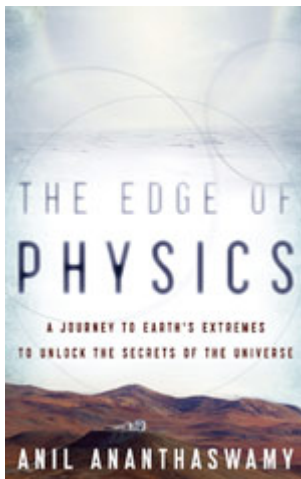

CERN Courier

CERN COURIER

Jul 20, 2010

Bookshelf

The Edge of Physics: A Journey to Earth's Extremes to Unlock the Secrets of the Universe by Anil Ananthaswamy, Houghton Mifflin Harcourt. Hardback ISBN 9780547394527, \$25. Paperback ISBN 9780547394527 \$15.95.



(http://images.iop.org/objects/ccr/cern/50/6/21/CCboo1_06_10.jpg)

Ananthaswamy (http://images.iop.org/objects/ccr/cern/50/6/21/CCboo1_06_10.jpg)

In his recent book **The Edge of Physics**, Anil Ananthaswamy, a science writer for **New Scientist**, covers the most extreme physics and astronomy experiments that are set to uncover the secrets of neutrinos, dark matter and dark energy, galaxy formation, supersymmetry and extra dimensions. The author takes us on an extraordinary journey over five continents to tour the best telescopes and particle detectors, from the summits of the Andes to deep down in the Soudan mine, stopping by the South Pole and paying a visit to CERN. Following him on this trip is already exciting, but reading his account of discussions with physicists, astronomers and engineers along the way is simply fascinating. He tells us about each experiment as he discovered them through discussions with the scientists involved. For example, he writes about the ATLAS experiment through the eyes of Peter Jenni, Fabiola Gianotti and François Butin, with added insight from a meeting with Peter Higgs.

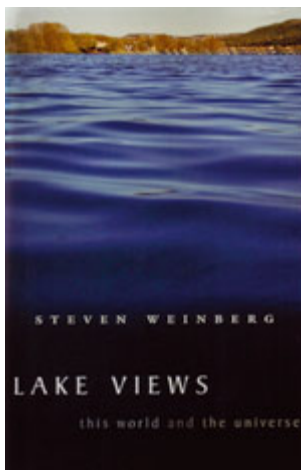
This makes for lively reading about all of these experiments. He not only tells us the most striking details about how each one was built, but he also includes accurate information about the science and technology behind them, avoiding clichés in his efforts to make it

understandable to all. You read about his stay at Lake Baikal, discussing neutrino physics with enthusiastic and dedicated physicists such as Igor Belolaptikov and Ralf Wischnewski, sharing stories and vodka with them on the shores of Lake Baikal in the midst of winter – the only time that the photomultiplier tubes of the underwater neutrino experiment can be serviced from the frozen surface of the lake. The reader learns about the scientific research at all of these places through personal accounts from the scientists involved. At times, it felt as if I was meeting old friends at a conference and hearing their best stories about their experiments, sharing their enthusiasm and discovering unknown details about their research.

The Edge of Physics also allowed me to learn more about the best astronomy instruments, some located in idyllic places such as Hawaii, while others are under construction in the least life-sustaining places, such as in the Karoo desert in South Africa or the Hanle Valley in India. Ananthaswamy's book is as much a tribute to the science as it is to the dedicated scientists pushing the limits of knowledge. His clear explanations and entertaining style will appeal to scientists and non-scientists alike. A book not to be missed.

Pauline Gagnon, Indiana University and ATLAS.

Lake Views: This World and the Universe by Steven Weinberg, Belknap Press/Harvard University Press. Hardback ISBN 9780674035157, \$25.95.



(http://images.iop.org/objects/ccr/cern/50/6/21/CCboo2_06_10.jpg)

Weinberg (http://images.iop.org/objects/ccr/cern/50/6/21/CCboo2_06_10.jpg)

This book collects some essays and book reviews written by Steve Weinberg between the years 2000 and 2008. They were written in his study at home, from where the author can see Lake Austin. In 25 chapters he covers an impressive number of subjects ranging from

military history to his review of Richard Dawkins' book **The God Delusion**, passing through fundamental physics, missile defence, the boycott of Israeli academics and even offering some advice to young students and postdoctoral fellows.

As with previous books, one is captivated by the depth and breadth of his knowledge, the elegance of his prose and his intellectual honesty. In each chapter there is a preamble where he explains the origin of the article, whether it was asked for by different journals or as an exposition to a learned society; an afterword reveals some of the reactions his views have elicited.

An important part of the book is dedicated to the current theory of multiverses and string landscapes. To a certain extent all of these developments were inspired by his remarkable work in the late 1980s (explained in the book) where he used anthropic reasoning to understand (if not explain) the possible value of the cosmological constant, also known as the dark energy of the universe. It is quite remarkable that the value derived from the observations carried out by groups studying galactic redshifts, as well as from the Wilkinson Microwave Anisotropy Probe satellite, are in good agreement with the values favoured by his analysis. The sections of the book describing this work, dealing with Einstein's famous blunder, are a masterpiece of insight and deep mastery of physics.

In other chapters, covering the humanities or religion, he takes his usual "rationalist, reductionist, realist and devoutly secular" viewpoint. Unlike Dawkins, his discourse is not the one of a "born-again atheist" (my quotes), but rather he explains his point of view in a relaxed form not devoid of humour. The effect of the relevant chapters is probably much stronger in US society, where religion plays a much bigger role than in Europe, where a large number of scientists, humanists, politicians and ordinary citizens would easily agree with his discourse. He raises provocation to the level of an art.

Another theme addressed in these essays is the ongoing discussion with philosophers or theologians on the notion of whether science explains only the "how" and not the "why" of things. He makes it very clear that the laws of nature have no purpose, and that the only legitimate purpose of science is to understand the basic laws that rule the universe. Finality is not the aim of science, but that does not make it a lesser element in the human endeavour to understand the universe that we live in.

Weinberg has not lost his punch. Far from that. This book is thought provoking, informative, challenging and fun to read. A single fault: it is too short.

Luis Álvarez-Gaumé, CERN.

Page 1: **Bookshelf**

Page 2: Bookshelf (page 2)

Page 3: Bookshelf (page 3)