Reviews

John Ellis

A trip through Weinberg's world

Life, the universe and everything
Steven Weinberg's latest set of essays covers a multitude of subjects.

Lake Views: This World and the Universe

Steven Weinberg
2010 Harvard University Press
£19.95hb 272pp

Steven Weinberg is a thinker of immense breadth and depth, a "scientific intellectual" of a kind that has become all too rare. One of the world's leading theoretical physicists, he shared the 1979 Nobel Prize for Physics for his work on the unification of electromagnetism with the weak force responsible for radioactivity. By then, he had already made his first foray into popular-science writing, discussing cosmology – not his primary specialty – in *The First Three Minutes*. In 2001 he extended his reach, setting out his trenchant views on subjects ranging from physics to the culture wars in a book of essays called *Facing Up: Science and Its Cultural Adversaries*.

Now, in his latest collection of essays, *Lake Views: This World and the Universe*, Weinberg has gone even further afield, writing again about physics but also more generally about science and philosophy, about defence and space policy, and about politics and (lack of) religion. Each of the essays dissects one of these subjects with the same logic, clarity and single-mindedness that his colleagues appreciate in Weinberg's research papers.

For physics students, Weinberg's essay on Einstein's ill-fated quest for a theory unifying gravity and electromagnetism should be required reading. He also cogently covers the twists and turns of what Einstein called his "greatest mistake": the cosmological constant, which has recently turned out to be one of Einstein's deepest insights – a salutary example of the principle that whatever is not forbidden by symmetry is generally compulsory. Similarly, students of physics and maybe others will value Weinberg's expositions of the Standard Model, dark energy, the multiverse and the search for a "final theory". Another interesting physics essay is about J Robert Oppenheimer, whose steely combination of intellect and principle, we learn, inspired Weinberg to pursue a career in theoretical physics.

Weinberg's lawyerly dissection of Steven Wolfram's claims to have initiated a new type of physics is also instructive. Very politely, and very systematically, he demolishes Wolfram's specific assertions about cellular automata while emphasizing the intrinsic interest of this aspiration. Many feel the urge to overturn the hegemony of quantum field theory, but Wolfram's ideas were insufficiently original and powerful to subvert it. For the time being, it maintains its tyranny as the basic framework for describing fundamental physics.

For me, one of the most stimulating essays in this collection is that on the nature of scientific explanation. All would-be philosophers of science would be well advised to read it carefully. Yet Weinberg has not entirely given up on social science; indeed, in a separate essay, he waxes optimistic about an impending truce in the "culture war" between scientists and sociologists of science. I wish I could share this rosy view, but as the recent Large Hadron Collider "black hole" scare and the ongoing climate debate indicate, the authority of science is still continuously challenged.

Another set of essays that I appreciated greatly was that on missile defence and space policy. Weinberg is a well-read amateur military historian with extensive experience as a Jason consultant for the US military, but he is no hawk. Instead, his dealings with the military-space-industrial complex seem to have sensitized him to the insanities in schemes for antiballistic-missile defence and manned spaceflight, and he pulls few punches in condemning them here. After reading one particularly excoriating passage, I almost pity any hapless Air Force general or politician who might, at some point, be on the receiving end of Weinberg's inquisition.

His observations on the mentality that leads to such misguided thinking are also instructive. Indeed, one of the most fascinating essays in the volume describes how the pursuit of glory has led repeatedly to poor military choices. Reading this, I could not help but reflect that theoretical physicists are similarly prone to making poor judgements when motivated by searches for personal glory – with the notable exception of Weinberg himself.

All of the essays in this group will

On that occasion, Weinberg's sense of grievance and subsequent actions were understandable. However, his decision (which he describes in a footnote) to cancel attendance at a 2007

If more of us could view things as rationally as Weinberg does on his lakeshore, our world would be the better for it

Imperial College conference that honoured his old friend Abdus Salam – this time because the National Union of Journalists voted for a boycott of Israeli products – left many of its participants disappointed and perplexed. We hope to see Weinberg return to the UK soon, as he says he doubtless will. There is much material for reflection

tion in these essays – for the person in the street as well as for the student, postdoc, senior scientist, philosopher or politician. If more of us could view the subjects of these essays as rationally and coolly as Weinberg does on his lakeshore, our world and our public discourse would be the better for it. To many, the most poignant essay in this collection may be the last one, in which Weinberg takes on religion. Less provocative than the biologist Richard Dawkins, Weinberg is nevertheless an outspoken atheist, who finds “a certain honour, or perhaps just a grim satisfaction” in facing up to an uncaring universe “with good humour, but without God”. At the end, one is left with an intriguing mental image: Weinberg gazing calmly into the metaphysical distance across his Texas lake, quietly prepared to meet his final theory.

John Ellis is a theoretical physicist at CERN,
e-mail john.ellis@cern.ch

Web life: The Unidentified Aerospace Phenomena Observations Reporting Scheme

Strictly speaking, a UFO is not the same thing as an alien spacecraft. However, the strong association between unidentified flying objects and little green men has led scientifically minded observers to adopt the less-emotive term “unidentified aerospace phenomena” (UAP) to describe various weird things that appear in the sky. In that spirit, the UAP Observations Reporting Scheme and its associated website has two goals: to help amateur and professional astronomers figure out what they have seen; and to collect reports of truly inexplicable events for further study.

Your first port of call should be the website's

extensive and well-illustrated list of misidentifications. That dancing blob of light you saw in the sky last night, for example, might have been upper-atmospheric lightning (also known as a "transient luminous event") or perhaps an aurora. A smaller, darting light could be a star or planet, both of which can sometimes appear to move against a dark background due to an optical illusion called autokinesis. There are also plenty of artificial objects to rule out, from disintegrating satellites to advertising blimps, helicopters and Chinese lanterns. In addition to photos, each misidentifications page includes a "telltale signs" section with practical tips to help users determine whether they have found the right explanation. If all this seems confusing, you might try downloading one of the site's flowcharts, which guide observers to the correct answer by asking a series of questions such as "Is it stationary?" and "Did it last more than 20 seconds?"

There is a separate set of pages for common daytime misidentifications. These include mundane things such as insects and birds, but also lenticular clouds, which form when stable, moist air flows over mountains. These clouds often take on the classic "flying saucer" domed-disc shape and may appear alone or in groups. Kites and other wind-borne objects such as weather balloons can also look like spacecraft to the untrained observer, especially if they are covered in holographic foil.

The site's blog contains a running list of recent UAPs and their explanations. Unfortunately, this page is a little light on content at the moment, with the most recent photos posted in late January. However, it does include some nice images of a funny-looking aurora borealis and of a Russian missile test that failed rather spectacularly over the Norwegian city of Tromsø in December 2009. And site administrator Philippe Ailleris – an amateur astronomer based in the Netherlands – has recently posted a notice inviting people to send in more strange sightings, so it is worth checking back occasionally to see if anyone has spotted something new.

Simple: you report it. To do this, you will need to download a form from the site and fill out a four-page questionnaire on what you observed. Be prepared to describe not only what you saw, but also anything you heard or, yes, smelled during the event, and to give your honest assessment of the probability that what you saw was some kind of hoax or well-established phenomenon. The form also asks for "support information" such as photos and audio or video recordings. Whatever you saw, the explanation is likely to be interesting – even if it turns out not to have been a genuine close encounter.