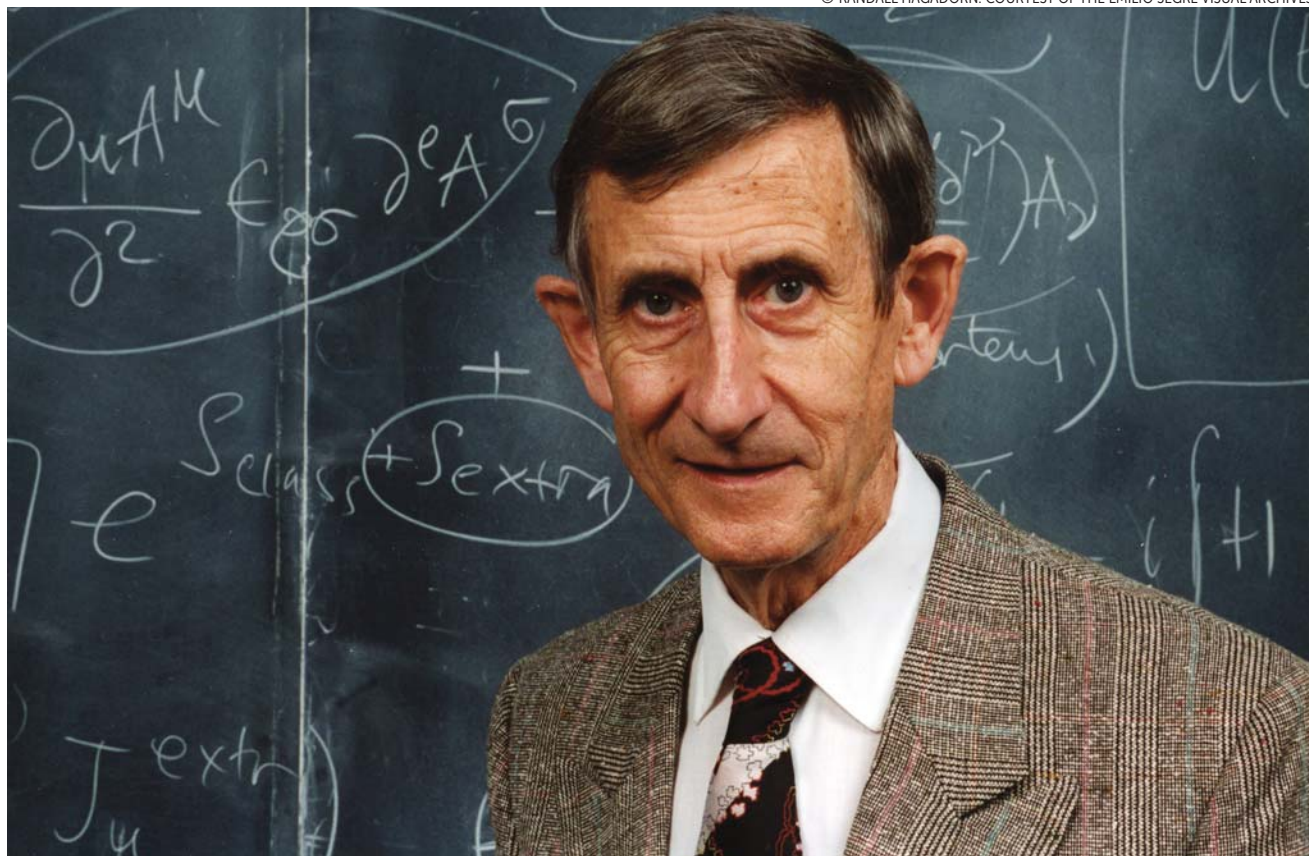




Letters from a remarkable life in science

Freeman Dyson was a good son. When he left his native Britain in 1947 to study physics with Hans Bethe at Cornell University, he wrote to his parents often about his new life in the US. Up to that point he'd been chiefly a mathematician, but his writing showed him to be an astute social observer. "The American picnic is not exactly what we understand by the term," he said in one letter. "It starts out with fried steak and salads, cooked on an open-air grille, and served with plates, forks, and other paraphernalia; this sort of thing, like the elegance of the average American home and of the women's clothes, seems to me rather a rebirth of the Victorian era, flourishing over here by virtue of the same conditions that nourished it in England. . . . I often feel that Victorian England and modern America would understand each

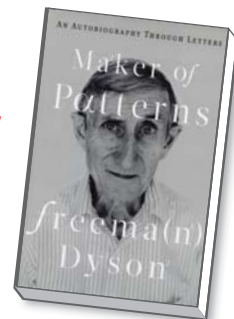
other better than either understands its contemporaries."

Dyson, now 95, is one of the great physicists of the 20th century. He is also the author of roughly a dozen popular books that describe many of his exploits in science and writing. His latest book, *Maker of Patterns: An Autobiography Through Letters*, provides a rich supplement of anecdotes and observations.

Seldom was Dyson the first to discover something big. Instead, he is notable for being among the first to blaze new territory across a range of research. He made significant contributions to adaptive optics, random matrices (a sort of statistical mechanics for nuclei), the scientific approach to the search for extraterrestrial intelligence, the use of fields in condensed-matter physics, the study of the late universe, the consequences of

Maker of Patterns
An Autobiography Through Letters

Freeman Dyson
Liveright, 2018.
\$27.95



not-so-constant fundamental constants, and the stability of matter. He also contributed to advances in climate change modeling when he worked at Oak Ridge National Laboratory in the 1970s.

The nonscientific public, if they know of Dyson at all, will have heard about his skepticism of the impact of climate change. That skepticism has put him at odds with many of his friends who, like him, hold generally progressive political views.

Physicists chiefly know Dyson for his contribution to the development of quantum electrodynamics in the late 1940s. In a 1949 paper for *Physical Review*, he synthesized two rival theories: the

field approach developed by Sin-iti Tomonaga and Julian Schwinger, and Richard Feynman's so-called path-integral approach. Because of his explanatory powers, the young Dyson—then just 25—became the bearer of the new quantum gospel to physicists in the US and Europe. For several years the diagrams used to depict quantum interactions, now known as Feynman diagrams, were called Feynman–Dyson graphs.

The 1965 Nobel Prize in Physics recognized Tomonaga, Schwinger, and Feyn-

man for their quantum electrodynamics work; Dyson did not share in the award. But as his letters show, he knew even as the work was being done that the other three men were the true discoverers and he was merely the expositor. In a letter to his parents in 1948, he described a journey he made to try out his new ideas on Feynman at Cornell: "He said he had given his copy of my paper to a graduate student to read, then asked the student if he himself ought to read it. The student said no, and Feynman accordingly

wasted no time on it and continued chasing his own ideas. Feynman and I really understand each other; I know that he is the one person in the world who has nothing to learn from what I have written, and he doesn't mind telling me so. That afternoon Feynman produced more brilliant ideas per square minute than I have ever seen anywhere before or since."

In addition to his scientific work, Dyson has some important engineering achievements, such as helping to develop adaptive-optic techniques and designing an intrinsically safe nuclear reactor that is still in use today for training and for producing medical isotopes. More important still is Dyson's work as a popularizer. For many decades now, mostly in the pages of the *New York Review of Books*, his essays have helped readers understand what it's like to be a scientist. His mathematical, scientific, and engineering skills have allowed him to estimate and describe the efficacy of various physical phenomena—a talent especially suitable for imagining the prospects for humans to travel to the far corners of the solar system.

What makes Dyson's letters a remarkable window into US history is that he is no mere expert; he was a witness to many of the events he describes. Consider one final example. In August 1963, when he was living in Washington, DC, and working at the Arms Control and Disarmament Agency, Dyson wrote two letters home to his parents. The first described his role in shaping the Limited Test Ban Treaty and the testimony he gave before the Senate.

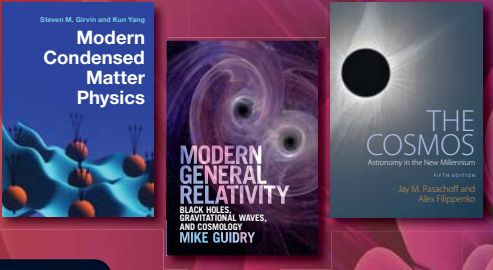
The second, written a day later, described Dyson's participation in a march in DC and a speech he heard from one of its organizers. "From two till four they had the official speeches at the Lincoln Memorial. It was very effective to have the huge figure of Lincoln towering over the speakers," he wrote. "The speeches were in general magnificent. All the famous negro leaders spoke, except James Farmer, who sent a message in writing from a Louisiana jail. The finest of them was Martin Luther King, who talks like an Old Testament prophet. He held the whole 250,000 spellbound with his biblical oratory. I felt I would be ready to go to jail for him anytime."

Phillip F. Schewe
Silver Spring, Maryland



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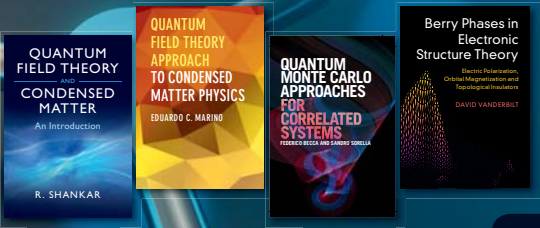
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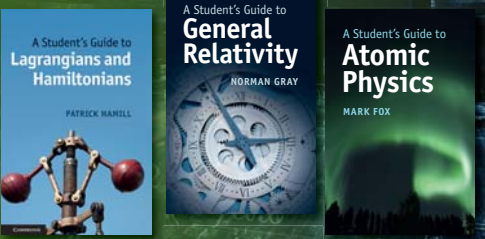


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