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Ingredients of the planet-formation puzzle: Gas substructures and kinematics in transition discs

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Bibliography

- Acke, B. & van den Ancker, M. E. 2006, A&A, 449, 267
- Alarcón, F., Bergin, E. A., & Teague, R. 2022, ApJ, 941, L24
- Alexander, R., Pascucci, I., Andrews, S., Armitage, P., & Cieza, L. 2014, in Protostars and Planets VI, ed. H. Beuther, R. S. Klessen, C. P. Dullemond, & T. Henning, 475
- Alexander, R. D., Clarke, C. J., & Pringle, J. E. 2006a, MNRAS, 369, 216
- Alexander, R. D., Clarke, C. J., & Pringle, J. E. 2006b, MNRAS, 369, 229
- ALMA Partnership, Brogan, C. L., Pérez, L. M., et al. 2015, ApJ, 808, L3
- André, P., Ward-Thompson, D., & Barsony, M. 1993, ApJ, 406, 122
- Andrews, S. M. 2020, ARA&A, 58, 483
- Andrews, S. M., Huang, J., Pérez, L. M., et al. 2018, ApJ, 869, L41
- Ansdell, M., Williams, J. P., Manara, C. F., et al. 2017, AJ, 153, 240
- Ansdell, M., Williams, J. P., van der Marel, N., et al. 2016, ApJ, 828, 46
- Ardila, D. R., Golimowski, D. A., Krist, J. E., et al. 2007, ApJ, 665, 512
- Armitage, P. J. 2019, Saas-Fee Advanced Course, 45, 1
- Asplund, M., Grevesse, N., & Sauval, A. J. 2005, in Astronomical Society of the Pacific Conference Series, Vol. 336, Cosmic Abundances as Records of Stellar Evolution and Nucleosynthesis, ed. T. G. Barnes, III & F. N. Bash, 25
- Avenhaus, H., Quanz, S. P., Garufi, A., et al. 2018, ApJ, 863, 44
- Avenhaus, H., Quanz, S. P., Meyer, M. R., et al. 2014, ApJ, 790, 56
- Bae, J., Hartmann, L., & Zhu, Z. 2015, ApJ, 805, 15
- Bae, J., Isella, A., Zhu, Z., et al. 2022, arXiv e-prints, arXiv:2210.13314

- Bae, J., Teague, R., & Zhu, Z. 2021, ApJ, 912, 56
- Bae, J. & Zhu, Z. 2018a, ApJ, 859, 118
- Bae, J. & Zhu, Z. 2018b, ApJ, 859, 119
- Balbus, S. A. & Hawley, J. F. 1991, ApJ, 376, 214
- Banzatti, A., Testi, L., Isella, A., et al. 2011, A&A, 525, A12
- Barenfeld, S. A., Carpenter, J. M., Ricci, L., & Isella, A. 2016, ApJ, 827, 142
- Barenfeld, S. A., Carpenter, J. M., Sargent, A. I., Isella, A., & Ricci, L. 2017, ApJ, 851, 85
- Bate, M. R., Lodato, G., & Pringle, J. E. 2010, MNRAS, 401, 1505
- Beckwith, S. V. W. & Sargent, A. I. 1993, ApJ, 402, 280
- Benisty, M., Bae, J., Facchini, S., et al. 2021, ApJ, 916, L2
- Benisty, M., Dominik, C., Follette, K., et al. 2022, arXiv e-prints, arXiv:2203.09991
- Benisty, M., Juhasz, A., Boccaletti, A., et al. 2015, A&A, 578, L6
- Benisty, M., Juhász, A., Facchini, S., et al. 2018, A&A, 619, A171
- Benisty, M., Stolker, T., Pohl, A., et al. 2017, A&A, 597, A42
- Béthune, W., Lesur, G., & Ferreira, J. 2017, A&A, 600, A75
- Beuzit, J. L., Vigan, A., Mouillet, D., et al. 2019, A&A, 631, A155
- Birnstiel, T., Klahr, H., & Ercolano, B. 2012, A&A, 539, A148
- Birnstiel, T., Ricci, L., Trotta, F., et al. 2010, A&A, 516, L14
- Blaes, O. M. & Balbus, S. A. 1994, ApJ, 421, 163
- Blandford, R. D. & Payne, D. G. 1982, MNRAS, 199, 883
- Blum, J., Gundlach, B., Mühle, S., & Trigo-Rodriguez, J. M. 2014, ICARUS, 235, 156
- Blum, J. & Wurm, G. 2008, ARA&A, 46, 21
- Boccaletti, A., Di Folco, E., Pantin, E., et al. 2020, A&A, 637, L5
- Boccaletti, A., Pantin, E., Lagrange, A. M., et al. 2013, A&A, 560, A20
- Boehler, Y., Ricci, L., Weaver, E., et al. 2018, ApJ, 853, 162
- Bohn, A. J., Benisty, M., Perraut, K., et al. 2022, A&A, 658, A183
- Boley, A. C. 2009, ApJ, 695, L53

- Bollati, F., Lodato, G., Price, D. J., & Pinte, C. 2021, MNRAS, 504, 5444
- Booth, A. S., Ilee, J. D., Walsh, C., et al. 2023, A&A, 669, A53
- Booth, A. S., Walsh, C., Ilee, J. D., et al. 2019, ApJ, 882, L31
- Booth, A. S., Walsh, C., Kama, M., et al. 2018, A&A, 611, A16
- Bosman, A. D., Bergin, E. A., Loomis, R. A., et al. 2021, ApJS, 257, 15
- Brauer, F., Henning, T., & Dullemond, C. P. 2008, A&A, 487, L1
- Brittain, S. D., Carr, J. S., Najita, J. R., Quanz, S. P., & Meyer, M. R. 2014, ApJ, 791, 136
- Brittain, S. D., Najita, J. R., & Carr, J. S. 2009, ApJ, 702, 85
- Brittain, S. D., Najita, J. R., & Carr, J. S. 2019, ApJ, 883, 37
- Brittain, S. D., Najita, J. R., Carr, J. S., et al. 2013, ApJ, 767, 159
- Bruderer, S. 2013, A&A, 559, A46
- Bruderer, S., van der Marel, N., van Dishoeck, E. F., & van Kempen, T. A. 2014, A&A, 562, A26
- Bruderer, S., van Dishoeck, E. F., Doty, S. D., & Herczeg, G. J. 2012, A&A, 541, A91
- Calcino, J., Hilder, T., Price, D. J., et al. 2022, ApJ, 929, L25
- Calvet, N., D'Alessio, P., Watson, D. M., et al. 2005, ApJ, 630, L185
- Casassus, S. 2016, PASA, 33, e013
- Casassus, S., Avenhaus, H., Pérez, S., et al. 2018, MNRAS, 477, 5104
- Casassus, S., Cárcamo, M., Hales, A., Weber, P., & Dent, B. 2022, ApJ, 933, L4
- Casassus, S., Christiaens, V., Cárcamo, M., et al. 2021, MNRAS, 507, 3789
- Casassus, S., Marino, S., Pérez, S., et al. 2015, ApJ, 811, 92
- Casassus, S. & Pérez, S. 2019, ApJ, 883, L41
- Cazzoletti, P., Manara, C. F., Liu, H. B., et al. 2019, A&A, 626, A11
- Cazzoletti, P., van Dishoeck, E. F., Pinilla, P., et al. 2018, A&A, 619, A161
- Chapillon, E., Guilloteau, S., Dutrey, A., & Piétu, V. 2008, A&A, 488, 565
- Cieza, L. A., Ruíz-Rodríguez, D., Hales, A., et al. 2019, MNRAS, 482, 698
- Clarke, C. 2011, in Physical Processes in Circumstellar Disks around Young Stars, ed. P. J. V. Garcia, 355–418

- Claudi, R., Maire, A. L., Mesa, D., et al. 2019, *A&A*, 622, A96
- Cleeves, L. I., Öberg, K. I., Wilner, D. J., et al. 2016, *ApJ*, 832, 110
- Cossins, P., Lodato, G., & Clarke, C. J. 2009, *MNRAS*, 393, 1157
- Cox, E. G., Harris, R. J., Looney, L. W., et al. 2017, *ApJ*, 851, 83
- Crapsi, A., van Dishoeck, E. F., Hogerheijde, M. R., Pontoppidan, K. M., & Dullemond, C. P. 2008, *A&A*, 486, 245
- Currie, T., Brittaine, S., Grady, C. A., Kenyon, S. J., & Muto, T. 2017, *Research Notes of the American Astronomical Society*, 1, 40
- Currie, T., Cloutier, R., Brittaine, S., et al. 2015, *ApJ*, 814, L27
- Czekala, I., Loomis, R. A., Teague, R., et al. 2021, *ApJS*, 257, 2
- D'Alessio, P., Calvet, N., & Hartmann, L. 2001, *ApJ*, 553, 321
- D'Alessio, P., Calvet, N., Hartmann, L., Lizano, S., & Cantó, J. 1999, *ApJ*, 527, 893
- de Boer, J., Langlois, M., van Holstein, R. G., et al. 2020, *A&A*, 633, A63
- Dipierro, G., Laibe, G., Price, D. J., & Lodato, G. 2016, *MNRAS*, 459, L1
- Dipierro, G., Lodato, G., Testi, L., & de Gregorio Monsalvo, I. 2014, *MNRAS*, 444, 1919
- Dominik, C. & Tielens, A. G. G. M. 1997, *ApJ*, 480, 647
- Donehew, B. & Brittaine, S. 2011, *AJ*, 141, 46
- Dong, R., Fung, J., & Chiang, E. 2016, *ApJ*, 826, 75
- Dong, R., Liu, S.-y., Eisner, J., et al. 2018, *ApJ*, 860, 124
- Dong, R., Liu, S.-Y., & Fung, J. 2019, *ApJ*, 870, 72
- Dong, R., van der Marel, N., Hashimoto, J., et al. 2017, *ApJ*, 836, 201
- Dong, R., Zhu, Z., Rafikov, R. R., & Stone, J. M. 2015, *ApJ*, 809, L5
- Draine, B. T. 2003, *ARA&A*, 41, 241
- Draine, B. T. 2006, *ApJ*, 636, 1114
- Drazin, P. G. & Reid, W. H. 1981, NASA STI/Recon Technical Report A, 82, 17950
- Drażkowska, J., Bitsch, B., Lambrechts, M., et al. 2022, arXiv e-prints, arXiv:2203.09759
- Du, F., Bergin, E. A., Hogerheijde, M., et al. 2017, *ApJ*, 842, 98

- Dullemond, C. P., Küffmeier, M., Goicovic, F., et al. 2019, A&A, 628, A20
- Dutrey, A., di Folco, E., Guilloteau, S., et al. 2014a, Nature, 514, 600
- Dutrey, A., Semenov, D., Chapillon, E., et al. 2014b, in Protostars and Planets VI, ed. H. Beuther, R. S. Klessen, C. P. Dullemond, & T. Henning, 317
- Ercolano, B., Barlow, M. J., & Storey, P. J. 2005, MNRAS, 362, 1038
- Ercolano, B., Barlow, M. J., Storey, P. J., & Liu, X.-W. 2003, MNRAS, 340, 1136
- Ercolano, B. & Clarke, C. J. 2010, MNRAS, 402, 2735
- Ercolano, B., Clarke, C. J., & Drake, J. J. 2009, ApJ, 699, 1639
- Ercolano, B., Drake, J. J., Raymond, J. C., & Clarke, C. C. 2008a, ApJ, 688, 398
- Ercolano, B. & Pascucci, I. 2017, Royal Society Open Science, 4, 170114
- Ercolano, B., Weber, M. L., & Owen, J. E. 2018, MNRAS, 473, L64
- Ercolano, B., Young, P. R., Drake, J. J., & Raymond, J. C. 2008b, ApJS, 175, 534
- Espaillat, C., Calvet, N., D'Alessio, P., et al. 2007, ApJ, 670, L135
- Espaillat, C., Muzerolle, J., Najita, J., et al. 2014, in Protostars and Planets VI, ed. H. Beuther, R. S. Klessen, C. P. Dullemond, & T. Henning, 497
- Evans, Neal J., I. 1999, ARA&A, 37, 311
- Facchini, S., Birnstiel, T., Bruderer, S., & van Dishoeck, E. F. 2017, A&A, 605, A16
- Facchini, S., Juhász, A., & Lodato, G. 2018, MNRAS, 473, 4459
- Favre, C., Cleeves, L. I., Bergin, E. A., Qi, C., & Blake, G. A. 2013, ApJ, 776, L38
- Fedele, D., Toci, C., Maud, L., & Lodato, G. 2021, A&A, 651, A90
- Ferland, G. J. 1979, MNRAS, 188, 669
- Ferreira, J., Dougados, C., & Cabrit, S. 2006, A&A, 453, 785
- Flock, M., Nelson, R. P., Turner, N. J., et al. 2017, ApJ, 850, 131
- Flock, M., Ruge, J. P., Dzyurkevich, N., et al. 2015, A&A, 574, A68
- Follette, K. B., Rameau, J., Dong, R., et al. 2017, AJ, 153, 264
- Foreman-Mackey, D., Hogg, D. W., Lang, D., & Goodman, J. 2013, PASP, 125, 306
- Francis, L. & van der Marel, N. 2020, ApJ, 892, 111

- Fung, J. & Chiang, E. 2016, *ApJ*, 832, 105
- Gaia Collaboration, Brown, A. G. A., Vallenari, A., et al. 2018, *A&A*, 616, A1
- Garcia Lopez, R., Natta, A., Testi, L., & Habart, E. 2006, *A&A*, 459, 837
- Garg, H., Pinte, C., Christiaens, V., et al. 2021, *MNRAS*, 504, 782
- Garufi, A., Benisty, M., Pinilla, P., et al. 2018, *A&A*, 620, A94
- Garufi, A., Quanz, S. P., Schmid, H. M., et al. 2016, *A&A*, 588, A8
- Ginski, C., Benisty, M., van Holstein, R. G., et al. 2018, *A&A*, 616, A79
- Goldreich, P. & Tremaine, S. 1979, *ApJ*, 233, 857
- Goldreich, P. & Tremaine, S. 1980, *ApJ*, 241, 425
- Gorti, U., Dullemond, C. P., & Hollenbach, D. 2009, *ApJ*, 705, 1237
- Gorti, U. & Hollenbach, D. 2009, *ApJ*, 690, 1539
- Gorti, U., Hollenbach, D., & Dullemond, C. P. 2015, *ApJ*, 804, 29
- Gorti, U., Liseau, R., Sándor, Z., & Clarke, C. 2016, *Space Sci. Rev.*, 205, 125
- Grady, C. A., Polomski, E. F., Henning, T., et al. 2001, *AJ*, 122, 3396
- Gravity Collaboration, Abuter, R., Accardo, M., et al. 2017, *A&A*, 602, A94
- Greene, T. P., Wilking, B. A., Andre, P., Young, E. T., & Lada, C. J. 1994, *ApJ*, 434, 614
- Gundlach, B., Kilias, S., Beitz, E., & Blum, J. 2011, *ICARUS*, 214, 717
- Güttler, C., Blum, J., Zsom, A., Ormel, C. W., & Dullemond, C. P. 2010, *A&A*, 513, A56
- Haffert, S. Y., Bohn, A. J., de Boer, J., et al. 2019, *Nature Astronomy*, 3, 749
- Hall, C., Dong, R., Teague, R., et al. 2020, *ApJ*, 904, 148
- Harsono, D., Bjerkeli, P., van der Wiel, M. H. D., et al. 2018, *Nature Astronomy*, 2, 646
- Hartmann, L., Calvet, N., Gullbring, E., & D'Alessio, P. 1998, *ApJ*, 495, 385
- Helled, R., Bodenheimer, P., Podolak, M., et al. 2014, in *Protostars and Planets VI*, ed. H. Beuther, R. S. Klessen, C. P. Dullemond, & T. Henning, 643
- Hennebelle, P., Lesur, G., & Fromang, S. 2017, *A&A*, 599, A86
- Herbig, G. H. 1950, *ApJ*, 111, 11
- Hogerheijde, M. R., Bergin, E. A., Brinch, C., et al. 2011, *Science*, 334, 338

- Hollenbach, D. & Gorti, U. 2009, *ApJ*, 703, 1203
- Hollenbach, D. J., Yorke, H. W., & Johnstone, D. 2000, in *Protostars and Planets IV*, ed. V. Mannings, A. P. Boss, & S. S. Russell, 401–428
- Horne, K. & Marsh, T. R. 1986, *MNRAS*, 218, 761
- Huang, J., Andrews, S. M., Pérez, L. M., et al. 2018, *ApJ*, 869, L43
- Huang, J., Bergin, E. A., Öberg, K. I., et al. 2021, *ApJS*, 257, 19
- Izidoro, A. & Raymond, S. N. 2018, in *Handbook of Exoplanets*, ed. H. J. Deeg & J. A. Belmonte, 142
- Izquierdo, A. F., Facchini, S., Rosotti, G. P., van Dishoeck, E. F., & Testi, L. 2022, *ApJ*, 928, 2
- Izquierdo, A. F., Testi, L., Facchini, S., Rosotti, G. P., & van Dishoeck, E. F. 2021, *A&A*, 650, A179
- Johansen, A. & Lambrechts, M. 2017, *Annual Review of Earth and Planetary Sciences*, 45, 359
- Johnson, J. A., Aller, K. M., Howard, A. W., & Crepp, J. R. 2010, *PASP*, 122, 905
- Jorsater, S. & van Moorsel, G. A. 1995, *AJ*, 110, 2037
- Jovanovic, N., Martinache, F., Guyon, O., et al. 2015, *PASP*, 127, 890
- Juhász, A., Benisty, M., Pohl, A., et al. 2015, *MNRAS*, 451, 1147
- Juhász, A. & Rosotti, G. P. 2018, *MNRAS*, 474, L32
- Kama, M., Bruderer, S., van Dishoeck, E. F., et al. 2016, *A&A*, 592, A83
- Kanagawa, K. D., Tanaka, H., Muto, T., Tanigawa, T., & Takeuchi, T. 2015, *MNRAS*, 448, 994
- Kashyap, V. & Drake, J. J. 2000, *Bulletin of the Astronomical Society of India*, 28, 475
- Keppler, M., Benisty, M., Müller, A., et al. 2018, *A&A*, 617, A44
- Keppler, M., Penzlin, A., Benisty, M., et al. 2020, *A&A*, 639, A62
- Keppler, M., Teague, R., Bae, J., et al. 2019, *A&A*, 625, A118
- Klahr, H. & Bodenheimer, P. 2004, in *IAU Symposium*, Vol. 202, *Planetary Systems in the Universe*, ed. A. Penny, 350
- Kley, W., D'Angelo, G., & Henning, T. 2001, *ApJ*, 547, 457
- Kokubo, E. & Ida, S. 1996, *ICARUS*, 123, 180

- Kothe, S., Güttler, C., & Blum, J. 2010, ApJ, 725, 1242
- Kratter, K. & Lodato, G. 2016, ARA&A, 54, 271
- Kratter, K. M., Murray-Clay, R. A., & Youdin, A. N. 2010, ApJ, 710, 1375
- Kraus, S., Kreplin, A., Fukugawa, M., et al. 2017, ApJ, 848, L11
- Krijt, S. & Kama, M. 2014, A&A, 566, L2
- Krijt, S., Ormel, C. W., Dominik, C., & Tielens, A. G. G. M. 2015, A&A, 574, A83
- Kwon, W., Looney, L. W., Mundy, L. G., Chiang, H.-F., & Kemball, A. J. 2009, ApJ, 696, 841
- Lada, C. J. 1987, in Star Forming Regions, ed. M. Peimbert & J. Jugaku, Vol. 115, 1
- Lambrechts, M. & Johansen, A. 2012, A&A, 544, A32
- Langlois, M., Pohl, A., Lagrange, A. M., et al. 2018, A&A, 614, A88
- Law, C. J., Loomis, R. A., Teague, R., et al. 2021a, ApJS, 257, 3
- Law, C. J., Teague, R., Loomis, R. A., et al. 2021b, ApJS, 257, 4
- Leemker, M., Booth, A. S., van Dishoeck, E. F., et al. 2022, A&A, 663, A23
- Leinert, C., Haas, M., Mundt, R., Richichi, A., & Zinnecker, H. 1991, A&A, 250, 407
- Lesur, G., Hennebelle, P., & Fromang, S. 2015, A&A, 582, L9
- Li, H., Colgate, S. A., Wendroff, B., & Liska, R. 2001, ApJ, 551, 874
- Li, H., Finn, J. M., Lovelace, R. V. E., & Colgate, S. A. 2000, ApJ, 533, 1023
- Lin, D. N. C. & Papaloizou, J. 1979, MNRAS, 188, 191
- Lin, D. N. C. & Papaloizou, J. 1986, ApJ, 309, 846
- Lin, D. N. C. & Pringle, J. E. 1987, MNRAS, 225, 607
- Lodato, G., Dipierro, G., Ragusa, E., et al. 2019, MNRAS, 486, 453
- Long, F., Herczeg, G. J., Harsono, D., et al. 2019, ApJ, 882, 49
- Long, F., Herczeg, G. J., Pascucci, I., et al. 2017, ApJ, 844, 99
- Long, F., Pinilla, P., Herczeg, G. J., et al. 2018, ApJ, 869, 17
- Lovelace, R. V. E., Li, H., Colgate, S. A., & Nelson, A. F. 1999, ApJ, 513, 805
- Lubow, S. H. & Zhu, Z. 2014, ApJ, 785, 32

- Lynden-Bell, D. & Pringle, J. E. 1974, MNRAS, 168, 603
- Macintosh, B., Graham, J. R., Ingraham, P., et al. 2014, Proceedings of the National Academy of Science, 111, 12661
- Maggio, A., Flaccomio, E., Favata, F., et al. 2007, ApJ, 660, 1462
- Manara, C. F., Ansdell, M., Rosotti, G. P., et al. 2022, arXiv e-prints, arXiv:2203.09930
- Manara, C. F., Morbidelli, A., & Guillot, T. 2018, A&A, 618, L3
- Mannings, V. & Sargent, A. I. 1997, ApJ, 490, 792
- Marino, S., Perez, S., & Casassus, S. 2015, ApJ, 798, L44
- Maud, L. T., Cesaroni, R., Kumar, M. S. N., et al. 2019, A&A, 627, L6
- Mayama, S., Akiyama, E., Panić, O., et al. 2018, ApJ, 868, L3
- Mayor, M. & Queloz, D. 1995, Nature, 378, 355
- McMullin, J. P., Waters, B., Schiebel, D., Young, W., & Golap, K. 2007, in Astronomical Society of the Pacific Conference Series, Vol. 376, Astronomical Data Analysis Software and Systems XVI, ed. R. A. Shaw, F. Hill, & D. J. Bell, 127
- McNally, C. P., Nelson, R. P., Paardekooper, S.-J., Benítez-Llambay, P., & Gressel, O. 2020, MNRAS, 493, 4382
- Ménard, F., Cuello, N., Ginski, C., et al. 2020, A&A, 639, L1
- Mendigutía, I., Mora, A., Montesinos, B., et al. 2012, A&A, 543, A59
- Mignone, A., Bodo, G., Massaglia, S., et al. 2007, ApJS, 170, 228
- Miley, J. M., Panić, O., Haworth, T. J., et al. 2019, MNRAS, 485, 739
- Miotello, A., Kamp, I., Birnstiel, T., Cleeves, L. I., & Kataoka, A. 2022, arXiv e-prints, arXiv:2203.09818
- Miotello, A., Testi, L., Lodato, G., et al. 2014, A&A, 567, A32
- Miotello, A., van Dishoeck, E. F., Williams, J. P., et al. 2017, A&A, 599, A113
- Morbidelli, A., Szulágyi, J., Cruda, A., et al. 2014, ICARUS, 232, 266
- Muley, D., Dong, R., & Fung, J. 2021, AJ, 162, 129
- Muro-Arena, G. A., Ginski, C., Dominik, C., et al. 2020, A&A, 636, L4
- Nakatani, R., Hosokawa, T., Yoshida, N., Nomura, H., & Kuiper, R. 2018a, ApJ, 857, 57

- Nakatani, R., Hosokawa, T., Yoshida, N., Nomura, H., & Kuiper, R. 2018b, ApJ, 865, 75
- Natta, A., Grinin, V., & Mannings, V. 2000, in Protostars and Planets IV, ed. V. Mannings, A. P. Boss, & S. S. Russell, 559–588
- Nealon, R., Dipierro, G., Alexander, R., Martin, R. G., & Nixon, C. 2018, MNRAS, 481, 20
- Nelson, R. P., Gressel, O., & Umurhan, O. M. 2013, MNRAS, 435, 2610
- Ney, E. P., Strecker, D. W., & Gehrz, R. D. 1973, ApJ, 180, 809
- Nielsen, E. L., De Rosa, R. J., Macintosh, B., et al. 2019, AJ, 158, 13
- Norfolk, B. J., Pinte, C., Calcino, J., et al. 2022, ApJ, 936, L4
- Öberg, K. I., Guzmán, V. V., Walsh, C., et al. 2021, ApJS, 257, 1
- O’dell, C. R. & Wen, Z. 1994, ApJ, 436, 194
- O’dell, C. R. & Wong, K. 1996, AJ, 111, 846
- Ogilvie, G. I. & Lubow, S. H. 2002, MNRAS, 330, 950
- Ormel, C. W. & Klahr, H. H. 2010, A&A, 520, A43
- Owen, J. E., Clarke, C. J., & Ercolano, B. 2012, MNRAS, 422, 1880
- Owen, J. E., Ercolano, B., & Clarke, C. J. 2011, MNRAS, 412, 13
- Owen, J. E., Ercolano, B., Clarke, C. J., & Alexander, R. D. 2010, MNRAS, 401, 1415
- Paneque-Carreño, T., Miotello, A., van Dishoeck, E. F., et al. 2022, A&A, 666, A168
- Paneque-Carreño, T., Miotello, A., van Dishoeck, E. F., et al. 2023, A&A, 669, A126
- Paneque-Carreño, T., Pérez, L. M., Benisty, M., et al. 2021, ApJ, 914, 88
- Panić, O., van Dishoeck, E. F., Hogerheijde, M. R., et al. 2010, A&A, 519, A110
- Papaloizou, J. & Lin, D. N. C. 1984, ApJ, 285, 818
- Pascucci, I., Cabrit, S., Edwards, S., et al. 2022, arXiv e-prints, arXiv:2203.10068
- Pascucci, I., Testi, L., Herczeg, G. J., et al. 2016, ApJ, 831, 125
- Paszun, D. & Dominik, C. 2009, A&A, 507, 1023
- Pérez, L. M., Carpenter, J. M., Andrews, S. M., et al. 2016, Science, 353, 1519
- Pérez, S., Casassus, S., & Benítez-Llambay, P. 2018, MNRAS, 480, L12

- Pérez, S., Casassus, S., Hales, A., et al. 2020, ApJ, 889, L24
- Perez, S., Casassus, S., Ménard, F., et al. 2015a, ApJ, 798, 85
- Perez, S., Dunhill, A., Casassus, S., et al. 2015b, ApJ, 811, L5
- Perraut, K. & Gravity Collaboration. 2021, in The 20.5th Cambridge Workshop on Cool Stars, Stellar Systems, and the Sun (CS20.5), Cambridge Workshop on Cool Stars, Stellar Systems, and the Sun, 334
- Phuong, N. T., Dutrey, A., Di Folco, E., et al. 2020a, A&A, 635, L9
- Phuong, N. T., Dutrey, A., Diep, P. N., et al. 2020b, A&A, 635, A12
- Picogna, G., Ercolano, B., Owen, J. E., & Weber, M. L. 2019, MNRAS, 487, 691
- Pineda, J. E., Szulágyi, J., Quanz, S. P., et al. 2019, ApJ, 871, 48
- Pinilla, P., Benisty, M., & Birnstiel, T. 2012a, A&A, 545, A81
- Pinilla, P., Birnstiel, T., Ricci, L., et al. 2012b, A&A, 538, A114
- Pinilla, P., Birnstiel, T., & Walsh, C. 2015, A&A, 580, A105
- Pinilla, P., Tazzari, M., Pascucci, I., et al. 2018, ApJ, 859, 32
- Pinilla, P. & Youdin, A. 2017, in Astrophysics and Space Science Library, Vol. 445, Formation, Evolution, and Dynamics of Young Solar Systems, ed. M. Pessah & O. Gressel, 91
- Pinte, C., Ménard, F., Duchêne, G., et al. 2018a, A&A, 609, A47
- Pinte, C., Price, D. J., Ménard, F., et al. 2020, ApJ, 890, L9
- Pinte, C., Price, D. J., Ménard, F., et al. 2018b, ApJ, 860, L13
- Pinte, C., Teague, R., Flaherty, K., et al. 2022, arXiv e-prints, arXiv:2203.09528
- Pinte, C., van der Plas, G., Ménard, F., et al. 2019, Nature Astronomy, 3, 1109
- Pohl, A., Benisty, M., Pinilla, P., et al. 2017, ApJ, 850, 52
- Pollack, J. B., Hubickyj, O., Bodenheimer, P., et al. 1996, ICARUS, 124, 62
- Preibisch, T. & Feigelson, E. D. 2005, ApJS, 160, 390
- Preibisch, T., Mehlhorn, M., Townsley, L., Broos, P., & Ratzka, T. 2014, A&A, 564, A120
- Pringle, J. E. 1981, ARA&A, 19, 137
- Pyerin, M. A., Delage, T. N., Kurtovic, N. T., et al. 2021, A&A, 656, A150
- Quanz, S. P., Amara, A., Meyer, M. R., et al. 2015, ApJ, 807, 64

- Quanz, S. P., Amara, A., Meyer, M. R., et al. 2013, *ApJ*, 766, L1
- Rab, C., Kamp, I., Dominik, C., et al. 2020, *A&A*, 642, A165
- Rab, C., Kamp, I., Ginski, C., et al. 2019, *A&A*, 624, A16
- Rafikov, R. R. 2002, *ApJ*, 569, 997
- Raymond, S. N., Izidoro, A., & Morbidelli, A. 2020, in *Planetary Astrobiology*, ed. V. S. Meadows, G. N. Arney, B. E. Schmidt, & D. J. Des Marais, 287
- Rice, W. K. M., Armitage, P. J., Bate, M. R., & Bonnell, I. A. 2003, *MNRAS*, 338, 227
- Richard, D. & Zahn, J.-P. 1999, *A&A*, 347, 734
- Riols, A. & Lesur, G. 2019, *A&A*, 625, A108
- Rosenfeld, K. A., Andrews, S. M., Hughes, A. M., Wilner, D. J., & Qi, C. 2013, *ApJ*, 774, 16
- Rosenfeld, K. A., Andrews, S. M., Wilner, D. J., & Stempels, H. C. 2012, *ApJ*, 759, 119
- Rosotti, G. P., Benisty, M., Juhász, A., et al. 2020a, *MNRAS*, 491, 1335
- Rosotti, G. P., Ilee, J. D., Facchini, S., et al. 2021, *MNRAS*, 501, 3427
- Rosotti, G. P., Teague, R., Dullemond, C., Booth, R. A., & Clarke, C. J. 2020b, *MNRAS*, 495, 173
- Ruden, S. P. 1993, in *Astronomical Society of the Pacific Conference Series*, Vol. 36, *Planets Around Pulsars*, ed. J. A. Phillips, S. E. Thorsett, & S. R. Kulkarni, 197–215
- Sakai, N., Hanawa, T., Zhang, Y., et al. 2019, *Nature*, 565, 206
- Salz, M., Banerjee, R., Mignone, A., et al. 2015, *A&A*, 576, A21
- Sanchis, E., Picogna, G., Ercolano, B., Testi, L., & Rosotti, G. 2020, *MNRAS*, 492, 3440
- Sano, T. & Stone, J. M. 2002, *ApJ*, 570, 314
- Savage, B. D. & Sembach, K. R. 1996, *ApJ*, 470, 893
- Shakura, N. I. & Sunyaev, R. A. 1973, *A&A*, 24, 337
- Shu, F. H., Adams, F. C., & Lizano, S. 1987, *ARA&A*, 25, 23
- Sissa, E., Gratton, R., Garufi, A., et al. 2018, *A&A*, 619, A160
- Skrutskie, M. F., Dutkiewicz, D., Strom, S. E., et al. 1990, *AJ*, 99, 1187

- Stadler, J., Benisty, M., Izquierdo, A., et al. 2023, *A&A*, 670, L1
- Stempels, H. C. & Gahm, G. F. 2004, *A&A*, 421, 1159
- Stolker, T., Dominik, C., Avenhaus, H., et al. 2016, *A&A*, 595, A113
- Stoll, M. H. R. & Kley, W. 2014, *A&A*, 572, A77
- Strom, K. M., Strom, S. E., Edwards, S., Cabrit, S., & Skrutskie, M. F. 1989, *AJ*, 97, 1451
- Sturm, J. A., Rosotti, G. P., & Dominik, C. 2020, *A&A*, 643, A92
- Szulágyi, J., Morbidelli, A., Crida, A., & Masset, F. 2014, *ApJ*, 782, 65
- Tabone, B., Rosotti, G. P., Cridland, A. J., Armitage, P. J., & Lodato, G. 2022a, *MNRAS*, 512, 2290
- Tabone, B., Rosotti, G. P., Lodato, G., et al. 2022b, *MNRAS*, 512, L74
- Takami, M., Karr, J. L., Hashimoto, J., et al. 2013, *ApJ*, 772, 145
- Tanaka, H. & Ida, S. 1999, *ICARUS*, 139, 350
- Tanigawa, T., Ohtsuki, K., & Machida, M. N. 2012, *ApJ*, 747, 47
- Tarter, C. B., Tucker, W. H., & Salpeter, E. E. 1969, *ApJ*, 156, 943
- Teague, R. 2019, *Journal of Open Source Software*, 4, 1220
- Teague, R. 2019, *The Journal of Open Source Software*, 4, 1632
- Teague, R., Bae, J., Aikawa, Y., et al. 2021, *ApJS*, 257, 18
- Teague, R., Bae, J., Andrews, S. M., et al. 2022a, *ApJ*, 936, 163
- Teague, R., Bae, J., Benisty, M., et al. 2022b, *ApJ*, 930, 144
- Teague, R., Bae, J., & Bergin, E. A. 2019a, *Nature*, 574, 378
- Teague, R., Bae, J., Bergin, E. A., Birnstiel, T., & Foreman-Mackey, D. 2018a, *ApJ*, 860, L12
- Teague, R., Bae, J., Birnstiel, T., & Bergin, E. A. 2018b, *ApJ*, 868, 113
- Teague, R., Bae, J., Huang, J., & Bergin, E. A. 2019b, *ApJ*, 884, L56
- Teague, R. & Foreman-Mackey, D. 2018, *Research Notes of the American Astronomical Society*, 2, 173
- Teague, R., Guilloteau, S., Semenov, D., et al. 2016, *A&A*, 592, A49
- Teague, R., Henning, T., Guilloteau, S., et al. 2018c, *ApJ*, 864, 133
- Terebey, S., Shu, F. H., & Cassen, P. 1984, *ApJ*, 286, 529

- Testi, L., Natta, A., Shepherd, D. S., & Wilner, D. J. 2001, *ApJ*, 554, 1087
- Testi, L., Natta, A., Shepherd, D. S., & Wilner, D. J. 2003, *A&A*, 403, 323
- Thalmann, C., Janson, M., Garufi, A., et al. 2016, *ApJ*, 828, L17
- Thies, I., Kroupa, P., Goodwin, S. P., Stamatellos, D., & Whitworth, A. P. 2011, *MNRAS*, 417, 1817
- Thommes, E. W., Duncan, M. J., & Levison, H. F. 2003, *ICARUS*, 161, 431
- Trapman, L., Facchini, S., Hogerheijde, M. R., van Dishoeck, E. F., & Bruderer, S. 2019, *A&A*, 629, A79
- Tripathi, A., Andrews, S. M., Birnstiel, T., & Wilner, D. J. 2017, *ApJ*, 845, 44
- Trotta, F., Testi, L., Natta, A., Isella, A., & Ricci, L. 2013, *A&A*, 558, A64
- Tsukagoshi, T., Momose, M., Hashimoto, J., et al. 2014, *ApJ*, 783, 90
- Tsukagoshi, T., Momose, M., Kitamura, Y., et al. 2019, *ApJ*, 871, 5
- Turner, N. J., Carballido, A., & Sano, T. 2010, *ApJ*, 708, 188
- Tychoniec, Ł., Tobin, J. J., Karska, A., et al. 2018, *ApJS*, 238, 19
- Ubeira Gabellini, M. G., Miotello, A., Facchini, S., et al. 2019, *MNRAS*, 486, 4638
- Uribe, A., Matsakos, T., & Konigl, A. 2015, in Cambridge Workshop on Cool Stars, Stellar Systems, and the Sun, Vol. 18, 18th Cambridge Workshop on Cool Stars, Stellar Systems, and the Sun, 739–742
- Uyama, T., Muto, T., Mawet, D., et al. 2020, *AJ*, 159, 118
- van der Marel, N., Birnstiel, T., Garufi, A., et al. 2021, *AJ*, 161, 33
- van der Marel, N. & Mulders, G. D. 2021, *AJ*, 162, 28
- van der Marel, N., van Dishoeck, E. F., Bruderer, S., et al. 2016, *A&A*, 585, A58
- van der Marel, N., van Dishoeck, E. F., Bruderer, S., et al. 2013, *Science*, 340, 1199
- Villenave, M., Benisty, M., Dent, W. R. F., et al. 2019, *A&A*, 624, A7
- Wada, K., Tanaka, H., Suyama, T., Kimura, H., & Yamamoto, T. 2008, *ApJ*, 677, 1296
- Wagner, K., Apai, D., Kasper, M., & Robberto, M. 2015, *ApJ*, 813, L2
- Wagner, K., Follette, K. B., Close, L. M., et al. 2018, *ApJ*, 863, L8
- Walsh, C., Daley, C., Facchini, S., & Juhász, A. 2017, *A&A*, 607, A114
- Walsh, C., Juhász, A., Pinilla, P., et al. 2014, *ApJ*, 791, L6

- Wang, L. & Goodman, J. 2017, ApJ, 847, 11
- Ward-Duong, K., Patience, J., Bulger, J., et al. 2018, AJ, 155, 54
- Weaver, E., Isella, A., & Boehler, Y. 2018, ApJ, 853, 113
- Weidenschilling, S. J. 1977, MNRAS, 180, 57
- Weidling, R., Güttler, C., & Blum, J. 2012, ICARUS, 218, 688
- Whipple, F. L. 1972, in From Plasma to Planet, ed. A. Elvius, 211
- Williams, J. P., Cieza, L., Hales, A., et al. 2019, ApJ, 875, L9
- Wölfer, L., Facchini, S., Kurtovic, N. T., et al. 2021, A&A, 648, A19
- Wölfer, L., Facchini, S., van der Marel, N., et al. 2023, A&A, 670, A154
- Wolszczan, A. & Frail, D. A. 1992, Nature, 355, 145
- Yen, H.-W. & Gu, P.-G. 2020, ApJ, 905, 89
- Yorke, H. W., Bodenheimer, P., & Laughlin, G. 1993, ApJ, 411, 274
- Yu, H., Teague, R., Bae, J., & Öberg, K. 2021, ApJ, 920, L33
- Zhang, S., Zhu, Z., Huang, J., et al. 2018, ApJ, 869, L47
- Zhu, Z. & Stone, J. M. 2018, ApJ, 857, 34
- Zhu, Z., Stone, J. M., & Bai, X.-N. 2015, ApJ, 801, 81
- Zhu, Z., Stone, J. M., & Rafikov, R. R. 2012, ApJ, 758, L42

