

Theoretical Physics

- Introduction to General Relativity and Cosmology (WiSe 2016/2017) -

Literature

Highly recommended for any serious scholar (which may even be willing to invest 90Euro):

- James B. Hartle *Gravity – An Introduction to Einstein’s General Relativity*, Addison Wesley 2003 [ISBN 0-8053-8662-9]

Bestowed with great attention to the didactical aspects of the presentation, this book is a true marble. For the author’s reflections on the composition and presentation of the material see: James B. Hartle *General relativity in the undergraduate physics curriculum*, Am. J. Phys. **74**(1), Januar 2006, S. 14–21.

Pretty new on the market

- A. Zee *Einstein Gravity in a Nutshell*, Princeton University Press 2013 [ISBN 978-0-691-14558-7]

With the “Nutshell” coming with 866(!) pages, the nut is pretty voluminous. Never mind. As with his previous “Quantum Field Theory in a Nushell”, in view of the many elucidating footnotes, his gravity-nutshell is a valuable complement to Hartle’s textbook.

Also recommended (the author made it into the subject-index)

- W. Rindler *Relativity: Special, General and Cosmological*, Oxford University Press (2006). [in German: *Relativitätstheorie, Speziell, Allgemein und Kosmologisch*, Wiley-VCH (2016).]

The advanced scholar, who is not afraid of some mathematical theorems and such, may enjoy

- (a) Robert M. Wald *General Relativity*, The University of Chicago Press 1984 [ISBN 0-226-87033-2]
- (b) Norbert Straumann *General Relativity – With Applications to Astrophysics*, Springer 2004 [ISBN 3-540-21924-2] (there may be a new edition on the market)

Suitable for undergraduates with a heart for the Astrophysics, in particular for physics teacher

- Bernard Schutz *Gravity – from the ground up*, Cambridge University Press 2003 [ISBN 0-521-45506-5]

You can’t go wrong with it

- Ray d’Inverno *Introducing Einstein’s Relativity*, Oxford University Press (1992) [in German: *Einführung in die Relativitätstheorie*, VCH Verlagsgesellschaft Weinheim 1995 (heute: Wiley VCH)]

And then we have the standards of the previous Millenium

- Steven Weinberg *Gravitation and Cosmology – Principles and Applications of the General Theory of Relativity*, John Wiley & Sons [ISBN 0-471-92567-5]
- Charles W. Miesner, Kip S. Thorne, John Archibald Wheeler *Gravitation*, W. H. Freeman and Company, New York [ISBN 0-7167-0344-0]

MTW is an absolute “must” for everybody, who has the time for half-year retreat to a lonely island, but wants to become a GRT-Wizzard later on. Attention! MTW comes with more than a thousand pages. In view of its weight, it is self-referential, possibly at the brink of becoming a black hole. Thus, it is not allowed to carry MTW with you, if you come close the GEO600 project near Hannover ...

Eternal Classic, of course, Landau-Lifshitz, Volume II “Classical Fieldtheory”. May be short on black holes and contemporary cosmology – but the foundations are there. In the LL style, that is clear and crisp ...