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Special Relativity and Classical Field Theory: The Theoretical Minimum, by Leonard Susskind & Art Freeman (Penguin), 2017. Pp. 525, 20 × 13 cm. Price £10·99 (paperback; ISBN 978 0 141 98501 5).

I bought this book (along with several others which I have reviewed recently) in 2024 August in England, mainly because I had previously read and reviewed[1] another book[2] in the series which I found to be quite good; see that review for background. Like that other book, this one is well written and is constructed with a hybrid approach: first some maths, then some physics, then more maths as needed. A frequent complaint about books on Special Relativity is the lack of distinction between purely relative effects as described by the Lorentz transformation, real effects such as the age difference between the travelling and stay-at-home twin, and the appearance of rapidly moving objects. Regarding the last, I was happy to see Terrell rotation mentioned (though I can't find it in the otherwise good ten-page small-print index). Regarding the second item, it is pointed out that the twins differ because one accelerates and one does not. That is true, but one is left with the impression that the acceleration is the cause of the difference. Regarding the first, while it is the Lorentz transformation, it is the Lorenz gauge. (That is a common mistake — and probably not a typo, since there are relatively few typos — which is so common that I don't always mention in my reviews; I usually do mention it when the author gets it right.)

The structure is perhaps a bit unusual, starting with the Lorentz transformation then moving to classical field theory, then to the Maxwell equations, then to classical physics, essentially the opposite of the historical path. However, that does adhere to the theme of the theoretical minimum. While the history of science can be interesting for its own sake, and also provide valuable insight, the historical path is usually not the shortest if the goal is to acquire a good working practical knowledge.* Interestingly, Chapter 9, which connects Susskind's with the traditional approach, is said never to have made it to the video site on which the books in the series are based. (It's still not there, so presumably the corresponding video, if it ever existed, has been lost.)

There are a few black-and-white figures scattered throughout the text, and a few footnotes; no references or suggestions for further reading. (All in all, the books in the series are similar in their structure, though the lack of punctuation and strange mode of referring to equations named after people in the other book I reviewed are not present here.) Between the main text and the index are two appendices, on magnetic monopoles and vector operators. Despite the length, the book is a breezy read, due both to the writing and the somewhat

*All the same, Susskind doesn't merely present the material, but also offers his own comments on what is important and so on. I added two such comments to my collection of quotes: "Notation is far more important than most people realize" (p. 173) and "[P]hysics is always harder without the mathematics" (p. 279). Interestingly, just a few seconds before I had added one by Feynman on the same topic: "[M]athematics is, to a large extent, invention of better notations."

larger than usual typeface and interline spacing. It is a rather faithful rendition of the video lectures, which I recommend to those who prefer that medium to books. I'll probably read the other books in the series and if I find myself able to watch video but not read perhaps even watch all of the lectures. Groucho Marx noted that if one isn't having fun then one is doing something wrong and that the fear of the thorn shouldn't keep one from the rose. Both apply here, as Susskind's enthusiasm comes through well, acting as a glove to help one approach a somewhat thorny topic. — Phillip Helbig.

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An Introduction to Brown Dwarfs. From very-low-mass stars to super-Jupiters, by John Gizis (IoP Publishing), 2024. Pp. 124, 26 × 18·5 cm. Price £75 (hardbound; ISBN 978 0 7503 3385 6).

An Introduction to Brown Dwarfs is an overview of the field of brown dwarfs, designed to bridge the gap from a general astronomy undergraduate education to doing research in the specific sub-field of brown dwarfs. I think that anyone interested in learning the basics of brown-dwarf astronomy will enjoy this textbook, as the tone throughout is both informative and accessible. The text includes insightful footnotes and interesting remarks on the history of the field, along with dozens of beautiful, colour figures that illustrate concepts clearly. In just eight chapters, Dr. Gizis covers all of the main areas of research in the brown-dwarf field, and explains many of the assumptions and customs of the field that are often discussed, yet rarely justified at conferences and in the literature.

The book explores brown dwarfs through a variety of lenses and contexts, but primarily focusses on two main paradigms: star-like and super-Jupiter-like. The text illustrates the similarities brown dwarfs share with both of these types of objects and the lessons that can be borrowed from both stellar and exoplanetary astronomy. The presentation and order of the text is logical and the narrative is easy to follow. Throughout the text, Dr. Gizis provides numerous resources for observational data, interior and atmospheric models, and other software and tools for brown-dwarf research. Highlights include tables of key photometric filters, thoughtful discussion of standard surveys and calibrations, helpful references to and figures of spectroscopic standards, highlights of key papers from the literature, and lists of models and software for different areas of research.

This text has only a couple of very minor issues, including a few errors and typos in the text and figures. Some minor choices in figure labelling or units could be more precise (for example, axes or legends occasionally omit key quantities), but these do not hinder comprehension. I also feel that some of the more interesting aspects of brown-dwarf research were overlooked, including rotation rates and angular-momentum evolution, as well as the role of magnetic fields and the presence of aurorae in brown atmospheres. However, after reading this textbook the reader will be well prepared to explore the literature on these topics themselves.