

Curriculum Vitae: Bruce T. Draine

- Address:** 108 Peyton Hall, Princeton University, Princeton, NJ 08544-1001
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- Born:** Calcutta, India; 1947 November 19
- Citizenship:** U.S.A.
- Degrees:** B.A., physics (high honors), Swarthmore College (1969)
M.Sc., experimental physics, Cornell University (1975)
Ph.D., theoretical physics, Cornell University (1978)
- Positions:** U.S. Peace Corps Volunteer, Nkwatia-Kwahu, Ghana (1969-71)
graduate student, Physics Dept., Cornell University (1971-77)
Center Fellow, Center for Astrophysics, Harvard Univ. (1977-79)
Member, Institute for Advanced Study (1979-80)
Long-term Member, Institute for Advanced Study (1980-82)
Assistant Professor, Dept. of Astrophysical Sciences, Princeton Univ. (1981-84).
Associate Professor, Dept. of Astrophysical Sciences, Princeton Univ. (1984-90).
Professor, Dept. of Astrophysical Sciences, Princeton Univ. (1990-)
Chair, Dept. of Astrophysical Sciences (1996-98)
Director, Princeton University Observatory (1996-98)
sabbatical leave, Arcetri Observatory, Florence (fall 1998)
W.M. Keck Distinguished Visiting Prof., Inst. for Advanced Study (fall 2004)
sabbatical leave, Arcetri Observatory, Florence (fall 2005)
Oort Professorship, Leiden University, Leiden (spring 2009)
sabbatical leave, Arcetri Observatory, Florence (fall 2012)
sabbatical leave, Arcetri Observatory, Florence,
and Institute for Advanced Study, Princeton (fall 2023, spring 2024)
- Awards:** Alfred P. Sloan Research Fellowship (1982-86)
Dannie Heineman Prize for Astrophysics (2004)
Elected to U.S. National Academy of Sciences (2007)
Oort Lecturer, Leiden University (April 2009)
Rossi Lectures, Arcetri Observatory (November 2012)
Cecilia Payne-Gaposchkin Lecturer, Harvard University (April 2014)
Thomas Gold Lecturer, Cornell University (April 2019)
Fellow of the American Astronomical Society (2020)
- Professional Associations:**
American Astronomical Society
International Astronomical Union
- Publications:** 2 books, 400+ articles; 48000+ citations (as per Astrophysical Data System)
- National and International Teams and Committees (2015-):**
co-I, Key Insights on Nearby Galaxies: A Far-Infrared Survey with Herschel
(KINGFISH), Herschel Space Observatory Key Program, 2008-2017
Annual Review of Astronomy & Astrophysics Editorial Committee, 2015-2019
Breakthrough Starshot Advisory Committee, 2016-
Astro 2020 Survey: Interstellar Medium, Star, and Planet Formation Panel, 2019-2020

Field of Research: Theoretical Astrophysics

Heating, Cooling, and Chemistry of Interstellar Gas

Interstellar Gas Dynamics; Shock Waves

Radiative Transfer

Optics of Small Particles

Methods for Computing Light Scattering from Arbitrarily-Shaped Targets

Physics of Interstellar Grains

Nucleation and Growth of Circumstellar and Interstellar Grains

Bibliography: Bruce T. Draine (as of 2023.05.08)ORCID: <http://orcid.org/0000-0002-0846-936X>**Books:**

- Draine, B.T.** 2011, *Physics of the Interstellar and Intergalactic Medium*. (Princeton: Princeton University Press) 568 pp. ISBN 978-0-691-12213-7
- Blain, A, Combes, F., & **Draine, B.T.** 2004, *The Cold Universe*, Saas-Fee Advanced Course 32 (2002). Swiss Society for Astrophysics and Astronomy. Edited by D. Pfenninger and Y. Revaz. (Berlin: Springer) 308 pp. ISBN 3-540-40838-X

Research Articles:

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- Draine, B.T.** 2024, “Sensitivity of Polarization to Grain Shape: I. Convex Shapes”, *Ap. J.*, **961**, 103. doi: 10.3847/1538-4357/ad0463
- Hunt, L.K., Belfiore, F., Lelli, F., **Draine, B.T.** Marasco, A., García-Burillo, S., Venturi, G., et al. 2023, “Gas, dust, and the CO-to-molecular gas conversion factor in low-metallicity starbursts”, *Astr. Astrophys.*, **675**, A64. doi: 10.1051/0004-6361/202245805
- Hensley, B.S., & **Draine, B.T.** 2023, “The AstroDust+PAH Model: A Unified Description of the Extinction, Emission, and Polarization from Dust in the Diffuse Interstellar Medium”, *Ap. J.*, 948:55; doi:10.3847/1538-4357/acc4c2
- Moseley, E.R., Teyssier, R., & **Draine, B.T.** 2023, “Dust Dynamics in RAMSES – I. Methods and turbulent acceleration”, *M.N.R.A.S.*, **518**, 2825-2844. doi:10.1093/mnrs/stac3231
- Sterken, V.J., Baalmann, L.R., **Draine, B.T.**, Godenko, E., Herbst, K., Hsu, H.-W., Hunziker, S., et al. . 2022, “Dust in and around the heliosphere and astrospheres”, *Space Science Reviews*, 218:71 doi:10.1007/s11214-022-00939-7
- Telesco, C.M., Varosi, F., Wright, C., **Draine, B.T.**, Fernandez, S.J., & Packham, C. 2022, “Mid-Infrared Polarization of the Diffuse Interstellar Medium toward CygOB2-12”, *Ap. J. Lett.*, **940**:L26. doi:10.3847/2041-8213/ac9b56
- Chellev, B., Brandt, T.D., Hensley, B.S., **Draine, B.T.**, & Matthaey, E. 2022, “An Optical Spectrum of the Diffuse Galactic Light from BOSS and IRIS”, *Ap. J.*, **932**:112. doi:10.3847/1538-4357/ac6efc
- Draine, B.T.** 2022, “On Far-Infrared and Submm Circular Polarization”, *Ap. J.*, **926**:90. doi:10.3847/1538-4357/ac3977
- Draine, B.T.** & Hensley, B.S. 2021c, “Using the Starlight Polarization Efficiency Integral to Constrain Shapes and Porosities of Interstellar Grains”, *Ap. J.*, **919**:65. doi:10.3847/1538-4357/ac0050
- Draine, B.T.**, Li, A., Hensley, B.S., Hunt, L.K., Sandstrom, K., & Smith, J.-D.T. 2021, “Excitation of Polycyclic Aromatic Hydrocarbon (PAH) Emission: Dependence on Starlight Spectrum, Intensity, PAH Size Distribution, and PAH Ionization”, *Ap. J.*, **917**:3. doi:10.3847/1538-4357/abff51
Online data: <https://doi.org/10.7910/DVN/LPUHIQ>
- Chasteney, J., Sandstrom, K., Chiang, I.-D., Hensley, B.S., **Draine, B.T.**, Gordon, K.D., Koch, E.W., et al. 2021, “Benchmarking Dust Emission Models in M101”, *Ap. J.*, 912:103. doi:10.3847/1538-4357/abe942
- Draine, B.T.** & Hensley, B.S. 2021b, “On the Shapes of Interstellar Grains: Modeling Extinction and Polarization by Spheroids and Continuous Distributions of Ellipsoids”, *Ap. J.*, 910:47. doi:10.3847/1538-4357/abddb7
- Draine, B.T.** & Hensley, B.S. 2021a, “The Dielectric Function of ‘AstroDust’ and Predictions for Polarization in the 3.4 μ m and 10 μ m Features”, *Ap. J.*, 909:94. doi:10.3847/1538-4357/abd6c6. Online data: <https://doi.org/10.34770/9ypp-dv78>
- Hensley, B.S., & **Draine, B.T.** 2021, “Observational Constraints on the Physical Properties of Interstellar Dust in the Post-Planck Era”, *Ap. J.*, 906:73. doi:10.3847/1538-4357/abc8f1

- Murphy, E.J., Hensley, B.S., Linden, S.T., **Draine, B.T.**, Dong, D., Momjian, E., Helou, G., & Evans, A.S. 2020, “Where’s the Dust?: The Deepening Anomaly of Microwave Emission in NGC 4725 B”, *Ap. J. Lett.*, 905, L23. doi:10.3847/2041-8213/abc7c8
- Moseley, E.R., **Draine, B.T.**, Tomida, K., & Stone, J.M. 2021, “Turbulent dissipation, CH⁺ abundance, H₂ line luminosities, and polarization in the cold neutral medium”, *M.N.R.A.S.*, 500, 3290. doi:10.1093/mnras/staa3384
- Hensley, B.S. & **Draine, B.T.** 2020, “Detection of PAH Absorption and Determination of the Mid-Infrared Diffuse Interstellar Extinction Curve from the Sightline Toward Cyg OB2-12”, *Ap. J.*, 895:38. doi:10.3847/1538-4357/ab8cc3
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N.B.: The General Geometry Anomalous Diffraction Theory code (GGADT), written in Fortran 95, has been made publicly available at <http://ggadt.org>.
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