illustrating how space-age fiction often depicts a techn-utopian future that was inspired by the technological determinism of the 1950s–1960s. In subsequent decades many young people were inspired to go into STEM fields, or to work for organizations like NASA.⁹ This trend continued into the 1990s with the *X-Files*-inspired “Scully Effect,” which attracted many young women into the sciences.¹⁰ Although cyberpunk stories from the 1980s onward largely depicted dystopias, such stories are still inspiring today's tech titans to attempt to imitate the technologies showcased therein: for example, Mark Zuckerberg's attempt to build the Metaverse is not unlike the virtual reality worlds previously imagined in novels such as Neal Stephenson's *Snow Crash* (1992) or Ernest Cline's *Ready Player One* (2011), yet disregards the grim futures depicted in these novels. More recently, genres such as climate fiction, Afrofuturism, and non-Western-centric, postcolonial science fiction, have tried to depict and inspire more hopeful and just futures, in the hope that, through the SF feedback loop, such futures are more likely to be achieved.

Participants also discussed specific proposed theories of influence between SF narrative and technoscientific innovation. One such theory is Stephenson's *hieroglyph* model, wherein a work of science fiction is used as a vision (or shorthand symbol or hieroglyph of the goal), bringing together and implicitly guiding a large group of individuals to work on an ambitious project, like the Apollo space missions.¹¹ The *adjacent possible* model, a term from biology, advanced by Doctorow, describes how innovation depends on predecessor technologies¹²; for example, a knowledge of metallurgy was needed before the helicopter, envisioned by Leonardo da Vinci hundreds of years earlier, could be built.¹³

The second and third *Applied Sci-Fi* events attempted to define a taxonomy of specific terminology and techniques for utilizing SF narratives, scenarios, and fictional artifacts (or *diegetic prototypes*) to prepare for uncertain futures: worldbuilding, threat-casting, forecasting, back-casting, scenario planning, experiential and speculative futures, critical futures, and SF prototyping.¹⁴ Futurist Julian Bleecker observed that if we think of a continuum with “art” (creative endeavors like writing fiction and illustrating fictional products) on one side, and strategy (logical approaches such as forecasts using surveys and spreadsheets) on the other, we could then contextualize and categorize these methods into some kind of taxonomy, based on how much creativity is involved.

The second event, “Designing the Future with Applied Sci-Fi,” held in September 2022, explored the artistic side of this continuum. The speakers explored the practices of *design fiction*, a term coined by SF writer Bruce Sterling (*Schismatrix* [1985], *Islands in the Net* [1988]) and futures consultant Julian Bleecker, two participants in the event.¹⁵ During the public panel, moderator Brian David Johnson (*Sci-Fi Prototyping* [2011]), former futurist at Intel, suggested that the purpose of writing science fiction is to sell books, while the main purpose of both design fiction and foresight is to help an organization plan for the future by exploring fictional products and scenarios. This planning could be via stories, but could also include experiential futures, like an apartment from a climate-affected future as designed by futures consultant Anab Jain, another participant in the event.¹⁶ Worldbuilding spans across science fiction and applied science fiction and is a necessary part of any SF project, whether a Hollywood film or a corporate futures workshop. For example, *Minority Report* (2002) included production design and real-life human-computer research done by the MIT Media Lab.

The third event, “Science Fictional Scenarios and Strategic Foresight,” held in December 2022, focused on the other end of this continuum: strategy. The purpose of strategic foresight is to imagine possible or plausible future scenarios and narratives in a more structured way. Dating back to the 1950s, foresight has been a key part of what has been called alternatively futurology, futures studies, or futures work. It was pioneered by the RAND Corporation to help the US government prepare for continued technological and socio-political change.¹⁷ In the 1970s the Shell Corporation adopted story writing and narrative techniques to plan beyond a few years into the future.¹⁸ Alumni from Shell, such as Peter Schwartz (who participated in this third *Applied Sci-Fi* event) and various Silicon Valley luminaries, co-founded the Global Business Network (GBN) in the 1980s and 1990s, a think-tank consultancy that brought futures work to organizations during the dot com era.¹⁹ The methods focused on best-case and worst-case scenarios, which might be considered mini-utopias or dystopias for a particular industry or client.

The fourth and final event, “Reimagining the Future of X,” was held in June 2023. Guests discussed best practices for the application of science fiction through the publication of anthologies, the hosting of workshops, and writing contests focused on a specific topic. CSI’s own anthologies, *Cities of Light: A Collection of Solar Futures* (2021), and *A Year Without Winter* (2019) are relevant for utopian studies scholars, in that their explicit goal is to anticipate “better futures,” or at least to prevent worse ones. A public panel

was moderated by Joey Eschrich (Arizona State University), with panelists including: SF writer and *io9* founder Annalee Newitz (*The Terraformers* [2023]); SF writer Tobias Buckell (*Reclaim, Restore, Return: Futurist Tales from the Caribbean* [2022]); security expert and military SF author August Cole (*Ghost Fleet* [2015]); and Tory Stephens, creative manager of climate fiction at *Grist Magazine*. Many of these SF anthologies were created for specific clients—companies such as Microsoft, or nonprofits such as the National Democratic Institute (NDI)—to envision various types of futures. These and other participants discussed both the promise and pitfalls of putting together such anthologies as corporate planning documents, thus rarely released to the public, in contrast with more public contests. Concerns ranged from the types of prompts that might be used, the criteria for inclusion in the anthology, and the rights of the authors to the stories (vs. the rights of the client).

The *Applied Sci-Fi* series brought together many experts and pioneers in various subfields of futures work. The forthcoming papers (to be included in an open-access book) may not be the project's final act; CSI hopes for more events, taking advantage of the community of practitioners, academics, writers, futurists, and other experts created over the two-year project.

Notes

1. For example, see Caroline Bassett, Ed Steinmueller, and George Voss, "Better Made Up: The Mutual Influence of Science Fiction and Innovation," *Nesta Working Paper* 13/07 (March 2013), https://media.nesta.org.uk/documents/better_made_up_the_mutual_influence_of_science_fiction_and_innovation.pdf.
2. On this, see Mark Brake and Neil Hook, *Different Engines: How Science Drives Fiction and Fiction Drives Science* (London: Macmillan, 2008); Sarah Cole, *Inventing Tomorrow: H.G. Wells and the Twentieth Century* (New York: Columbia University Press, 2020); Nathan Shedroff and Christopher Noessel, *Make It So: Interaction Design Lessons from Science Fiction* (New York: Rosenfeld Media, 2012).
3. See, for example, Mark Strauss, "Ten Inventions Inspired by Science Fiction," *Smithsonian Magazine*, March 15, 2012, <https://www.smithsonianmag.com/science-nature/ten-inventions-inspired-by-science-fiction-128080674/>.
4. As described by David A. Kirby, *Lab Coats in Hollywood: Science, Scientists, and Cinema* (Cambridge, MA: MIT Press, 2011), 1–8.
5. On the "Sci-Fi Feedback Loop," see Kevin Bankston, "'First Man' and the Sci-Fi–Science Feedback Loop," *The Atlantic*, October 12, 2018, <https://www.theatlantic.com/science/archive/2018/10/first-man-sci-fi-science-feedback-loop/572821/>; and Patrick

Purdy, "From Science Fiction to Science Fact: How Design Can Influence the Future User Experience Magazine," *UX: User Experience*, June 2013, <https://uxpamagazine.org/science-fiction-to-science-fact/>.

6. The V-2 rocket, developed by the Nazis, was primarily overseen by Werner von Braun; after World War II he was moved to the United States and worked on the space program there.

7. Glen Negley and J. Max Patrick, eds., *The Quest for Utopia: An Anthology of Imaginary Societies* (New York: Henry Schuman, 1952), 588.

8. Darko Suvin, *Metamorphoses of Science Fiction: On the Poetics and History of a Literary Genre* (New Haven: Yale University Press, 1979), 61.

9. For more on science-fiction-inspired STEM careers, see Carolyn Collins Petersen, "Science Fiction Was an Inspiration for Many Professional Astronomers," *Universe Today*, August 30, 2022, <https://www.universetoday.com/157351/science-fiction-was-an-inspiration-for-many-professional-astronomers/>; Neal Stephenson, "Innovation Starvation," *Wired*, October 27, 2011, <https://www.wired.com/2011/10/stephenson-innovation-starvation/>; Janet Vertesi, "All These Worlds Are Yours Except . . .": Science Fiction and Folk Fictions at NASA," *Engaging Science, Technology, and Society* 5 (June 2019): 135–59, <https://doi.org/10.17351/ests2019.315>.

10. The "Scully Effect" is a popular term for how the *X-Files* character of Dana Scully, a medical doctor and scientist, inspired many young women to go into STEM. See Shaunacy Ferro, "The 'Scully Effect' Is Real: Female X-Files Fans More Likely to Go Into STEM," *Mental Floss*, April 18, 2018, <https://www.mentalfloss.com/article/540530/scully-effect-female-x-files-viewers-stem-careers>.

11. Stephenson, "Innovation Starvation."

12. For more on how the *adjacent possible* model came to be identified with innovation, see Steven Johnson, *Where Good Ideas Come from: The Natural History of Innovation* (New York: Riverhead Books, 2011), 31.

13. Example given in Cory Doctorow, "I've Created a Monster! (And So Can You)," *Frankenbook*, April 30, 2018, <https://www.frankenbook.org/pub/ive-create-a-monster/release/1>.

14. David Kirby, "The Future Is Now: Diegetic Prototypes and the Role of Popular Films in Generating Real-World Technological Development," *Social Studies of Science* 40, no. 1 (February 2010): 41–70, <https://doi.org/10.1177/0306312709338325>.

15. See Nik Badminton, "What Is Design Fiction?," *Futurist.com*, June 23, 2022, <https://futurist.com/2022/06/23/what-is-design-fiction/>. Bruce Sterling and Julian Bleeker asked each other in 2005 "if design and science fiction could work together somehow to tell stories through fictional objects?" In a 2009 essay Bleeker raised this question: "How can science fiction be a purposeful, deliberate, direct participant in the practices of science fact?" ("Design Fiction: A Short Essay on Design, Science, Fact and Fiction," *Near Future Laboratory*, March 17, 2009, <https://blog.nearfuturelaboratory.com/2009/03/17/design-fiction-a-short-essay-on-design-science-fact-and-fiction/>). Later still, Sterling formally defined design fiction as "the deliberate use of diegetic prototypes," a term defined by David Kirby, another participant in these sessions, as "to suspend

disbelief about change.” See also Torie Bosch, “Bruce Sterling on Design Fictions,” *Slate*, March 2, 2012, <https://slate.com/technology/2012/03/bruce-sterling-on-design-fictions.html>).

16. See Jain’s work featured in Karen Francis Eng, “An Unsettling Peek into the Reality of Life in 2050,” *Ideas.Ted.Com*, December 19, 2017, <https://ideas.ted.com/an-unsettling-peek-into-the-reality-of-life-in-2050/>.

17. See, for example, Jennifer M. Gidley, *The Future: A Very Short Introduction* (Oxford: Oxford University Press, 2017), 7, <https://doi.org/10.1093/actrade/9780198735281.001.0001>.

18. An overview of how Shell used different techniques for forecasting the future can be found in Angela Wilkinson and Roland Kupers, “Living in the Futures,” *Harvard Business Review*, May 1, 2013, <https://hbr.org/2013/05/living-in-the-futures>.

19. More of this history can be found in Fred Turner, *From Counterculture to Cyberculture: Stewart Brand, the Whole Earth Network, and the Rise of Digital Utopianism* (Chicago: University of Chicago Press, 2008).