Not only does the book concentrate more on the scientists than do similar books, it also goes beyond the usual familiar narratives, giving credit where it is due and providing more background, and should be valuable to anyone interested in an accurate but non-technical history of astrophysical black holes. — PHILLIP HELBIG.

*Reference*

(1) J. M. Maldacena, *Adv. Theor. Math. Phys.*, **2**, 231, 1998; *Int. J. Theor. Phys.*, **38**, 1113, 1999 (reprint).

**The Beauty of Falling: A Life in Pursuit of Gravity**, by Claudia de Rham (Princeton University Press), 2024. Pp. 231, 22·5 × 14·5 cm. Price £49·99/$64·99 (hardbound; ISBN 978 0 691 23749 7).

In this book, Swiss-born Claudia de Rham, now a professor at Imperial College, mixes descriptions of her work on gravitation with that of her (initially very successful but ultimately failed) quest to become an astronaut as well as those of other details of her life (*e.g.*, her childhood in several countries, learning her native language French from a Swedish mother in Peru, managing two careers in gravitational physics with her husband Andrew Tolley and their three daughters). The personal details are strewn throughout the book, which is best described as an introduction to the physics of gravitation together with a summary of modern developments, in particular those in which she has been involved (especially massive gravity). Seven chapters cover Special Relativity and the equivalence principle; curvature; tides and gravitational waves; singularities (after more details on her quest to become an astronaut, foiled by a positive test for latent tuberculosis, probably from her time in Madagascar); dark matter, dark energy, vacuum energy, and the cosmological-constant problem; massive gravity (*i.e.*, a theory in which the graviton has a non-zero rest mass); and (possible) tests of massive gravity; a short concluding chapter ends the main part of the book, followed by a two-page bibliography (mostly technical papers) and an eleven-page index, both in small print. There are a few black-and-white diagrams and photos scattered throughout the book (including one of the Einstein equation as graffiti on an abandoned locomotive in Bolivia) and fortunately footnotes rather than endnotes.

Of the many books I've read on General Relativity (GR), this is probably the best non-technical description (there are only very few equations, usually not part of the main narrative) — as simple as possible, but not simpler*. That is partly because she isn't attempting too much, but rather concentrating on aspects which lead up to her own work; it is also because she does a very good job describing a rather technical topic. (Qualitative analogies are always misleading at some level, but she emphasizes the weaknesses of some common qualitative descriptions of GR without finding them totally worthless.) The description of her own work on massive gravity bridges the gap between purely qualitative descriptions and the technical literature; we meet ghosts, extra dimensions, and types of gravitational-wave polarization which don't exist in unmodified GR. However, a common mistake is repeated, namely that Eratosthenes

*A saying attributed to Einstein, who at least said something similar.[1]

demonstrated that the Earth is round. (In fact, his method of measuring the circumference of the Earth requires two assumptions: that the Earth is round and that the Sun is far enough away for its light to be considered parallel. An observer on a flat Earth would see a nearby Sun at a different height above the horizon at noon depending on 'latitude'.) Some order-of-magnitude estimates appear to be wrong probably due to typos or bad editing, but I can't figure out how she could conclude that two astronauts initially one metre apart would, due to their mutual gravitational attraction, be moving as fast as garden snails after only a few milliseconds. (The point was to demonstrate the weakness of gravity; fortunately it is so weak that overestimating it by several orders of magnitude still results in a relatively weak force.) It would have been nice to know why she thinks that the Universe is probably infinite.

Despite my minor quibbles this book was a very enjoyable read and for some could be a good first book on GR, giving not only a broad overview but also highlighting current work in the field and, *via* both unsolved puzzles and the author's own enthusiasm, explaining the beauty of falling for gravity. — Phillip Helbig.

*Reference*

(1) https://quoteinvestigator.com/2011/05/13/einstein-simple/

**Space Oddities: The Mysterious Anomalies Challenging Our Understanding of the Universe**, by Harry Cliff (Picador), 2024. Pp. 285, 19·5 × 13 cm. Price £10·99 (paperback; ISBN 978 1 5290 9288 2).

Harry Cliff is a particle physicist at the University of Cambridge working on the *LHCb* experiment at CERN. This is his second popular-science book, and his interest in outreach also led to a joint post between Cambridge and the Science Museum in London (2012–2018).

Although David Bowie is not mentioned in the book, the title is an obvious nod to one of his songs. However, not all of the oddities concern space (*i.e.*, astrophysics); there are also chapters on anomalies in particle physics as well as in the overlapping field of astroparticle physics. The book begins with a quote from my childhood hero Isaac Asimov: "The most exciting phrase to hear in science, the one that heralds new discoveries, is not 'Eureka' (I found it!) but 'That's funny...'." Or, as Robert Pirsig put it, "The TV scientist who mutters sadly, 'The experiment is a failure; we have failed to achieve what we had hoped for', is suffering mainly from a bad scriptwriter."[1] After a prologue discussing anomalies in general *via* some specific examples — explored in more detail later — and the first chapter on the standard model of cosmology, Cliff takes us on a tour of about a dozen anomalies, starting with two, the anomalous precession of the perihelion of Mercury and the Lamb shift, the resolution of both of which turned out to be new physics (resolution (*a*)). If theory and experiment disagree, there are three possible explanations other than new physics: a mistake in the experiment (*b*), a mistake in the theoretical prediction (*e.g.*, a mathematical error or failing to take a significant effect into account) (*c*), or a statistical fluke (*d*).

The third chapter discusses, in addition to some background on statistics, two claimed detections which do not point to new physics: the *BICEP2* debacle (which was very bizarre but more or less falls into (*c*), though not for the