

## 9 References

- [1] Abel, T., G. L. Bryan, and M. L. Norman, 2002: The Formation of the First Star in the Universe. *Science*, **295**, 93–98.
- [2] Athreya, R. M., V. K. Kapahi, P. J. McCarthy, and W. van Breugel, 1998: Large rotation measures in radio galaxies at  $z \lesssim 2$ . *A&A*, **329**, 809–820.
- [3] Barrow, K. S. S., J. H. Wise, A. Aykutalp, B. W. O’Shea, M. L. Norman, and H. Xu, 2017: First Light II: Emission Line Extinction, Population III Stars, and X-ray Binaries. *ArXiv e-prints*.
- [4] Barrow, K. S. S., J. H. Wise, M. L. Norman, B. W. O’Shea, and H. Xu, 2017: First light: exploring the spectra of high-redshift galaxies in the Renaissance Simulations. *MNRAS*, **469**, 4863–4878.
- [5] Beck, R. and R. Wielebinski, 2013: *Magnetic Fields in Galaxies*. p. 641.
- [6] Berger, M. J. and P. Colella, 1989: Local adaptive mesh refinement for shock hydrodynamics. *J. Comput. Phys.*, **82**, 64–84.
- [7] Bernet, M. L., F. Miniati, S. J. Lilly, P. P. Kronberg, and M. Dessauges-Zavadsky, 2008: Strong magnetic fields in normal galaxies at high redshift. *Nature*, **454**, 302–304.
- [8] Bordner, J. and M. L. Norman, 2012: Enzo-p / cello: Scalable adaptive mesh refinement for astrophysics and cosmology. In *Proceedings of the Extreme Scaling Workshop*, University of Illinois at Urbana-Champaign, Champaign, IL, USA, BW-XSEDE ’12, pp. 4:1–4:11.
- [9] Bordner, J. and M. L. Norman, 2018: Computational Cosmology and Astrophysics on Adaptive Meshes using Charm++. *arXiv e-prints*, arXiv:1810.01319.
- [10] Brandenburg, A. and K. Subramanian, 2005: Astrophysical magnetic fields and nonlinear dynamo theory. *Physics Reports*, **417**, 1–209.
- [11] Brinchmann, J., S. Charlot, S. D. M. White, C. Tremonti, G. Kauffmann, T. Heckman, and J. Brinkmann, 2004: The physical properties of star-forming galaxies in the low-redshift Universe. *MNRAS*, **351**, 1151–1179.
- [12] Bryan, G. L., M. L. Norman, B. W. O’Shea, T. Abel, J. H. Wise, M. J. Turk, D. R. Reynolds, D. C. Collins, P. Wang, S. W. Skillman, B. Smith, R. P. Harkness, J. Bordner, J.-h. Kim, M. Kuhlen, H. Xu, N. Goldbaum, C. Hummels, A. G. Kritsuk, E. Tasker, S. Skory, C. M. Simpson, O. Hahn, J. S. Oishi, G. C. So, F. Zhao, R. Cen, Y. Li, and Enzo Collaboration, 2014: ENZO: An Adaptive Mesh Refinement Code for Astrophysics. *ApJS*, **211**, 19.
- [13] Bryan, G. L., M. L. Norman, J. M. Stone, R. Cen, and J. P. Ostriker, 1995: A piecewise parabolic method for cosmological hydrodynamics. *Comput. Phys. Commun.*, **89**, 149–168.
- [14] Butsky, I., J. Zrake, J.-h. Kim, H.-I. Yang, and T. Abel, 2017: Ab Initio Simulations of a Supernova-driven Galactic Dynamo in an Isolated Disk Galaxy. *ApJ*, **843**, 113.
- [15] Chyży, K. T., R. Beck, S. Kohle, U. Klein, and M. Urbanik, 2000: Regular magnetic fields in the dwarf irregular galaxy NGC 4449. *A&A*, **355**, 128–137.
- [16] Chyży, K. T., M. Weżgowiec, R. Beck, and D. J. Bomans, 2011: Magnetic fields in Local Group dwarf irregulars. *A&A*, **529**, A94.

- [17] Clark, P. C. and S. C. O. Glover, 2015: Does the CO-to-H<sub>2</sub> conversion factor depend on the star formation rate? *MNRAS*, **452**, 2057–2070.
- [18] Clark, S. E., J. E. G. Peek, and M. E. Putman, 2014: Magnetically Aligned H I Fibers and the Rolling Hough Transform. *ApJ*, **789**, 82.
- [19] Collins, D. C., A. G. Kritsuk, P. Padoan, H. Li, H. Xu, S. D. Ustyugov, and M. L. Norman, 2012: The Two States of Star-forming Clouds. *ApJ*, **750**, 13.
- [20] Collins, D. C., A. G. Kritsuk, P. Padoan, M. L. Norman, and H. Xu, 2011: Power Spectra in Super Alfvénic Turbulence with Self Gravity.
- [21] Collins, D. C., P. Padoan, M. L. Norman, and H. Xu, 2011: Mass and Magnetic Distributions in Self-gravitating Super-Alfvénic Turbulence with Adaptive Mesh Refinement. *ApJ*, **731**, 59.
- [22] Collins, D. C., H. Xu, M. L. Norman, H. Li, and S. Li, 2010: Cosmological Adaptive Mesh Refinement Magnetohydrodynamics with Enzo. *ApJS*, **186**, 308–333.
- [23] Crutcher, R. M., 2012: Magnetic Fields in Molecular Clouds. *ARA&A*, **50**, 29–63.
- [24] Daddi, E., M. Dickinson, G. Morrison, R. Chary, A. Cimatti, D. Elbaz, D. Frayer, A. Renzini, A. Pope, D. M. Alexander, F. E. Bauer, M. Giavalisco, M. Huynh, J. Kurk, and M. Mignoli, 2007: Multiwavelength Study of Massive Galaxies at  $z \sim 2$ . I. Star Formation and Galaxy Growth. *ApJ*, **670**, 156–172.
- [25] Daly, R. A. and A. Loeb, 1990: A possible origin of galactic magnetic fields. *ApJ*, **364**, 451–455.
- [26] de Avillez, M. A. and D. Breitschwerdt, 2005: Global dynamical evolution of the ISM in star forming galaxies. I. High resolution 3D simulations: Effect of the magnetic field. *A&A*, **436**, 585–600.
- [27] Egan, H., B. D. Smith, B. W. O’Shea, and J. M. Shull, 2014: Bringing Simulation and Observation Together to Better Understand the Intergalactic Medium. *ApJ*, **791**, 64.
- [28] Elmegreen, B. G. and J. Scalo, 2004: Interstellar Turbulence I: Observations and Processes. *ARA&A*, **42**, 211–273.
- [29] Farnes, J. S., S. P. O’Sullivan, M. E. Corrigan, and B. M. Gaensler, 2014: Faraday Rotation from Magnesium II Absorbers toward Polarized Background Radio Sources. *ApJ*, **795**, 63.
- [30] Fauvet, L., J. F. Macías-Pérez, J. Aumont, F. X. Désert, T. R. Jaffe, A. J. Banday, M. Tristram, A. H. Waelkens, and D. Santos, 2011: Joint 3D modelling of the polarized Galactic synchrotron and thermal dust foreground diffuse emission. *A&A*, **526**, A145.
- [31] Federrath, C. and R. S. Klessen, 2012: The Star Formation Rate of Turbulent Magnetized Clouds: Comparing Theory, Simulations, and Observations. *ArXiv e-prints*.
- [32] Ferland, G. J., M. Chatzikos, F. Guzmán, M. L. Lykins, P. A. M. van Hoof, R. J. R. Williams, N. P. Abel, N. R. Badnell, F. P. Keenan, R. L. Porter, and P. C. Stancil, 2017: The 2017 Release Cloudy. *Revista Mexicana de Astronomía y Astrofísica*, **53**, 385–438.
- [33] Fletcher, A., R. Beck, A. Shukurov, E. M. Berkhuijsen, and C. Horellou, 2011: Magnetic fields and spiral arms in the galaxy M51. *MNRAS*, **412**, 2396–2416.

- [34] Gaensler, B. M., J. M. Dickey, N. M. McClure-Griffiths, A. J. Green, M. H. Wieringa, and R. F. Haynes, 2001: Radio Polarization from the Inner Galaxy at Arcminute Resolution. *ApJ*, **549**, 959–978.
- [35] Genzel, R., L. J. Tacconi, F. Combes, A. Bolatto, R. Neri, A. Sternberg, M. C. Cooper, N. Bouché, F. Bournaud, A. Burkert, J. Comerford, P. Cox, M. Davis, N. M. Förster Schreiber, S. Garcia-Burillo, J. Gracia-Carpio, D. Lutz, T. Naab, S. Newman, A. Saintonge, K. Shapiro, A. Shapley, and B. Weiner, 2012: The Metallicity Dependence of the CO to H<sub>2</sub> Conversion Factor in  $z \approx 1$  Star-forming Galaxies. *ApJ*, **746**, 69.
- [36] Green, J. A., N. M. McClure-Griffiths, J. L. Caswell, T. Robishaw, and L. Harvey-Smith, 2012: MAGMO: coherent magnetic fields in the star-forming regions of the Carina-Sagittarius spiral arm tangent. *MNRAS*, **425**, 2530–2547.
- [37] Hahn, O. and T. Abel, 2011: Multi-scale initial conditions for cosmological simulations. *MNRAS*, **415**, 2101–2121.
- [38] Hallman, E. J., B. W. O’Shea, J. O. Burns, M. L. Norman, R. Harkness, and R. Wagner, 2007: The Santa Fe Light Cone Simulation Project. I. Confusion and the Warm-Hot Intergalactic Medium in Upcoming Sunyaev-Zel’dovich Effect Surveys. *ApJ*, **671**, 27–39.
- [39] Han, J. L., 2017: Observing Interstellar and Intergalactic Magnetic Fields. *ARA&A*, **55**, 111–157.
- [40] Han, J. L., W. van Straten, T. J. W. Lazio, A. Deller, C. Sobey, J. Xu, D. Schnitzeler, H. Imai, S. Chatterjee, J.-P. Macquart, M. Kramer, and J. M. Cordes, 2015: Three-dimensional Tomography of the Galactic and Extragalactic Magnetoionic Medium with the SKA. *Advancing Astrophysics with the Square Kilometre Array (AASKA14)*, 41.
- [41] Haverkorn, M., 2015: Magnetic Fields in the Milky Way. In Lazarian, A., E. M. de Gouveia Dal Pino, and C. Melioli, eds., *Magnetic Fields in Diffuse Media*, vol. 407 of *Astrophysics and Space Science Library*, p. 483.
- [42] Heald, G., R. Braun, and R. Edmonds, 2009: The Westerbork SINGS survey. II Polarization, Faraday rotation, and magnetic fields. *A&A*, **503**, 409–435.
- [43] Helou, G. and M. D. Bicay, 1993: A physical model of the infrared-to-radio correlation in galaxies. *ApJ*, **415**, 93–100.
- [44] Helou, G., B. T. Soifer, and M. Rowan-Robinson, 1985: Thermal infrared and nonthermal radio - Remarkable correlation in disks of galaxies. *ApJL*, **298**, L7–L11.
- [45] Heyer, M. H. and C. M. Brunt, 2012: Trans-Alfvénic motions in the Taurus molecular cloud. *MNRAS*, **420**, 1562–1569.
- [46] Hill, A. S., M. R. Joung, M.-M. Mac Low, R. A. Benjamin, L. M. Haffner, C. Klingenberg, and K. Waagan, 2012: Vertical Structure of a Supernova-driven Turbulent, Magnetized Interstellar Medium. *ApJ*, **750**, 104.
- [47] Hopkins, P. F., D. Kereš, J. Oñorbe, C.-A. Faucher-Giguère, E. Quataert, N. Murray, and J. S. Bullock, 2014: Galaxies on FIRE (Feedback In Realistic Environments): stellar feedback explains cosmologically inefficient star formation. *MNRAS*, **445**, 581–603.
- [48] Hoyle, F., 1969: Magnetic Fields and Highly Condensed Objects. *Nature*, **223**, 936.

- [49] Hummels, C. B. and G. L. Bryan, 2012: Adaptive Mesh Refinement Simulations of Galaxy Formation: Exploring Numerical and Physical Parameters. *ApJ*, **749**, 140.
- [50] Hummels, C. B., G. L. Bryan, B. D. Smith, and M. J. Turk, 2013: Constraints on hydrodynamical subgrid models from quasar absorption line studies of the simulated circumgalactic medium. *MNRAS*, **430**, 1548–1565.
- [51] Hummels, C. B., B. D. Smith, P. F. Hopkins, B. W. O’Shea, D. W. Silvia, J. K. Werk, N. Lehner, J. H. Wise, D. C. Collins, and I. S. Butsky, 2019: The Impact of Enhanced Halo Resolution on the Simulated Circumgalactic Medium. *ApJ*, **882(2)**, 156.
- [52] Jackson, J. M., J. M. Rathborne, R. Y. Shah, R. Simon, T. M. Bania, D. P. Clemens, E. T. Chambers, A. M. Johnson, M. Dormody, R. Lavoie, and M. H. Heyer, 2006: The Boston University-Five College Radio Astronomy Observatory Galactic Ring Survey. *ApJS*, **163**, 145–159.
- [53] Jaffe, T. R., A. J. Banday, J. P. Leahy, S. Leach, and A. W. Strong, 2011: Connecting synchrotron, cosmic rays and magnetic fields in the plane of the Galaxy. *MNRAS*, **416**, 1152–1162.
- [54] Jansson, R. and G. R. Farrar, 2012: The Galactic Magnetic Field. *ApJL*, **761**, L11.
- [55] Joshi, R. and H. Chand, 2013: Dependence of residual rotation measure on intervening Mg II absorbers at cosmic distances. *MNRAS*, **434**, 3566–3571.
- [56] Joung, M. K. R. and M.-M. Mac Low, 2006: Turbulent Structure of a Stratified Supernova-driven Interstellar Medium. *ApJ*, **653**, 1266–1279.
- [57] Joung, M. R., M. E. Putman, G. L. Bryan, X. Fernández, and J. E. G. Peek, 2012: Gas Accretion is Dominated by Warm Ionized Gas in Milky Way Mass Galaxies at  $z \sim 0$ . *ApJ*, **759**, 137.
- [58] Jurusik, W., R. T. Drzazga, M. Jableka, K. T. Chyży, R. Beck, U. Klein, and M. Weżgowiec, 2014: Magnetic fields and star formation in low-mass Magellanic-type and peculiar galaxies. *A&A*, **567**, A134.
- [59] Kamionkowski, M., A. Kosowsky, and A. Stebbins, 1997: A Probe of Primordial Gravity Waves and Vorticity. *Physical Review Letters*, **78(11)**, 2058–2061.
- [60] Kim, C.-G., S. K. Choi, and R. Flauger, 2019: Dust Polarization Maps from TIGRESS: E/B power asymmetry and TE correlation. *arXiv e-prints*, arXiv:1901.07079.
- [61] Kim, C.-G. and E. C. Ostriker, 2015: Momentum Injection by Supernovae in the Interstellar Medium. *ApJ*, **802**, 99.
- [62] Kritsuk, A. G., R. Flauger, and S. D. Ustyugov, 2018: Dust-Polarization Maps for Local Interstellar Turbulence. *Physical Review Letters*, **121(2)**, 021104.
- [63] Kritsuk, A. G., Å. Nordlund, D. Collins, P. Padoan, M. L. Norman, T. Abel, R. Banerjee, C. Federrath, M. Flock, D. Lee, P. S. Li, W.-C. Müller, R. Teyssier, S. D. Ustyugov, C. Vogel, and H. Xu, 2011: Comparing Numerical Methods for Isothermal Magnetized Supersonic Turbulence. *ApJ*, **737**, 13.
- [64] Kritsuk, A. G., M. L. Norman, and R. Wagner, 2011: On the Density Distribution in Star-forming Interstellar Clouds. *ApJL*, **727**, L20.

- [65] Kritsuk, A. G., S. D. Ustyugov, and M. L. Norman, 2011: Interstellar Turbulence and Star Formation. In J. Alves, B. G. Elmegreen, J. M. Girart, & V. Trimble, ed., *Computational Star Formation*, vol. 270 of *IAU Symposium*, pp. 179–186.
- [66] Kronberg, P. P., M. L. Bernet, F. Miniati, S. J. Lilly, M. B. Short, and D. M. Higdon, 2008: A Global Probe of Cosmic Magnetic Fields to High Redshifts. *ApJ*, **676**, 70–79.
- [67] Li, H.-b., C. D. Dowell, A. Goodman, R. Hildebrand, and G. Novak, 2009: Anchoring Magnetic Field in Turbulent Molecular Clouds. *ApJ*, **704**, 891–897.
- [68] Li, H.-b., M. Fang, T. Henning, and J. Kainulainen, 2013: The link between magnetic fields and filamentary clouds: bimodal cloud orientations in the Gould Belt. *MNRAS*, **436**, 3707–3719.
- [69] Li, H.-b., A. Goodman, T. K. Sridharan, M. Houde, Z.-Y. Li, G. Novak, and K. S. Tang, 2014: The Link between Magnetic Fields and Cloud/Star Formation. *ArXiv e-prints*.
- [70] Li, H.-B. and T. Henning, 2011: The alignment of molecular cloud magnetic fields with the spiral arms in M33. *Nature*, **479**, 499–501.
- [71] Mac Low, M.-M. and R. S. Klessen, 2004: Control of star formation by supersonic turbulence. *Rev. Mod. Phys.*, **76**, 125–194.
- [72] Mao, S. A., C. Carilli, B. M. Gaensler, O. Wucknitz, C. Keeton, A. Basu, R. Beck, P. P. Kronberg, and E. Zweibel, 2017: Detection of microgauss coherent magnetic fields in a galaxy five billion years ago. *Nature Astronomy*, **1**, 621–626.
- [73] Mao, S. A., B. M. Gaensler, M. Haverkorn, E. G. Zweibel, G. J. Madsen, N. M. McClure-Griffiths, A. Shukurov, and P. P. Kronberg, 2010: A Survey of Extragalactic Faraday Rotation at High Galactic Latitude: The Vertical Magnetic Field of the Milky Way Toward the Galactic Poles. *ApJ*, **714**, 1170–1186.
- [74] Mao, S. A., N. M. McClure-Griffiths, B. M. Gaensler, M. Haverkorn, R. Beck, D. McConnell, M. Wolleben, S. Stanimirović, J. M. Dickey, and L. Staveley-Smith, 2012: Magnetic Field Structure of the Large Magellanic Cloud from Faraday Rotation Measures of Diffuse Polarized Emission. *ApJ*, **759**, 25.
- [75] Mao, S. A., E. Zweibel, A. Fletcher, J. Ott, and F. Tabatabaei, 2015: Properties of the Magneto-ionic Medium in the Halo of M51 Revealed by Wide-band Polarimetry. *ApJ*, **800**, 92.
- [76] McKee, C. F. and E. C. Ostriker, 2007: Theory of Star Formation. *ARA&A*, **45**, 565–687.
- [77] McMullin, J. P., B. Waters, D. Schiebel, W. Young, and K. Golap, 2007: CASA Architecture and Applications. In Shaw, R. A., F. Hill, and D. J. Bell, eds., *Astronomical Data Analysis Software and Systems XVI*, vol. 376 of *Astronomical Society of the Pacific Conference Series*, p. 127.
- [78] Meece, G. R., B. D. Smith, and B. W. O’Shea, 2014: Fragmentation in Dusty Low-metallicity Star-forming Halos. *ApJ*, **783**, 75.
- [79] Moss, D. and A. Shukurov, 1996: Turbulence and magnetic fields in elliptical galaxies. *MNRAS*, **279**, 229–239.
- [80] Moss, D., R. Stepanov, T. G. Arshakian, R. Beck, M. Krause, and D. Sokoloff, 2012: Multiscale magnetic fields in spiral galaxies: evolution and reversals. *A&A*, **537**, A68.

- [81] Murphy, E. J., G. Helou, R. Braun, J. D. P. Kenney, L. Armus, D. Calzetti, B. T. Draine, R. C. Kennicutt, Jr., H. Roussel, F. Walter, G. J. Bendo, B. Buckalew, D. A. Dale, C. W. Engelbracht, J. D. T. Smith, and M. D. Thornley, 2006: The Effect of Star Formation on the Far-Infrared-Radio Correlation within Galaxies. *ApJL*, **651**, L111–L115.
- [82] Neronov, A. and I. Vovk, 2010: Evidence for Strong Extragalactic Magnetic Fields from Fermi Observations of TeV Blazars. *Science*, **328**, 73–.
- [83] Nikiel-Wroczyński, B., M. Soida, M. Urbanik, R. Beck, and D. J. Bomans, 2013: Intergalactic magnetic fields in Stephan’s Quintet. *MNRAS*, **435**, 149–157.
- [84] Niklas, S. and R. Beck, 1997: A new approach to the radio-far infrared correlation for non-calorimeter galaxies. *A&A*, **320**, 54–64.
- [85] O’Shea, B. W. and M. L. Norman, 2007: Population III Star Formation in a  $\Lambda$ CDM Universe. I. The Effect of Formation Redshift and Environment on Protostellar Accretion Rate. *ApJ*, **654**, 66–92.
- [86] Padoan, P., C. Federrath, G. Chabrier, N. J. Evans, II, D. Johnstone, J. K. Jørgensen, C. F. McKee, and Å. Nordlund, 2013: The Star Formation Rate of Molecular Clouds. *ArXiv e-prints*.
- [87] Padoan, P., R. Jimenez, M. Juvela, and Å. Nordlund, 2004: The Average Magnetic Field Strength in Molecular Clouds: New Evidence of Super-Alfvénic Turbulence. *ApJL*, **604**, L49–L52.
- [88] Padoan, P. and Å. Nordlund, 1999: A Super-Alfvénic Model of Dark Clouds. *ApJ*, **526**, 279–294.
- [89] —, 2004: The “Mysterious” Origin of Brown Dwarfs. *ApJ*, **617**, 559–564.
- [90] Padoan, P., L. Pan, T. Haugbølle, and Å. Nordlund, 2016: Supernova Driving. I. The Origin of Molecular Cloud Turbulence. *ApJ*, **822**, 11.
- [91] Pakmor, R., F. A. Gomez, R. J. J. Grand, F. Marinacci, C. M. Simpson, V. Springel, D. J. R. Campbell, C. S. Frenk, T. Guillet, C. Pfrommer, and S. D. M. White, 2017: Magnetic field formation in the Milky Way-like disk galaxies of the Auriga project. *ArXiv e-prints*.
- [92] Peebles, M. S., J. K. Werk, J. Tumlinson, B. D. Oppenheimer, J. X. Prochaska, N. Katz, and D. H. Weinberg, 2014: A Budget and Accounting of Metals at  $z \sim 0$ : Results from the COS-Halos Survey. *ApJ*, **786**, 54.
- [93] Planck Collaboration, R. Adam, P. A. R. Ade, N. Aghanim, M. I. R. Alves, M. Arnaud, D. Arzoumanian, M. Ashdown, J. Aumont, C. Baccigalupi, A. J. Banday, R. B. Barreiro, N. Bartolo, E. Battaner, K. Benabed, A. Benoit-Lévy, J.-P. Bernard, M. Bersanelli, P. Bielewicz, A. Bonaldi, L. Bonavera, J. R. Bond, J. Borrill, F. R. Bouchet, F. Boulanger, A. Bracco, C. Burigana, R. C. Butler, E. Calabrese, J.-F. Cardoso, A. Catalano, A. Chamballu, H. C. Chiang, P. R. Christensen, S. Colombi, L. P. L. Colombo, C. Combet, F. Couchot, B. P. Crill, A. Curto, F. Cuttaia, L. Danese, R. D. Davies, R. J. Davis, P. de Bernardis, A. de Rosa, G. de Zotti, J. Delabrouille, C. Dickinson, J. M. Diego, H. Dole, S. Donzelli, O. Doré, M. Douspis, A. Ducout, X. Dupac, G. Efstathiou, F. Elsner, T. A. Enßlin, H. K. Eriksen, E. Falgarone, K. Ferrière, F. Finelli, O. Forni, M. Frailis, A. A. Fraisse, E. Franceschi, A. Frejsel, S. Galeotta, S. Galli, K. Ganga, T. Ghosh, M. Giard, E. Gjerløw, J. González-Nuevo, K. M. Górski, A. Gregorio, A. Gruppuso, V. Guillet, F. K. Hansen, D. Hanson, D. L. Harrison, S. Henrot-Versillé, C. Hernández-Monteagudo, D. Herranz, S. R. Hildebrandt, E. Hivon, W. A. Holmes, W. Hovest, K. M. Huffenberger, G. Hurier, A. H. Jaffe, T. R. Jaffe, W. C. Jones, E. Keihänen, R. Keskitalo, T. S. Kisner, R. Kneissl, J. Knoche, M. Kunz, H. Kurki-Suonio,

- G. Lagache, J.-M. Lamarre, A. Lasenby, M. Lattanzi, R. Leonardi, F. Levrier, M. Liguori, P. B. Lilje, M. Linden-Vørnle, M. López-Caniego, P. M. Lubin, J. F. Macías-Pérez, B. Maffei, D. Maino, N. Mandolesi, M. Maris, D. J. Marshall, P. G. Martin, E. Martínez-González, S. Masi, S. Matarrese, P. Mazzotta, A. Melchiorri, L. Mendes, A. Mennella, M. Migliaccio, M.-A. Miville-Deschênes, A. Moneti, L. Montier, G. Morgante, D. Mortlock, D. Munshi, J. A. Murphy, P. Naselsky, P. Natoli, H. U. Nørgaard-Nielsen, F. Noviello, D. Novikov, I. Novikov, N. Oppermann, C. A. Oxborrow, L. Pagano, F. Pajot, D. Paoletti, F. Pasian, O. Perdereau, L. Perotto, F. Perrotta, V. Pettorino, F. Piacentini, M. Piat, S. Plaszczyński, E. Pointecouteau, G. Polenta, N. Ponthieu, L. Popa, G. W. Pratt, S. Prunet, J.-L. Puget, J. P. Rachen, W. T. Reach, M. Reinecke, M. Remazeilles, C. Renault, I. Ristorcelli, G. Rocha, G. Roudier, J. A. Rubiño-Martín, B. Rusholme, M. Sandri, D. Santos, G. Savini, D. Scott, J. D. Soler, L. D. Spencer, V. Stolyarov, R. Sudiwala, R. Sunyaev, D. Sutton, A.-S. Suur-Uski, J.-F. Sygnet, J. A. Tauber, L. Terenzi, L. Toffolatti, M. Tomasi, M. Tristram, M. Tucci, G. Umana, L. Valenziano, J. Valiviita, B. Van Tent, P. Vielva, F. Villa, L. A. Wade, B. D. Wandelt, I. K. Wehus, H. Wiesemeyer, D. Yvon, A. Zacchei, and A. Zonca, 2015: Planck intermediate results. XIX. An overview of the polarized thermal emission from Galactic dust. *A&A*, **576**, A104.
- [94] Planck Collaboration, R. Adam, P. A. R. Ade, N. Aghanim, M. I. R. Alves, M. Arnaud, D. Arzoumanian, M. Ashdown, J. Aumont, C. Baccigalupi, A. J. Banday, R. B. Barreiro, N. Bartolo, E. Battaner, K. Benabed, A. Benoit-Lévy, J.-P. Bernard, M. Bersanelli, P. Bielewicz, A. Bonaldi, L. Bonavera, J. R. Bond, J. Borrill, F. R. Bouchet, F. Boulanger, A. Bracco, C. Burigana, R. C. Butler, E. Calabrese, J.-F. Cardoso, A. Catalano, A. Chamballu, H. C. Chiang, P. R. Christensen, S. Colombi, L. P. L. Colombo, C. Combet, F. Couchot, B. P. Crill, A. Curto, F. Cuttaia, L. Danese, R. D. Davies, R. J. Davis, P. de Bernardis, A. de Rosa, G. de Zotti, J. Delabrouille, C. Dickinson, J. M. Diego, H. Dole, S. Donzelli, O. Doré, M. Douspis, A. Ducout, X. Dupac, G. Efstathiou, F. Elsner, T. A. Enßlin, H. K. Eriksen, E. Falgarone, K. Ferrière, F. Finelli, O. Forni, M. Frailis, A. A. Fraisse, E. Franceschi, A. Frejsel, S. Galeotta, S. Galli, K. Ganga, T. Ghosh, M. Giard, E. Gjerløw, J. González-Nuevo, K. M. Górski, A. Gregorio, A. Gruppuso, V. Guillet, F. K. Hansen, D. Hanson, D. L. Harrison, S. Henrot-Versillé, C. Hernández-Monteagudo, D. Herranz, S. R. Hildebrandt, E. Hivon, W. A. Holmes, W. Hovest, K. M. Huffenberger, G. Hurier, A. H. Jaffe, T. R. Jaffe, W. C. Jones, E. Keihänen, R. Keskitalo, T. S. Kisner, R. Kneissl, J. Knoche, M. Kunz, H. Kurki-Suonio, G. Lagache, J.-M. Lamarre, A. Lasenby, M. Lattanzi, C. R. Lawrence, R. Leonardi, F. Levrier, M. Liguori, P. B. Lilje, M. Linden-Vørnle, M. López-Caniego, P. M. Lubin, J. F. Macías-Pérez, B. Maffei, D. Maino, N. Mandolesi, M. Maris, D. J. Marshall, P. G. Martin, E. Martínez-González, S. Masi, S. Matarrese, P. Mazzotta, A. Melchiorri, L. Mendes, A. Mennella, M. Migliaccio, M.-A. Miville-Deschênes, A. Moneti, L. Montier, G. Morgante, D. Mortlock, D. Munshi, J. A. Murphy, P. Naselsky, P. Natoli, H. U. Nørgaard-Nielsen, F. Noviello, D. Novikov, I. Novikov, N. Oppermann, C. A. Oxborrow, L. Pagano, F. Pajot, D. Paoletti, F. Pasian, O. Perdereau, L. Perotto, F. Perrotta, V. Pettorino, F. Piacentini, M. Piat, S. Plaszczyński, E. Pointecouteau, G. Polenta, N. Ponthieu, L. Popa, G. W. Pratt, S. Prunet, J.-L. Puget, J. P. Rachen, W. T. Reach, M. Reinecke, M. Remazeilles, C. Renault, I. Ristorcelli, G. Rocha, G. Roudier, J. A. Rubiño-Martín, B. Rusholme, M. Sandri, D. Santos, G. Savini, D. Scott, J. D. Soler, L. D. Spencer, V. Stolyarov, R. Sudiwala, R. Sunyaev, D. Sutton, A.-S. Suur-Uski, J.-F. Sygnet, J. A. Tauber, L. Terenzi, L. Toffolatti, M. Tomasi, M. Tristram, M. Tucci, G. Umana, L. Valenziano, J. Valiviita, B. Van Tent, P. Vielva, F. Villa, L. A. Wade, B. D. Wandelt, I. K. Wehus, H. Wiesemeyer, D. Yvon, A. Zacchei, and A. Zonca, 2014: Planck intermediate results. XXXII. The relative orientation between the magnetic field and structures traced by interstellar dust. *ArXiv e-prints*.
- [95] Planck Collaboration, P. A. R. Ade, N. Aghanim, M. Arnaud, M. Ashdown, J. Aumont, C. Bac-

- cigalupi, A. J. Banday, R. B. Barreiro, N. Bartolo, E. Battaner, K. Benabed, A. Benoit-Lévy, J. P. Bernard, M. Bersanelli, P. Bielewicz, A. Bonaldi, L. Bonavera, J. R. Bond, J. Borrill, F. R. Bouchet, F. Boulanger, A. Bracco, C. Burigana, E. Calabrese, J. F. Cardoso, A. Catalano, A. Chamballu, R. R. Chary, H. C. Chiang, P. R. Christensen, L. P. L. Colombo, C. Combet, B. P. Crill, A. Curto, F. Cuttaia, L. Danese, R. D. Davies, R. J. Davis, P. de Bernardis, A. de Rosa, G. de Zotti, J. Delabrouille, J. M. Delouis, C. Dickinson, J. M. Diego, H. Dole, S. Donzelli, O. Doré, M. Douspis, J. Dunkley, X. Dupac, G. Efstathiou, F. Elsner, T. A. Enßlin, H. K. Eriksen, E. Falgarone, K. Ferrière, F. Finelli, O. Forni, M. Frailis, A. A. Fraisse, E. Franceschi, A. Frolov, S. Galeotta, S. Galli, K. Ganga, T. Ghosh, M. Giard, E. Gjerløw, J. González-Nuevo, K. M. Górski, A. Gruppuso, V. Guillet, F. K. Hansen, D. L. Harrison, G. Helou, C. Hernández-Monteagudo, D. Herranz, S. R. Hildebrandt, E. Hivon, A. Hornstrup, W. Hovest, Z. Huang, K. M. Huffenberger, G. Hurier, T. R. Jaffe, W. C. Jones, M. Juvela, E. Keihänen, R. Keskitalo, T. S. Kisner, R. Kneissl, J. Knoche, M. Kunz, H. Kurki-Suonio, J. M. Lamarre, A. Lasenby, M. Lattanzi, C. R. Lawrence, R. Leonardi, J. León-Tavares, F. Levrier, M. Liguori, P. B. Lilje, M. Linden-Vørnle, M. López-Caniego, P. M. Lubin, J. F. Macías-Pérez, B. Maffei, D. Maino, N. Mandolesi, M. Maris, P. G. Martin, E. Martínez-González, S. Masi, S. Matarrese, P. McGehee, A. Melchiorri, A. Mennella, M. Migliaccio, M. A. Miville-Deschênes, A. Moneti, L. Montier, G. Morgante, D. Mortlock, D. Munshi, J. A. Murphy, P. Naselsky, F. Nati, P. Natoli, D. Novikov, I. Novikov, N. Oppermann, C. A. Oxborrow, L. Pagano, F. Pajot, D. Paoletti, F. Pasian, O. Perdereau, V. Pettorino, F. Piacentini, M. Piat, E. Pierpaoli, S. Plaszczynski, E. Pointecouteau, G. Polenta, N. Ponthieu, G. W. Pratt, S. Prunet, J. L. Puget, J. P. Rachen, W. T. Reach, R. Rebolo, M. Reinecke, M. Remazeilles, C. Renault, A. Renzi, I. Ristorcelli, G. Rocha, C. Rosset, M. Rossetti, G. Roudier, J. A. Rubiño-Martín, B. Rusholme, M. Sandri, D. Santos, M. Savelainen, G. Savini, D. Scott, P. Serra, J. D. Soler, V. Stolyarov, R. Sudiwala, R. Sunyaev, A. S. Suur-Uski, J. F. Sygnet, J. A. Tauber, L. Terenzi, L. Toffolatti, M. Tomasi, M. Tristram, M. Tucci, G. Umana, L. Valenziano, J. Valiviita, B. Van Tent, P. Vielva, F. Villa, L. A. Wade, B. D. Wandelt, I. K. Wehus, D. Yvon, A. Zacchei, and A. Zonca, 2016: Planck intermediate results. XXXVIII. E- and B-modes of dust polarization from the magnetized filamentary structure of the interstellar medium. *A&A*, **586**, A141.
- [96] Planck Collaboration, Y. Akrami, M. Ashdown, J. Aumont, C. Baccigalupi, M. Ballardini, A. J. Banday, R. B. Barreiro, N. Bartolo, S. Basak, K. Benabed, J.-P. Bernard, M. Bersanelli, P. Bielewicz, J. R. Bond, J. Borrill, F. R. Bouchet, F. Boulanger, A. Bracco, M. Bucher, C. Burigana, E. Calabrese, J.-F. Cardoso, J. Carron, H. C. Chiang, C. Combet, B. P. Crill, P. de Bernardis, G. de Zotti, J. Delabrouille, J.-M. Delouis, E. Di Valentino, C. Dickinson, J. M. Diego, A. Ducout, X. Dupac, F. Elsner, T. A. Enßlin, E. Falgarone, Y. Fantaye, K. Ferrière, F. Finelli, F. Forastieri, M. Frailis, A. A. Fraisse, E. Franceschi, A. Frolov, S. Galeotta, S. Galli, K. Ganga, R. T. Génova-Santos, T. Ghosh, J. González-Nuevo, K. M. Górski, A. Gruppuso, J. E. Gudmundsson, V. Guillet, W. Handley, F. K. Hansen, D. Herranz, Z. Huang, A. H. Jaffe, W. C. Jones, E. Keihänen, R. Keskitalo, K. Kiiveri, J. Kim, N. Krachmalnicoff, M. Kunz, H. Kurki-Suonio, J.-M. Lamarre, A. Lasenby, M. Le Jeune, F. Levrier, M. Liguori, P. B. Lilje, V. Lindholm, M. López-Caniego, P. M. Lubin, Y.-Z. Ma, J. F. Macías-Pérez, G. Maggio, D. Maino, N. Mandolesi, A. Mangilli, P. G. Martin, E. Martínez-González, S. Matarrese, J. D. McEwen, P. R. Meinhold, A. Melchiorri, M. Migliaccio, M.-A. Miville-Deschênes, D. Molinari, A. Moneti, L. Montier, G. Morgante, P. Natoli, L. Pagano, D. Paoletti, V. Pettorino, F. Piacentini, G. Polenta, J. P. Rachen, M. Reinecke, M. Remazeilles, A. Renzi, G. Rocha, C. Rosset, G. Roudier, J. A. Rubiño-Martín, B. Ruiz-Granados, L. Salvati, M. Sandri, M. Savelainen, D. Scott, J. D. Soler, L. D. Spencer, J. A. Tauber, D. Tavagnacco, L. Toffolatti, M. Tomasi, T. Trombetti, J. Valiviita, F. Vansyngel, F. Van Tent, P. Vielva, F. Villa, N. Vittorio, I. K. Wehus, A. Zacchei, and A. Zonca, 2018: Planck intermediate results. LIV. Polarized dust foregrounds. *ArXiv e-prints*.



- [97] Rey-Raposo, R., C. Dobbs, and A. Duarte-Cabral, 2014: Are turbulent spheres suitable initial conditions for star-forming clouds? *ArXiv e-prints*.
- [98] Reynolds, D. R., J. C. Hayes, P. Paschos, and M. L. Norman, 2009: Self-consistent solution of cosmological radiation-hydrodynamics and chemical ionization. *J. Comput. Phys.*, **228**, 6833–6854.
- [99] Rieder, M. and R. Teyssier, 2016: A small-scale dynamo in feedback-dominated galaxies as the origin of cosmic magnetic fields - I. The kinematic phase. *MNRAS*, **457**, 1722–1738.
- [100] —, 2017: A small-scale dynamo in feedback-dominated galaxies - II. The saturation phase and the final magnetic configuration. *MNRAS*, **471**, 2674–2686.
- [101] Roman-Duval, J., J. M. Jackson, M. Heyer, J. Rathborne, and R. Simon, 2010: Physical Properties and Galactic Distribution of Molecular Clouds Identified in the Galactic Ring Survey. *ApJ*, **723**, 492–507.
- [102] Roychowdhury, S. and J. N. Chengalur, 2012: The radio-far-infrared correlation in the faintest star-forming dwarf galaxies. *MNRAS*, **423**, L127–L131.
- [103] Salem, M. and G. L. Bryan, 2014: Cosmic ray driven outflows in global galaxy disc models. *MNRAS*, **437**, 3312–3330.
- [104] Salem, M., G. L. Bryan, and C. Hummels, 2014: Cosmological Simulations of Galaxy Formation with Cosmic Rays. *ApJL*, **797**, L18.
- [105] Scannapieco, C., M. Wadepuhl, O. H. Parry, J. F. Navarro, A. Jenkins, V. Springel, R. Teyssier, E. Carlson, H. M. P. Couchman, R. A. Crain, C. Dalla Vecchia, C. S. Frenk, C. Kobayashi, P. Monaco, G. Murante, T. Okamoto, T. Quinn, J. Schaye, G. S. Stinson, T. Theuns, J. Wadsley, S. D. M. White, and R. Woods, 2012: The Aquila comparison project: the effects of feedback and numerical methods on simulations of galaxy formation. *MNRAS*, **423**, 1726–1749.
- [106] Schleicher, D. R. G. and R. Beck, 2013: A new interpretation of the far-infrared - radio correlation and the expected breakdown at high redshift. *A&A*, **556**, A142.
- [107] Schleicher, D. R. G., M. Latif, J. Schober, W. Schmidt, S. Bovino, C. Federrath, J. Niemeyer, R. Banerjee, and R. S. Klessen, 2013: Magnetic fields during high redshift structure formation. *Astronomische Nachrichten*, **334**, 531.
- [108] Schmidt, W., D. C. Collins, and A. G. Kritsuk, 2013: Local support against gravity in magnetoturbulent fluids. *MNRAS*, **431**, 3196–3215.
- [109] Seljak, U., 1997: Measuring Polarization in the Cosmic Microwave Background. *ApJ*, **482**(1), 6–16.
- [110] Seljak, U. and M. Zaldarriaga, 1997: Signature of Gravity Waves in the Polarization of the Microwave Background. *Physical Review Letters*, **78**(11), 2054–2057.
- [111] Shetty, R. and E. C. Ostriker, 2012: Maximally Star-forming Galactic Disks. II. Vertically Resolved Hydrodynamic Simulations of Starburst Regulation. *ApJ*, **754**, 2.
- [112] Simpson, C. M., G. L. Bryan, K. V. Johnston, B. D. Smith, M.-M. Mac Low, S. Sharma, and J. Tumlinson, 2013: The effect of feedback and reionization on star formation in low-mass dwarf galaxy haloes. *MNRAS*, **432**, 1989–2011.

- [113] Skillman, S. W., H. Xu, E. J. Hallman, B. W. O’Shea, J. O. Burns, H. Li, D. C. Collins, and M. L. Norman, 2013: Cosmological Magnetohydrodynamic Simulations of Galaxy Cluster Radio Relics: Insights and Warnings for Observations. *ApJ*, **765**, 21.
- [114] Smith, B., S. Sigurdsson, and T. Abel, 2008: Metal cooling in simulations of cosmic structure formation. *MNRAS*, **385**, 1443–1454.
- [115] Smith, B. D., E. J. Hallman, J. M. Shull, and B. W. O’Shea, 2011: The Nature of the Warm/Hot Intergalactic Medium. I. Numerical Methods, Convergence, and O VI Absorption. *ApJ*, **731**, 6–+.
- [116] Sparre, M., C. C. Hayward, V. Springel, M. Vogelsberger, S. Genel, P. Torrey, D. Nelson, D. Sijacki, and L. Hernquist, 2015: The star formation main sequence and stellar mass assembly of galaxies in the Illustris simulation. *MNRAS*, **447**, 3548–3563.
- [117] Speagle, J. S., C. L. Steinhardt, P. L. Capak, and J. D. Silverman, 2014: A Highly Consistent Framework for the Evolution of the Star-Forming ”Main Sequence” from  $z \sim 0$ –6. *ApJS*, **214**, 15.
- [118] Stil, J. M., M. Krause, R. Beck, and A. R. Taylor, 2009: The Integrated Polarization of Spiral Galaxy Disks. *ApJ*, **693**, 1392–1403.
- [119] Sur, S., D. R. G. Schleicher, R. Banerjee, C. Federrath, and R. S. Klessen, 2010: The Generation of Strong Magnetic Fields During the Formation of the First Stars. *ApJL*, **721**, L134–L138.
- [120] Tabatabaei, F. S., T. P. K. Martinsson, J. H. Knapen, J. E. Beckman, B. Koribalski, and B. G. Elmegreen, 2016: An Empirical Relation between the Large-scale Magnetic Field and the Dynamical Mass in Galaxies. *ApJL*, **818**, L10.
- [121] Tasker, E. J., 2011: Star Formation in Disk Galaxies. II. The Effect Of Star Formation and Photoelectric Heating on the Formation and Evolution of Giant Molecular Clouds. *ApJ*, **730**, 11.
- [122] Thomson, R. C. and A. H. Nelson, 1980: The interpretation of pulsar rotation measures and the magnetic field of the galaxy. *MNRAS*, **191**, 863–870.
- [123] Turk, M. J., T. Abel, and B. O’Shea, 2009: The Formation of Population III Binaries from Cosmological Initial Conditions. *Science*, **325**, 601–.
- [124] Turk, M. J., B. D. Smith, J. S. Oishi, S. Skory, S. W. Skillman, T. Abel, and M. L. Norman, 2011: yt: A Multi-code Analysis Toolkit for Astrophysical Simulation Data. *ApJS*, **192**, 9.
- [125] Van Eck, C., J.-A. Brown, A. Shukurov, and A. Fletcher, 2014: Magnetic Fields in a Sample of Nearby Spiral Galaxies. *ArXiv e-prints*.
- [126] Vazza, F., M. Brüggen, C. Gheller, S. Hackstein, D. Wittor, and P. M. Hinz, 2017: Simulations of extragalactic magnetic fields and of their observables. *ArXiv e-prints*.
- [127] Vogelsberger, M., S. Genel, V. Springel, P. Torrey, D. Sijacki, D. Xu, G. Snyder, D. Nelson, and L. Hernquist, 2014: Introducing the Illustris Project: simulating the coevolution of dark and visible matter in the Universe. *MNRAS*, **444**, 1518–1547.
- [128] Voit, G. M., G. L. Bryan, B. W. O’Shea, and M. Donahue, 2015: Precipitation-regulated Star Formation in Galaxies. *ApJL*, **808**, L30.
- [129] Voit, G. M., G. Meece, Y. Li, B. W. O’Shea, G. L. Bryan, and M. Donahue, 2017: A Global Model for Circumgalactic and Cluster-core Precipitation. *ApJ*, **845**, 80.

- [130] Walch, S., P. Girichidis, T. Naab, A. Gatto, S. C. O. Glover, R. Wünsch, R. S. Klessen, P. C. Clark, T. Peters, D. Derigs, and C. Baczynski, 2015: The SILCC (Simulating the LifeCycle of molecular Clouds) project - I. Chemical evolution of the supernova-driven ISM. *MNRAS*, **454**, 238–268.
- [131] Wang, P. and T. Abel, 2009: Magnetohydrodynamic Simulations of Disk Galaxy Formation: The Magnetization of the Cold and Warm Medium. *ApJ*, **696**, 96–109.
- [132] Wang, P., T. Abel, and R. Kaehler, 2010: Adaptive mesh fluid simulations on GPU. *NewA*, **15**, 581–589.
- [133] Widrow, L. M., 2002: Origin of galactic and extragalactic magnetic fields. *Reviews of Modern Physics*, **74**, 775–823.
- [134] Widrow, L. M., D. Ryu, D. R. G. Schleicher, K. Subramanian, C. G. Tsagas, and R. A. Treumann, 2012: The First Magnetic Fields. *Space Science Reviews*, **166**, 37–70.
- [135] Wielebinski, R. and F. Krause, 1993: Magnetic fields in galaxies. *Astronomy and Astrophysics Review*, **4**, 449–485.
- [136] Wise, J. H. and T. Abel, 2011: ENZO+MORAY: radiation hydrodynamics adaptive mesh refinement simulations with adaptive ray tracing. *MNRAS*, **414**, 3458–3491.
- [137] Wise, J. H., T. Abel, M. J. Turk, M. L. Norman, and B. D. Smith, 2012: The birth of a galaxy - II. The role of radiation pressure. *MNRAS*, **427**, 311–326.