

# David Nathaniel Spergel

*Charles Young Professor of Astronomy on the Class of 1897 Foundation*

Current position: Chair, Department of Astrophysical Sciences, Princeton University  
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Associate Faculty, Mechanical and Aerospace Engineering  
Fellow, Princeton Center for Theoretical Physics

Previous positions: W.M. Keck Distinguished Visiting Professor of Astrophysics,  
Institute for Advanced Study, 9/00-6/01  
Associate Professor, Princeton University, 7/92- 1/97  
Visiting Associate Professor, Department of Astronomy  
University of Maryland, 9/95-8/96  
Assistant Professor, Princeton University, 7/87 - 6/92  
Long-term Member, Institute for Advanced Study, 5/86-8/88  
Post-Doctoral Fellow, Harvard University, 1/86-4/86  
Teaching Assistant, Harvard University, 1985  
NSF Graduate Fellow, Harvard University, 1982- 1985  
Research Assistant, Oxford University, 9/82- 8/83

Education: Ph.D. Harvard University, 1985 (Astronomy)  
Thesis advisor: William H. Press  
Thesis title: *Astrophysical Implications of Weakly-Interacting Massive Particles*  
A.M. Harvard University, 1984 (Astronomy)  
Oxford University, 1983 (Harvard Travelling Scholar)  
A.B. Princeton University, 1982 (Astronomy *summa cum laude*, Phi Beta Kappa)  
Undergraduate thesis advisor: Gillian R. Knapp  
Senior thesis title: *Evolution of Proto-Planetary Nebulae*

Honors and Awards: Alfred P. Sloan Research Fellow (1988-1992)  
NSF Presidential Young Investigator Award (1988-1993)  
Helen B. Warner Prize (1994)  
Bart Bok Prize (1994)  
AAS Second Century Lecturer (2000)  
Time Magazine: "One of America's Top Scientists" (2001)  
MacArthur Fellowship (2001)  
National Academy of Sciences (2007)  
ISI Highly Cited Scientist (2007)

Long-Term Projects Member, Science Working Group, Wilkinson Microwave Anisotropy Probe (WMAP), NASA MIDEX mission

Personal Data: Born, March 25, 1961, Rochester, NY, USA  
Married, Laura H. Kahn, M.D., M.P.H., M.P.P., August 26, 1990.  
Children: Julian, Sarah, Joshua

## PROFESSIONAL SOCIETIES & SERVICE

### Professional Societies:

Member, American Astronomical Society  
Member, American Physical Society  
Member, International Astronomical Union  
Member, Governing Board, IAU Commission #33 (The Galaxy), 1995 - 1997  
Vice President, IAU Commission #33 (The Galaxy), 1998 - 2000  
President, IAU Commission #33 (The Galaxy), 2001-2003

### Advisory Boards

NSF Advisory Committee for Astronomical Sciences, Theory, Experimental and Laboratory Astrophysics Subcommittee, 1989.  
NAS Astronomy Survey: Particle Astrophysics Subcommittee, 1990.  
NAS "Thaddeus Report" Cosmology Sub-panel, 1996.  
Scientific Advisory Board, Hayden Planetarium, 10/94 - 10/97  
Advisory Board, Institute for Theoretical Physics, Executive Committee, 1996-2000; Chair, 1998 - 1999  
NAS Committee on Astronomy & Astrophysics, 7/97 - 7/00  
NAS Committee on Gravity Physics, Cosmology sub-committee chair, 10/97 - 6/99  
NAS Committee on Physics of the Universe, 1/01 - 1/02  
NASA Origins Subcommittee, Chair, 6/03 - 12/04  
NASA Space Science Advisory Council, 6/03 - 12/04  
NASA Science Advisory Council, Chair, 1/05 - 1/06  
NASA Astrophysics Subcommittee, Chair, 9/05 - 6/07

### Scientific Review Panels:

Editorial Board, FAS Ground Based Laser Verification Report, 1989.  
Chair, grant review panel, NASA Ultraviolet and Gravitational Astrophysics Theory and Data Analysis Program, 8/91.  
SMEX Optical/Ultraviolet Review, April 1993.  
NASA Astrophysics Subcommittee, June 1992 - June 1994  
UV MOWG, June 1994 - October 1995  
NASA Suborbital Review, August 1996  
Chair, Astrophysics Subcommittee, Space Interferometry Mission, 3/97 -  
HST Cycle 8 Review, October 1998

### Conference Organization

NAS Frontiers in Science  
Participant, , 11/90, 11/91, 11/94  
Scientific Organizing Committee, 11/95, 11/96, 11/97  
Organizer, Cosmology session, 11/95, 11/96  
Maryland Astrophysics Meeting (SOC), 10/95, 10/96, 10/97, 10/98  
Aspen Center for Physics (SOC) 1/97, 1/98, 1/99  
Princeton Microwave Background Workshop  
Organizer, 5/91, 5/94, 11/96, 11/97, 11/98  
Bahcall Festschrift, SOC, 5/95  
TAUP (Underground Physics Conference) (SOC), 1991, 1992, 1993  
Organizer, Supercomputing Session, AAS meeting, 6/95  
Ostriker Festschrift, SOC, 5/97  
Critical Dialogues in Cosmology, SOC, 5/96

### Scientific Journals

Editor, Princeton Series in Astrophysics, Princeton University Press  
Science Advisor, Science Advisor, NPR Earth & Sky radio program  
Scientific Advisory Board, New Astronomy

## BIBLIOGRAPHY

### Publications: Refereed Journals

1. J.J. Binney and D.N. Spergel, "Spectral Stellar Dynamics", *Astrophysical Journal*, **252**, 308 (1982).
2. D.N. Spergel, J.L. Guiliani, and G.R. Knapp, "Mass Loss from Evolved Stars II: Radio Continuum Emission and Evolution to Planetary Nebulae", *Astrophysical Journal*, **275**, 330 (1983).
3. J.J. Binney and D.N. Spergel, "Spectral Stellar Dynamics II: The Action Integrals", *M.N.R.A.S.*, **206**, 159 (1984).
4. D.N. Spergel and W.H. Press, "Effect of Hypothetical, Weakly-Interacting, Massive Particles on Energy Transport in the Solar Interior", *Astrophysical Journal*, **294**, 663 (1985).
5. W.H. Press and D.N. Spergel, "Capture by the Sun of a Galactic Population of Weakly-Interacting, Massive Particles", *Astrophysical Journal*, **296**, 679 (1985).
6. L.M. Krauss, K. Freese, D.N. Spergel, and W.H. Press, "Cold Dark Matter Candidates and the Solar Neutrino Problem", *Astrophysical Journal*, **299**, 1001 (1985).
7. A.K. Drukier, K. Freese, and D.N. Spergel, "Detecting Cold Dark Matter Candidates", *Phys. Rev. D*, **33**, 3495 (1986).
8. L.M. Krauss, A.Guth, D.N. Spergel, G.B. Field, and W.H. Press, "Inflation and Shadow Matter", *Nature* **319**, 748 (1986).
9. E.M. Chudnofsky, G.B. Field, D.N. Spergel, and A. Vilenkin, "Detecting Superconducting Strings", *Phys. Rev.*, **D34**, 944 (1986).
10. R. Gilliland, J. Faulkner, W.H. Press, and D.N. Spergel, "Modelling the Effects of Weakly-Interacting, Massive Particles on the Solar Interior", *Astrophysical Journal*, **306**, 703 (1986).
11. G.B. Field and D.N. Spergel, "Cost of Space-Based Laser Missile Defense", *Science* **231**, 1387 (1986).
12. F.T. Avignone III, R. Brodzinsky, G. Gelmini, A.K. Drukier, D.N. Spergel, S. Dimopoloulus, B.Lynne and G. Starkman, "Limits on Axions from the Ultralow Background Germanium Spectrometer", *Phys. Rev. D*, **35**, 2752 (1987).
13. D.N. Spergel, T. Piran, and J. Goodman, "Dynamics of Superconducting Cosmic Strings", *Nucl. Phys. B*, **291**, 847 (1987).
14. A. Babul, B. Paczynski, and D.N. Spergel, "Gamma-Ray Bursts from Superconducting Cosmic Strings at Large Redshifts", *Astrophys. J. Lett*, **316**, L 49 (1987).
15. J.N. Bahcall, T. Piran, W.H. Press, and D.N. Spergel, "Neutrino Temperatures and Fluxes from the LMC Supernova", *Nature*, **327**, 682 (1987).
16. D.N. Spergel, T.Piran, A. Loeb, J. Goodman and J.N. Bahcall, "A Simple Model for the Neutrino Cooling of the LMC Supernova", *Science*, **237**, 1471 (1987).
17. S.Ahlen, F.T.Avignone III, R.Brodzinsky, A.K. Drukier, G.Gelmini, and D.Spergel, "Limits on Cold Dark Matter Candidates from the Ultralow Background Germanium Spectrometer", *Phys. Lett. B*, **195**, 603 (1987).
18. W. H. Press and D.N. Spergel, "Extrapolation Schemes for N-body Codes", *Astrophysical Journal*, **325**, 715 (1988).
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24. D.N. Spergel and J. Faulkner, "Weakly Interacting Particles and Horizontal Branch Stars", *Ap. J. Letters*, **331**, L21 (1988).
25. D.N. Spergel, W.H. Press, and R. Scherrer, "Superconducting Cosmic String Dynamos", *Nature*, **334**, 682 (1988).
26. D.N. Spergel, D.H. Weinberg and J.R. Gott, III, "Can Neutrinos Comprise Galactic Halos?", *Phys. Rev. D*, **38**, 2014 (1988).
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33. M.H. Lee and D.N. Spergel, "An Analytical Approach to Gravitational Lensing By an Ensemble of Axisymmetric Lenses", *Astrophys. J.*, **357**, 23 (1990).
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38. L. Blitz and D.N. Spergel, "The Shape of Our Galaxy", *Astrophys. J.*, **370**, 205 (1991).
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71. K. Johnston, D.N. Spergel and L. Hernquist, "The Disruption of the Sagittarius Dwarf Galaxy", *Ap. J.*, 451, 598 (1995).
72. G. Starkman and D.N. Spergel, "A New Technique for Detecting Supersymmetric Dark Matter", *Physical Review Letters*, 74, 2623 (1995).
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77. Neil J. Cornish, David N. Spergel & Glenn D. Starkman, "Does Chaotic Mixing Facilitate  $\Omega < 1$  Inflation?", *Phys. Rev. Letters.*, 77, 215–218 (1996).
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81. J. J. Dalcanton, D. N. Spergel, & F J Summers, "The Formation of LSB Galaxies", *Ap. J.*, 482, 659 (1997).
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  106. D.M. Goldberg and D.N. Spergel, “Using Perturbative Least Action to Recover Cos-

- mological Initial Conditions”, *ApJ*, 544, 21 (2000).
107. Narayanan, V.K., Spergel, D.N, Dave, R., & Ma, C.P., “Constraints on the Mass of Warm Dark Matter Particles and the Shape of the Linear Power Spectrum from the Lyman  $\alpha$  Forest”, *ApJ*, 543, L103.
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  111. R. Dave, D.N. Spergel, P.J. Steinhardt, & B.D. Wandelt, “Halo Properties in Cosmological Simulations of Self-Interacting Cold Dark Matter”, *ApJ*, 547, 574 (2001).
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