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Les Lumières: probing the cosmic Epoch of Reionization with high-redshift quasars

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BIBLIOGRAPHY

- Abazajian K. N., et al., 2016, [arXiv e-prints](#), p. arXiv:1610.02743
- Abdalla E., et al., 2022, [Journal of High Energy Astrophysics](#), 34, 49
- Abdul Karim M., et al., 2025, [Phys. Rev. D](#), 112, 083515
- Abdurashidova Z., et al., 2022, [ApJ](#), 925, 221
- Adame A. G., et al., 2025, [J. Cosmology Astropart. Phys.](#), 2025, 021
- Adams N. J., et al., 2024, [ApJ](#), 965, 169
- Ade P., et al., 2019, [J. Cosmology Astropart. Phys.](#), 2019, 056
- Alam S., et al., 2021, [Phys. Rev. D](#), 103, 083533
- Albrecht A., Steinhardt P. J., 1982, [Phys. Rev. Lett.](#), 48, 1220
- Almgren A. S., Bell J. B., Lijewski M. J., Lukić Z., Van Andel E., 2013, [ApJ](#), 765, 39
- Alpher R. A., Bethe H., Gamow G., 1948, [Physical Review](#), 73, 803
- Alsing J., Charnock T., Feeney S., Wandelt B., 2019, [MNRAS](#), 488, 4440
- Asthana S., Haehnelt M. G., Kulkarni G., Aubert D., Bolton J. S., Keating L. C., 2024, [MNRAS](#), 533, 2843
- Astropy Collaboration et al., 2013, [A&A](#), 558, A33
- Astropy Collaboration et al., 2018, [AJ](#), 156, 123
- Astropy Collaboration et al., 2022, [ApJ](#), 935, 167
- Atek H., et al., 2024, [Nature](#), 626, 975
- Aubert D., Teyssier R., 2010, [ApJ](#), 724, 244
- Bach K., Lee H.-W., 2015, [MNRAS](#), 446, 264
- Bayes T., Price R., 1763, *Philosophical Transactions of the Royal Society of London Series I*, 53, 370
- Bañados E., et al., 2018, [Nature](#), 553, 473
- Bañados E., et al., 2025, [MNRAS](#), 542, 1088
- Becker G. D., Bolton J. S., Haehnelt M. G., Sargent W. L. W., 2011, [MNRAS](#), 410, 1096
- Becker G. D., Bolton J. S., Madau P., Pettini M., Ryan-Weber E. V., Venemans B. P., 2015, [MNRAS](#), 447, 3402
- Becker G. D., D'Aloisio A., Christenson H. M., Zhu Y., Worseck G., Bolton J. S., 2021, [MNRAS](#), 508, 1853
- Becker G. D., Bolton J. S., Zhu Y., Hashemi S., 2024, [MNRAS](#), 533, 1525
- Berestetskii V. B., Lifshitz E. M., Pitaevskii V. B., 1971, *Relativistic quantum theory*. Pt.1
- Beringue B., et al., 2025, [arXiv e-prints](#), p. arXiv:2506.06274
- Bethe H. A., Salpeter E. E., 1957, *Quantum Mechanics of One- and Two-Electron Atoms*
- Bingham E., et al., 2018, [arXiv e-prints](#), p. arXiv:1810.09538
- Boera E., Becker G. D., Bolton J. S., Nasir F., 2019, [ApJ](#), 872, 101
- Bogdán Á., et al., 2024, [Nature Astronomy](#), 8, 126

- Bolan P., et al., 2022, *MNRAS*, 517, 3263
- Bolton J. S., Haehnelt M. G., 2007a, *MNRAS*, 374, 493
- Bolton J. S., Haehnelt M. G., 2007b, *MNRAS*, 382, 325
- Bolton J. S., Becker G. D., Wyithe J. S. B., Haehnelt M. G., Sargent W. L. W., 2010, *MNRAS*, 406, 612
- Bolton J. S., Haehnelt M. G., Warren S. J., Hewett P. C., Mortlock D. J., Venemans B. P., McMahon R. G., Simpson C., 2011, *MNRAS*, 416, L70
- Bolton J. S., Becker G. D., Raskutti S., Wyithe J. S. B., Haehnelt M. G., Sargent W. L. W., 2012, *MNRAS*, 419, 2880
- Bolton J. S., Puchwein E., Sijacki D., Haehnelt M. G., Kim T.-S., Meiksin A., Regan J. A., Viel M., 2017, *MNRAS*, 464, 897
- Bond J. R., Cole S., Efstathiou G., Kaiser N., 1991, *ApJ*, 379, 440
- Bondi H., Gold T., 1948, *MNRAS*, 108, 252
- Born M., Jordan P., 1925, *Zeitschrift fur Physik*, 34, 858
- Bosman S. E. I., 2021, *arXiv e-prints*, p. arXiv:2108.12446
- Bosman S. E. I., Fan X., Jiang L., Reed S., Matsuoka Y., Becker G., Haehnelt M., 2018, *MNRAS*, 479, 1055
- Bosman S. E. I., et al., 2022, *MNRAS*, 514, 55
- Bouwens R. J., et al., 2015, *ApJ*, 803, 34
- Bouwens R. J., et al., 2021, *AJ*, 162, 47
- Bradbury J., et al., 2018, JAX: composable transformations of Python+NumPy programs, <http://github.com/google/jax>
- Bromm V., 2013, *Reports on Progress in Physics*, 76, 112901
- Bruton S., Lin Y.-H., Scarlata C., Hayes M. J., 2023, *ApJ*, 949, L40
- Bunker A. J., et al., 2023, *A&A*, 677, A88
- Busca N. G., et al., 2013, *A&A*, 552, A96
- Carniani S., et al., 2024, *Nature*, 633, 318
- Cen R., Haiman Z., 2000, *ApJ*, 542, L75
- Chabanier S., et al., 2019, *J. Cosmology Astropart. Phys.*, 2019, 017
- Chen H., 2024, *MNRAS*, 528, L33
- Chen H., Gnedin N. Y., 2021, *ApJ*, 911, 60
- Cheng C., et al., 2018, *ApJ*, 868, 26
- Chiu H.-Y., 1964, *Physics Today*, 17, 21
- Chornock R., Berger E., Fox D. B., Lunnan R., Drout M. R., Fong W.-f., Laskar T., Roth K. C., 2013, *ApJ*, 774, 26
- Choudhury T. R., Paranjape A., Bosman S. E. I., 2021, *MNRAS*, 501, 5782
- Christensen L., et al., 2023, *A&A*, 680, A82
- Collette A., 2013, Python and HDF5. O'Reilly
- Cook W. G., Glushchenko I. A., Ijjas A., Pretorius F., Steinhardt P. J., 2020, *Physics Letters B*, 808, 135690
- Cranmer K., Brehmer J., Louppe G., 2020, *Proceedings of the National Academy of Science*, 117, 30055
- Croft R. A. C., Weinberg D. H., Katz N., Hernquist L., 1998, *ApJ*, 495, 44

- Croft R. A. C., Weinberg D. H., Bolte M., Burles S., Hernquist L., Katz N., Kirkman D., Tytler D., 2002, *ApJ*, 581, 20
- Curtis-Lake E., et al., 2023, *Nature Astronomy*, 7, 622
- D’Aloisio A., McQuinn M., Davies F. B., Furlanetto S. R., 2018, *MNRAS*, 473, 560
- D’Odorico V., et al., 2023, *MNRAS*, 523, 1399
- Davies F. B., Furlanetto S. R., 2016, *MNRAS*, 460, 1328
- Davies F. B., Furlanetto S. R., 2022, *MNRAS*, 514, 1302
- Davies F. B., Hennawi J. F., 2023, *arXiv e-prints*, p. arXiv:2312.06763
- Davies F. B., Furlanetto S. R., McQuinn M., 2016, *MNRAS*, 457, 3006
- Davies F. B., et al., 2018a, *ApJ*, 864, 142
- Davies F. B., et al., 2018b, *ApJ*, 864, 143
- Davies F. B., Hennawi J. F., Eilers A.-C., 2019, *ApJ*, 884, L19
- Davies F. B., Hennawi J. F., Eilers A.-C., 2020, *MNRAS*, 493, 1330
- Davies F. B., Bañados E., Hennawi J. F., Bosman S. E. I., 2025, *ApJ*, 989, L27
- Davies F. B., et al., 2026, *MNRAS*, 545, staf1862
- Davis M., Efstathiou G., Frenk C. S., White S. D. M., 1985, *ApJ*, 292, 371
- Davé R., Anglés-Alcázar D., Narayanan D., Li Q., Rafieferantsoa M. H., Appleby S., 2019, *MNRAS*, 486, 2827
- Delubac T., et al., 2015, *A&A*, 574, A59
- Donnan C. T., et al., 2024, *MNRAS*, 533, 3222
- Draine B. T., 2011, *Physics of the Interstellar and Intergalactic Medium*
- Duane S., Kennedy A. D., Pendleton B. J., Roweth D., 1987, *Physics Letters B*, 195, 216
- Žurovčíková D., Katz H., Bosman S. E. I., Davies F. B., Devriendt J., Slyz A., 2020, *MNRAS*, 493, 4256
- Žurovčíková D., et al., 2024, *ApJ*, 969, 162
- Dyson F. J., 1949, *Physical Review*, 75, 486
- Edge D. O., Shakeshaft J. R., McAdam W. B., Baldwin J. E., Archer S., 1959, *Mem. RAS*, 68, 37
- Eilers A.-C., Davies F. B., Hennawi J. F., Prochaska J. X., Lukić Z., Mazzucchelli C., 2017, *ApJ*, 840, 24
- Eilers A.-C., Davies F. B., Hennawi J. F., 2018, *ApJ*, 864, 53
- Eilers A.-C., et al., 2020, *ApJ*, 900, 37
- Eilers A.-C., Hennawi J. F., Davies F. B., Simcoe R. A., 2021, *ApJ*, 917, 38
- Einasto J., Kaasik A., Saar E., 1974, *Nature*, 250, 309
- Einstein A., 1916, *Annalen der Physik*, 354, 769
- Einstein A., 1917, *Sitzungsberichte der Königlich Preussischen Akademie der Wissenschaften*, pp 142–152
- Elbers W., 2025, *arXiv e-prints*, p. arXiv:2508.21069

- Elias J. H., Joyce R. R., Liang M., Muller G. P., Hileman E. A., George J. R., 2006, in McLean I. S., Iye M., eds, Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series Vol. 6269, Ground-based and Airborne Instrumentation for Astronomy. p. 62694C, [doi:10.1117/12.671817](https://doi.org/10.1117/12.671817)
- Endsley R., Stark D. P., Whitler L., Topping M. W., Chen Z., Plat A., Chisholm J., Charlot S., 2023, *MNRAS*, 524, 2312
- Englert F., Brout R., 1964, *Phys. Rev. Lett.*, 13, 321
- Euclid Collaboration et al., 2019, *A&A*, 631, A85
- Euclid Collaboration et al., 2026, in prep.
- Event Horizon Telescope Collaboration et al., 2019, *ApJ*, 875, L1
- Event Horizon Telescope Collaboration et al., 2022, *ApJ*, 930, L12
- Fan X., et al., 2000, *AJ*, 120, 1167
- Fan X., Narayanan V. K., Strauss M. A., White R. L., Becker R. H., Pentericci L., Rix H.-W., 2002, *AJ*, 123, 1247
- Fan X., et al., 2006, *AJ*, 132, 117
- Fan X., Bañados E., Simcoe R. A., 2023, *ARA&A*, 61, 373
- Faucher-Giguère C.-A., Prochaska J. X., Lidz A., Hernquist L., Zaldarriaga M., 2008, *ApJ*, 681, 831
- Fausey H. M., et al., 2025a, *MNRAS*, 536, 2839
- Fausey H. M., van der Horst A. J., Tanvir N. R., Wiersema K., Fynbo J. P. U., Hartmann D., de Ugarte Postigo A., 2025b, *ApJ*, 985, 28
- Feynman R. P., 1948, *Reviews of Modern Physics*, 20, 367
- Finkelstein S. L., et al., 2019, *ApJ*, 879, 36
- Font-Ribera A., et al., 2014, *J. Cosmology Astropart. Phys.*, 2014, 027
- Foreman-Mackey D., 2016, *The Journal of Open Source Software*, 1, 24
- Friedmann A., 1922, *Zeitschrift für Physik*, 10, 377
- Fumagalli M., O’Meara J. M., Prochaska J. X., Worseck G., 2013, *ApJ*, 775, 78
- Furlanetto S. R., Oh S. P., 2005, *MNRAS*, 363, 1031
- Furlanetto S. R., Zaldarriaga M., Hernquist L., 2004, *ApJ*, 613, 1
- Furlanetto S. R., Oh S. P., Briggs F. H., 2006, *Phys. Rep.*, 433, 181
- Gaikwad P., et al., 2020, *MNRAS*, 494, 5091
- Gaikwad P., Srianand R., Haehnelt M. G., Choudhury T. R., 2021, *MNRAS*, 506, 4389
- Gaikwad P., et al., 2023, *MNRAS*, 525, 4093
- Garaldi E., Kannan R., Smith A., Springel V., Pakmor R., Vogelsberger M., Hernquist L., 2022, *MNRAS*, 512, 4909
- Garcia-Gallego O., Iršič V., Haehnelt M. G., Bolton J. S., 2025a, *arXiv e-prints*, p. arXiv:2510.00107
- Garcia-Gallego O., Iršič V., Haehnelt M. G., Viel M., Bolton J. S., 2025b, *Phys. Rev. D*, 112, 043502
- Garzilli A., Boyarsky A., Ruchayskiy O., 2017, *Physics Letters B*, 773, 258
- Gnedin N. Y., 2014, *ApJ*, 793, 29

- Gnedin N. Y., Madau P., 2022, *Living Reviews in Computational Astrophysics*, 8, 3
- Gnedin N. Y., Ostriker J. P., 1997, *ApJ*, 486, 581
- Gnedin N., Zhu H., 2025, *The Open Journal of Astrophysics*, 8, 111
- Goto H., et al., 2021, *ApJ*, 923, 229
- Greig B., Mesinger A., McGreer I. D., Gallerani S., Haiman Z., 2017a, *MNRAS*, 466, 1814
- Greig B., Mesinger A., Haiman Z., Simcoe R. A., 2017b, *MNRAS*, 466, 4239
- Greig B., Mesinger A., Bañados E., 2019, *MNRAS*, 484, 5094
- Greig B., Mesinger A., Davies F. B., Wang F., Yang J., Hennawi J. F., 2022, *MNRAS*, 512, 5390
- Greig B., et al., 2024a, *MNRAS*, 530, 3208
- Greig B., et al., 2024b, *MNRAS*, 533, 3312
- Gruzinov A., Hu W., 1998, *ApJ*, 508, 435
- Gunn J. E., Peterson B. A., 1965, *ApJ*, 142, 1633
- Guralnik G. S., Hagen C. R., Kibble T. W., 1964, *Phys. Rev. Lett.*, 13, 585
- Guth A. H., 1981, *Phys. Rev. D*, 23, 347
- Haardt F., Madau P., 1996, *ApJ*, 461, 20
- Haardt F., Madau P., 2012, *ApJ*, 746, 125
- Hamilton W. R., 1834, *Philosophical Transactions of the Royal Society of London*, pp 247–308
- Hamilton W. R., 1835, *Philosophical Transactions of the Royal Society of London*, pp 95–144
- Harris C. R., et al., 2020, *Nature*, 585, 357
- Hartoog O. E., et al., 2015, *A&A*, 580, A139
- Hastings W. K., 1970, *Biometrika*, 57, 97
- Hayes M. J., Scarlata C., 2023, *ApJ*, 954, L14
- Hazard C., Mackey M. B., Shimmins A. J., 1963, *Nature*, 197, 1037
- Heintz K. E., et al., 2024, *Science*, 384, 890
- Heintz K. E., et al., 2025, *A&A*, 693, A60
- Heisenberg W., 1925, *Zeitschrift fur Physik*, 33, 879
- Heisenberg W., 1927, *Zeitschrift fur Physik*, 43, 172
- Heitler W., 1954, Quantum theory of radiation
- Hennawi J. F., Kist T., Davies F. B., Tamanas J., 2025, *MNRAS*, 539, 2621
- Hennawi J. F., et al., 2026, in prep.
- Higgs P. W., 1964, *Phys. Rev. Lett.*, 13, 508
- Hinshaw G., et al., 2013, *ApJS*, 208, 19
- Hoag A., et al., 2019, *ApJ*, 878, 12
- Hoffman M. D., Gelman A., 2011, *arXiv e-prints*, p. arXiv:1111.4246
- Hoyle F., 1948, *MNRAS*, 108, 372
- Hsiao T. Y.-Y., et al., 2024, *ApJ*, 973, 8
- Hu W., et al., 2021, *Nature Astronomy*, 5, 485
- Hubble E., 1929, *Proceedings of the National Academy of Science*, 15, 168
- Huberty M., Scarlata C., Hayes M. J., Gazagnes S., 2025, *ApJ*, 987, 82

- Hui L., Gnedin N. Y., 1997, *MNRAS*, 292, 27
- Hunter J. D., 2007, *Computing in Science and Engineering*, 9, 90
- Ijjas A., Steinhardt P. J., 2016, *Phys. Rev. Lett.*, 117, 121304
- Ijjas A., Steinhardt P. J., Loeb A., 2013, *Physics Letters B*, 723, 261
- Iliev I. T., Mellema G., Pen U.-L., Merz H., Shapiro P. R., Alvarez M. A., 2006, *MNRAS*, 369, 1625
- Inoue A. K., et al., 2018, *PASJ*, 70, 55
- Iršič V., et al., 2017a, *Phys. Rev. D*, 96, 023522
- Iršič V., Viel M., Haehnelt M. G., Bolton J. S., Becker G. D., 2017b, *Phys. Rev. Lett.*, 119, 031302
- Ishimoto R., et al., 2020, *ApJ*, 903, 60
- Ivanov M. M., Toomey M. W., Karaçaylı N. G., 2025, *Phys. Rev. Lett.*, 134, 091001
- Jhaveri T., Karwal T., Hu W., 2025, *Phys. Rev. D*, 112, 043541
- Jin X., et al., 2023, *ApJ*, 942, 59
- Jones G. C., et al., 2025, *MNRAS*, 536, 2355
- Jung I., et al., 2020, *ApJ*, 904, 144
- Kageura Y., et al., 2025, *ApJS*, 278, 33
- Kageura Y., Ouchi M., Naokawa F., Umeda H., Matsumoto A., Harikane Y., Nakane M., Thai T. T., 2026, *arXiv e-prints*, p. arXiv:2601.09644
- Kannan R., Garaldi E., Smith A., Pakmor R., Springel V., Vogelsberger M., Hernquist L., 2022, *MNRAS*, 511, 4005
- Kant I., 1784, *Berlinische Monatsschrift*, Dezember-Heft, 481
- Kapteyn J. C., 1922, *ApJ*, 55, 302
- Karaçaylı N. G., Font-Ribera A., Padmanabhan N., 2020, *MNRAS*, 497, 4742
- Karaçaylı N. G., et al., 2025, *J. Cosmology Astropart. Phys.*, 2025, 004
- Karzas W. J., Latter R., 1961, *ApJS*, 6, 167
- Kaurov A. A., 2016, *ApJ*, 831, 198
- Kaurov A. A., Gnedin N. Y., 2014, *ApJ*, 787, 146
- Keating L. C., Puchwein E., Bolton J. S., Haehnelt M. G., Kulkarni G., 2024a, *MNRAS*, 531, L34
- Keating L. C., Bolton J. S., Cullen F., Haehnelt M. G., Puchwein E., Kulkarni G., 2024b, *MNRAS*, 532, 1646
- Khrykin I. S., Hennawi J. F., McQuinn M., Worseck G., 2016, *ApJ*, 824, 133
- Khrykin I. S., Hennawi J. F., Worseck G., Davies F. B., 2021, *MNRAS*, 505, 649
- Kist T., Ijjas A., 2022, *J. Cosmology Astropart. Phys.*, 2022, 046
- Kist T., Hennawi J. F., Davies F. B., 2025a, *arXiv e-prints*, p. arXiv:2508.21812
- Kist T., Hennawi J. F., Davies F. B., 2025b, *MNRAS*, 538, 2704
- Kist T., Hennawi J. F., Davies F. B., 2025c, *MNRAS*, 544, 2316
- Kist T., et al., 2026, *MNRAS*, 545, staf2219
- Knox L., Scoccimarro R., Dodelson S., 1998, *Phys. Rev. Lett.*, 81, 2004

- Kogut A., et al., 2003, *ApJS*, 148, 161
- Kokorev V., et al., 2023, *ApJ*, 957, L7
- Konno A., et al., 2014, *ApJ*, 797, 16
- Konno A., et al., 2018, *PASJ*, 70, S16
- Koopmans L., et al., 2015, in *Advancing Astrophysics with the Square Kilometre Array (AASKA14)*. p. 1, doi:10.22323/1.215.0001
- Lamb D. Q., Reichart D. E., 2000, *ApJ*, 536, 1
- Laplace P. S., 1812, *Théorie analytique des probabilités*. Courcier, Paris, <http://eudml.org/doc/203064>
- Laplace P.-S., 1814, *Essai philosophique sur les probabilités*. Courcier, Paris, <http://eudml.org/doc/203193>
- Laplace P. S., 1820, *Théorie analytique des probabilités*. Courcier, Paris, <http://eudml.org/doc/203444>
- Larson R. L., et al., 2023, *ApJ*, 953, L29
- Lee K.-G., et al., 2015, *ApJ*, 799, 196
- Lemaître G., 1927, *Annales de la Société Scientifique de Bruxelles*, 47, 49
- Leschinski K., 2021, *SkyCalc_ipy*: SkyCalc wrapper for interactive Python
- Lewis J. S. W., et al., 2022, *MNRAS*, 516, 3389
- Lidz A., Faucher-Giguère C.-A., Dall’Aglio A., McQuinn M., Fechner C., Zaldarriaga M., Hernquist L., Dutta S., 2010, *ApJ*, 718, 199
- Lidz A., Chang T.-C., Mas-Ribas L., Sun G., 2021, *ApJ*, 917, 58
- Linde A. D., 1982, *Physics Letters B*, 108, 389
- Liu A., Shaw J. R., 2020, *PASP*, 132, 062001
- Lu T.-Y., et al., 2024a, *arXiv e-prints*, p. arXiv:2411.04176
- Lu T.-Y., Mason C. A., Hutter A., Mesinger A., Qin Y., Stark D. P., Endsley R., 2024b, *MNRAS*, 528, 4872
- Lukić Z., Stark C. W., Nugent P., White M., Meiksin A. A., Almgren A., 2015, *MNRAS*, 446, 3697
- Madau P., Dickinson M., 2014, *ARA&A*, 52, 415
- Madau P., Haardt F., Rees M. J., 1999, *ApJ*, 514, 648
- Madau P., Giallongo E., Grazian A., Haardt F., 2024, *ApJ*, 971, 75
- Maiolino R., et al., 2024a, *Nature*, 627, 59
- Maiolino R., et al., 2024b, *A&A*, 691, A145
- Maitra S., Kulkarni G., Arora V., Viel M., Asthana S., Bolton J. S., Haehnelt M. G., Keating L., 2026, *arXiv e-prints*, p. arXiv:2601.16263
- Malloy M., Lidz A., 2015, *ApJ*, 799, 179
- Marshak N. X., Simotas K., Lukić Z., Park H., Ahrens J., Johnson C. R., 2025, *arXiv e-prints*, p. arXiv:2512.12466
- du Mas des Bourboux H., et al., 2017, *A&A*, 608, A130
- du Mas des Bourboux H., et al., 2020, *ApJ*, 901, 153
- Mason C. A., Gronke M., 2020, *MNRAS*, 499, 1395
- Mason C. A., Treu T., Dijkstra M., Mesinger A., Trenti M., Pentericci L., de Barros S., Vanzella E., 2018, *ApJ*, 856, 2
- Mason C. A., et al., 2019, *MNRAS*, 485, 3947

- Mason C. A., Chen Z., Stark D. P., Yi Lu T., Topping M., Tang M., 2026, *A&A*, 705, A114
- Matsumura T., et al., 2014, *Journal of Low Temperature Physics*, 176, 733
- Matthews B. M., et al., 2021, *ApJS*, 252, 15
- McDonald P., 2003, *ApJ*, 585, 34
- McDonald P., Miralda-Escudé J., Rauch M., Sargent W. L. W., Barlow T. A., Cen R., Ostriker J. P., 2000, *ApJ*, 543, 1
- McDonald P., et al., 2006, *ApJS*, 163, 80
- McGreer I. D., Mesinger A., Fan X., 2011, *MNRAS*, 415, 3237
- McGreer I. D., Mesinger A., D’Odorico V., 2015, *MNRAS*, 447, 499
- Meiksin A., Madau P., 1993, *ApJ*, 412, 34
- Meiksin A., Tittley E. R., Brown C. K., 2010, *MNRAS*, 401, 77
- Melandri A., et al., 2015, *A&A*, 581, A86
- Mellema G., Iliev I. T., Alvarez M. A., Shapiro P. R., 2006, *New Astronomy*, 11, 374
- Mertens F. G., et al., 2020, *MNRAS*, 493, 1662
- Mesinger A., 2010, *MNRAS*, 407, 1328
- Mesinger A., Furlanetto S., Cen R., 2011, *MNRAS*, 411, 955
- Mesinger A., Aykutalp A., Vanzella E., Pentericci L., Ferrara A., Dijkstra M., 2015, *MNRAS*, 446, 566
- Metropolis N., Rosenbluth A. W., Rosenbluth M. N., Teller A. H., Teller E., 1953, *J. Chem. Phys.*, 21, 1087
- Miralda-Escudé J., Ostriker J. P., 1990, *ApJ*, 350, 1
- Miralda-Escudé J., 1998, *ApJ*, 501, 15
- Miralda-Escudé J., Haehnelt M., Rees M. J., 2000, *ApJ*, 530, 1
- Morales A. M., Mason C. A., Bruton S., Gronke M., Haardt F., Scarlata C., 2021, *ApJ*, 919, 120
- Morey K. A., Eilers A.-C., Davies F. B., Hennawi J. F., Simcoe R. A., 2021, *ApJ*, 921, 88
- Mortlock D., 2016, in Mesinger A., ed., *Astrophysics and Space Science Library Vol. 423, Understanding the Epoch of Cosmic Reionization: Challenges and Progress*. p. 187, [doi:10.1007/978-3-319-21957-8_7](https://doi.org/10.1007/978-3-319-21957-8_7)
- Mortlock D. J., et al., 2011, *Nature*, 474, 616
- Muñoz J. B., Mirocha J., Chisholm J., Furlanetto S. R., Mason C., 2024, *MNRAS*, 535, L37
- Nakane M., et al., 2024, *ApJ*, 967, 28
- Neal R. M., 1996, in , *Bayesian Learning for Neural Networks*. Springer New York, New York, NY, pp 55–98, [doi:10.1007/978-1-4612-0745-0_3](https://doi.org/10.1007/978-1-4612-0745-0_3), https://doi.org/10.1007/978-1-4612-0745-0_3
- Nikolić I., Mesinger A., Mason C. A., Lu T.-Y., Tang M., Prelogović D., Gagnon-Hartman S., Stark D. P., 2025, *A&A*, 699, A323
- Ning Y., Jiang L., Zheng Z.-Y., Wu J., 2022, *ApJ*, 926, 230
- O’Meara J. M., Prochaska J. X., Worseck G., Chen H.-W., Madau P., 2013, *ApJ*, 765, 137

- Ocvirk P., et al., 2016, *MNRAS*, 463, 1462
- Ocvirk P., et al., 2020, *MNRAS*, 496, 4087
- Ono Y., et al., 2012, *ApJ*, 744, 83
- Onorato S., et al., 2025, *MNRAS*, 540, 1308
- Oort J. H., 1932, *BAIN*, 6, 249
- Ostriker J. P., Peebles P. J. E., 1973, *ApJ*, 186, 467
- Ouchi M., et al., 2010, *ApJ*, 723, 869
- Ouchi M., et al., 2018, *PASJ*, 70, S13
- Padovani P., et al., 2017, *A&A Rev.*, 25, 2
- Pakmor R., et al., 2023, *MNRAS*, 524, 2539
- Palanque-Delabrouille N., et al., 2013, *A&A*, 559, A85
- Palanque-Delabrouille N., et al., 2015, *J. Cosmology Astropart. Phys.*, 2015, 011
- Park H., et al., 2025, *ApJ*, 983, 91
- Patel M., Warren S. J., Mortlock D. J., Fynbo J. P. U., 2010, *A&A*, 512, L3
- Pawlik A. H., Schaye J., van Scherpenzeel E., 2009, *MNRAS*, 394, 1812
- Pedregosa F., et al., 2011, *Journal of Machine Learning Research*, 12, 2825
- Peebles P. J. E., 1993, *Principles of Physical Cosmology*, doi:10.1515/9780691206721.
- Penzias A. A., Wilson R. W., 1965, *ApJ*, 142, 419
- Perlmutter S., et al., 1999, *ApJ*, 517, 565
- Phan D., Pradhan N., Jankowiak M., 2019, *arXiv e-prints*, p. arXiv:1912.11554
- Pillepich A., et al., 2018, *MNRAS*, 473, 4077
- Planck Collaboration et al., 2014, *A&A*, 571, A16
- Planck Collaboration et al., 2016, *A&A*, 594, A13
- Planck Collaboration et al., 2020, *A&A*, 641, A6
- Poincare H., 1906, *Popular Astronomy*, 14, 475
- Press W. H., Schechter P., 1974, *ApJ*, 187, 425
- Pritchard J. R., Loeb A., 2012, *Reports on Progress in Physics*, 75, 086901
- Prochaska J. X., Worseck G., O'Meara J. M., 2009, *ApJ*, 705, L113
- Prochaska J., et al., 2020, *The Journal of Open Source Software*, 5, 2308
- Puchwein E., et al., 2023, *MNRAS*, 519, 6162
- Pâris I., et al., 2011, *A&A*, 530, A50
- Pérez F., Granger B. E., 2007, *Computing in Science and Engineering*, 9, 21
- Ravoux C., et al., 2025, *J. Cosmology Astropart. Phys.*, 2025, 079
- Reichardt C. L., 2016, in Mesinger A., ed., *Astrophysics and Space Science Library Vol. 423, Understanding the Epoch of Cosmic Reionization: Challenges and Progress*. p. 227, doi:10.1007/978-3-319-21957-8_8
- Reichardt C. L., et al., 2021, *ApJ*, 908, 199
- Reiman D. M., Tamasan J., Prochaska J. X., Ďurovčíková D., 2020, *arXiv e-prints*, p. arXiv:2006.00615
- Riess A. G., et al., 1998, *AJ*, 116, 1009

- Robertson B. E., Ellis R. S., Furlanetto S. R., Dunlop J. S., 2015, *ApJ*, 802, L19
- Robertson B., et al., 2024, *ApJ*, 970, 31
- Romano M., Grazian A., Giallongo E., Cristiani S., Fontanot F., Boutsia K., Fiore F., Menci N., 2019, *A&A*, 632, A45
- Rubin V. C., Ford Jr. W. K., 1970, *ApJ*, 159, 379
- Rudie G. C., Steidel C. C., Shapley A. E., Pettini M., 2013, *ApJ*, 769, 146
- Sailer N., Farren G. S., Ferraro S., White M., 2026, *Phys. Rev. Lett.*, 136, 081002
- Salpeter E. E., 1964, *ApJ*, 140, 796
- Satyavolu S., Kulkarni G., Keating L. C., Haehnelt M. G., 2023a, *MNRAS*, 521, 3108
- Satyavolu S., et al., 2023b, *MNRAS*, 522, 4918
- Sawyer F., Bolton J. S., Becker G. D., Conaboy L., Haehnelt M. G., Keating L., Kulkarni G., Puchwein E., 2025, *MNRAS*
- Saxena A., et al., 2024, *A&A*, 684, A84
- Schaye J., et al., 2015, *MNRAS*, 446, 521
- Schaye J., et al., 2023, *MNRAS*, 526, 4978
- Schenker M. A., Stark D. P., Ellis R. S., Robertson B. E., Dunlop J. S., McLure R. J., Kneib J.-P., Richard J., 2012, *ApJ*, 744, 179
- Schmidt M., 1963, *Nature*, 197, 1040
- Schroeder J., Mesinger A., Haiman Z., 2013, *MNRAS*, 428, 3058
- Schrödinger E., 1926a, *Annalen der Physik*, 384, 361
- Schrödinger E., 1926b, *Annalen der Physik*, 384, 489
- Schrödinger E., 1926c, *Annalen der Physik*, 385, 437
- Schrödinger E., 1926d, *Annalen der Physik*, 386, 109
- Schwinger J., 1948, *Physical Review*, 73, 416
- Seljak U., et al., 2005, *Phys. Rev. D*, 71, 103515
- Seljak U., Slosar A., McDonald P., 2006, *J. Cosmology Astropart. Phys.*, 2006, 014
- Sellentin E., Starck J.-L., 2019, *J. Cosmology Astropart. Phys.*, 2019, 021
- Sharma Y. M., Davies F. B., Gaikwad P., Nasir F., Bosman S. E. I., 2025, *ApJ*, 983, 118
- Shen Y., et al., 2007, *AJ*, 133, 2222
- Simmonds C., et al., 2024, *MNRAS*, 535, 2998
- Slipher V. M., 1913, *Lowell Observatory Bulletin*, 2, 56
- Slipher V. M., 1917, *Proceedings of the American Philosophical Society*, 56, 403
- Slosar A., et al., 2013, *J. Cosmology Astropart. Phys.*, 2013, 026
- So G. C., Norman M. L., Reynolds D. R., Wise J. H., 2014, *ApJ*, 789, 149
- Sobacchi E., Mesinger A., 2015, *MNRAS*, 453, 1843
- Songaila A., Cowie L. L., 2010, *ApJ*, 721, 1448
- Spina B., Bosman S. E. I., Davies F. B., Gaikwad P., Zhu Y., 2024, *A&A*, 688, L26

- Springel V., et al., 2005, *Nature*, 435, 629
- Stark D. P., Ellis R. S., Chiu K., Ouchi M., Bunker A., 2010, *MNRAS*, 408, 1628
- Stark D. P., Ellis R. S., Ouchi M., 2011, *ApJ*, 728, L2
- Sun Z., Ting Y.-S., Cai Z., 2023, *ApJS*, 269, 4
- Sunyaev R. A., Zeldovich I. B., 1980, *ARA&A*, 18, 537
- Suzuki N., 2006, *ApJS*, 163, 110
- Suzuki N., Tytler D., Kirkman D., O'Meara J. M., Lubin D., 2005, *ApJ*, 618, 592
- Tang M., Stark D. P., Topping M. W., Mason C., Ellis R. S., 2024, *ApJ*, 975, 208
- Tepper-García T., 2006, *MNRAS*, 369, 2025
- Thomson Baron Kelvin W., 1904, Baltimore Lectures on Molecular Dynamics and the Wave Theory of Light. Cambridge Library Collection - Physical Sciences, Cambridge University Press
- Tomonaga S., 1946, *Progress of Theoretical Physics*, 1, 27
- Torrallba-Torregrosa A., et al., 2024, *A&A*, 689, A44
- Totani T., Kawai N., Kosugi G., Aoki K., Yamada T., Iye M., Ohta K., Hattori T., 2006, *PASJ*, 58, 485
- Totani T., et al., 2014, *PASJ*, 66, 63
- Totani T., Aoki K., Hattori T., Kawai N., 2016, *PASJ*, 68, 15
- Trac H., Chen N., Holst I., Alvarez M. A., Cen R., 2022, *ApJ*, 927, 186
- Trapp A. C., Furlanetto S. R., Davies F. B., 2023, *MNRAS*, 524, 5891
- Trott C. M., et al., 2020, *MNRAS*, 493, 4711
- Übler H., et al., 2024, *MNRAS*, 531, 355
- Umeda H., Ouchi M., Nakajima K., Harikane Y., Ono Y., Xu Y., Isobe Y., Zhang Y., 2024, *ApJ*, 971, 124
- Umeda H., et al., 2025, *ApJS*, 277, 37
- Umeda H., Ouchi M., Kageura Y., Harikane Y., Nakane M., Thai T. T., Nakajima K., 2026, *ApJ*, 997, 86
- Viel M., Haehnelt M. G., Springel V., 2004, *MNRAS*, 354, 684
- Viel M., Lesgourgues J., Haehnelt M. G., Matarrese S., Riotto A., 2005, *Phys. Rev. D*, 71, 063534
- Viel M., Becker G. D., Bolton J. S., Haehnelt M. G., 2013, *Phys. Rev. D*, 88, 043502
- Villasenor B., Robertson B., Madau P., Schneider E., 2022, *ApJ*, 933, 59
- Villasenor B., Robertson B., Madau P., Schneider E., 2023, *Phys. Rev. D*, 108, 023502
- Virtanen P., et al., 2020, *Nature Methods*, 17, 261
- Vogelsberger M., et al., 2014, *MNRAS*, 444, 1518
- Voigt W., 1912, Über das Gesetz der Intensitätsverteilung innerhalb der Linien eines Gasspektrums. Sitzungsberichte Vol. 1912,25, München, <https://publikationen.badw.de/de/003395768>
- Walther M., Oñorbe J., Hennawi J. F., Lukić Z., 2019, *ApJ*, 872, 13

- Wang F., et al., 2020, *ApJ*, 896, 23
- Weinberg S., 1989, *Reviews of Modern Physics*, 61, 1
- Witstok J., et al., 2024, *A&A*, 682, A40
- Witstok J., et al., 2025, *Nature*, 639, 897
- Wold I. G. B., et al., 2022, *ApJ*, 927, 36
- Wolfson M., Hennawi J. F., Davies F. B., Oñorbe J., 2023, *MNRAS*, 521, 4056
- Worseck G., et al., 2014, *MNRAS*, 445, 1745
- Xu Y., Yue B., Chen X., 2017, *ApJ*, 844, 117
- Yang J., et al., 2020a, *ApJ*, 897, L14
- Yang J., et al., 2020b, *ApJ*, 904, 26
- Zel'dovich Y. B., 1970, *A&A*, 5, 84
- Zheng Z.-Y., et al., 2017, *ApJ*, 842, L22
- Zhou Y., Chen H., Matteo T. D., Ni Y., Croft R. A. C., Bird S., 2024, *MNRAS*, 528, 3730
- Zhu Y., et al., 2022, *ApJ*, 932, 76
- Zhu Y., et al., 2024, *MNRAS*, 533, L49
- Zwicky F., 1933, *Helvetica Physica Acta*, 6, 110