

## Reviewer 1

Thank you for agreeing to review this proposal. Your help in the assessment of this book will help us greatly in our editorial decision. All comments will be treated as confidential and any extracts communicated to the author(s) will be strictly anonymous.

### Section 1: Market

1. This book primarily targets a general audience. Do you think it would also appeal to students? If so, which courses/modules would it be suitable for? Please indicate whether these are core or optional modules.

It would be a useful book in a history of science course. It would also be useful as a useful supplementary textbook in an undergraduate course on special relativity. We do have a large first-year core module that includes special relativity.

2. What are the key topics you cover in your teaching? Please list them below.

I teach a maths course, but our first-year course Mechanics and Matter does contain a segment on special relativity

3. Which new topics or debates have you seen emerge in the last five years that you have addressed in your teaching?

N/A

4. How many students take this unit/course at your institution, and are numbers growing, stable or falling?

We have approximately 100 students taking the first-year course that includes special relativity

5. More generally, is interest in this subject area growing, stable or falling?

Stable

6. Would you purchase this book?

If it is reasonably priced, yes

7. Would you ask your students to purchase this book?

I would suggest it if I was giving a course on special relativity

8. Would you recommend that your library purchase this book?

Yes

9. The book is likely to be published in electronic format – would you expect that you, your students or your library would be more likely to acquire this version? Please use this space to give us any thoughts you may have regarding the ebook version.

Unsure

### Section 3: Proposal

10. Is this proposal a useful or important contribution to the subject? How would you rate its scholarship?

Not being a historian of science, I don't know how the proposed book would compare to academic scholarship. However, it would be a book that I, as someone with an amateur interest in this area, would be interested to read.

11. What are the strengths of this proposal?

There are three things I really like about this proposal:

- a) I like the idea of telling the story of the intellectual development of special relativity through the individual stories of the scientists. I think this approach is much more likely to engage with a popular audience than an approach that concentrates entirely on the science
- b) Special relativity is a topic that has a popular appeal. Most people have heard of  $E=mc^2$ .
- c) Quite surprisingly, given the intimidating reputation of relativity, much of the core maths is simple high-school maths. It is the concepts that are challenging rather than the maths. I generally don't like the idea of including equations in a book meant for a popular audience, but this might be an exception. I learned about special relativity for the first time in high school. I still remember the excitement of being able to show, by just using some simple algebra, that time must slow down and lengths must contract for someone travelling at high speed.

12. What are the weaknesses of this proposal? How could they be remedied?

The weakness is that I think the author has thrown everything and the kitchen sink into the proposal. I know the author has taught a course in very much the same manner as the book he is proposing, so he may have a clearer idea of how he is going to write the book, but judging from the proposal I think he is trying to include too much.

13. Could this proposal be improved or have a better focus? If so, how?

There are a few ways I think the proposal could be improved:

- a) The list of scientists whose stories he is proposing to include seems to me to belong to a history of physics, not just of special relativity. It is important to include people like Galileo, Faraday etc, people who are central to the development, and I love the idea of going all the way back to ancient Greece, but too many of the scientists in the list seem peripheral. Less is more!
- b) I was a little scared by the estimate of 50-100 equations. As I wrote above, there is case for being ambitious and writing a book for a general audience that does include some basic high-school maths (the level of Pythagoras' theorem). However, if the book contains too many, it may still be interesting for physics geeks like me, but it may fail to engage with a general audience.
- c) If it really is going to be a book for a popular audience, I would suggest not having technical appendices, but technical boxes at various points through the book. The

reader is then free to dip into the more technical bits if they feel like it, rather than being intimidated by a huge technical appendix. I think it is also a useful discipline, since it forces the author to think more carefully about how much technical detail to include.

14. Do you think the author is suitably qualified for this project?

Yes

15. Given the likely audience, how would you rate the writing style of the proposal?

Good

16. What do you think of the title?

The secondary title is very clear. 'Superfluous' is a little recondite for my taste, but I can see why the author likes it.

17. Are there any major topics or themes that are omitted?

No

18. Are there any chapters or sections that are not required?

No

#### Section 4: Competition

19. Is there a need for this book?

Yes, I don't know of any book like it.

20. What would be the main competing books in this area? Please list title, author, publisher and publication date.

Title	Author	Publisher, year	Strengths	Weaknesses	Course text/ Recommended reading?
The First Three Minutes	Steven Weinberg		Excellent book for a popular audience		
Theoretical Physics	Malcolm Longair	CUP	Excellent book for a more academic audience		

21. How does this proposal compare with these books?

I haven't read Weinberg's book for a long time, but my memory, which may be wrong, is that it doesn't contain any equations. However, I do remember it does a good job of explaining the physics of the first three minutes after the big bang, without the patronising glossing-over that is so common in books for a popular audience. Longair's book, on the other hand, is a brilliant book about the intellectual development of several areas of physics, but is not really a book for a popular audience. I think that the author is correct that if he is going to write a

popular-science book on relativity that is not superficial he does need to include some maths. The challenge, if he wants to keep his audience, is to keep on the Weinberg side of things rather than the Longair side, although I do love Longair's book.

### Section 5: Finally

22. Would you recommend that we publish this book?

Yes

*Thank you for your assistance and for taking the time to fill out this questionnaire.*

### Reviewer 2

Thank you for agreeing to review this proposal. Your help in the assessment of this book will help us greatly in our editorial decision. All comments will be treated as confidential and any extracts communicated to the author(s) will be strictly anonymous.

### Section 1: Market

**1. This book primarily targets a general audience. Do you think it would also appeal to students? If so, which courses/modules would it be suitable for? Please indicate whether these are core or optional modules.**

Yes, I believe students might find this book appealing. Considering the scope of topics covered, the relevant courses would be courses in electromagnetism, surveys of physics or the history of science. If the book ends up as comprehensive as planned, libraries might buy it as a reference work.

**2. What are the key topics you cover in your teaching? Please list them below.**

Have formerly taught introductory physics, astronomy, and the history of astronomy (as well as oral and written communication for engineers).

**3. Which new topics or debates have you seen emerge in the last five years that you have addressed in your teaching?** I have not taught recently, but clearly the imaging of black holes and the physics of black holes, and gravitational lensing are currently of interest. The proposal does not say if it covers these topics or not.

**4. How many students take this unit/course at your institution, and are numbers growing, stable or falling?** (Not currently teaching)

**5. More generally, is interest in this subject area growing, stable or falling?**

**6. Would you purchase this book?** Yes (but admittedly, I buy and read more physics/astronomy/history of science books than many people).

**7. Would you ask your students to purchase this book?** I believe I would put it on a list of recommended reading rather than required. This is because the proposed book would be too encyclopaedic to efficiently and cost-effectively serve as the main

textbook for a physics class, which typically would not cover such a broad historical perspective.

8. **Would you recommend that your library purchase this book?** Perhaps, depending on the quality of the writing/editing. In the sample chapter, the storytelling is quite good, but the technical explanations are not always clear and even the non-technical narrative would need a lot of editing for style and grammar.
9. **The book is likely to be published in electronic format – would you expect that you, your students or your library would be more likely to acquire this version? Please use this space to give us any thoughts you may have regarding the ebook version.** The advantage of the e-book would be the ease of hopping back and forth between related sections that are not contiguous, or between the main narrative and the technical appendix material (assuming there were links in the text).

### Section 3: Proposal

10. **Is this proposal a useful or important contribution to the subject? How would you rate its scholarship?** The proposed book would have a somewhat unusual format, combining elements that would appeal to the “general public” perhaps (more likely, it would appeal to a subset of readers with science and engineering backgrounds) and to students. In this, it is quite unusual and has the potential to be useful. In other respects, the subjects covered in the proposed book do overlap with other books, making it more difficult for the proposed book to stand out in a crowded market. The success of such a book would rest on the quality of the writing. As to scholarship: the author seems to be well acquainted with the subject through teaching it. It does not appear that the author has experience writing and publishing biographical and historical texts (e.g. articles in journals relevant to the teaching of physics or to the history of science).

From the sample chapter, I would say that historians of physics might take issue with the author’s writing style, which might tend to gloss over nuances in the history of his topic. For example, the author tells the story of Michelson being accused of sexual harassment by his maid, and being “completely exonerated.” The author appears to have gotten this story from Michelson’s daughter’s account (the book *The Master of Light*). By today’s standards it seems very risky to take the daughter’s account as being unbiased, or to think that the maid got a fair hearing in her accusation against a notable figure!

Along the same lines, although the author does mention that some details he gives are from Michelson’s daughter, he does not actually give any references in his chapter, and I believe he should cite specific sources.

Another example of a potential issue with the proposed book is the selection of facts the author made in his abbreviated biography. Michelson was the first American Jew to receive a Nobel Prize, and his difficulty getting accepted (as a young man) into the US Naval Academy may have been due to antisemitism. These facts are not mentioned at all. Also not mentioned is Michelson’s affiliation with the Mount Wilson Observatory, which is odd because all of his other affiliations are given. These omissions are relatively minor, but a reader or book reviewer who was more of an historian of science might feel that the author lacked the appropriate background to stray from writing about the physics to writing also about the history/biography.

11. **What are the strengths of this proposal?** The author has much experience teaching the material and a genuine appreciation of the subject. The sample chapter

(at least the narrative part, as the technical appendices were not included) needs editing, but has a good balance of detail and “big picture.” I found it an enjoyable read.

- 12. What are the weaknesses of this proposal? How could they be remedied?** The primary weakness, in my view, is the broad (encyclopaedic) scope of the proposed book. The sample chapter is from the latter part of the book. I’m not sure that all of the earlier chapters will make a really useful contribution to the book (as opposed to having their material presented in more summary, digested form).

Another weakness is that, in the sample chapter, some of the technical details may not be clear to a “general” reader, which is the intended audience for the narrative part of each chapter. For example, the description of Fizeau’s experimental set-up is not clear and probably needs a diagram. The author has explained that  $c$  is the speed of light (so, is talking to a general reader), but has not defined optical dispersion. (If optical dispersion is explained elsewhere in the book, that reference should be made.) Also on page 11, the statement about the “effect” being proportional to  $(V\text{-Earth}/C)^2$  would not be understandable to a general reader. Later it is related to the precision necessary in measuring displacement of fringes—but interference fringes are not explained at all in this chapter (though they may appear elsewhere in the book).

- 13. Could this proposal be improved or have a better focus? If so, how?** The author could explain in more detail the key ideas of each chapter, and how they relate to the overall theme of the book. What IS the main idea of the book, anyway? Alternatively, the author could narrow the focus to Einstein, special relativity, and simple questions with intricate answers (as he says).
- 14. Do you think the author is suitably qualified for this project?** The author certainly has the physics knowledge and teaching experience with undergraduates. It doesn’t appear that the author has experience writing book-length material for a general audience.
- 15. Given the likely audience, how would you rate the writing style of the proposal?** The style of the sample chapter is somewhat glib. Unfortunately, some remarks that work well in lecture don’t always come off as well in writing.
- 16. What do you think of the title?** I worry that the potential reader will not relate to it. The title is from a quote that is about Einstein changing the standard of scientific acceptability (and about Einstein’s attitude). The quote is not a generally familiar one (in which case it would serve as a shorthand for accepted ideas), nor does the single word “superfluous” make sense on its own.
- 17. Are there any major topics or themes that are omitted?** The outline suggests a very wide scope for the book, but does not go into much specific detail (other than naming names) for each chapter. So, it is difficult to tell if any relevant themes are omitted. For example, the summary of the first chapter states “we’ll explore the habits of mind that primarily Plato and Aristotle endowed us with,” and mentions Ptolemy’s model of the solar system. This is very scant information about the actual topics in this chapter.
- 18. Are there any chapters or sections that are not required?** One could imagine the book starting with Michelson (currently proposed as chapter 13) or perhaps Newton

(chapter 9) and being quite rich even so. Without a more detailed proposal, giving the main idea of each chapter, it is difficult to tell if all chapters are really necessary. By way of comparison, Belkora's book "Minding the Heavens: The Story of Our Discovery of the Milky Way," which also takes a biographical approach, covers in detail only the period from the mid-1700s to mid-1900s. There is a central question to be answered—what is the nature of our stellar system, and how does it relate to other apparent "island universes"—and each chapter provides a specific part of the answer. In the proposed book, it is not clear what the central question is. Having read the Michelson sample chapter, I look back at the description of the first few chapters and wonder, what do epicyclic planetary models or even Copernicus's ideas about the motion of the earth contribute to the ideas of the Michelson chapter, that they require whole chapters on their own?

#### Section 4: Competition

19. **Is there a need for this book?** On one hand, there seems to be a perennial interest in Einstein. On the other hand, there are a lot of Einstein books out there! A "necessary" book would be accessible and very engagingly written.

20. **What would be the main competing books in this area? Please list title, author, publisher and publication date.**

Title	Author	Publisher, year	Strengths	Weaknesses	Course text/ Recommended reading?
Einstein for Dummies  (includes sections on Ancient Greeks to modern era, similar to proposed book)	Carlos I. Calle	2005, Wiley	Fun, accessible, includes historical context	Flow of text not good	
Einstein's Clocks, Poincare's Maps	Peter Galison	2003, Norton	A "fresh, idiosyncratic" take on the subject; biographical material on Einstein and Poincare	Too technical for a general audience	
What is Relativity? An Intuitive Introduction to Einstein's Ideas, and Why they Matter	Jeff Bennett		Virtually no math; accessible for the general reader	Nothing new for readers familiar with the subject	
The Road to Relativity: The History and Meaning of Einstein's 'The	Gutfreund and Renn	2015, Princeton UP	Has short biographical sketches; places work in broader	Too technical for a general audience	

Foundation of General Relativity			intellectual and historical context		
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**21. How does this proposal compare with these books?**

The proposal seems to cover much of the same ground as Einstein for Dummies, and is probably aimed in part at the same general audience, with students attracted by the more technical appendices of the proposed book. The proposed book has a vastly greater scope than the rest of the books on this list. The proposed book has an unusual format, with more accessible stories followed by technical appendices. Steven Weinberg seems to have been the main exponent of this format. I believe the writing would have to be really excellent (as Weinberg's is) to reach a general audience in the same way.

**Section 5: Finally**

**22. Would you recommend that we publish this book?** The sample chapter has promise because there is quite a strong narrative arc and the level of detail is generally appropriate (with some caveats). But I believe the proposed book as a whole lacks focus, and covers far too much ground to be commercially viable.

*Thank you for your assistance and for taking the time to fill out this questionnaire.*