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Bibliography

- Allen, L. E., et al. 2004, *ApJS*, 154, 363
- Alonso-Herrero, A., Rieke, G. H., Rieke, M. J., et al. 2006, *ApJ*, 650, 835
- Armus, L., Mazzarella, J. M., Evans, A. S., et al. 2009, *PASP*, 121, 559
- Asensio Ramos, A., & Ramos Almeida, C. 2009, *ApJ*, 696, 2075
- Banks, K., Larson, M., Aymergen, C., & Zhang, B. 2008, *Proc. SPIE*, 7017,
- Barbá, R. H., Maíz Apellániz, J., Pérez, E., et al. 2009, *Ap&SS*, 324, 309
- Beck, S. C., Turner, J. L., & Kloosterman, J. 2007, *AJ*, 134, 1237
- Beirão, P., Brandl, B. R., Devost, D., et al. 2006, *ApJ*, 643, L1
- Beirão, P., Appleton, P. N., Brandl, B. R., Seibert, M., Jarrett, T., & Houck, J. R. 2009, *ApJ*, 693, 1650
- Beirão, P., Armus, L., Appleton, P. N., et al. 2010, *A&A*, 518, L60
- Belenguer, T., Alcacera, M. A., Aricha, A., et al. 2008, *Proc. SPIE*, 7010,
- Bernard-Salas, J., et al. 2009, *ApJS*, 184, 230
- Bik, A., Puga, E., Waters, L. B. F. M., et al. 2010, *ApJ*, 713, 883
- Bonnell, I. A., Vine, S. G., & Bate, M. R. 2004, *MNRAS*, 349, 735
- Brandl, B. R., Devost, D., Higdon, S. J. U., et al. 2004, *ApJS*, 154, 188
- Brandl, B. R., et al. 2006, *ApJ*, 653, 1129
- Brandl, B. R., Sijnders, L., den Brok, M., et al. 2009, *ApJ*, 699, 1982
- Browder, J. S., & Ballard, S. 1969, *Appl. Opt.* 8, 793-798
- Browder, J. S., & Ballard, S. 1972, *Appl. Opt.* 11, 841-843
- Calzetti, D., Kennicutt, R. C., Jr., Bianchi, L., et al. 2005, *ApJ*, 633, 871
- Calzetti, D., Wu, S.-Y., Hong, S., et al. 2010, *ApJ*, 714, 1256
- Caputi, K. I., Lagache, G., Yan, L., et al. 2007, *ApJ*, 660, 97
- Cassinelli, J. P., & Swank, J. H. 1983, *ApJ*, 271, 681
- Castor, J., McCray, R., & Weaver, R. 1975, *ApJ*, 200, L107
- Charlot, S., & Bruzual, A. G. 1991, *ApJ*, 367, 126
- Chien, L.-H., Barnes, J. E., Kewley, L. J., & Chambers, K. C. 2007, *ApJ*, 660, L105
- Chini, R., Kruegel, E., & Kreysa, E. 1992, *A&A*, 266, 177
- Chu, Y.-H., & Kennicutt, R. C., Jr. 1994, *ApJ*, 425, 720

Bibliography

- Chu, Y.-H., & Mac Low, M.-M. 1990, *ApJ*, 365, 510
- Churchwell, E., & Goss, W. M. 1999, *ApJ*, 514, 188
- Crosthwaite, L. P., Turner, J. L., Hurt, R. L., et al. 2001, *AJ*, 122, 797
- Crowther, P. A., Schnurr, O., Hirschi, R., Yusof, N., Parker, R. J., Goodwin, S. P., & Kassim, H. A. 2010, *MNRAS*, 1103
- da Cunha, E., Charlot, S., & Elbaz, D. 2008, *MNRAS*, 388, 1595
- Decin, L., Morris, P. W., Appleton, P. N., Charmandaris, V., Armus, L., & Houck, J. R. 2004, *ApJS*, 154, 408
- Dickel, J. R., Milne, D. K., Kennicutt, R. C., Chu, Y.-H., & Schommer, R. A. 1994, *AJ*, 107, 1067
- Dole, H., Lagache, G., Puget, J.-L., et al. 2006, *A&A*, 451, 417
- Donahue, M., de Messières, G. E., O'Connell, R. W., Voit, G. M., Hoffer, A., McNamara, B. R., & Nulsen, P. E. J. 2011, *ApJ*, 732, 40
- Dopita, M. A., et al. 2005, *ApJ*, 619, 755
- Dopita, M. A., et al. 2006, *ApJ*, 639, 788
- Dopita, M. A., et al. 2006, *ApJ*, 647, 244
- Dopita, M. A., et al. 2006, *ApJS*, 167, 177
- Dors, O. L., Jr., Storchi-Bergmann, T., Riffel, R. A., & Schimdt, A. A. 2008, *A&A*, 482, 59
- Draine, B. T. 2003, *ARA&A*, 41, 241
- Draine, B. T., Dale, D. A., Bendo, G., et al. 2007, *ApJ*, 663, 866
- Draine, B. T. 2011, *EAS Publications Series*, 46, 29
- Drissen, L., Crowther, P. A., Úbeda, L., & Martin, P. 2008, *MNRAS*, 389, 1033
- Dudik, R. P., Weingartner, J. C., Satyapal, S., et al. 2007, *ApJ*, 664, 71
- Elbaz, D., & Cesarsky, C. J. 2003, *Science*, 300, 270
- Elbaz, D., Dickinson, M., Hwang, H. S., et al. 2011, *A&A*, 533, A119
- Eldridge, J. J., & Relaño, M. 2011, *MNRAS*, 411, 235
- Elfhag, T., Booth, R. S., Hoeglund, B., Johansson, L. E. B., & Sandqvist, A. 1996, *A&AS*, 115, 439
- Elmegreen, B. G., & Lada, C. J. 1977, *ApJ*, 214, 725
- Elmegreen, B. G. 2011, *EAS Publications Series*, 51, 45
- Fariña, C., Bosch, G. L., & Barbá, R. H. 2012, *AJ*, 143, 43
- Fazio, G. G., Hora, J. L., Allen, L. E., et al. 2004, *ApJS*, 154, 10
- Feast, M. W., & Catchpole, R. M. 1997, *MNRAS*, 286, L1
- Ferland, G. J., Korista, K. T., Verner, D. A., et al. 1998, *PASP*, 110, 761
- Fernández-Ontiveros, J. A., Prieto, M. A., & Acosta-Pulido, J. A. 2009, *MNRAS*, 392, L16
- Fischera, J., & Dopita, M. 2005, *ApJ*, 619, 340
- Freedman, W. L., Wilson, C. D., & Madore, B. F. 1991, *ApJ*, 372, 455
- Galliano, F., Madden, S. C., Jones, A. P., Wilson, C. D., Bernard, J.-P., & Le Peintre, F. 2003, *A&A*, 407, 159

- Galliano, F. 2004, Ph.D. Thesis,
- Gautier, T. N., III, Fink, U., Larson, H. P., & Treffers, R. R. 1976, *ApJ*, 207, L129
- Gerin, M., Combes, F., & Nakai, N. 1988, *A&A*, 203, 44
- Glauser, A. M., Glasse, A., Morrison, J. E., et al. 2010, *Proc. SPIE*, 7731,
- Gonzalez-Delgado, R. M., Perez, E., Diaz, A. I., et al. 1995, *ApJ*, 439, 604
- González Delgado, R. M., García-Vargas, M. L., Goldader, J., Leitherer, C., & Pasquali, A. 1999, *ApJ*, 513, 707
- González Delgado, R. M., & Pérez, E. 2000, *MNRAS*, 317, 64
- Gratton, R. G., Bragaglia, A., Clementini, G., Carretta, E., Di Fabrizio, L., Maio, M., & Taribello, E. 2004, *A&A*, 421, 937
- de Grijs, R., Lee, J. T., Mora Herrera, M. C., Fritze-v. Alvensleben, U., & Anders, P. 2003, *New A*, 8, 155
- Groves, B. 2004, "Dust in Photoionized Nebulae", Ph.D. Thesis, Australian National University, Australia
- Groves, B., Dopita, M. A., Sutherland, R. S., Kewley, L. J., Fischera, J., Leitherer, C., Brandl, B., & van Breugel, W. 2008, *ApJS*, 176, 438
- Groves, B., Nefs, B., & Brandl, B. 2008, *MNRAS*, 391, L113
- Groves, B. A., & Allen, M. G. 2010, *New Astronomy*, 15, 614
- Haan, S., Armus, L., Laine, S., et al. 2011, *ApJS*, 197, 27
- Haschke, R., Grebel, E. K., & Duffau, S. 2011, *AJ*, 141, 158
- Heckman, T. M. 2005, *Starbursts: From 30 Doradus to Lyman Break Galaxies*, 329, 3
- Heiner, J. S., Allen, R. J., & van der Kruit, P. C. 2009, *ApJ*, 700, 545
- Houck, J. R., et al. 2004, *ApJS*, 154, 18
- Hummel, E., van der Hulst, J. M., & Keel, W. C. 1987, *A&A*, 172, 32
- Hunter, D. A., Shaya, E. J., Scowen, P., Hester, J. J., Groth, E. J., Lynds, R., & O'Neil, E. J., Jr. 1995, *ApJ*, 444, 758
- Hunter, D. A., Baum, W. A., O'Neil, E. J., Jr., & Lynds, R. 1996, *ApJ*, 456, 174
- Indebetouw, R., et al. 2009, *ApJ*, 694, 84
- Israel, F. P., & Baas, F. 2003, *A&A*, 404, 495
- Israel, F. P., Wall, W. F., Raban, D., Reach, W. T., Bot, C., Oonk, J. B. R., Ysard, N., & Bernard, J. P. 2010, *A&A*, 519, A67
- Jonsson, P., Groves, B. A., & Cox, T. J. 2010, *MNRAS*, 403, 17
- Kaufman, M. J., Wolfire, M. G., Hollenbach, D. J., & Luhman, M. L. 1999, *ApJ*, 527, 795
- Kaufman, M. J., Wolfire, M. G., & Hollenbach, D. J. 2006, *ApJ*, 644, 283
- Kennicutt, R. C., Jr. 1984, *ApJ*, 287, 116
- Kennicutt, R. C., Jr. 1998, *ARA&A*, 36, 189
- Kennicutt, R. C., Jr., Armus, L., Bendo, G., et al. 2003, *PASP*, 115, 928
- Kilbinger, M., et al. 2010, *MNRAS*, 405, 2381
- Kim, H.-S., et al. 2007, *ApJ*, 669, 1003
- Kotilainen, J. K., Reunanen, J., Laine, S., & Ryder, S. D. 2000, *A&A*, 353, 834

Bibliography

- Kramer, C., Buchbender, C., Xilouris, E. M., et al. 2010, *A&A*, 518, L67
- Kroes, G., Oudenhuisen, A., de Haan, M., Jager, R., & Pauwels, E. 2010, *Proc. SPIE*, 7731,
- Kroupa, P. 2002, *Science*, 295, 82
- Krumholz, M. R., Matzner, C. D., & McKee, C. F. 2006, *ApJ*, 653, 36
- Lada, C. J., & Lada, E. A. 2003, *ARA&A*, 41, 57
- Lagache, G., Puget, J.-L., & Dole, H. 2005, *ARA&A*, 43, 727
- Lançon, A., Goldader, J. D., Leitherer, C., & González Delgado, R. M. 2001, *ApJ*, 552, 150
- Lawton, B., Gordon, K. D., Babler, B., et al. 2010, *ApJ*, 716, 453
- Lazendic, J. S., Dickel, J. R., & Jones, P. A. 2003, *ApJ*, 596, 287
- Lebouteiller, V., Bernard-Salas, J., Brandl, B., Whelan, D. G., Wu, Y., Charmandaris, V., Devost, D., & Houck, J. R. 2008, *ApJ*, 680, 398
- Lebouteiller, V., Bernard-Salas, J., Whelan, D. G., et al. 2011, *ApJ*, 728, 45
- Lebrón, M., Mangum, J. G., Mauersberger, R., et al. 2011, *A&A*, 534, A56
- Leitherer, C., et al. 1999, *ApJS*, 123, 3
- Levesque, E. M., Kewley, L. J., & Larson, K. L. 2010, *AJ*, 139, 712
- Maercker, M., & Burton, M. G. 2005, *A&A*, 438, 663
- Magrini, L., Vílchez, J. M., Mampaso, A., Corradi, R. L. M., & Leisy, P. 2007, *A&A*, 470, 865
- Maíz-Apellániz, J. 2001, *ApJ*, 563, 151
- Maíz-Apellániz, J., Pérez, E., & Mas-Hesse, J. M. 2004, *AJ*, 128, 1196
- Mak, D. S. Y., Pun, C. S. J., & Kong, A. K. H. 2011, *ApJ*, 728, 10
- Malhotra, S., et al. 2001, *ApJ*, 561, 766
- Maloney, P. R., Hollenbach, D. J., & Tielens, A. G. G. M. 1996, *ApJ*, 466, 561
- Maraston, C. 2005, *MNRAS*, 362, 799
- Marchesini, D., van Dokkum, P. G., Förster Schreiber, N. M., et al. 2009, *ApJ*, 701, 1765
- Martínez-Galarza, J. R., Groves, B., Brandl, B., et al. 2011, *ApJ*, 738, 176
- Mason, R. E., Levenson, N. A., Packham, C., et al. 2007, *ApJ*, 659, 241
- Mathis, J. S., Rumpl, W., & Nordsieck, K. H. 1977, *ApJ*, 217, 425
- Matsuoka, Y., Yuan, F.-T., Takeuchi, Y., & Yanagisawa, K. 2011, *arXiv:1111.4522*
- Meier, D. S., Turner, J. L., & Schinnerer, E. 2011, *AJ*, 142, 32
- Melnick, J. 1980, *A&A*, 86, 304
- Micelotta, E. R., Jones, A. P., & Tielens, A. G. G. M. 2010, *A&A*, 510, A37
- Mineo, S. 2011, Ph.D. Thesis,
- Miura, R., et al. 2010, *ApJ*, 724, 1120
- Morisset, C., Schaerer, D., Bouret, J.-C., & Martins, F. 2004, *A&A*, 415, 577
- Motte, F., Andre, P., & Neri, R. 1998, *A&A*, 336, 150
- Oey, M. S., & Clarke, C. J. 1997, *MNRAS*, 289, 570
- Peeters, E., Mattiotta, A. L., Hudgins, D. M., & Allamandola, L. J. 2004, *ApJ*, 617, L65
- Pellegrini, E. W., Baldwin, J. A., & Ferland, G. J. 2010, *ApJS*, 191, 160

- Pereira-Santaella, M., Alonso-Herrero, A., Rieke, G. H., et al. 2010, *ApJS*, 188, 447
- Petrosian, A. R., & Burenkov, A. N. 1993, *A&A*, 279, 21
- Phillips, M. M., Pagel, B. E. J., Edmunds, M. G., & Diaz, A. 1984, *MNRAS*, 210, 701
- Poglitsch, A., Waelkens, C., Geis, N., et al. 2010, *A&A*, 518, L2
- Quillen, A. C., Frogel, J. A., Kuchinski, L. E., & Terndrup, D. M. 1995, *AJ*, 110, 156
- Reach, W. T., Megeath, S. T., Cohen, M., et al. 2005, *PASP*, 117, 978
- Read, A. M. 2003, *MNRAS*, 342, 715
- Relaño, M., Lisenfeld, U., Pérez-González, P. G., Vílchez, J. M., & Battaner, E. 2007, *ApJ*, 667, L141
- Relaño, M., & Kennicutt, R. C. 2009, *ApJ*, 699, 1125
- Ressler, M. E., Cho, H., Lee, R. A. M., et al. 2008, *Proc. SPIE*, 7021,
- Rieke, G. H., Alonso-Herrero, A., Weiner, B. J., et al. 2009, *ApJ*, 692, 556
- Robitaille, T. P., & Whitney, B. A. 2010, *ApJ*, 710, L11
- Rubin, R. H., Simpson, J. P., Lord, S. D., et al. 1994, *ApJ*, 420, 772
- Russell, S. C., & Dopita, M. A. 1992, *ApJ*, 384, 508
- Sanders, D. B., & Mirabel, I. F. 1996, *ARA&A*, 34, 749
- Sandstrom, K., Krause, O., Linz, H., et al. 2010, *A&A*, 518, L59
- Sargsyan, L. A., & Weedman, D. W. 2009, *ApJ*, 701, 1398
- Schinnerer, E., Böker, T., Meier, D. S., & Calzetti, D. 2008, *ApJ*, 684, L21
- Searle, L., Sargent, W. L. W., & Bagnuolo, W. G. 1973, *ApJ*, 179, 427
- Seale, J. P., Looney, L. W., Chu, Y.-H., et al. 2009, *ApJ*, 699, 150
- Servillat, M., Dieball, A., Webb, N. A., et al. 2008, *A&A*, 490, 641
- Shields, G. A. 1990, *ARA&A*, 28, 525
- Siebenmorgen, R., & Krügel, E. 2007, *A&A*, 461, 445
- Silva, L., Granato, G. L., Bressan, A., & Danese, L. 1998, *ApJ*, 509, 103
- Smith, B. J., Struck, C., & Pogge, R. W. 1997, *ApJ*, 483, 754
- Smith, B. J., & Struck, C. 2001, *AJ*, 121, 710
- Smith, J. D. T., et al. 2007, *PASP*, 119, 1133
- Smith, J. D. T., et al. 2007, *ApJ*, 656, 770
- Smith, T. F., & White, G. K. 1975, *Journal of Physics C Solid State Physics*, 8, 2031
- Sofia, U. J., & Jenkins, E. B. 1998, *ApJ*, 499, 951
- Stiavelli, M. 2010, *American Institute of Physics Conference Series*, 1294, 158
- Storchi-Bergmann, T., Nemmen, R. S., Spinelli, P. F., et al. 2005, *ApJ*, 624, L13
- Struck, C., & Smith, B. J. 2003, *ApJ*, 589, 157
- Takagi, T., Arimoto, N., & Hanami, H. 2003, *MNRAS*, 340, 813
- Taniguchi, Y., Kawara, K., Nishida, M., Tamura, S., & Nishida, M. T. 1988, *AJ*, 95, 1378
- Terlevich, R. 1997, *Revista Mexicana de Astronomia y Astrofisica Conference Series*, 6, 1
- Tielens, A. G. G. M. 2008, *ARA&A*, 46, 289
- Toomre, A. 1977, *Evolution of Galaxies and Stellar Populations*, 401

Bibliography

- Tosaki, T., Miura, R., Sawada, T., et al. 2007, *ApJ*, 664, L27
- Townsley, L. K., Broos, P. S., Feigelson, E. D., Brandl, B. R., Chu, Y.-H., Garmire, G. P., & Pavlov, G. G. 2006, *AJ*, 131, 2140
- Tüllmann, R., et al. 2008, *ApJ*, 685, 919
- Van Kerckhoven, C., et al. 2000, *A&A*, 357, 1013
- Vázquez, G. A., & Leitherer, C. 2005, *ApJ*, 621, 695
- Walborn, N. R., & Blades, J. C. 1987, *ApJ*, 323, L65
- Walborn, N. R., & Blades, J. C. 1997, *ApJS*, 112, 457
- Walborn, N. R., Maíz-Apellániz, J., & Barbá, R. H. 2002, *AJ*, 124, 1601
- Walcher, J., Groves, B., Budavári, T., & Dale, D. 2011, *Ap&SS*, 331, 1
- Walsh, J. R., Nandy, K., Thompson, G. I., & Meaburn, J. 1986, *MNRAS*, 220, 453
- Wang, G. 1992, *Acta Astrophysica Sinica*, 11, 311
- Wang, Q. D. 1999, *ApJ*, 510, L139
- Weedman, D. W., Feldman, F. R., Balzano, V. A., et al. 1981, *ApJ*, 248, 105
- Wells, M., Hawkins, G., & Olofsson, G. 2004, *Proc. SPIE*, 5487, 794
- Wells, M., Lee, D., Oudenhuisen, A., et al. 2006, *Proc. SPIE*, 6265
- Werner, M. W., Becklin, E. E., Gatley, I., Ellis, M. J., Hyland, A. R., Robinson, G., & Thomas, J. A. 1978, *MNRAS*, 184, 365
- Westerlund, B. E. 1997, *Cambridge Astrophysics Series*, 29
- Whitney, B. A., et al. 2008, *AJ*, 136, 18
- Whitworth, A. 1979, *MNRAS*, 186, 59
- Wilson, C. D., & Scoville, N. 1992, *ApJ*, 385, 512
- Wilson, C. D., Harris, W. E., Longden, R., & Scoville, N. Z. 2006, *ApJ*, 641, 763
- Wolf, C. 2009, *MNRAS*, 397, 520
- Wright, G. S., Rieke, G., Barella, P., et al. 2008, *Proc. SPIE*, 7010,
- Yang, H., Chu, Y.-H., Skillman, E. D., & Terlevich, R. 1996, *AJ*, 112, 146
- Yun, M. S., & Hibbard, J. E. 2001, *ApJ*, 550, 104
- Zakamska, N. L. 2010, *Nature*, 465, 60
- Zinnecker, H., & Yorke, H. W. 2007, *ARA&A*, 45, 481