

THOMAS M. DAME

Curriculum Vitae

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CURRENT POSITIONS

Senior Radio Astronomer, Smithsonian Astrophysical Observatory  
Lecturer on Astronomy, Harvard University

EDUCATION

B.A. (Magna cum Laude), Astronomy and Physics, Boston University, 1976  
M.A., Astronomy, Columbia University, 1978  
M. Phil., Columbia University, 1979  
Ph.D., Astronomy, Columbia University, 1983  
Dissertation: Molecular Clouds and Galactic Spiral Structure (Advisor: P. Thaddeus)

PREVIOUS POSITIONS

1988 Teaching Fellow, Core Program, Harvard University  
1985–86 Research Associate, Columbia Univ., Dept. of Astronomy  
1983–84 National Research Council Resident Research Associate at the NASA  
Goddard Institute for Space Studies, 2880 Broadway, N.Y., N.Y. 10025  
1976–80 Teaching Assistant, Columbia College

HONORS AND AWARDS

Secretary's Research Prize, Smithsonian Institution, 2009  
Special Achievement Awards, Smithsonian Institution, 1989, 1997, 1999, 2007, 2009, 2010  
Postdoctoral Associateship, National Academy of Sciences (N.R.C.), 1983–84  
Columbia University Graduate Fellowship, 1976–78  
College Prize for Excellence in Astronomy, Boston University, 1976

PROFESSIONAL MEMBERSHIP

International Astronomical Union  
American Astronomical Society

PUBLICATIONS

1. "Molecular Clouds and Galactic Spiral Structure," R. S. Cohen, H. I. Cong, T. M. Dame, and P. Thaddeus, 1980. *Astrophysical Journal*, 239, L53.
2. "Columbia CO Survey: Molecular Clouds and Spiral Structure," R. S. Cohen, T. M. Dame, and P. Thaddeus, 1980, in *Interstellar Molecules*, ed. B. H. Andrew (IAU Symp. No. 87) (Dordrecht: Reidel), 205.
3. "The Interrelation of Cosmic  $\gamma$ -Rays and Interstellar Gas in the Range  $l = 65^\circ$ – $180^\circ$ ," K. Arnaud, K., Li Ti Pei, P. A. Riley, A. W. Wolfendale, T. M. Dame, J. E. Brock, and P. Thaddeus, 1982, *Monthly Notices of the Royal Astronomical Society*, 201, 745.
4. "A Large Molecular Cloud Toward the SNR W50 and SS 433," Y.-L. Huang, T. M. Dame, and P. Thaddeus, 1983, *Astrophysical Journal*, 272, 609.
5. "Molecular Clouds and Galactic Spiral Structure," T. M. Dame, 1983, Ph.D. thesis Columbia Univ., pub. as NASA Technical Paper 2288.
6. "Gamma-Rays From Atomic and Molecular Gas in the First Galactic Quadrant," F. Lebrun, K. Bennett, G. F. Bignami, J. B. G. M. Bloemen, R. Buccheri, P. A. Caraveo, M. Gottwald, W. Hermsen, G. Kanbach, H. A. Mayer-Hasselwander, T. Montmerle, J. A. Paul, B. Sacco, A. W. Strong, R. D. Wills, T. M. Dame, R. S. Cohen, and P. Thaddeus, 1983, *Astrophysical Journal*, 274, 231.
7. "A Wide-Latitude CO Survey of Molecular Clouds in the Northern Milky Way," T. M. Dame, and P. Thaddeus, 1984, *The Local Interstellar Medium* (in IAU Colloquium No. 81), NASA Conference Publication 2345, 235.
8. "The Number and Distribution of Molecular Clouds in the Inner Galaxy," P. Thaddeus and T. M. Dame, 1984, *Workshop on Star Formation*, in *Occasional Reports of the Royal Observatory, Edinburgh*, ed. R. Wolstencroft, 13, 15.
9. "The Largest Molecular Complexes in the First Galactic Quadrant," T. M. Dame, B. G. Elmegreen, R. S. Cohen, and P. Thaddeus 1985, in *The Milky Way Galaxy*, ed. H. van Woerden, R. J. Allen, and W. B. Burton (IAU Symp. No. 106, 1983) (Dordrecht: Reidel), 303.
10. "Molecular Clouds and Star Formation in the Inner Galaxy: An Intercomparison of CO, H II, and Far-Infrared Surveys," P. C. Myers, T. M. Dame, P. Thaddeus, R. S. Cohen, R. F. Silverberg, E. Dwek, and M. G. Hauser, 1985, *Astrophysical Journal*, 301, 398.
11. "A Wide-Latitude CO Survey of Molecular Clouds in the Northern Milky Way," Dame, T. M. and P. Thaddeus, 1985, *Astrophysical Journal*, 297, 751.
12. "Constraints on the Galactic Distribution of Cosmic Rays from the COS-B Gamma-Ray Data," J. B. G. M. Bloemen, A. W. Strong, L. Blitz, R. S. Cohen, T. M. Dame, D. A. Grabelsky, W. Hermsen, F. Lebrun, H. A. Mayer-Hasselwander, and P. Thaddeus, 1985, in *Proc. of 19th International Cosmic Ray Conference*, (La Jolla, Calif., 11–23 Aug. 1985), 1, 329.
13. "The Radial Distribution of Galactic Gamma Rays III. The Distribution of Cosmic Rays in the Galaxy and the CO–H<sub>2</sub> Calibration," J. B. G. M. Bloemen, A. W. Strong, L. Blitz, R. S. Cohen,

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14. "The Columbia CO Survey of Molecular Clouds in the First Galactic Quadrant," R. S. Cohen, T. M. Dame, and P. Thaddeus, 1986, *Astrophysical Journal Supplement*, 60, 695.
  15. "The Largest Molecular Cloud Complexes in the First Galactic Quadrant," T. M. Dame, B. G. Elmegreen, R. S. Cohen, and P. Thaddeus, 1986, *Astrophysical Journal*, 305, 892.
  16. "Gamma-Ray/Gas Correlations over the Whole Galaxy," A. W. Strong, J. B. G.M. Bloemen, T. M. Dame, I. A. Grenier, W. Hermsen, F. Lebrun, L.-Å. Nyman, A. M. T. Pollock, and P. Thaddeus, 1987, in *Proc. 20th International Cosmic Ray Conference, Moscow*, eds. V. A. Kozyarivsky et al. (Moscow: NAUKA), 1, 125.
  17. "On the Deficiency of Diffuse, High-Energy Gamma Rays Toward the Region of the Galactic Center," J. G. Stacy, T. M. Dame, and P. Thaddeus, 1987, in *Proc. 20th International Cosmic Ray Conference, Moscow*, eds. V. A. Kozyarivsky et al. (Moscow: NAUKA), 1, 117.
  18. "A Composite CO Survey of the Entire Milky Way," T. M. Dame, H. Ungerechts, R. S. Cohen, E. J. de Geus, I. A. Grenier, J. May, D. C. Murphy, L.-Å. Nyman, and P. Thaddeus, 1987, *Astrophysical Journal*, 322, 706.
  19. "A Composite CO Survey of the Entire Milky Way," T. M. Dame, 1988, in *Molecular Clouds in the Milky Way and External Galaxies*, eds. R. Dickman, R. L. Snell, and J. S. Young (Lecture Notes in Physics 315) (New York: Springer-Verlag, 1988), 309.
  20. "A  $^{12}\text{CO}$  Survey of the Large Magellanic Cloud," M. Rubio, G. Garay, T. M. Dame, and P. Thaddeus 1988, in *Molecular Clouds in the Milky Way and External Galaxies*, eds. R. Dickman, R. L. Snell, and J. S. Young (Lecture Notes in Physics 315) (New York: Springer-Verlag), p. 423.
  21. "The Molecular Milky Way," T. M. Dame, 1988, *Sky and Telescope* (July), 76, 22.
  22. "A Complete CO Survey of the Large Magellanic Clouds," T. M. Dame, 1988, in *Physics and Chemistry of Interstellar Molecular Clouds*, eds. G. Winnewisser and J. T. Armstrong (Lecture Notes in Physics 331)(New York: Springer-Verlag), p. 245.
  23. "The Radial Distribution of Galactic Gamma Rays IV. The Whole Galaxy," A. W. Strong, J. B. G. M. Bloemen, T. M. Dame, I. A. Grenier, W. Hermsen, F. Lebrun, L.-Å. Nyman, A. Pollock, and P. Thaddeus, 1988, *Astronomy and Astrophysics*, 207, 1.
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  25. "Wide-Line Molecular Clouds and the Gamma-Ray Deficit Toward the Galactic Center," J. G. Stacy, M. E. Bitran, T. M. Dame, and P. Thaddeus, *The Galactic Center (IAU Symposium 136, 1988)*, ed. M. Morris (Dordrecht: Reidel), 157.
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  38. "Diffuse Gamma Ray Emission in the Galactic Plane from Cosmic Ray, Matter, and Photon Interactions", D. L. Bertsch, T. M. Dame, C. E. Fichtel, S. D. Hunter, P. Sreekumar, J. G. Stacy, and P. Thaddeus, 1993, *Astrophysical Journal*, 416, 587.

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40. "The Distribution of Neutral Gas in the Milky Way", T. M. Dame, 1993, *Back to the Galaxy*, ed. S. Holt and F. Verter, (AIP Conf. Proc. 278) (New York: AIP), p. 267.
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46. "A Rosat-Detected, New Galactic Supernova Remnant in Sagittarius, G13.3-1.3," F. D. Seward, T. M. Dame, R. A. Fesen, and B. Aschenbach 1995, *Astrophysical Journal*, 449, 681.
47. "Molecular Spiral Arms in M31," L. Loinard, T. M. Dame, E. Koper, J. Lequeux, P. Thaddeus, and J. S. Young 1996, *Astrophysical Journal*, 469, L101.
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51. "EGRET Observations of the Diffuse Gamma Ray Emission from the Galactic Plane," S. D. Hunter, D. L. Bertsch, J. R. Catelli, T. M. Dame, S. W. Digel, B. L. Dingus, J. A. Esposito, C. E. Fichtel, R. C. Hartman, G. Kanbach, D. A. Kniffen, Y. C. Lin, H. A. Mayer-Hasselwander, P. F.

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52. "Molecular Gas in the Galactic Center Region. I. Data from a Large Scale C<sup>18</sup>O (J=1-0) Survey," G. Dahmen, S. Hüttemeister, T. L. Wilson, R. Mauersberger, A. Linhart, L. Bronfman, A. R. Tieftrunk, K. Meyer, W. Wiedenhöver, T. M. Dame, E. S. Palmer, J. May, J. Aparici, and F. Mac-Auliffe 1997, *Astronomy and Astrophysics Suppl.*, 125, 1.
53. "Evidence for an X-Ray Emitting Galactic Bulge: Shadows Cast by Distant Molecular Clouds," S. Park, J. P. Finley, S. L. Snowden, and T. M. Dame 1997, *Astrophysical Journal*, 476, L77.
54. "A Sensitive Search for Molecular Gas in High Velocity Clouds," B. Wakker, E. M. Murphy, H. van Woerden, and T. M. Dame 1997, *Astrophysical Journal*, 488, 216.
55. "Diffuse High-Energy Gamma-Ray Emission in Monoceros," S. W. Digel, I. A. Grenier, S. D. Hunter, T. M. Dame, and P. Thaddeus 1997, in *Proc. 4th Compton Symposium*, ed. C. D. Dermer, M. S. Strickman, and J. D. Kurfess, (New York: AIP), p. 1188.
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57. "Enhanced CO J=2-1/J=1-0 Ratio as a Marker of Supernova Remnant-Molecular Cloud Interactions: The Cases of W 44 and IC 443," M. Seta, T. Hasegawa, T. M. Dame, S. Sakamoto, T. Oka, T. Handa, M. Hayashi, J.-I. Morino, K. Sorai, and K. Usuda 1998, *Astrophysical Journal*, 505, 286.
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62. "Large-Scale Molecular Surveys of the Galaxy and M31," T. M. Dame 1999, 3rd Cologne-Zermatt Symposium, *The Physics and Chemistry of the Interstellar Medium*, eds. V. Ossenkopf, J. Stutzki, G. Winnewisser, (Herdecke: GCA-Verlag), p. 100.
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66. "The Milky Way in Molecular Clouds: A Complete CO Survey," Dame, T. M., Hartmann, D., and Thaddeus, P. 2001, *Astrophysical Journal*, 547, 792.
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ABSTRACTS

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- "Chandra Observations of Dust Grains", Smith, Randall K., Graessle, Dale, and Dame, T. M. 2005, Six Years of Science with Chandra Symposium, Cambridge, Massachusetts (2-4 Nov. 2005).
- "The X-Ray Dust Halo toward Terzan 2", Valencic, L. A., Smith, R. K., Dwek, E., Grassle, D., and Dame, T. M. 2008, AAS HEAD meeting #10, #29.12.
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- "A New Molecular Arm in the Far Outer Galaxy," Dame, T. M. and Thaddeus, P. 2011, AAS Meeting 218, #217.03.
- "GALFA HI: Candidate Sites for H<sub>2</sub> Formation in Cold HI Emission and Other Tracers," Newton, J., Gobson, S. J., Douglas, K. A., Koo, B., Kang, J., Park, G., Peek, J. E. G., Korpela, E. J., Heiles, C., and Dame, T. M. 2012, AAS Meeting #219, #349.24.
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“Measuring the CMB temperature in the classroom with a low-cost antenna and radiometer,” Karkare, K. et al. 2014, AAS Meeting #224, #415.02.

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INVITED TALKS

- "A Composite CO Survey of the Entire Milky Way," 1988, Molecular Clouds in the Milky Way and External Galaxies, University of Massachusetts, Amherst (2–4 Nov. 1987).
- "A Complete CO Survey of the Large Magellanic Clouds," 1988, Physics and Chemistry of Interstellar Molecular Clouds, Conference to Commemorate the 600th Anniversary of University of Cologne and 20th Anniversary of Gornergrat Observatory, Zermatt, Switzerland (22–25 Sept. 1988).
- "Molecular Clouds as Tracers of Galactic Spiral Structure," 1990, Third Haystack Conference on Atoms, Ions, and Molecules, Westford, Massachusetts (23–25 May, 1990).
- "CO as a Tracer of H<sub>2</sub> in Giant Molecular Clouds", 1991, 21st General Assembly of the International Astronomical Union, Buenos Aires, Argentina (23 July – 1 Aug, 1991).
- "Distribution and Kinematics of the Interstellar Gas", 1992, Third Annual October Astrophysics Conference in Maryland, "Back to the Galaxy", University of Maryland (12-14 Oct, 1992).
- "Detection of a Thick Molecular Disk of the Galaxy", 1993, workshop on "The ISM in Galactic Halos: Current Views", Space Telescope Science Institute, Baltimore, Maryland (11-13 Aug, 1993).
- "The CO-to-H<sub>2</sub> Conversion Factor" 1995, (Expert Panelist), I.A.U. Symp. 170, "CO: Twenty-five Years of Millimeter-Wave Spectroscopy" (29 May-2 June, 1995).
- "Large-Scale Molecular Surveys of the Galaxy and M31", 1998, 3rd Cologne-Zermatt Symposium on The Physics and Chemistry of the Interstellar Medium, Zermatt, Switzerland (22-25 Sept, 1998).
- "Molecular Gas in the Milky Way", 2000, Galaxy Disks and Disk Galaxies, meeting sponsored by the Vatican Observatory, Pontifical Gregorian University, Rome, Italy (12-16 June 2000).
- "A Large Extension of the CfA Galactic CO Survey", 2003, Milky Way Surveys: The Structure and Evolution of Our Galaxy. The 5<sup>th</sup> Boston University Astrophysics Conference, Boston, Massachusetts (15-17 June 2003)
- "A Large Extension of the CfA Galactic CO Survey", 2004, The Molecular Universe conference, State University of New York at Stony Brook (7-8 June 2004).
- "Galactic Spiral Structure in CO", 2008, 212th AAS Meeting, Topical Meeting on "Spiral Structure of the Galaxy", St. Louis, MO (1-5 June 2008).
- "Tracing Galactic Spiral Arms in CO and HI", 2010, ESO Workshop on Spiral Structure in the Milky Way: Confronting Observations and Theory", Bahia Inglesa, Chile (7-11 November 2010).
- "The Galactic Distribution of Molecular Gas," 2011, Workshop on "The Interstellar Medium in Three Dimensions with Gaia", Leiden, Netherlands (11-14 July 2011).
- "Current Perspectives on the Spiral Structure of the Milky Way," Plenary Talk at the 222<sup>nd</sup> Meeting of the AAS, #400.01 (2-6 June 2013).