Stories and Basic Science Collide

AVITAL PERCHER

Short story collections with multiple authors are a curious act. Each story is like a distinct performer given a moment to shine on a shared cabaret stage. But the true test of the show is the whole. Such collections are often not connected beyond a common prompt, leaving the reader to navigate a mishmash of performances and ideas.

This approach works well, however, in *Collision: Stories From the Science of CERN*—first because of its grounding in particle physics, a field whose tangible impact is likely many years away, and second because of the stories' collaborative origins.

The anthology began with scientists submitting writing prompts to authors, who then visited CERN—the European Organization for Nuclear Research—where the writers turned scientific ideas into fantastical short stories. Alternatively put: a group of authors were accelerated in a 27-kilometer-long ring and smashed into a selection of ideas, resulting in a collection that pokes and prods at the meanings and implications of CERN's research. Each story includes an afterword by the scientist who proposed the idea, bringing in the researchers' experiences working at CERN and how the story compares to the current state of research. The overall result is delightful—an imaginative narrative performance, encored with a reflection grounded in reality.

Launched in 1954 and based in Geneva, Switzerland, CERN is the world's largest particle physics laboratory, with more than 12,000 scientists researching fundamental questions, including how dark matter fits into the current model for particle physics. CERN's 2023 budget was $1.3 billion, primarily composed of contributions from 23 European Union member states.

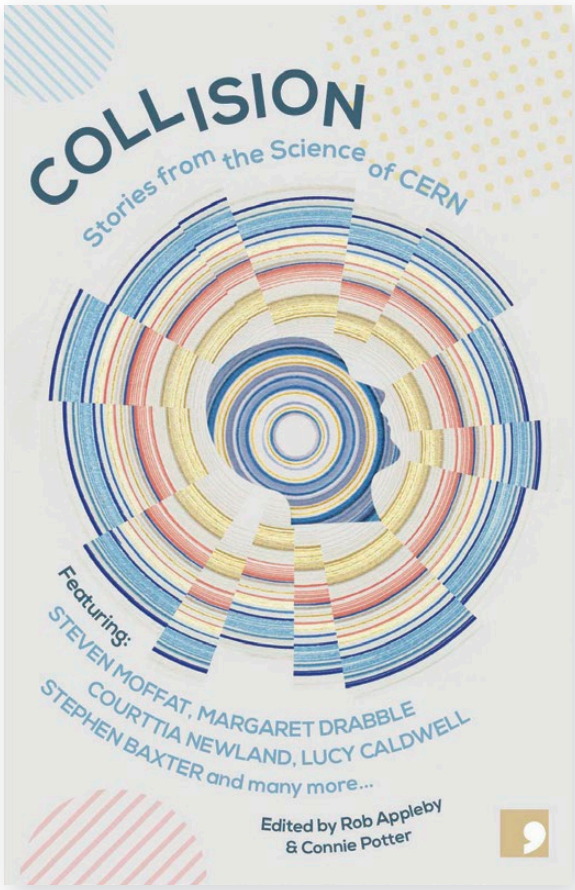
Collision redirects CERN's mammoth enterprise from its usual purpose of exploring the deepest mysteries of the universe to ask a daring question: So what? The anthology shines for readers intrigued by the question of what the field of particle physics means for humanity.

To me, this is as awesome a question as one can find. The exploration of how a discipline of science is shaped by—and also shapes—some aspect of existence is like a multicourse meal. It starts with the motives and moves on to explore how the scientists perceive their work and themselves. Cleanse the palate and delve into what external factors might be influencing the field; where do the CERN chefs source their

ingredients from and how does it affect their recipes? Finally, gorge on the question of what the emerging physics knowledge will do for and to humanity. Fiction provides a unique approach to understanding these questions and connecting social context and personal values.

Collision's stories can be clustered into several themes. First, there are the inner worlds of the scientists. In general, the range of characterizations is refreshing and humanizing. For example, "Side Channels from Andromeda" by Peter Kalu explores how posttraumatic stress disorder complicates a researcher's work and ability to function. In "Marble Run" by Luan Goldie, the protagonist, a scientist and mother, is unable to step away from her work, nodding to the impact that research can have on family responsibilities.

"The Ogre, the Monk, and the Maiden" by Margaret Drabble is one of highlights of the collection. It presents one of the few nontraditional romantic relationships—a triad—that I've come across in the genre. (Others include Robert A. Heinlein's *Stranger in a Strange Land* and *Time Enough for Love*, N. K. Jemisin's *Broken Earth* trilogy, and Martha Wells's *Murderbot Diaries* series.) The story includes a delightful mix of backgrounds and interests for the characters, with one member of the trio originally being a linguist and another "tormented by god and metaphysics and predestination." It reminded me how diverse the driving force behind all scientists' passion for their work actually is—and must be, if they are to achieve the deepest exploration of the unknown. But what truly struck me was how the interactions among the characters represented the space in which their passions and research merged and evolved. There has been momentum within the scientific enterprise to dispel the trope of the lone "hero scientist," in the recognition that teams are more commonly the research dynamic behind advances at the bench. But I believe there is scant fiction that delves into how the backgrounds and relationships of team members themselves might converge in shaping the research.



Collision: Stories From the Science of CERN
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A second theme is the impact of CERN's science on humanity's future. The horizon of technology—the cornerstone of science fiction! Here, though, the book is lackluster. Although fun and well written, the technology-centric stories did not push boundaries or envision new ways particle physics might impact society. In "Skipping" by Ian Watson, two pilots travel to distant worlds through so-called graviton highways. In "Gauguin's Questions" by Stephen Baxter, an artificial intelligence oversees a particle accelerator; this has perhaps become a more pressing topic considering the recent progress of large language models. These stories didn't immerse me in a "future state" through a new capacity emerging distinctly from the field of particle physics, per se. Overall, the tech-focused stories left me wanting more deeply considered possible futures—a result, possibly, of an inability to see the potential effect of particle physics research on humanity, at least in comparison with the well-articulated, near-future ideas that fiction writers have explored in the realms of biotechnology and artificial intelligence.

A third theme of the collection explores what particle physics research means for society. CERN has a particular relevance to this topic due to the lab's significant costs and it being *the* flagship institution for international collaboration on basic research. Several stories are thought-provoking: in "Absences," author Desiree Reynolds imagines a mid-twentieth-century conversation between the American writer and activist James Baldwin and CERN's first director, Felix Bloch. The question of who has the liberty to dwell upon the fate of humankind is as relevant then as it is to today's conversations on who contributes—and shapes—the progress of science. In "Afterglow" by Bidisha, a stereotypical mad scientist runs amok, but the story is refreshingly placed in the context of broader geopolitics and scientific

ambition. A small spoiler: for once, the scientist is the pawn. And to my relief, the collection only includes one dystopian story. In "Cold Open" by Lillian Weezer, several teenagers living amid widespread antipathy toward scientific knowledge excavate the remains of an earlier time when science was not taboo. The story pushes a particular vein of contemporary thinking to such an absurd conclusion that I had difficulty relating; such a reality feels too far away compared to other dystopian futures that loom so close to the horizon.

I suspect the effect of this diverse exploration of the field will vary by audience. Stories like these, grounded in particle physics, might evade meaningful connection, even for readers who are interested in other scientific disciplines. For comparison, a work that takes a brainy physics theme—in this case quantum mechanics—and viscerally explores its impact on humanity's sense of self is Ted Chiang's short story "Anxiety Is the Dizziness of Freedom," published in his 2020 story collection, *Exhalation*.

However, I hope this anthology makes its way to both CERN leadership and reform advocates alike. The responsibilities of leadership extend beyond technical details and long-term strategy. CERN's leaders are luminaries whose word choices influence institutional culture at all levels—and little is as effective as fiction at demonstrating this influence. Even the community at an institution such as CERN—dedicated to objective observation and rational scientific exploration—operates within a social system of values and principles to achieve its technical goals. Stories such as those featured in *Collision* serve as a mirror of scientists' discourse, refracted through the perception of talented writers. I would have loved to see, for example, a story that explored the discussions behind CERN's 25 by '25 initiative, which commits to increasing the percentage of women personnel from 21% to 25% by 2025. Such a story, whether skewering or supportive, would provide CERN's community with another perspective to compare with the bullet points on their slide decks.

Such reflections are a critical self-check for any scientific or technological institution. *Collision* goes a step beyond, asking the scientists themselves to take part in this effort of a collective, artistic exploration of what their enterprise means. In the process, they have created a tool to reflect on how and why society invests in research. May we get to see many more such thought experiments.

Avital Percher *works at the National Science Foundation and was a cofounder of the National Science Policy Network.*