the audience of his view on that topic at a recent philosophy-of-cosmology conference I attended in Milan). Pontzen speculates that such a simulation might employ sub-grid methods, as one would need the entire Universe to simulate the Universe in detail (though if our Universe is simulated, we don't know anything about the universe in which that simulation is running). (However, if simulating consciousness is a goal (and one could argue that simulated consciousness is also consciousness), I wonder why the much easier task of simulating a brain and its sensory inputs is not a more popular topic.) In the same, final, chapter is an over-arching discussion of 'Simulations, science and reality' which also serves as a summary of the book.

This is not a book about the details of simulations[†] but about their purpose, their role within science, even the human side of them, presenting a balanced view by an expert on the subject. Thirteen pages of small-print endnotes sometimes play the role of footnotes but are mostly references, usually to the scientific literature but also to various internet resources. An eleven-page small-print index ends the book. There are no figures. It is well written with a lower than average number of typos and so on. My only real complaint is a paragraph which, while also recognizing his contributions, is strongly critical of Feynman as a person; even if true, I don't see the relevance to the rest of the book nor any reason why Feynman is singled out for such criticism. Apart from that, I can warmly recommend the book. — Phillip Helbig.

References

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Steven Weinberg: A Life in Physics, by Steven Weinberg (Cambridge University Press), 2025. Pp. 253, 23·5 × 16 cm. Price £25/$29·95 (hardbound; ISBN 978 1 009 51347 0).

Steven Weinberg's (1933–2021) autobiography will become an invaluable source for future historians of physics and astronomy. His candid memoir of a scintillating life in physics opens with a child's memory of the key books that sparked his innate curiosity about the physical world. George Gamow's creation, Mr. Tompkins, introduced young Steven to the weird world of Special Relativity and quantum mechanics; science-fiction classics likewise stirred his imagination; and from Jeans' *The Mysterious Universe* he gleaned that he "would need special mathematics" to make sense of the universe. 'Making sense' became Weinberg's lifetime goal.

Weinberg was polishing his memoirs at the time of his death. Steven's wife, Louise, has organized and edited them to produce this engaging account of his life as a scientist and public intellectual. Many vignettes of his formative encounters with dozens of leading physicists in the mid-20th Century enrich the narrative. Weinberg's talent as a writer of popular science shines through brightly. He offers many good stories: on working styles, he liked to work on fundamental physics with the TV tuned to the History Channel, a trick that doubled his productivity — absorbing some old knowledge while striving to

[†]Those interested in that aspect might want to consult a book[5] reviewed last year in these pages[6].

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