

The realistic reductionist

Lake Views

This World and the Universe

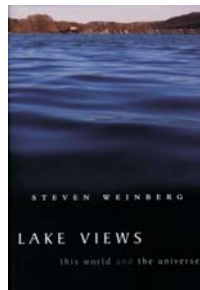
Steven Weinberg

Harvard U. Press, Cambridge, MA,
2010. \$25.95 (272 pp.).

ISBN 978-0-674-03515-7

Reviewed by Leonard Susskind

I've long been a Steven Weinberg fan, so I accepted the offer to review *Lake Views: This World and the Universe*. It's the first time I've ever agreed to review a book. And I'm glad I did. *Lake Views* is a very readable account of Weinberg's thoughts about science, politics, and life, conveying both his deep intelligence and his ruthless pursuit of truth—in physics, philosophy, and even public policy. Yet this intellectual warrior also comes off as a kind and sympathetic man who respects others, even his intellectual enemies.



By inclination, Weinberg is an extreme reductionist. But he is also a realist and acknowledges when something is not working the way he might want it to. In 1987 the arch-reductionist concluded that certain facts seemed to be inconsistent with any explanation based on the usual kind of mathematical reasoning. Instead, it seemed they might be true only because if they were not, we observers could not be here to observe them. Weinberg undoubtedly disliked such anthropic-principle explanations. But when, to his disappointment, he found that the anthropic principle might explain the apparent vanishing of the cosmological constant, he said so loudly and clearly, despite the great hostility of the physics community toward the principle.

Lake Views is a collection of essays that appeared in the *New York Review of*

Science. In the essay "What Price Glory," we learn about the invention of the stirrup, which Weinberg says was a work of genius—but completely ineffective against infantry. In the essay "Without God," Weinberg the unapologetic atheist and unyielding enemy of irrational faith makes his appearance. And in "Against the Boycott," Weinberg exposes the extreme one-sided prejudice of a mindless boycott of Israeli academics by leftist British academics. There is much more, beautifully written, often entertaining, and always thought provoking.

Books, here in *PHYSICS TODAY*, and in other periodicals over the past decade. The primary title doesn't suggest much, other than that the author's study overlooks a lake. The subtitle—*This World and the Universe*—is more revealing. Understanding the universe has always been Weinberg's scientific passion. For example, he discusses the fate of humans in the universe in two essays, "The Future of Science and the Universe" and "Living in the Multiverse." In response to Freeman Dyson's optimistic view of the far future, Weinberg, ever the realist, states that the laws of nature do not allow life to go on forever. Weinberg is not by nature a pessimist: He is a lively, sociable—at times even jolly—conversationalist who always seems to enjoy life. But he prides himself on being a person who is not in denial. If modern physical theories imply that protons and nuclei will all eventually decay, then life will eventually expire, and that, according to Weinberg, is just the way it is.

Weinberg also has much to say about this world, meaning human culture, history, and politics. Several of the essays express his longtime hope to see nuclear disarmament, or at least nuclear-weapons stability. The views expressed in his essays "On Missile Defense" and "The Growing Nuclear Danger" are informed: Weinberg remarks, "In one way or another, I have been involved with ballistic missile defense for almost half a century." He collaborated on a book with the late US senator Edward Kennedy opposing Richard Nixon's missile defense system and was a member of JASON, an independent group of scientists that advises the US government on matters of science and technology. Weinberg concludes in his essays that missile defense is almost certainly more dangerous than no missile defense and that ballistic missiles are the least likely of all possible ways to deliver nuclear weapons. That response is not knee-jerk liberalism but, rather, a carefully thought-out argument, gracefully explained. Weinberg obviously hates nuclear weapons, but he knows full well that in the present dangerous world it may not be feasible or even desirable to completely disarm.

Many other fascinating and unex-

pected insights inhabit *Lake Views*. In the essay "What Price Glory," we learn about the invention of the stirrup, which Weinberg says was a work of genius—but completely ineffective against infantry. In the essay "Without God," Weinberg the unapologetic atheist and unyielding enemy of irrational faith makes his appearance. And in "Against the Boycott," Weinberg exposes the extreme one-sided prejudice of a mindless boycott of Israeli academics by leftist British academics. There is much more, beautifully written, often entertaining, and always thought provoking.

Nevertheless his outlook and mine do occasionally differ. I could have been mistaken, but I felt while reading "Waiting for a Final Theory" that Weinberg believes we may be on the brink of a final theory. He suggests that it may only be a matter of putting together general relativity with quantum mechanics and the standard model of particle physics, and possibly using string theory. He says, "Such an understanding could be achieved tomorrow by some bright graduate student, or it might just as well take another century or so." He seems to think that what we now know may be more than what we have yet to learn. That's not what I think. The enormously puzzling paradoxes that quantum mechanics presents, the mystery of the principle that says the world is a kind of hologram, the inconsistencies that arise when theorists try to apply probability to the multiverse—all these things make me think that even if that bright graduate student would put together a stringy description of the standard model, we would still be far from a final theory. Frankly, though, if there were not things to disagree about, I would find *Lake Views* less interesting.

More often than not, when I read Weinberg's writings, I feel that I'm in an echo chamber, so close are our views. I don't know if the similarity of outlook represents something deep or just the fact that we grew up in the same era, in the same neighborhood in the Bronx. But any serious reader, regardless of outlook, will ponder Weinberg's *Lake Views* long after finishing the book.

Leonard Susskind is the Felix Bloch Professor of Physics at Stanford University in Stanford, California. His current research includes gauge theories, quark confinement, gravity in lower dimensions, quantum cosmology, and models of internal structure of hadrons.