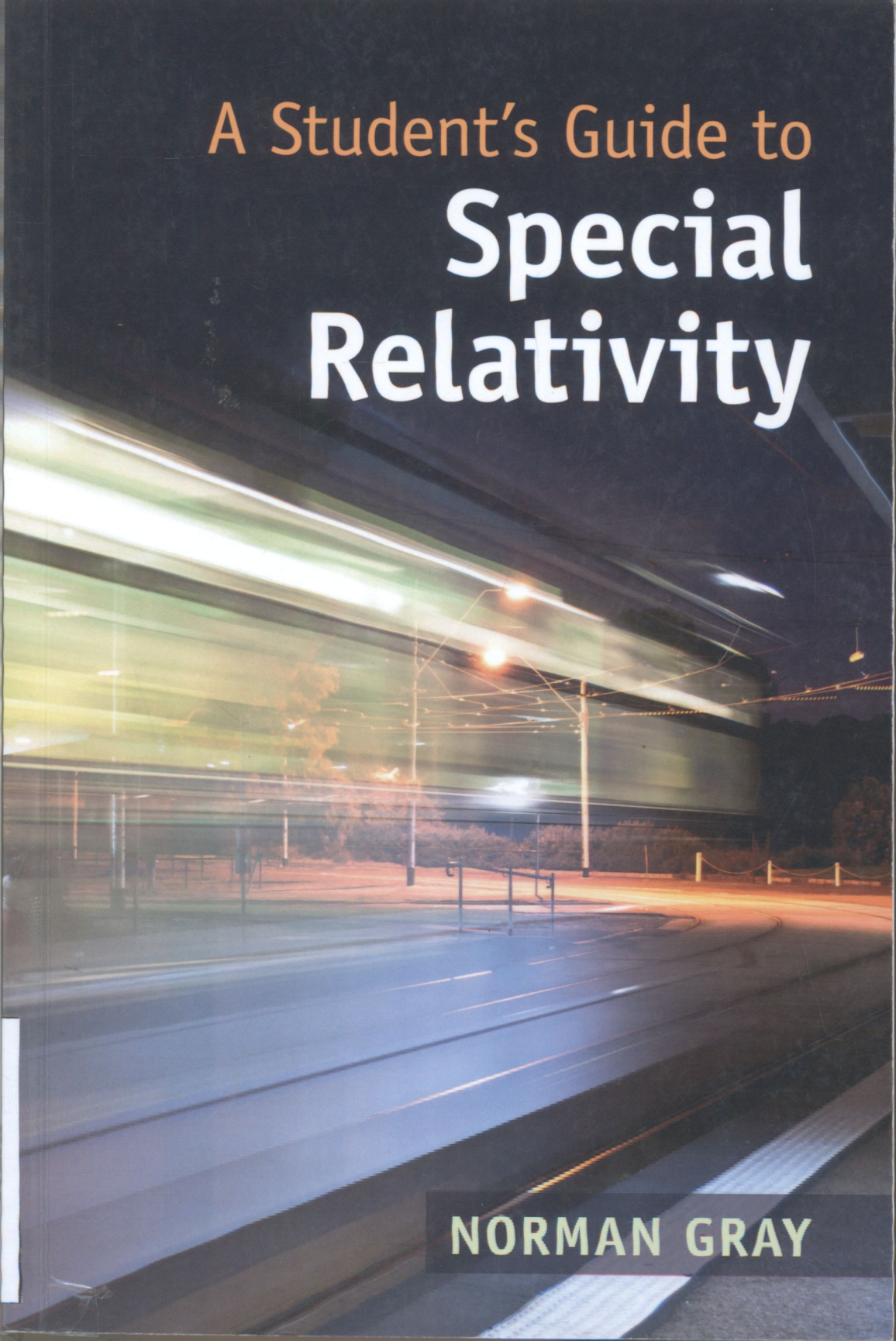
A Student's Guide to Special Relativity



NORMAN GRAY

A Student's Guide to Special Relativity

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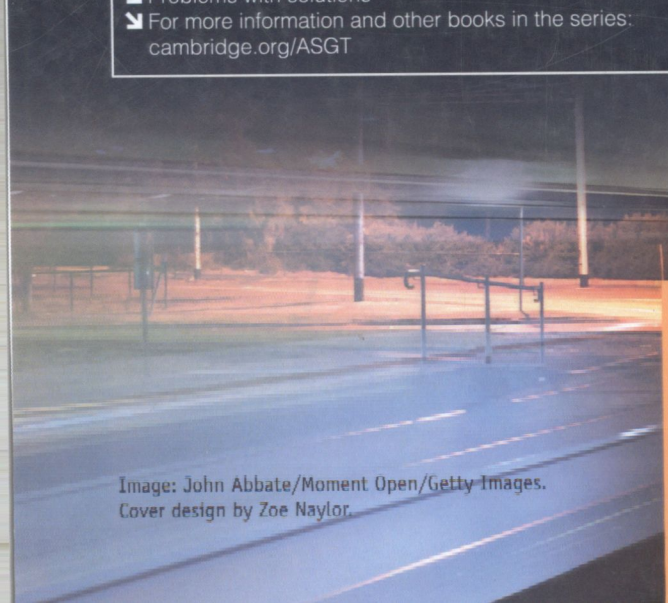
Contents

This compact yet informative Guide presents an accessible route through Special Relativity, taking a modern axiomatic and geometrical approach. It begins by explaining key concepts and introducing Einstein's postulates. The consequences of the postulates – length contraction and time dilation – are unravelled qualitatively and then quantitatively. These strands are then tied together using the mathematical framework of the Lorentz transformation, before applying these ideas to kinematics and dynamics. This volume demonstrates the essential simplicity of the core ideas of Special Relativity, while acknowledging the challenges of developing new intuitions and dealing with the apparent paradoxes that arise. A valuable supplementary resource for intermediate undergraduates, as well as independent learners with some technical background, the Guide includes numerous exercises with hints and notes provided online. It lays the foundations for further study in General Relativity, which is introduced briefly in an appendix.

Norman Gray is in the School of Physics and Astronomy, University of Glasgow, where he has, over the last 20 years, taught courses covering both special and general relativity. Since his PhD in particle theory, he has had a varied research career, most recently concentrating on the interface between astronomy and computing. He is author of *A Student's Guide to General Relativity* (2019), which has been a successful addition to Cambridge University Press's growing series of Student's Guides.

Online Resources
www.cambridge.org/gray-sgsr

- Problems with solutions
- For more information and other books in the series: cambridge.org/ASGT



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