

# Bibliography

Benjamin P Abbott, Richard Abbott, TD Abbott, MR Abernathy, Fausto Acernese, Kendall Ackley, Carl Adams, Thomas Adams, Paolo Addresso, RX Adhikari, et al. Observation of gravitational waves from a binary black hole merger. *Physical review letters*, 116(6):061102, 2016.

AA Abdo, Markus Ackermann, Marco Ajello, WB Atwood, M Axelsson, Luca Baldini, J Ballet, Guido Barbiellini, D Bastieri, BM Baughman, et al. Fermi lat observations of ls i+ 61 303: First detection of an orbital modulation in gev gamma rays. *The Astrophysical Journal Letters*, 701(2):L123, 2009.

Marek A Abramowicz. The paczyński-wiita potential. a step-by-step derivation-commentary on: Paczyński b. and wiita pj, 1980, a&a, 88, 23. *Astronomy & Astrophysics*, 500(1):213–214, 2009.

Marek A Abramowicz and P Chris Fragile. Foundations of black hole accretion disk theory. *Living Reviews in Relativity*, 16(1):1, 2013.

Fred C Adams, Manasse Mbonye, and Gregory Laughlin. Possible effects of a cosmological constant on black hole evolution. *Physics Letters B*, 450(4):339–342, 1999.

- Peter AR Ade, N Aghanim, C Armitage-Caplan, M Arnaud, M Ashdown, F Atrio-Barandela, J Aumont, C Baccigalupi, AJ Banday, RB Barreiro, et al. Planck 2013 results. xxx. cosmic infrared background measurements and implications for star formation. *Astronomy & Astrophysics*, 571:A30, 2014.
- J Albert, E Aliu, H Anderhub, P Antoranz, A Armada, M Asensio, C Baixeras, JA Barrio, M Bartelt, H Bartko, et al. Variable very-high-energy gamma-ray emission from the microquasar ls i+ 61 303. *science*, 312(5781):1771–1773, 2006.
- John Antoniadis, Paulo CC Freire, Norbert Wex, Thomas M Tauris, Ryan S Lynch, Marten H van Kerkwijk, Michael Kramer, Cees Bassa, Vik S Dhillon, Thomas Driebe, et al. A massive pulsar in a compact relativistic binary. *Science*, 340(6131):1233232, 2013.
- Christian Armendariz-Picon, T Damour, and Vki-inflation Mukhanov. k-inflation. *Physics Letters B*, 458(2):209–218, 1999.
- Ioulia Vladimirovna Artemova, G Björnsson, and Igor Dmitrievich Novikov. Modified newtonian potentials for the description of relativistic effects in accretion disks around black holes. *The Astrophysical Journal*, 461:565, 1996.
- Hideki Asada. Gravitational time delay of light for various models of modified gravity. *Physics Letters B*, 661(2):78–81, 2008.
- Pia Astone, M Bassan, P Bonifazi, P Carelli, MG Castellano, G Cavallari, E Coccia, C Cosmelli, V Fafone, S Frasca, et al. Long-term operation of the rome” explorer” cryogenic gravitational wave detector. *Physical Review D*, 47(2):362, 1993.

- JN Bahcall, A Dar, and T Piran. Neutrinos from the recent lmc supernova. *Nature*, 326(6109):135–136, 1987.
- Andrés Balaguera-Antolínez, Christian G Böhmer, and Marek Nowakowski. Scales set by the cosmological constant. *Classical and Quantum Gravity*, 23(2):485, 2005.
- Cosimo Bambi, Tomohiro Harada, Rohta Takahashi, and Naoki Yoshida. Outflows from accreting super-spinars. *Physical Review D*, 81(10):104004, 2010.
- JM Bardeen, C DeWitt, and B DeWitt. Black holes. gordon and breach, 1973.
- SD Barthelmy, W Baumgartner, J Cummings, N Gehrels, C Markwardt, T Sakamoto, O Godet, P Evans, J Osborne, AP Beardmore, et al. Swift-bat/-xrt refined analysis on trigger 324362 (ls i+ 61 303). *GRB Coordinates Network*, 8215, 2008.
- Yu V Baryshev, Arthur D Chernin, and P Teerikorpi. The cold local hubble flow as a signature of dark energy. *Astronomy & Astrophysics*, 378(3):729–734, 2001.
- Florian Bauer, JOAN SOL, and Hrvoje Štefančić. Relaxing a large cosmological constant in the astrophysical domain. *Modern Physics Letters A*, 26(34):2559–2578, 2011.
- Charles L Bennett, Anthony J Banday, Krzysztof M Górski, G Hinshaw, P Jackson, P Keegstra, A Kogut, George F Smoot, David T Wilkinson, and Edward L Wright. Four-year cobe\* dmr cosmic microwave background observations: maps and basic results. *The Astrophysical Journal Letters*, 464(1):L1, 1996.
- Juerg Beringer, J-F Arguin, RM Barnett, K Copic, O Dahl, DE Groom, C-J Lin, J Lys, H Murayama, CG Wohl, et al. Review of particle physics particle data

- group. *Physical Review D (Particles, Fields, Gravitation and Cosmology)*, 86(1), 2012.
- E. Berti, , E. Barausse, V. Cardoso, L. Gualtieri, P. Pani, U. Sperhake, L. C. Stein, N. Wex, K. Yagi, T. Baker, C. P. Burgess, F. S. Coelho, D. Doneva, A. De Felice, P. G. Ferreira, P. C. C. Freire, J. Healy, C. Herdeiro, M. Horbatsch, B. Kleihaus, A. Klein, K. Kokkotas, J. Kunz, P. Laguna, R. N. Lang, T. G. F. Li, T. Lit-tenberg, A. Matas, S. Mirshekari, H. Okawa, E. Radu, R. O’Shaughnessy, B. S. Sathyaprakash, C. Van Den Broeck, H. A. Winther, H. Witek, M. Emad Aghili, J. Alsing, B. Bolen, L. Bombelli, S. Caudill, L. Chen, J. C. Degollado, R. Fujita, C. Gao, D. Gerosa, S. Kamali, H. O. Silva, J. G. Rosa, L. Sadeghian, M. Sampaio, H. Sotani, and M. Zilhao. Testing general relativity with present and future astro-physical observations. *Classical and Quantum Gravity*, 32(24):243001, December 2015. doi: 10.1088/0264-9381/32/24/243001.
- Gianfranco Bertone and David Merritt. Dark matter dynamics and indirect detection. *Modern Physics Letters A*, 20(14):1021–1036, 2005.
- Bruno Bertotti, Luciano Iess, and Paolo Tortora. A test of general relativity using radio links with the cassini spacecraft. *Nature*, 425(6956):374–376, 2003.
- A Bhadra, K Sarkar, and KK Nandi. Testing gravity at the second post-newtonian level through gravitational deflection of massive particles. *Physical Review D*, 75(12):123004, 2007.
- Arunava Bhadra, Swarnadeep Biswas, and Kabita Sarkar. Gravitational deflection of

- light in the schwarzschild–de sitter space-time. *Physical Review D*, 82(6):063003, 2010.
- Debbijoy Bhattacharya, Shubhrangshu Ghosh, and Banibrata Mukhopadhyay. Disk-outflow coupling: Energetics around spinning black holes. *The Astrophysical Journal*, 713(1):105, 2010.
- RM Bionta, G Blewitt, CB Bratton, D Casper, A Ciocio, R Claus, B Cortez, M Crouch, ST Dye, S Errede, et al. Observation of a neutrino burst in coincidence with supernova 1987a in the large magellanic cloud. *Physical Review Letters*, 58(14):1494, 1987.
- GS Bisnovatyi-Kogan and RVE Lovelace. Advective accretion disks and related problems including magnetic fields. *New Astronomy Reviews*, 45(11):663–742, 2001.
- Roger D Blandford and Roman L Znajek. Electromagnetic extraction of energy from kerr black holes. *Monthly Notices of the Royal Astronomical Society*, 179(3):433–456, 1977.
- HJ Bondi. On spherically symmetrical accretion. *Monthly Notices of the Royal Astronomical Society*, 112(2):195–204, 1952.
- Lutz Bornschein et al. Katrin-direct measurement of neutrino masses in the sub-ev region. *arXiv preprint hep-ex/0309007*, 2003.
- Valentí Bosch-Ramon, Josep M Paredes, Marc Ribó, Jon M Miller, Pablo Reig, and Josep Martí. Orbital x-ray variability of the microquasar ls 5039. *The Astrophysical Journal*, 628(1):388, 2005.

- S K Bose and W D McGlinn. Effect of finite mass on gravitational transit time. *Physical Review D*, 38(8):2335, 1988.
- Sebastian Böser, Marek Kowalski, Lukas Schulte, Nora Linn Strotjohann, and Markus Voge. Detecting extra-galactic supernova neutrinos in the antarctic ice. *Astroparticle Physics*, 62:54–65, 2015.
- Valerio Bozza. Gravitational lensing in the strong field limit. *Physical Review D*, 66(10):103001, 2002.
- Rene P Breton, Victoria M Kaspi, Michael Kramer, Maura A McLaughlin, Maxim Lyutikov, Scott M Ransom, Ingrid H Stairs, Robert D Ferdman, Fernando Camilo, and Andrea Possenti. Relativistic spin precession in the double pulsar. *Science*, 321(5885):104–107, 2008.
- Robert R Caldwell. A phantom menace? cosmological consequences of a dark energy component with super-negative equation of state. *Physics Letters B*, 545(1):23–29, 2002.
- Robert R Caldwell, Rahul Dave, and Paul J Steinhardt. Cosmological imprint of an energy component with general equation of state. *Physical Review Letters*, 80(8):1582, 1998.
- Vitor Cardoso, Isabella P Carucci, Paolo Pani, and Thomas P Sotiriou. Matter around kerr black holes in scalar-tensor theories: scalarization and superradiant instability. *Physical Review D*, 88(4):044056, 2013.
- J Casares, M Ribó, I Ribas, JM Paredes, J Martí, and A Herrero. A possible black

- hole in the  $\gamma$ -ray microquasar Irs 5039. *Monthly Notices of the Royal Astronomical Society*, 364(3):899–908, 2005.
- A Cattaneo, SM Faber, J Binney, A Dekel, J Kormendy, R Mushotzky, A Babul, PN Best, M Brüggen, AC Fabian, et al. The role of black holes in galaxy formation and evolution. *Nature*, 460(7252):213–219, 2009.
- Sandip K Chakrabarti and Ramon Khanna. A newtonian description of the geometry around a rotating black hole. *Monthly Notices of the Royal Astronomical Society*, 256(2):300–306, 1992.
- Sandip K Chakrabarti and Soumen Mondal. Studies of accretion flows around rotating black holes–i. particle dynamics in a pseudo-kerr potential. *Monthly Notices of the Royal Astronomical Society*, 369(2):976–984, 2006.
- Chi-kwan Chan, Dimitrios Psaltis, and Feryal Özel. Spectral methods for time-dependent studies of accretion flows. i. two-dimensional, viscous, hydrodynamic disks. *The Astrophysical Journal*, 628(1):353, 2005.
- Bertrand Chauvineau and Tania Regimbau. Local effects of a cosmological constant. *Physical Review D*, 85(6):067302, 2012.
- LX Cheng, YQ Ma, KS Cheng, T Lu, and YY Zhou. The time delay of gamma-ray bursts in the soft energy band. *Astronomy and Astrophysics*, 300:746, 1995.
- Maria Chernyakova, Andrii Neronov, Sergey Molkov, Denys Malyshev, Alexander Lutovinov, and Guy Pooley. Superorbital modulation of x-ray emission from gamma-ray binary Irs 61 303. *The Astrophysical Journal Letters*, 747(2):L29, 2012.

- Anirban N Chowdhury, Mandar Patil, Daniele Malafarina, and Pankaj S Joshi. Circular geodesics and accretion disks in the janis-newman-winicour and gamma metric spacetimes. *Physical Review D*, 85(10):104031, 2012.
- William S Cleveland. Robust locally weighted regression and smoothing scatterplots. *Journal of the American statistical association*, 74(368):829–836, 1979.
- William S Cleveland and Susan J Devlin. Locally weighted regression: an approach to regression analysis by local fitting. *Journal of the American statistical association*, 83(403):596–610, 1988.
- Alan A Coley and David L Wiltshire. What is general relativity? *Physica Scripta*, 92(5):053001, 2017. URL <http://stacks.iop.org/1402-4896/92/i=5/a=053001>.
- C Cremaschini, JC Miller, and M Tessarotto. The kinetic theory of quasi-stationary collisionless accretion disc plasmas. *arXiv preprint arXiv:1201.1838*, 2012.
- Thibault Damour and Gilles Esposito-Farese. Tensor-multi-scalar theories of gravitation. *Classical and Quantum Gravity*, 9(9):2093, 1992.
- Antonio De Felice and Shinji Tsujikawa.  $f(r)$  theories. *Living Reviews in Relativity*, 13(1):3, 2010.
- Claudia de Rham. Massive gravity. *Living Reviews in Relativity*, 17(1):7, 2014.
- W. de Sitter. The motion of the perihelion on the classical theory of relativity. *The Observatory*, 40:302–303, August 1917.

- Jean-Pierre De Villiers, John F Hawley, Julian H Krolik, and Shigenobu Hirose. Magnetically driven accretion in the kerr metric. iii. unbound outflows. *The Astrophysical Journal*, 620(2):878, 2005.
- Justin P DeAndrea and Kevin M Alexander. Editorial note: Negative time delay in strongly naked singularity lensing [phys. rev. d 89, 123012 (2014)]. *Physical Review D*, 89(12):129904, 2014.
- V. Dhawan, A. Mioduszewski, and M. Rupen. LS I +61 303 is a Be-Pulsar binary, not a Microquasar. In *VI Microquasar Workshop: Microquasars and Beyond*, page 52.1, 2006.
- Salomé Dibi, Samia Drappeau, P Chris Fragile, Sera Markoff, and Jason Dexter. General relativistic magnetohydrodynamic simulations of accretion on to sgr a\*: how important are radiative losses? *Monthly Notices of the Royal Astronomical Society*, 426(3):1928–1939, 2012.
- Sheperd Doeleman, Eric Agol, Don Backer, Fred Baganoff, Geoffrey C Bower, Avery Broderick, Andrew Fabian, Vincent Fish, Charles Gammie, Paul Ho, et al. Imaging an event horizon: submm-vlbi of a super massive black hole. *arXiv preprint arXiv:0906.3899*, 2009.
- Gia Dvali, Gregory Gabadadze, and Massimo Porrati. 4d gravity on a brane in 5d minkowski space. *Physics Letters B*, 485(1):208–214, 2000.
- A. Einstein. Erklärung der Perihelionbewegung der Merkur aus der allgemeinen Rel-

- ativitatstheorie. *Sitzungsber. preuss.Akad. Wiss.*, vol. 47, No.2, pp. 831-839, 1915, 47:831–839, 1915a.
- A. Einstein. Die Feldgleichungen der Gravitation. *Sitzungsberichte der Königlich Preußischen Akademie der Wissenschaften (Berlin)*, Seite 844-847., 1915b.
- Albert Einstein and Nathan Rosen. On gravitational waves. *Journal of the Franklin Institute*, 223(1):43–54, 1937.
- CW Francis Everitt, DB DeBra, BW Parkinson, JP Turneaure, JW Conklin, MI Heifetz, GM Keiser, AS Silbergleit, T Holmes, J Kolodziejczak, et al. Gravity probe b: final results of a space experiment to test general relativity. *Physical Review Letters*, 106(22):221101, 2011.
- AC Fabian. Observational evidence of active galactic nuclei feedback. *Annual Review of Astronomy and Astrophysics*, 50:455–489, 2012.
- Valerio Faraoni, Shawn D Belknap-Keet, and Marianne Lapierre-Léonard. Paczynski-wiita-like potential for any static spherical black hole in metric theories of gravity. *Physical Review D*, 93(4):044042, 2016.
- EE Fenimore. Jjm int zand, jp norris, et al. *Astrophys. J*, 448:L101, 1995.
- Stefano Finazzi, Stefano Liberati, and Lorenzo Sindoni. Cosmological constant: A lesson from bose-einstein condensates. *Physical review letters*, 108(7):071101, 2012.
- Edward B Fomalont and SM Kopeikin. The measurement of the light deflection from jupiter: experimental results. *The Astrophysical Journal*, 598(1):704, 2003.

- P Chris Fragile, Anna Gillespie, Timothy Monahan, Marco Rodriguez, and Peter Anninos. Numerical simulations of optically thick accretion onto a black hole. i. spherical case. *The Astrophysical Journal Supplement Series*, 201(2):9, 2012.
- S Ghosh. Rotating central objects with hard surfaces: A pseudo-newtonian potential for relativistic accretion disks. *Astronomy & Astrophysics*, 418(3):795–799, 2004.
- Samrat Ghosh and Arunava Bhadra. Influences of dark energy and dark matter on gravitational time advancement. *The European Physical Journal C*, 75(10):494, 2015.
- Shubhrangshu Ghosh and Prabir Banik. Characteristics of transonic spherical symmetric accretion flow in schwarzschild-de sitter and schwarzschild anti-de sitter backgrounds, in pseudo-general relativistic paradigm. *International Journal of Modern Physics D*, 24(11):1550084, 2015.
- Shubhrangshu Ghosh and Banibrata Mukhopadhyay. Generalized pseudo-newtonian potential for studying accretion disk dynamics in off-equatorial planes around rotating black holes: Description of a vector potential. *The Astrophysical Journal*, 667(1):367, 2007.
- Shubhrangshu Ghosh, Tamal Sarkar, and Arunava Bhadra. Newtonian analogue of corresponding space–time dynamics of rotating black holes: implication for black hole accretion. *Monthly Notices of the Royal Astronomical Society*, 445(4):4460–4476, 2014.
- Shubhrangshu Ghosh, Tamal Sarkar, and Arunava Bhadra. Newtonian analogue of

- static general relativistic spacetimes: An extension to naked singularities. *Physical Review D*, 92(8):083010, 2015.
- LEH Godfrey, JEJ Lovell, S Burke-Spolaor, Ronald Ekers, GV Bicknell, M Birkinshaw, DM Worrall, DL Jauncey, DA Schwartz, HL Marshall, et al. Periodic structure in the megaparsec-scale jet of pks 0637–752. *The Astrophysical Journal Letters*, 758(2):L27, 2012.
- Paolo Goldoni and Sandro Mereghetti. X-ray observations of the peculiar be star lsi+ 61 303. *arXiv preprint astro-ph/9502044*, 1995.
- Jeremy Goodman and Jonathan C Tan. Supermassive stars in quasar disks. *The Astrophysical Journal*, 608(1):108, 2004.
- Alexander AH Graham and Rahul Jha. Nonexistence of black holes with noncanonical scalar fields. *Physical Review D*, 89(8):084056, 2014.
- PC Gregory. Bayesian analysis of radio observations of the be x-ray binary ls i+ 61 303. *The Astrophysical Journal*, 575(1):427, 2002.
- PC Gregory and AR Taylor. New highly variable radio source, possible counterpart of  $\gamma$ -ray source cg135+ 1. *Nature*, 272(5655):704–706, 1978.
- D Hadasch, DF Torres, T Tanaka, RHD Corbet, AB Hill, R Dubois, G Dubus, T Glanzman, S Corbel, J Li, et al. Long-term monitoring of the high-energy  $\gamma$ -ray emission from ls i+ 61 303 and ls 5039. *The Astrophysical Journal*, 749(1):54, 2012.
- Jon Hakkila, Timothy W Giblin, Jay P Norris, P Chris Fragile, and Jerry T Bonnell.

- Correlations between lag, luminosity, and duration in gamma-ray burst pulses. *The Astrophysical Journal Letters*, 677(2):L81, 2008.
- MJ Hardcastle, DA Evans, and JH Croston. Hot and cold gas accretion and feedback in radio-loud active galaxies. *Monthly Notices of the Royal Astronomical Society*, 376(4):1849–1856, 2007.
- John F Hawley and Julian H Krolik. Magnetically driven jets in the kerr metric. *The Astrophysical Journal*, 641(1):103, 2006.
- Carlos AR Herdeiro and Eugen Radu. Kerr black holes with scalar hair. *Physical review letters*, 112(22):221101, 2014.
- K Hirata, Takaaki Kajita, Masatoshi Koshiba, M Nakahata, Y Oyama, N Sato, A Suzuki, M Takita, Y Totsuka, T Kifune, et al. Observation of a neutrino burst from the supernova sn1987a. *Physical Review Letters*, 58(14):1490, 1987.
- Luis C Ho. Nuclear activity in nearby galaxies. *Annu. Rev. Astron. Astrophys.*, 46: 475–539, 2008.
- Gerardt Hooft. *Introduction to general relativity*. Rinton Press, 2001.
- Russell A Hulse. The discovery of the binary pulsar. *Reviews of Modern Physics*, 66 (3):699, 1994.
- JB Hutchings and D Crampton. Spectroscopy of the unique degenerate binary star ls i+ 61 303. *Publications of the Astronomical Society of the Pacific*, 93(554):486, 1981.

- Mustapha Ishak, Wolfgang Rindler, Jason Dossett, Jacob Moldenhauer, and Chris Allison. A new independent limit on the cosmological constant/dark energy from the relativistic bending of light by galaxies and clusters of galaxies. *Monthly Notices of the Royal Astronomical Society*, 388(3):1279–1283, 2008.
- Mustapha Ishak, Austin Peel, and MA Troxel. Stringent restriction from the growth of large-scale structure on apparent acceleration in inhomogeneous cosmological models. *Physical review letters*, 111(25):251302, 2013.
- Rossen I Ivanov and Emil M Prodanov. Pseudo-newtonian potential for charged particle in kerr–newman geometry. *Physics Letters B*, 611(1):34–38, 2005.
- Allen I Janis, Ezra T Newman, and Jeffrey Winicour. Reality of the schwarzschild singularity. *Physical Review Letters*, 20(16):878, 1968.
- RMJ Janssen, HJA Röttgering, PN Best, and J Brinchmann. The triggering probability of radio-loud agn—a comparison of high and low excitation radio galaxies in hosts of different colors. *Astronomy & Astrophysics*, 541:A62, 2012.
- Pankaj S Joshi, Daniele Malafarina, and Ramesh Narayan. Equilibrium configurations from gravitational collapse. *Classical and Quantum Gravity*, 28(23):235018, 2011.
- Pankaj S Joshi, Daniele Malafarina, and Ramesh Narayan. Distinguishing black holes from naked singularities through their accretion disc properties. *Classical and Quantum Gravity*, 31(1):015002, 2013.
- Valeria Kagramanova, Jutta Kunz, and Claus Lämmerzahl. Solar system effects in schwarzschild–de sitter space–time. *Physics Letters B*, 634(5):465–470, 2006.

- Janusz Karkowski and Edward Malec. Bondi accretion onto cosmological black holes. *Physical Review D*, 87(4):044007, 2013.
- Iosif B Khriplovich and EV Pitjeva. Upper limits on density of dark matter in solar system. *International Journal of Modern Physics D*, 15(04):615–618, 2006.
- Eiichiro Komatsu, KM Smith, J Dunkley, CL Bennett, B Gold, G Hinshaw, N Jarosik, D Larson, MR Nolta, L Page, et al. Seven-year wilkinson microwave anisotropy probe (wmap\*) observations: cosmological interpretation. *The Astrophysical Journal Supplement Series*, 192(2):18, 2011.
- Serguei S Komissarov, Maxim V Barkov, Nektarios Vlahakis, and ArieH Königl. Magnetic acceleration of relativistic active galactic nucleus jets. *Monthly Notices of the Royal Astronomical Society*, 380(1):51–70, 2007.
- Alex S Konopliv, Sami W Asmar, William M Folkner, Özgür Karatekin, Daniel C Nunes, Suzanne E Smrekar, Charles F Yoder, and Maria T Zuber. Mars high resolution gravity fields from mro, mars seasonal gravity, and other dynamical parameters. *Icarus*, 211(1):401–428, 2011.
- Roman Konoplya and Alexander Zhidenko. Detection of gravitational waves from black holes: Is there a window for alternative theories? *Physics Letters B*, 756: 350–353, 2016.
- Friedrich Kottler. Über die physikalischen grundlagen der einsteinschen gravitationstheorie. *Annalen der Physik*, 361(14):401–462, 1918.

- GV Kraniotis. Precise relativistic orbits in kerr and kerr-(anti) de sitter spacetimes. *Classical and Quantum Gravity*, 21(19):4743, 2004.
- Andrzej Krasiński. A newtonian model of the source of the kerr metric. *Physics Letters A*, 80(4):238–242, 1980.
- SB Lambert and C Le Poncin-Lafitte. Determining the relativistic parameter  $\gamma$  using very long baseline interferometry. *Astronomy & Astrophysics*, 499(1):331–335, 2009.
- DE Lebach, BE Corey, II Shapiro, MI Ratner, JC Webber, AEE Rogers, JL Davis, and TA Herring. Measurement of the solar gravitational deflection of radio waves using very-long-baseline interferometry. *Physical Review Letters*, 75(8):1439, 1995.
- Jian Li, Diego F Torres, Shu Zhang, Yupeng Chen, Daniela Hadasch, Paul S Ray, Peter Kretschmar, Nanda Rea, and Jianmin Wang. Long-term x-ray monitoring of ls i+ 61 303: analysis of spectral variability and flares. *The Astrophysical Journal*, 733(2):89, 2011a.
- Jian Li, Diego F Torres, Shu Zhang, Daniela Hadasch, Nanda Rea, G Andrea Calian-dro, Yupeng Chen, and Jianmin Wang. Unveiling the super-orbital modulation of ls i+ 61 303 in x-rays. *The Astrophysical Journal Letters*, 744(1):L13, 2011b.
- Yu-Feng Li, Jun Cao, Yifang Wang, and Liang Zhan. Unambiguous determination of the neutrino mass hierarchy using reactor neutrinos. *Physical Review D*, 88(1):013008, 2013.
- Zhaosheng Li, Li Chen, and Dehua Wang. Spectral lags obtained by ccf of smoothed

- light curves. *Publications of the Astronomical Society of the Pacific*, 124(914):297, 2012.
- Shuang Liang and Yi Xie. New upper limit on the cosmological constant from solar system dynamics. *Research in Astronomy and Astrophysics*, 14(5):527, 2014.
- Hubert W Lilliefors. On the kolmogorov-smirnov test for normality with mean and variance unknown. *Journal of the American Statistical Association*, 62(318):399–402, 1967.
- Bennett Link, Richard I Epstein, and William C Priedhorsky. Prevalent properties of gamma-ray burst variability. *The Astrophysical Journal*, 408:L81–L84, 1993.
- V Lipunov and E Gorbovskoy. An extra long x-ray plateau in a gamma-ray burst and the spinar paradigm. *The Astrophysical Journal Letters*, 665(2):L97, 2007.
- Michael J Longo. New precision tests of the einstein equivalence principle from sn1987a. *Physical review letters*, 60(3):173, 1988.
- Thomas J Loredo and Donald Q Lamb. Bayesian analysis of neutrinos observed from supernova sn 1987a. *Physical Review D*, 65(6):063002, 2002.
- Arthur Lue and Glenn Starkman. Gravitational leakage into extra dimensions: Probing dark energy using local gravity. *Physical Review D*, 67(6):064002, 2003.
- Patryk Mach, Edward Malec, and Janusz Karkowski. Spherical steady accretion flows: Dependence on the cosmological constant, exact isothermal solutions, and applications to cosmology. *Physical Review D*, 88(8):084056, 2013.

- Philip D Mannheim and Demosthenes Kazanas. Exact vacuum solution to conformal weyl gravity and galactic rotation curves. *The Astrophysical Journal*, 342:635–638, 1989.
- Philip D Mannheim and James G OBrien. Impact of a global quadratic potential on galactic rotation curves. *Physical review letters*, 106(12):121101, 2011.
- L Maraschi and A Treves. A model for lsi 61 303. *Monthly Notices of the Royal Astronomical Society*, 194(1):1P–5P, 1981.
- Alan P Marscher and Svetlana G Jorstad. The megaparsec-scale x-ray jet of the bl lac object oj287. *The Astrophysical Journal*, 729(1):26, 2011.
- Alejo Martínez-Sansigre and Steve Rawlings. Observational constraints on the spin of the most massive black holes from radio observations. *Monthly Notices of the Royal Astronomical Society*, 414(3):1937–1964, 2011.
- Maria Massi. LSI+ 61° 303 in the context of microquasars. *Astronomy & Astrophysics*, 422(1):267–270, 2004.
- Maria Massi, M Ribó, JM Paredes, M Peracaula, and Robert Estalella. One-sided jet at milliarcsecond scales in LSI+ 61° 303 *Astronomy & Astrophysics*, 376(1): 217–223, 2001.
- Ian G McCarthy, Joop Schaye, Trevor J Ponman, Richard G Bower, Craig M Booth, C Dalla Vecchia, Robert A Crain, Volker Springel, Tom Theuns, and Robert PC Wiersma. The case for agn feedback in galaxy groups. *Monthly Notices of the Royal Astronomical Society*, 406(2):822–839, 2010.

- Jonathan C McKinney. Probing black hole gravity. *Science*, 337(6097):916–917, 2012.
- Jonathan C McKinney and Charles F Gammie. A measurement of the electromagnetic luminosity of a kerr black hole. *The Astrophysical Journal*, 611(2):977, 2004.
- M Virginia McSwain, Paul S Ray, Scott M Ransom, Mallory SE Roberts, Sean M Dougherty, and Guy G Pooley. A radio pulsar search of the  $\gamma$ -ray binaries ls i+ 61 303 and ls 5039. *The Astrophysical Journal*, 738(1):105, 2011.
- Redouane Mecheri, Toufik Abdelatif, Abdanour Irbah, Janine Provost, and Gabrielle Berthomieu. New values of gravitational moments  $j_2$  and  $j_4$  deduced from helioseismology. *Solar Physics*, 222(2):191–197, 2004.
- David L Meier. A magnetically switched, rotating black hole model for the production of extragalactic radio jets and the fanaroff and riley class division. *The Astrophysical Journal*, 522(2):753, 1999.
- Haim Mendelson and Tsevi Mazeh. Discovery of a 26.5-day optical periodicity of lsi+ 61 303. *Monthly Notices of the Royal Astronomical Society*, 239(3):733–740, 1989.
- C. W. Misner, K. S. Thorne, and J. A. Wheeler. *Gravitation*. 1973.
- Javier Moldón, Marc Ribó, and Josep M Paredes. Periodic morphological changes in gamma-ray binaries. In *AIP Conference Proceedings*, volume 1505, pages 386–389. AIP, 2012.
- Philipp Mösta, Bruno C Mundim, Joshua A Faber, Roland Haas, Scott C Noble, Tanja Bode, Frank Löffler, Christian D Ott, Christian Reisswig, and Erik Schnetter.

- Grhydro: a new open-source general-relativistic magnetohydrodynamics code for the einstein toolkit. *Classical and quantum gravity*, 31(1):015005, 2013.
- Banibrata Mukhopadhyay. Description of pseudo-newtonian potential for the relativistic accretion disks around kerr black holes. *The Astrophysical Journal*, 581(1):427, 2002.
- Banibrata Mukhopadhyay. Higher-order nonlinearity in accretion disks: Quasi-periodic oscillations of black hole and neutron star sources and their spin. *The Astrophysical Journal*, 694(1):387, 2009.
- Banibrata Mukhopadhyay and Ranjeev Misra. Pseudo-newtonian potentials to describe the temporal effects on relativistic accretion disks around rotating black holes and neutron stars. *The Astrophysical Journal*, 582(1):347, 2003.
- Banibrata Mukhopadhyay, Debbijoy Bhattacharya, and P Sreekumar. Observational evidences for spinning black holes: A proof of general relativity for spacetime around rotating black holes. *International Journal of Modern Physics D*, 21(11):1250086, 2012.
- Ramesh Narayan, Tsvi Piran, and Amotz Shemi. Neutron star and black hole binaries in the galaxy. *The Astrophysical Journal*, 379:L17–L20, 1991.
- Wei-Tou Ni. Theoretical frameworks for testing relativistic gravity. iv. a compendium of metric theories of gravity and their post newtonian limits. *The Astrophysical Journal*, 176:769, 1972.
- Shinichi Nojiri and Sergei D Odintsov. Unified cosmic history in modified gravity:

- from  $f(r)$  theory to lorentz non-invariant models. *Physics Reports*, 505(2):59–144, 2011.
- Jay P Norris, Jerry T Bonnell, Demosthenes Kazanas, Jeffrey D Scargle, Jon Hakkila, and Timothy W Giblin. Long-lag, wide-pulse gamma-ray bursts. *The Astrophysical Journal*, 627(1):324, 2005.
- JP Norris, GF Marani, and JT Bonnell. Connection between energy-dependent lags and peak luminosity in gamma-ray bursts. *The Astrophysical Journal*, 534(1):248, 2000.
- Michael A Nowak and Robert V Wagoner. Diskoseismology: Probing accretion disks. i-trapped adiabatic oscillations. *The Astrophysical Journal*, 378:656–664, 1991.
- Marek Nowakowski, Juan-Carlos Sanabria, and Alejandro Garcia. Gravitational equilibrium in the presence of a positive cosmological constant. *Physical Review D*, 66(2):023003, 2002.
- Keith A Olive, Particle Data Group, et al. Review of particle physics. *Chinese physics C*, 38(9):090001, 2014.
- B Paczynsky and Paul J Wiita. Thick accretion disks and supercritical luminosities. *Astronomy and Astrophysics*, 88:23–31, 1980.
- Alessandro Papitto, Diego F Torres, and Nanda Rea. Possible changes of state and relevant timescales for a neutron star in ls i+ 61 303. *The Astrophysical Journal*, 756(2):188, 2012.

- JM Paredes, P Marziani, J Marti, J Fabregat, MJ Coe, C Everall, F Figueras, C Jordi, AJ Norton, T Prince, et al. Photometric and h  $\alpha$  observations of LSI+ 61 $^{\circ}$  303: detection of a  $\sim 26$  day v and jhk band modulation. *arXiv preprint astro-ph/9402016*, 1994.
- JM Paredes, J Marti, M Peracaula, and M Ribo. Evidence of x-ray periodicity in lsi+ 61 303. *Astronomy and Astrophysics*, 320:L25–L28, 1997.
- Josep M Paredes, Marc Ribó, Valentí Bosch-Ramon, Jennifer R West, Yousaf M Butt, Diego F Torres, and Josep Martí. Chandra observations of the gamma-ray binary ls i+ 61 303: Extended x-ray structure? *The Astrophysical Journal Letters*, 664 (1):L39, 2007.
- Mandar Patil and Pankaj S Joshi. High energy particle collisions in superspinning kerr geometry. *Physical Review D*, 84(10):104001, 2011.
- P James E Peebles and Bharat Ratra. The cosmological constant and dark energy. *Reviews of modern physics*, 75(2):559, 2003.
- Volker Perlick. Gravitational lensing from a spacetime perspective. *arXiv preprint arXiv:1010.3416*, 2010.
- Saul Perlmutter, G Aldering, G Goldhaber, RA Knop, P Nugent, PG Castro, S Deustua, S Fabbro, A Goobar, DE Groom, et al. Measurements of  $\omega$  and  $\lambda$  from 42 high-redshift supernovae. *The Astrophysical Journal*, 517(2):565, 1999.
- Eric Poisson and Clifford M Will. *Gravity: Newtonian, Post-Newtonian, Relativistic*. Cambridge University Press, 2014.

- Richard H Price. Nonspherical perturbations of relativistic gravitational collapse. i. scalar and gravitational perturbations. *Physical Review D*, 5(10):2419, 1972.
- JE Pringle. Accretion discs in astrophysics. *Annual review of astronomy and astrophysics*, 19(1):137–160, 1981.
- Daniela Pugliese, Hernando Quevedo, and Remo Ruffini. Circular motion of neutral test particles in reissner-nordström spacetime. *Physical Review D*, 83(2):024021, 2011a.
- Daniela Pugliese, Hernando Quevedo, and Remo Ruffini. Motion of charged test particles in reissner-nordström spacetime. *Physical Review D*, 83(10):104052, 2011b.
- SR Rajesh and Banibrata Mukhopadhyay. Two-temperature accretion around rotating black holes: a description of the general advective flow paradigm in the presence of various cooling processes to explain low to high luminous sources. *Monthly Notices of the Royal Astronomical Society*, 402(2):961–984, 2010.
- N Rea, DF Torres, M van der Klis, PG Jonker, M Méndez, and A Sierpowska-Bartosik. Deep chandra observations of tev binaries—i. ls i+ 61 303. *Monthly Notices of the Royal Astronomical Society*, 405(4):2206–2214, 2010.
- Christopher S Reynolds. The spin of supermassive black holes. *Classical and Quantum Gravity*, 30(24):244004, 2013.
- Christopher S Reynolds. Measuring black hole spin using x-ray reflection spectroscopy. *Space Science Reviews*, 183(1-4):277–294, 2014.

Luciano Rezzolla, Olindo Zanotti, and José A Font. Dynamics of thick discs around schwarzschild-de sitter black holes. *Astronomy & Astrophysics*, 412(3):603–613, 2003.

Luciano Rezzolla, Enrico Barausse, Ernst Nils Dorband, Denis Pollney, Christian Reisswig, Jennifer Seiler, and Sascha Husa. Final spin from the coalescence of two black holes. *Physical Review D*, 78(4):044002, 2008.

Adam G Riess, Alexei V Filippenko, Peter Challis, Alejandro Clocchiatti, Alan Diercks, Peter M Garnavich, Ron L Gilliland, Craig J Hogan, Saurabh Jha, Robert P Kirshner, et al. Observational evidence from supernovae for an accelerating universe and a cosmological constant. *The Astronomical Journal*, 116(3):1009, 1998.

Arundhati Roychoudhury, Samir K Sarkar, and Arunava Bhadra. Spectral lag features of grb 060814 from swift bat and suzaku observations. *The Astrophysical Journal*, 782(2):105, 2014.

Aleksander Sadowski, Ramesh Narayan, Jonathan C McKinney, and Alexander Tchekhovskoy. Numerical simulations of super-critical black hole accretion flows in general relativity. *Monthly Notices of the Royal Astronomical Society*, 439(1):503–520, 2014.

Satyabrata Sahu, Mandar Patil, D Narasimha, and Pankaj S Joshi. Time delay between relativistic images as a probe of cosmic censorship. *Physical Review D*, 88(10):103002, 2013.

- Kabita Sarkar and Arunava Bhadra. Strong field gravitational lensing in scalar–tensor theories. *Classical and Quantum Gravity*, 23(22):6101, 2006.
- Tamal Sarkar, Shubhrangshu Ghosh, and Arunava Bhadra. Newtonian analogue of schwarzschild–de sitter spacetime: Influence on the local kinematics in galaxies. *Physical Review D*, 90(6):063008, 2014.
- Kevin Schawinski, Daniel Thomas, Marc Sarzi, Claudia Maraston, Sugata Kaviraj, Seok-Joo Joo, Sukyoung K Yi, and Joseph Silk. Observational evidence for agn feedback in early-type galaxies. *Monthly Notices of the Royal Astronomical Society*, 382(4):1415–1431, 2007.
- Leonard I Schiff. On experimental tests of the general theory of relativity. *American Journal of Physics*, 28(4):340–343, 1960.
- David N Schramm, R Mayle, and James R Wilson. Neutrinos from gravitational collapse. *Il Nuovo Cimento C*, 9(2):443–450, 1986.
- Oldřich Semerák and Vladimír Karas. Pseudo-newtonian models of a rotating black hole field. *arXiv preprint astro-ph/9901289*, 1999.
- Oldřich Semerák and Miroslav Žáček. Oscillations of static discs around schwarzschild black holes: Effect of self-gravitation. *Publications of the Astronomical Society of Japan*, 52(6):1067–1074, 2000.
- Rebecca Shafee, Ramesh Narayan, and Jeffrey E McClintock. Viscous torque and dissipation in the inner regions of a thin accretion disk: implications for measuring black hole spin. *The Astrophysical Journal*, 676(1):549, 2008.

- N I Shakura and Rashid Alievich Sunyaev. Black holes in binary systems. observational appearance. *Astronomy and Astrophysics*, 24:337–355, 1973.
- Steven S Shapiro, James L Davis, Daniel E Lebach, and JS Gregory. Measurement of the solar gravitational deflection of radio waves using geodetic very-long-baseline interferometry data, 1979–1999. *Physical Review Letters*, 92(12):121101, 2004.
- Stuart L Shapiro and Saul A Teukolsky. Black holes. *Black Holes, White Dwarfs, and Neutron Stars: The Physics of Compact Objects*, pages 335–369, 1983.
- Prateek Sharma, Eliot Quataert, Gregory W Hammett, and James M Stone. Electron heating in hot accretion flows. *The Astrophysical Journal*, 667(2):714, 2007.
- Lara Sidoli, Alberto Pellizzoni, Stefano Vercellone, Michele Moroni, Sandro Mereghetti, and Marco Tavani. Xmm-newton observation of a spectral state transition in the peculiar radio/x-ray/ $\gamma$ -ray source ls i+ 61 303. *Astronomy & Astrophysics*, 459(3):901–907, 2006.
- L. Silberstein. The motion of the perihelion of Mercury deduced from the classical theory of relativity. *Monthly Notices Roy. Astron. Soc.*, 77:503–510, April 1917. doi: 10.1093/mnras/77.6.503.
- T Singh and RS Srivastava. Newtonian analogue of force and motion of a free particle in the gravitational field of kerr-de sitter space-time. *Astrophysics and space science*, 139(2):263–273, 1987.
- Sergei Slobodov, Kristin Schleich, and Donald M Witt. Effects of a cosmological

- constant on the x-ray fluorescence spectra of black hole accretion disks. *arXiv preprint gr-qc/0402066*, 2004.
- A Smith, Philip Kaaret, J Holder, A Falcone, G Maier, D Pandel, and M Stroh. Long-term x-ray monitoring of the tev binary ls i+ 61 303 with the rossi x-ray timing explorer. *The Astrophysical Journal*, 693(2):1621, 2009.
- Luigi Stella and Mario Vietri. khz quasiperiodic oscillations in low-mass x-ray binaries as probes of general relativity in the strong-field regime. *Physical Review Letters*, 82(1):17, 1999.
- Thaisa Storchi-Bergmann. Signatures of mass accretion onto agn from sub-parsec to kiloparsec scales. In *Eleventh IAU Regional Latin American Meeting of Astronomy*, volume 26, pages 135–138. Instituto de Astronomia Universidad Nacional Autonoma de Mex, 2006.
- Thaisa Storchi-Bergmann, Oli L Dors Jr, Rogemar A Riffel, Kambiz Fathi, David J Axon, Andrew Robinson, Alessandro Marconi, and Göran Östlin. Nuclear spirals as feeding channels to the supermassive black hole: the case of the galaxy ngc 6951. *The Astrophysical Journal*, 670(2):959, 2007.
- Z Stuchlík and S Hledík. Some properties of the schwarzschild–de sitter and schwarzschild–anti-de sitter spacetimes. *Physical Review D*, 60(4):044006, 1999.
- Z Stuchlík, P Slaný, and S Hledík. Equilibrium configurations of perfect fluid orbiting schwarzschild-de sitter black holes. *Astronomy and Astrophysics*, 363:425–439, 2000.

- Zdenek Stuchlik and Massimo Calvani. Null geodesics in black hole metrics with non-zero cosmological constant. *General Relativity and Gravitation*, 23(5):507–519, 1991.
- Zdeněk Stuchlík and Jiří Kovář. Pseudo-newtonian gravitational potential for schwarzschild -de sitter space-times. *International Journal of Modern Physics D*, 17(11):2089–2105, 2008.
- Zdeněk Stuchlík and Jan Schee. Influence of the cosmological constant on the motion of magellanic clouds in the gravitational field of milky way. *Journal of Cosmology and Astroparticle Physics*, 2011(09):018, 2011.
- Zdeněk Stuchlík and Petr Slaný. Equatorial circular orbits in the kerr–de sitter spacetimes. *Physical Review D*, 69(6):064001, 2004.
- Zdeněk Stuchlík, Petr Slaný, and Jiří Kovář. Pseudo-newtonian and general relativistic barotropic tori in schwarzschild–de sitter spacetimes. *Classical and Quantum Gravity*, 26(21):215013, 2009.
- AR Taylor and PC Gregory. Two-frequency radio spectra during an outburst of the periodic radio star lsi+ 61 deg 303. *The Astrophysical Journal*, 283:273–278, 1984.
- AR Taylor, G Young, M Peracaula, HT Kenny, and PC Gregory. An x-ray outburst. from the radio emitting x-ray binary lsi+ 61 303. *Astronomy and Astrophysics*, 305:817, 1996.
- Emilio Tejeda and Stephan Rosswog. An accurate newtonian description of particle

- motion around a schwarzschild black hole. *Monthly Notices of the Royal Astronomical Society*, 433(3):1930–1940, 2013.
- Emilio Tejeda and Stephan Rosswog. Generalized newtonian description of particle motion in spherically symmetric spacetimes. *arXiv preprint arXiv:1402.1171*, 2014.
- Kip S Thorne. Multipole expansions of gravitational radiation. *Reviews of Modern Physics*, 52(2):299, 1980.
- Diego F Torres, Shu Zhang, Jian Li, Nanda Rea, G Andrea Caliendo, Daniela Hadasch, Yupeng Chen, Jianmin Wang, and Paul S Ray. Variability in the orbital profiles of the x-ray emission of the  $\gamma$ -ray binary ls i+ 61 303. *The Astrophysical Journal Letters*, 719(1):L104, 2010.
- Diego F Torres, Nanda Rea, Paolo Esposito, Jian Li, Yupeng Chen, and Shu Zhang. A magnetar-like event from ls i+ 61 303 and its nature as a gamma-ray binary. *The Astrophysical Journal*, 744(2):106, 2011.
- Vyacheslav G Turyshev. Space-based tests of relativistic gravitation. In *Gravity: Where Do We Stand?*, pages 211–233. Springer, 2016.
- P Uttley, T Wilkinson, P Cassatella, J Wilms, K Pottschmidt, M Hanke, and M Böck. The causal connection between disc and power-law variability in hard state black hole x-ray binaries. *Monthly Notices of the Royal Astronomical Society: Letters*, 414(1):L60–L64, 2011.
- Arkady I Vainshtein. To the problem of nonvanishing gravitation mass. *Physics Letters B*, 39(3):393–394, 1972.

- KS Virbhadra, D Narasimha, and SM Chitre. Role of the scalar field in gravitational lensing. *ASTRONOMY AND ASTROPHYSICS-BERLIN-*, 337:1–8, 1998.
- Robert M Wald. *General Relativity*. University of Chicago Press, 1984.
- Robert M Wald. *Black holes and relativistic stars*. University of Chicago Press, 1999.
- Joseph Weber. Detection and generation of gravitational waves. *Physical Review*, 117(1):306, 1960.
- Christopher Wegg. Pseudo-newtonian potentials for nearly parabolic orbits. *The Astrophysical Journal*, 749(2):183, 2012.
- S. Weinberg. *Gravitation and Cosmology: Principles and Applications of the General Theory of Relativity*. July 1972.
- Steven Weinberg. The cosmological constant problem. *Reviews of modern physics*, 61(1):1, 1989.
- Joel M Weisberg and Yuping Huang. Relativistic measurements from timing the binary pulsar psr b1913+ 16. *The Astrophysical Journal*, 829(1):55, 2016.
- Norbert Wex. Testing relativistic gravity with radio pulsars. *arXiv preprint arXiv:1402.5594*, 2014.
- Clifford M Will. Theoretical frameworks for testing relativistic gravity. iii. conservation laws, lorentz invariance, and values of the ppn parameters. *The Astrophysical Journal*, 169:125, 1971.

- Clifford M Will. *Theory and experiment in gravitational physics*. Cambridge University Press, 1993.
- Clifford M Will. The confrontation between general relativity and experiment: a centenary perspective. *Progress of Theoretical Physics Supplement*, 163:146–162, 2006.
- Clifford M Will. The confrontation between general relativity and experiment. *Living reviews in relativity*, 17(1):4, 2014.
- Andrzej A Zdziarski, Andrii Neronov, and Maria Chernyakova. A compact pulsar wind nebula model of the  $\gamma$ -ray-loud binary ls i+ 61 303. *Monthly Notices of the Royal Astronomical Society*, 403(4):1873–1886, 2010.
- Ivaylo Zlatev, Limin Wang, and Paul J Steinhardt. Quintessence, cosmic coincidence, and the cosmological constant. *Physical Review Letters*, 82(5):896, 1999.