One giant peep for mankind

CHRISTOPHER POTTER

KNOCKING ON HEAVEN'S DOOR by LISA RANDALL
Bodley Head £20
ebook £20.87 pp464
THE MAGIC OF REALITY
by RICHARD DAWKINS
Bantam Press £20
ebook £20.87 pp272

Lisa Randall — a professor of particle physics and cosmology at Harvard — needed to vent her frustration about "the way science is currently understood and applied". Knocking on Heaven's Door, written with dry wit and ice-cool clarity, is the result.

Modern science, as Randall tells it, is the story of how humans have used technology to extend the reach of their senses. Four hundred years after Galileo placed a couple of lenses in a tube and swung the crude device up into the night sky, the telescope has become the space observatory. Galileo was the first human being to see clearly the mountains on the Moon. The Planck spacecraft, launched in 2009, was sent out to look for the faintest evidence of radiation left over from the big bang. It is not due to deliver its best data for several years yet.

At the other end of the scale is the particle collider, which, by injecting and concentrating large amounts of energy into tiny regions of space, occasionally and fleetingly calls into existence the tiniest constituents of the fabric of reality. The Large Hadron Collider (LHC) at Cern will not be operating at full power for a year or two, but it already produces so much data that it may take several more years before any discoveries can be claimed definitively.

It is easy to be overwhelmed by big science but, as Randall points out, scientists don't usually set out to answer the big questions; they are much more likely to become obsessed about some small question that they then worry at tenaciously, sometimes for years. The irony of the LHC is that although it is enormous — 27 kilometres of tunnel four metres wide built deep underground, housing 1,232 magnets each weighing 30 tons — what is truly jaw-dropping about it is the fineness of the measurements being made. Individual proton collisions carry no more kinetic energy than two mosquitoes flying into each other, and even then most of the energy of the collision is carried forward with the rest of the beam as it makes its 11,000 circuits of the tunnel every second.

Out of years of data — the accumulated record of a billion collisions every second — evidence from just a handful of collisions of the right sort may be all that is needed to point current theory in a completely new direction. The history of physics is one of increasingly subtle and refined measurement made by increasingly ingenious and indirect means. Knocking on Heaven's Door is a book that anyone at all interested in science must read. This is surely the science book of the year.

Richard Dawkins's latest book is a surprise. The man who is fast becoming the nation's irascible teddy bear has written a delightful book for children (it may tempt parents, too). The Magic of Reality is a charming and free-ranging history of science. Go back through the family photo album and meet your 170,000,000th great-grandmother, or learn how we come down with flu. Imaginatively chosen detail — did you know that there's an Alaskan frog that spends winter frozen into a block of ice? — keeps the narrative lively. I wish there had been such a book when I was a schoolboy. I would have devoured it, and pored over the beautiful illustrations (by Dave McKean). I would probably even have enjoyed Dawkins's retelling of various ancient myths he has collected from cultures around the globe and through history. As an adult these sections feel like mild propaganda.

Available at the Bookshop price of £16 (Randall) and £17 (inc p&p) and £20.37 (ebooks) on 0845 271 2135