make sense of new knowledge. Louise and Steven passionately shared their life experiences as academics in search of truth. Each had a study as a place for quiet work at home. Steven recounts (page 112) that he became habituated at working from his desk overlooking the garden. We are in the time of the Vietnam war, when Steven spent his time on informed interest in international affairs, trying to make sense of the new world order. Louise steered him away from the dismal company of disheartened older men and directed her young husband to get back to working on physics. Steven writes: "I do not exaggerate when I confess that she saved my life", a great life in physics no less. Weinberg's prose style is redolent of Émile Zola's novelistic realism, which blends rather well with the racy travelogue approach of Gamow's *My World Line* (Viking, 1970). Weinberg is instructive on how one should write history of science in a contemporary style, composed of social contexts, complex conundrums, and conflicting conclusions. Echoing Copernicus (1543), I recommend diligent readers "to buy, read, and enjoy this work." — Simon Mitton.

The Known Unknowns: The Unsolved Mysteries of the Cosmos, by Lawrence M. Krauss (Head of Zeus), 2024 (originally published in 2023). Pp. 373, 20 × 13 cm. Price £9·99 (paperback; ISBN 9781801100656).

Lawrence Krauss has worked at various US universities in several fields related to cosmology and particle physics (including strong gravitational lensing, so his papers on that topic crossed my desk back at the beginning of my career — yes, real papers and a proper antique desk back then) and has written around a dozen popular-science books (of which so far, apart from this book, I've read only his biography of Richard Feynman). The title refers to a famous quotation by former US Vice President Dick Cheney, which follows one by Feynman in which he notes that he isn't frightened by not knowing things.

Space, time, matter, life, and consciousness. Those are the topics explored in the corresponding five chapters. While the known unknowns are mentioned, most of the text is a presentation of what we do know. Of course, 36–60 pages per topic is not anywhere near enough to give a complete overview; rather, there is a very broad-brush summary and a few topics are discussed in somewhat more detail. Readers familiar with a topic will thus probably find little that is new, and even the known unknowns might be familiar. Each chapter begins with a list of a handful of questions, the answers to which are always 'We don't know.' One example from each chapter: 'Does time have a beginning?', 'Are there hidden dimensions?', 'Will matter end?', 'Is DNA life unique?', 'Can we create [consciousness]?' While those questions are discussed in the corresponding chapters, they are not a table of contents: the order isn't always the same, and they arise in the context of discussion of more specific topics.

There are some good discussions, such as the relationship between the geometry and destiny of the Universe and how that is affected by the presence of a cosmological constant or some more bizarre form of dark energy, a topic often presented wrongly. The book is well written and a good mixture of the current consensus on various topics and the author's own opinions. I learned a few things, such as the puzzle of conflicting measurements (depending on the method) of the half-life of the neutron. However, I'm struggling to find the target readership. Those familiar with the topics will already know the known unknowns. Those who aren't can't get an impression of how they relate to the rest of the corresponding field from the information provided here. (Having said that, discussion of a few topics in a bit more detail avoids repeating broader

but shallower capsule summaries of entire fields.) They could also be led astray by statements such as that dark energy causes the Universe to expand, or an unfortunate typo (resulting in an essentially opposite statement) in the otherwise good discussion of why the net electric charge in a spatially closed universe must be zero. Most readers of this *Magazine* will probably be more familiar with the first three chapters than the last two and might very well learn more from them, but by the same token it would be difficult to appreciate Krauss's description of the known unknowns if they don't know the known knowns.

There are no figures and neither footnotes nor endnotes. The seventeen-page index is quite thorough for a book such as this one, though unusually not set in a smaller font than the main text. Despite my qualms, this is not a bad book by any means, but one of those which the potential reader should browse personally first (as indeed I had done before I bought it) in order to decide whether it is worth reading. — Phillip Helbig.

Amazing Worlds of Science Fiction and Science Fact, by Keith Cooper (Reaktion), 2025. Pp. 248, 21·5 × 14 cm. Price £15 (hardbound; ISBN 978 1 78914 994 4).

Planetary science and Science Fiction (SF) were always closely related. Well before *Sputnik* in 1957, some of SF's earliest writers (*e.g.*, Verne and Wells) and indeed hugely influential, 1950s-based ones (*e.g.*, Asimov, Clarke, and Heinlein) often looked up at the (mainly) night sky and postulated. Here, Keith Cooper (*Astronomy Now*'s editor) brings these two areas back into focus. Within SF, barren, dry Tatooine (*Star Wars*), spice-laden Arrakis (*Dune*), and icy Gethen (*Left Hand of Darkness*) are themselves spectacular but there are real, strange exoplanets out there (*e.g.*, the Trappist-1 system, Proxima b, Kepler 16b, and LHS 1140b).

Earlier SF lacked much of the data we now have but many current writers use up-to-date information in formulating their scenarios. This is not only due to the marvellous 2·4-m *Hubble* but also because of its more recent and powerful 6·5-m upstart — the *JWST* (both outside our protective atmosphere). The book's appendix lists a number of SF scribes consulted and also has a column (nice!) of major SF novels, films, and TV (all referenced therein).

The cover and book title 'nods' to *Amazing Stories* — a US-based 1950s 'pulp', comic-like paperback publication. Carrying many now classic SF short stories, it was often taken to the UK (as ship's ballast). Cooper also deals herein with the Earth Similarity Index — our own planet being of course 1·00. The nearest to us in said Index — Teegarden's Star — has 0·95, though that exoplanet is not at all like ours in many ways. And so far, we appear to be alone.

Cooper also deals with biosignatures (phosphine and dimethyl sulphide) — strong signatories of possible life elsewhere. And our own Solar System has prime candidates: not only Jupiter's Ganymede, Callisto, and (*vide* Clarke's *2010* novel/movie) Europa, but also Saturn's Enceladus. And all amino acids linked to life are left-handed whereas sugars are right-handed. The text here ranges over many other scientific items (including Roche limits, magnetic pulsars, extratrojans, ecumenpolises, and Dyson spheres).

Cooper's book contains a lot of data but no mathematical formulae. And it is nice when he uses such terms as 'astronomical unit' or 'parsec' and then defines them. This tome appears to be targeted at SF readers and those (non-professional astronomers) who enjoy popular science. However, many in the astronomy field will also enjoy this. I certainly did. Recommended. — David Lally.