References on General Relativity

O.L. Santos-Pereira
e-mail: osvaldo.pereira@sciencedata.ai

Abstract

Quantum Observables

1 Non technical references

References

[1] Kip S. Thorne, Black Holes and Time Warps: Einstein's Outrageous Legacy, W. W. Norton, New York, 1994.

[2] Robert Geroch, General Relativity from A to B, University of Chicago Press, Chicago, 1978.

[3] Bernard F. Schutz, Gravity from the Ground Up: An Introductory Guide to Gravity and General Relativity, Cambridge University Press, Cambridge, 2003.

[4] Robert M. Wald, Space, Time, and Gravity: the Theory of the Big Bang and Black Holes, University of Chicago Press, Chicago, 1977.

2 Basic References

References

[1] Ray d'Inverno, Introducing Einstein's Relativity, Oxford University Press, Oxford, 1992.

[2] James B. Hartle, Gravity: an Introduction to Einstein's General Relativity, Addison-Wesley, New York, 2002.

[3] Ian R. Kenyon, General Relativity, Oxford University Press, Oxford, 1991.

[4] Bernard F. Schutz, A First Course in General Relativity, Cambridge University Press, Cambridge, 1986.

[5] Hans Stephani. Relativity: An Introduction to Special and General Relativity. Cambridge University Press; 3 edition (February 12, 2004)

[6] Hans Stephani, General Relativity: An Introduction to the Theory of the Gravitational Field, Cambridge U. Press, Cambridge, 1990.

[7] Alan P. Lightman, William H. Press, Saul A. Teukolsky, Problem Book in Relativity and Gravitation Princeton University Press, 1975. In print, ISBN 0-691-08162-X.

[8] J. Martin, General Relativity: A First Course For Physicists Prentice Hall, 1995. In print, ISBN 0-13-291196-5.

[9] C. Clarke, Elementary General Relativity. Halsted Press, 1980. Out of print.

3 Advanced References

References

[1] Charles W. Misner, Kip S. Thorne and John Archibald Wheeler, Gravitation, W. H. Freeman Press, San Francisco, 1973.

[2] Robert M. Wald, General Relativity, University of Chicago Press, Chicago, 1984.

[3] John Stewart. Advanced General Relativity. Cambridge University Press (November 26, 1993).

[4] Paul A. Dirac, General Theory of Relativity Princeton University Press, 1996. In print, ISBN 0-691-01146-X.

[5] Hans C. Ohanian, Reno Rufkin and Remo Ruffini, Gravitation and Spacetime, 2nd ed. W. W. Norton, 1994. In print, ISBN 0-393-96501-5.

[6] Gregory L. Naber, Spacetime and Singularities: An Introduction. Cambridge University Press, 1989. In print, ISBN 0-521-33612-0.

[7] L. D. Landau, The Classical Theory of Fields. Course of Theoretical Physics, Vol. 2. Classical Theory. Butterworth-Heinemann, 1980. ISBN 0-7506-2768-9.

4 Mathematics Oriented References

References

[1] Oyvind Gron. Einstein's Theory: A Rigorous Introduction for the Mathematically Untrained. Springer; 2011 edition

5 Math for General Relativity: Tensor Calculus

References

[1] Taha Sochi. Principles of Tensor Calculus.

[2] Taha Sochi.Introduction to Differential Geometry of Space Curves and Surfaces.

[3] Taha Sochi. Tensor Calculus Made Simple.

6 Math for General Relativity: Differential Geometry

References

[1] Barrett O'Neill, Semi-Riemannian Geometry: with Applications to Relativity, Academic Press, New York, 1983.

[2] Kenichi Kanatani. Geometric Computation for Machine Vision. Clarendon Press (July 8, 1993).

[3] Kenichi Kanatani. Understanding Geometric Algebra: Hamilton, Grassmann, and Clifford for Computer Vision and Graphics.

7 Softwares

References

[1] galpy: Python package for galactic dynamics

8 Selected Topics: Burgers Equation

References

[1] Tuba Ceylan, Philippe G. LeFloch, Baver Okutmustur. The relativistic Burgers equation on a FLRW background and its finite volume approximation. 2015. arXiv:1512.08142v1.

[2] Philippe G. LeFloch, Hasan Makhlof, Baver Okutmustur. Relativistic Burgers equations on curved spacetimes. Derivation and finite volume approximation (2012). arXiv:1206.3018v2.

[3] Baver Okutmustur, Tuba Ceylan. The relativistic Burgers equation on a de Sitter spacetime. Derivation and finite volume approximation (2015). arXiv:1505.03546v1.

9 Selected Topics: Cosmological Constant

References

[1] Christian G. Boehmer. General Relativistic Static Fluid Solutions with Cosmological Constant (2003). arXiv:gr-qc/0308057v3.

10 Teacher Websites

Physics Page: This site contains notes and solutions to various problems in some textbooks in physics and related fields. The site is fairly technical and uses whatever mathematics is required to explain the various topics.

John C. Baez. The Meaning of Einstein's Equation: This is a brief introduction to general relativity, designed for both students and teachers of the subject. While there are many excellent expositions of general relativity, few adequately explain the geometrical meaning of the basic equation of the theory: Einstein's equation. Here we give a simple formulation of this equation in terms of the motion of freely falling test particles. We also sketch some of the consequences of this formulation and explain how it is equivalent to the usual one in terms of tensors. Finally, we include an annotated bibliography of books, articles and websites suitable for the student of relativity.
(PDF version)

Professor Zhao H. page: lecture notes on cosmology, general relativity and astronomy.

11 Blogs

Comments for physicspages.com: This blog is maintained for posting comments and reports of errors onphysicspages.com site.

12 Online Courses

13 Youtube Lectures

Physics Unsimplified: Youtube Channel with lessons on general relativity, besides the videos there are also slides to accompany.