

CURRICULUM VITAE

JOHN W. HARVEY

Education

1969 Ph.D., University of Colorado
1964 M.A., University of California
1963 B.A., University of California

Professional Employment

2018 - DCC Visiting Research Scholar, Lunar & Planetary Lab, Univ. Arizona
2018 – Astronomer Emeritus, National Solar Observatory
1984 – 2018 Astronomer/Tenure, National Solar Observatory
1974 – 1983 Astronomer/Tenure, Kitt Peak National Observatory
1972 – 1974 Associate Astronomer, Kitt Peak National Observatory
1969 – 1972 Assistant Astronomer, Kitt Peak National Observatory
1964 – 1969 Graduate Assistant, High Altitude Observatory
1959 – 1964 Research Assistant, Lockheed Solar Observatory

Professional Memberships

American Astronomical Society
American Geophysical Union
International Astronomical Union
Institute of Electrical and Electronic Engineers (Life Member)

Professional Service Activities

1974 – 1977 Member, High Altitude Observatory Advisory Committee
1975 – 1998 Member, Editorial Board, *Solar Physics*
1975 – 1976 Participant, NASA Coronal Hole Workshop
1975 – 1980 Member, NASA Facility Definition Team, Solar Optical Telescope for Spacelab
1976 – 1992 Co-Investigator, Solar Optical Universal Polarimeter Experiment for Spacelab 2 (Payload Specialist Finalist)
1977 – 1978 Chairman, KPNO Solar System Program
1978 – 1979 Member, NASA Solar Cycle and Dynamics Mission Science Working Group
1979 – 1980 Member, NAS Solar Physics Working Group, Astronomy Survey Committee
1979 – 1980 Vice Chairperson, AAS Solar Physics Division
1979 – 1980 Member, Organizing Committee IAU Commissions 10 & 12
1980 Member, NASA Science and Applications Space Platform Users Group
1980 – 1981 Chairperson, AAS Solar Physics Division
1981 Member, Scientific Programs Evaluation Committee, University Corporation for Atmospheric Research
1981 – 1985 Member, Editorial Committee, *Annual Review of Astronomy and Astrophysics*

1981 – 1984 Member, NAS Committee on Solar and Space Physics
 1981 – 1992 Co-Investigator, Coordinated Filtergraph Spectrograph for the Orbiting Solar Laboratory
 1981 – 1992 Facility Scientist, NASA Orbiting Solar Laboratory
 1981 – 1988 Member, NASA Advanced Solar Observatory Science Working Group
 1982 Member, AAS Congressional Liaison Committee
 1982 Vice Chairperson, AAS Solar Physics Division
 1982 – 1985 Member, NSF Astronomy Advisory Committee
 1983 Member, KPNO NNTT Scientific Advisory Committee
 1983 – 1984 Member, NASA Science Working Group on the Measurement of Solar Oscillations from Space
 1983 – 1986 Member, Organizing Committee, IAU Commission 12
 1983 – 1985 Member, AAS Warner/Pierce Prize Committee
 1984 – 1987 Member, NASA Space and Earth Science Advisory Committee
 1984 – 1987 Member, NASA Helioseismology Steering Committee
 1985 – 1988 Vice President, IAU Commission 12
 1987 – 1988 Member, NAS Committee on Solar Physics
 1988 – 1995 Member, NASA Solar Probe Science Study Team
 1988 – 1991 President, IAU Commission 12
 1989 Invited Lecturer, NCAR Summer Colloquium
 1989 – 1990 Member, NAS AASC Solar Panel
 1990 – 1995 Member, NASA Solar Physics Management Operations WG
 1991 – 1994 Member, IAU Commission 12 Organizing Committee
 1994 – 1997 Member, IAU Commission 10 Organizing Committee
 1995 Member, NRL External Review Panel for Solar Physics
 1996 Member, NASA Solar Probe Science Definition Team
 1996 – 1998 Member, NASA SOLAR-B Science Definition Team
 1997 – 1999 Member, AAS Heineman Prize Committee
 1998 – 2005 Co-Editor, *Solar Physics*
 2001 – 2004 Member, SPD/AAS Hale Prize Nomination Committee
 2003 – 2006 Member, NRC Associateship Review Panel
 2003 – 2004 Member, IAC Scientific Advisory Committee
 2006 – Honorary Member, Editorial Board, *Solar Physics*
 2008 Chair, External Review Committee of Division of Solar and Plasma Astrophysics, National Astronomical Observatory of Japan
 2008 Member, External Review Committee of National Astronomical Observatory of Japan
 2009 Member, Swiss Science and Technology Expert Review of Istituto Ricerche Solari Locarno
 2010 – 2012 Member, NRC, A Decadal Strategy for Solar and Space Physics, Panel on Solar and Heliospheric Physics
 2011 Member, Swedish Research Council Expert Panel Review of Swedish Institute for Solar Physics
 2011 Member, NRC Solar Probe Plus Assessment Group
 2013 Member, NRC Committee on Evaluating NOAA's Plan to Mitigate the Loss of Total Solar Irradiance Measurements from Space

2014 Member, External Review of the NRL Space Research and Space
Technology Focus Area

Significant Instrumentation Projects

1970 40-channel magnetograph (with W. Livingston)
1970 Multi-slit spectrograph for coronal spectroscopy (with W. Livingston)
1971 Stokes spectropolarimeter for 13-meter spectrograph
1974 512-channel magnetograph for Vacuum Telescope (with W. Livingston)
1977 Solid state array detector optical interface for 13-meter spectrograph
1979 Stokes spectropolarimeter for 1-meter Fourier Transform Spectrometer
(with J. Brault)
1981 Helioseismology imager for South Pole
1984 GONG helioseismology imager (with team)
1990 Spectromagnetograph for Vacuum Telescope (with H. Jones and team)
2000 SOLIS instruments (with C. Keller and team)

Field Experience

Conducted experiments at total solar eclipses in Alaska (1963), Mexico (1970),
Mauritania (1973), and India (1980). Successful solar observations from geographic
South Pole (1981, 1987, 1988, 1990, & 1994).

Honors and Awards

1981 Annual James Arthur Lecture, Center for Astrophysics
1982 Antarctic Service Medal
1984 Annual Spring Lecturer, Princeton Dept. of Astrophysical Sciences
1990 NASA Exceptional Scientific Achievement Medal
1994 NRL Alan Berman Research Publication Award
1995 AURA Science Award
1996 Antarctic mountain (2644 m) named Harvey Summit
1999 AAS/SPD George Ellery Hale Prize
2003 Asteroid 26924 named Johnharvey by IAU
2004 NOAA Research Outstanding Scientific Paper Award
2005 AURA Science Achievement Award (with J. Sudol)
2007 AURA Team Excellence Award (with team)
2008 AURA Science Achievement Award
2011 National Academy of Science Arctowski Medal
2012 Listed in Who's Who in the World
2012 Listed in Who's Who in America
2012 Listed in American Men & Women of Science
2015 Invited to write memoirs for *Solar Physics*
2016 AURA Outstanding Technology Achievement Award
2020 Fellow of the American Astronomical Society

Edited Conference Proceedings

- “Solar Seismology from Space”, ed. R. K. Ulrich, J. Harvey, E.J. Rhodes, Jr., and J. Toomre, NASA, JPL Pub. 84-84, 1984.
- “Solar-Space Observations and Stellar Prospects”, ed. J. W. Harvey, H. S. Hudson, and R. W. Noyes, *Advances in Space Research* 4 (8), 1984.
- “Synoptic Solar Physics”, ed. K. S. Balasubramaniam, J. W. Harvey, and D. M. Rabin, ASP Conf. Ser. 140, 1998.
- “The Physics of the Solar Corona and Transition Region”, ed. O. Engvold, J. W. Harvey, C. J. Schrijver, and N. E. Hurlburt, Kluwer Academic Publishers, 2000.
- “Helioseismic Diagnostics of Solar Convection and Activity”, ed. T. L. Duvall, Jr, J. W. Harvey, A. G. Kosovichev, and Z. Svestka, Kluwer Academic Publishers, 2001.

Consultant

- “The Sun, Voyage through the Universe”, Time-Life Books, Alexandria, VA, 1990.

Research Publications

As of June 2023, Google Scholar reports 518 separate publications including abstracts, invited and contributed conference papers, and journal papers with a total of 17,637 citations and an H-index of 70. Following is a chronological list of mostly refereed journal papers.

1. "Height of an Ellerman 'Bomb'," J. Harvey, *The Observatory* **83**, 37, 1963.
2. "Photospheric Granulation in the Near Ultraviolet," J. Harvey and H. E. Ramsey, *Pub. Astron. Soc. Pacific* **75**, 283, 1963.
3. "Photospheric Magnetic Fields and Chromospheric Features," R. Howard and J. W. Harvey, *Astrophys. J.* **139**, 1328, 1964.
4. "Coronal Polar Rays and Polar Magnetic Fields", J. W. Harvey, *Astrophys. J.* **141**, 832, 1965.
5. "The Magnetic Field in Some Prominences Measured with the He I, 5876 Å Line," J. W. Harvey and E. Tandberg-Hanssen, *Solar Phys.* **3**, 316, 1968.
6. "Coronal Polar Plumes," Gordon Newkirk and J. W. Harvey, *Solar Phys.* **3**, 321, 1968.
7. "Influence of Magnetic Fields on the Structure of the Solar Corona," G. Newkirk, M. D. Altschuler and J. Harvey, *IAU Symp. 35*, 379, 1968.
8. "Magnetic Fields Associated with Solar Active-Region Prominences," J. W. Harvey, *NCAR Cooperative Thesis No. 17*, NCAR, Boulder, 1969.
9. "Magnetograph Measurements with Temperature-Sensitive Lines," J. Harvey and W. Livingston, *Solar Phys.* **10**, 283, 1969.
10. "Observational Evidence for Quantization in Photospheric Magnetic Flux," W. Livingston and J. Harvey, *Solar Phys.* **10**, 294, 1969.
11. "The Improved Solar Magnetograph of the High Altitude Observatory," J. W. Harvey, R. H. Lee and E. Tandberg-Hanssen, *Applied Optics* **8**, 2370, 1969.
12. "Photospheric Magnetic Fields on March 7, 1970," W. Livingston, J. Harvey and C. Slaughter, *Nature* **226**, 1146, 1970.
13. "Comments on a Paper by Semel," J. Harvey and W. Livingston, *Astron. Astrophys.* **9**, 151, 1970.
14. "Short Period Oscillations and Doppler Velocity Gradients," J. Harvey, *Solar Phys.* **11**, 26, 1970.

15. "Spectroscopic Determinations of Solar Rotation," R. Howard and J. Harvey, *Solar Phys.* **12**, 23, 1970.
16. "Fraunhofer Lines Without Zeeman Splitting," G. Sistla and J. W. Harvey, *Solar Phys.* **12**, 66, 1970.
17. "Solar Magnetic Fields - Small Scale," J. Harvey, *Pub. Astron. Soc. Pacific* **83**, 539, 1971.
18. "Magnetic Fields Measured with the 10830 Å He I Line," J. W. Harvey and D. N. B. Hall, *IAU Symp.* **43**, 279, 1971.
19. "The Kitt Peak Magnetograph I. Principles of the Instrument," W. Livingston and J. W. Harvey, *Kitt Peak National Observatory Contribution No. 558*, 1971.
20. "The Kitt Peak Magnetograph IV. 40-Channel Probe and the Detection of Weak Photospheric Fields," W. Livingston and J. W. Harvey, *IAU Symp.* **43**, 51, 1971.
21. "The Kitt Peak Magnetograph III. Automation and the 40-Channel Probe," W. Livingston, J. W. Harvey and C. D. Slaughter, *Publ. Royal Obs. Edinburgh* **8**, 52, 1971.
22. "Observations of Magnetic Field Changes in Active Regions," K. L. Harvey, W. C. Livingston and J. W. Harvey, *IAU Symp.* **43**, 422, 1971.
23. "A Line-Profile Stokesmeter: Preliminary Results on Non-Sunspot Fields," J. W. Harvey, W. Livingston and C. D. Slaughter, *Line Formation in the Presence of Magnetic Fields (HAO Conference Proceedings)*, 227, 1972.
24. "Observations of Short Period Oscillations in Two Dimensions," J. W. Harvey and R. Howard, *Solar Phys.* **23**, 300, 1972.
25. "A Comparison between the Helium 10830 Å and the Hydrogen H α Chromospheres," R. G. Giovanelli, D. N. B. Hall and J. W. Harvey, *Solar Phys.* **22**, 53, 1972.
26. "Real-Time Masking of Solar Photographs with Photochromic Glass" J. W. Harvey, *AAS Photo-Bulletin*, No. 1, 5, 1972.
27. "Interferometry Applied to Visible Solar Features," J. W. Harvey, *Nature* **235**, 90, 1972.
28. "C2 in Sunspots," J. W. Harvey, *Solar Phys.* **24**, 354, 1972.
29. "Recent Solar Magnetograph Results," J. W. Harvey, *Solar Activity Observations and Predictions*, MIT Press, p.52, 1972.
30. "Observations of Sunspot Umbral Velocity Oscillations," Arvind Bhatnagar, W. C. Livingston and J. W. Harvey, *Solar Phys.* **27**, 80, 1972.
31. "Polar Magnetic Fields and the New Solar Cycle," B. Gillespie, J. Harvey, W. Livingston and K. Harvey, *Astrophys. J.* **186**, L85, 1973.
32. "Fraunhofer Lines with Large Zeeman Splitting," J. W. Harvey, *Solar Phys.* **28**, 9, 1973.
33. "Polarization of Red System CN Lines in Sunspots," J. W. Harvey, *Solar Phys.* **28**, 43, 1973.
34. "Observations of Moving Magnetic Features Near Sunspots," K. Harvey and J. Harvey, *Solar Phys.* **28**, 61, 1973.
35. "Solar Speckle Interferometry," J. W. Harvey and J. B. Breckinridge, *Astrophys. J.* **182**, L137, 1973.
36. "The Topological Association of H α Structures and Magnetic Fields," Y. Nakagawa, M. A. Raadu and J. W. Harvey, *Solar Phys.* **30**, 421, 1973.
37. "A Comparison of EUV Spectroheliograms and Photospheric Magnetograms," Joseph B. Gurman, George L. Withbroe and J. W. Harvey, *Solar Phys.* **34**, 105, 1974.
38. "Photospheric Magnetic and Velocity Fields in Active Regions," J. W. Harvey, *Flare-Related Magnetic Field Dynamics (HAO Conference Proceedings)*, 1, 1974.

39. "Comparison of Skylab X-Ray and Ground-Based Helium Observations," J. Harvey, A. S. Krieger, A. F. Timothy and G. S. Vaiana, *Osserv. Mem. Oss. Astrofis. Arcetri* **104**, 50, 1975.
40. "Table of Solar Diatomic Molecular Lines I. Spectral Range: 6100 - 6600 Å", R. Boyer, P. Sotirovski and J. W. Harvey, *Astron. Astrophys. Suppl.* **19**, 359, 1975.
41. "Photoelectric Speckle Interferometry of the Solar Granulation," J. W. Harvey and M. Schwarzschild, *Astrophys. J.* **196**, 221, 1975.
42. "Ephemeral Active Regions in 1970 and 1973," K. L. Harvey, J. W. Harvey and S. F. Martin, *Solar Phys.* **40**, 87, 1975.
43. "The Calculation of Force-Free Fields from Discrete Flux Distributions," N. R. Sheeley, Jr. and J. W. Harvey, *Solar Phys.* **45**, 275, 1975.
44. "Solar Magnetograph Employing Integrated Diode Arrays," W. C. Livingston, J. Harvey, C. Slaughter and D. Trumbo, *Applied Optics* **15**, 40, 1976.
45. "The Kitt Peak 60-cm Vacuum Telescope," W. C. Livingston, J. Harvey, A. K. Pierce, D. Schrage, B. Gillespie, J. Simmons and C. Slaughter, *Applied Optics* **15**, 33, 1976.
46. "Table of Solar Diatomic Molecular Lines II. Spectral Range: 6600 - 7100 Å," R. Boyer, P. Sotirovski and J. W. Harvey, *Astron. Astrophys. Suppl.* **24**, 111, 1976.
47. "Digital Image Reconstruction Applied to Alpha Orionis," C. R. Lynds, S. P. Worden and J. W. Harvey, *Astrophys. J.* **207**, 174, 1976.
48. "A Study of the Magnetic and Velocity Fields in an Active Region," K. L. Harvey and J. W. Harvey, *Solar Phys.* **47**, 233, 1976.
49. "Coronal Holes, Solar Wind Streams, and Recurrent Geomagnetic Disturbances," N. R. Sheeley, Jr., J. W. Harvey and W. C. Feldman, *Solar Phys.* **49**, 271, 1976.
50. "The Kitt Peak CID Systems," R. S. Aikens, J. W. Harvey and C. R. Lynds, *IAU Colloq.* **40**, 25-1, 1976.
51. "Reconstructed Images of Alpha Orionis Using Stellar Speckle Interferometry," S. P. Worden, C. R. Lynds and J. W. Harvey, *J. Opt. Soc. Am.* **66**, 1243, 1976.
52. "High Resolution Mapping of the Magnetic Field of the Solar Corona," M. D. Altschuler, R. Levine, M. Stix and J. Harvey, *Solar Phys.* **51**, 345, 1977.
53. "A Pictorial Comparison of Interplanetary Magnetic Field Polarity, Solar Wind Speed, and Geomagnetic Disturbance Index During the Sunspot Cycle," N. R. Sheeley, J. R. Asbridge, S. J. Bame and J. W. Harvey, *Solar Phys.* **52**, 485, 1977.
54. "Observations of Small-Scale Photospheric Magnetic Fields," J. Harvey, *Highlights in Astronomy* **4**, Part II, 223, 1977.
55. "Solar Sources of the Interplanetary Magnetic Field and Solar Wind," R. H. Levine, M. D. Altschuler and J. W. Harvey, *J. Geophys. Res.* **82**, 1061, 1977.
56. "Open Magnetic Structures on the Sun," R. H. Levine, M. D. Altschuler, J. W. Harvey and B. V. Jackson, *Astrophys. J.* **215**, 636, 1977.
57. "Apparent Solar Oscillations and Fluctuations in the Earth's Atmosphere," E. Fossat, J. Harvey, M. Hausman and C. Slaughter, *Astron. Astrophys.* **59**, 279, 1977.
58. "Magnetic Properties of X-ray Bright Points," L. Golub, A. S. Krieger, J. W. Harvey and G. S. Vaiana, *Solar Phys.* **53**, 111, 1977.
59. "A Comparison of He II 304 Å and He I 10830 Å Spectroheliograms," J. W. Harvey and N. R. Sheeley, *Solar Phys.* **54**, 343, 1977.
60. "Direct Observations of the Heterogeneity of Supergiant Disks," J. W. Harvey, C. R. Lynds and S. P. Worden, *Highlights in Astronomy* **4**, Part II, 405, 1977.

61. "Non-Spot Magnetic Fields," J. W. Harvey, *Illustrated Glossary for Solar and Solar-Terrestrial Physics*, Reidel, Ch. 3, 1977.
62. "A Photographic Spectral Atlas of a Sunspot Between 3813 and 9182 Å, J. W. Harvey, *Kitt Peak Special Publication*, 1977.
63. "One Dimensional Speckle Interferometry of the Solar Granulation," C. Aime, G. Ricort and J. Harvey, *Astrophys. J.* **221**, 362, 1978.
64. "Motions in Solar Magnetic Tubes. II: The Oscillations," R. G. Giovanelli, W. C. Livingston and J. W. Harvey, *Solar Phys.* **59**, 49, 1978.
65. "Motions in Solar Magnetic Tubes. III: Outward Wave Propagation in Sunspot Umbraes," R. G. Giovanelli, J. W. Harvey and W. C. Livingston, *Solar Phys.* **58**, 347, 1978.
66. "Magnetic Fields and Flows Between 1 AU and 0.3 AU During the Primary Mission of Helios 1," L. F. Burlaga, N. F. Ness, F. Mariani, B. Bavassana, U. Villante, H. Rosenbauer, R. Schwenn and J. Harvey, *J. Geophys. Res.* **83**, 5167, 1978.
67. "Table of Solar Diatomic Molecular Lines. III. Spectral Range: 7100 - 7600 Å," R. Boyer, P. Sotirovski and J. W. Harvey, *Astron. Astrophys. Suppl.* **33**, 145, 1978.
68. "Coronal Holes, Solar Wind Streams, and Geomagnetic Activity During the New Sunspot Cycle," N. R. Sheeley, Jr. and J. W. Harvey, *Solar Phys.* **59**, 159, 1978.
69. "Adaptive Optics for Solar Observations?," J. W. Harvey, *Osserv. Mem. Oss. Astrofis. Arcetri* **106**, 81, 1978.
70. "Aspects of Solar Research at Kitt Peak in the 1980s, J. W. Harvey, *Osserv. Mem. Oss. Astrofis. Arcetri* **106**, 228, 1978.
71. "A Promising Technique for Achieving High Resolution Solar Observations," J. W. Harvey and M. K. Stein, *Osserv. Mem. Oss. Astrofis. Arcetri* **106**, 303, 1978.
72. "Summary of the Workshop," J. W. Harvey, *Osserv. Mem. Oss. Astrofis. Arcetri* **106**, 313, 1978.
73. "Coronal Holes and Solar Magnetic Fields," J. W. Harvey and N. R. Sheeley, Jr., *Space Science Rev.* **23**, 139, 1979.
74. "Photospheric Velocity Fields as Indicators of Flare Activity," K. Harvey and J. Harvey, *Solar Terrestrial Predictions, Proceedings*, Vol. 3, C-41, 1979.
75. "An Observational Study of Wave Propagation through The Solar Atmosphere from the Photosphere to the Corona," K. Harvey and J. Harvey, *NASA Contract Report NAS8-33104*, 1980.
76. "Observations of Magnetic Fields on Two Late-Type Dwarf Stars," R. Robinson, S. P. Worden and J. W. Harvey, *Astrophys. J.* **236**, L155, 1980.
77. "The Kitt Peak Coronal Velocity Experiment" W. Livingston, J. Harvey, L. A. Doe, B. Gillespie and G. Ladd, *Bull. Astron. Soc. India* **8**, 43, 1980.
78. "Synoptic Solar Magnetic Field Maps for the Interval Including Carrington Rotations 1601 - 1680," J. Harvey, B. Gillespie, P. Miedaner and C. Slaughter, *World Data Center A Report UAG-77*, 1980.
79. "Coronal Holes, Solar Wind Streams and Geomagnetic Disturbances During 1978 and 1979," N. R. Sheeley, Jr. and J. W. Harvey, *Solar Phys.* **70**, 237, 1981.
80. "Power Spectrum of Differential Refraction and Comparison with Solar Diameter Fluctuation Measurements," E. Fossat, G. Grec and J. W. Harvey, *Astron. Astrophys.* **94**, 95, 1981.

81. "The Five-Minute Oscillations - What's Left to be Done?" E. J. Rhodes, Jr., R. K. Ulrich, J. W. Harvey and T. L. Duvall, Jr., in *Solar Instrumentation, What's Next?*, (ed. R. Dunn), Sacramento Peak Observatory, Sunspot, p. 37, 1981.
82. "Variation of the Solar He I 10830 Å Lines: 1977 - 1980," J. W. Harvey, in *Variations of the Solar Constant*, (ed. S. Sofia), NASA CP 2191, p. 265, 1981.
83. "Kitt Peak Coronal Velocity Experiment," W. Livingston, J. Harvey, L. A. Doe, B. Gillespie and G. Ladd, in *Observations of Total Solar Eclipse 16 February 1980*, (ed. S. Trehan), Indian National Science Academy, New Delhi, p. 19, 1981.
84. "Table of Solar Diatomic Molecular Lines IV. Spectral Range: 7600 - 8100 Å," R. Boyer, P. Sotirovski and J. W. Harvey, *Astron. Astrophys. Suppl.* **47**, 145, 1982.
85. "Magnetic Measurements of Coronal Holes During 1975 - 1980," K. L. Harvey, N. R. Sheeley, Jr. and J. W. Harvey, *Solar Phys.* **79**, 149, 1982.
86. "Observations of Coronal Structure during Sunspot Maximum," N. R. Sheeley, Jr., R. A. Howard, M. J. Koomen, D. J. Michels, K. L. Harvey and J. W. Harvey, *Space Sci. Rev.* **33**, 219, 1982.
87. "Astronomy on Ice," J. Harvey, M. Pomerantz and T. Duvall, Jr., *Sky and Telescope* **64**, 520, 1982.
88. "Coherent Scattering in the Solar Spectrum: Survey of Linear Polarization in the Range 3165 – 4230 Å," J. O. Stenflo, D. Twerenbold and J. W. Harvey, *Astron. Astrophys. Suppl.* **52**, 161, 1983.
89. "Large-Scale Patterns in Solar Activity During the Ascending Phase of Cycle 21," V. Gaizauskas, K. L. Harvey, J. W. Harvey and C. Zwaan, *Astrophys. J.* **265**, 1056, 1983.
90. "Observations of Solar Oscillations of Low and Intermediate Degree," T. L. Duvall, Jr. and J. W. Harvey, *Nature* **302**, 24, 1983.
91. "A Comparison of Coronal Holes in Soft X-Ray and He 10830 Å Images," S. Kahler, J. Davis and J. Harvey, *Solar Phys.* **87**, 47, 1983.
92. "Theory of Force-Free Magnetic Fields for Sunspots and the Energy of Solar Flares. III. The Theory of Quadrupolar Sunspots and the Active Region of August 1972," H.-S. Yang, H.-M. Chang and J. W. Harvey, *Solar Phys.* **84**, 139, 1983.
93. "Flare Build-Up: 21 May 1980", J. W. Harvey, *Advances in Space Research* **2**, 31, 1983.
94. "Dynamics of the Preflare Magnetic Field," J. W. Harvey, *Space Sci. Rev.* **34**, 55, 1983.
95. "Large Scale Motions and Structure of the Sun," M. A. Pomerantz, J. W. Harvey and T. Duvall, Jr., *Antarctic J. of the U. S.* **17**, (5), 232, 1983.
96. "Coherent Scattering in the Solar Spectrum: Survey of Linear Polarization in the Range 4200-9950 Å," J. O. Stenflo, D. Twerenbold, J. W. Harvey and J. Brault, *Astron. Astrophys. Suppl.* **54**, 505, 1983.
97. "On Solar Oscillations with a 13-Day Period," T. L. Duvall, Jr., H. P. Jones and J. W. Harvey, *Nature* **304**, 517, 1983.
98. "Diagnostics of Solar Magnetic Fluxtubes Using a Fourier Transform Spectrometer," J. O. Stenflo, J. W. Harvey, J. Brault and S. Solanki, *Astron. Astrophys.* **131**, 333, 1984.
99. "Helium 10830 Å Irradiance: 1975-1983," J. Harvey, in *Workshop on Solar Variability on Active Region Time-Scales*, (eds. G. Chapman, H. Hudson, B. La Bonte), NASA CP-2310, 197, 1984.
100. "Observations of Intermediate-Degree Solar Oscillations," J. W. Harvey and T. L. Duvall, Jr., *Solar Seismology from Space*, (ed. R. Ulrich), JPL 84-84, p. 165, 1984.

101. "Rotational Frequency Splitting of Solar Oscillations," T. L. Duvall, Jr. and J. W. Harvey, *Nature* **310**, 19, 1984.
102. "The Internal Rotation of the Sun," T. L. Duvall, Jr., W. A. Dziembowski, P. R. Goode, D. O. Gough, J. W. Harvey and J. W. Leibacher, *Nature* **310**, 22, 1984.
103. "Frequencies of Solar p-mode Oscillations," J. W. Harvey and T. L. Duvall, Jr., in *Theoretical Problems in Stellar Stability and Oscillations*, Univ. of Liège, p. 209, 1984.
104. "Trends in Measurement of Vector Magnetic Fields Using the Zeeman Effect," J. W. Harvey, in *Measurements of Solar Vector Magnetic Fields*, (ed. M. J. Haggard), NASA CP 2374, p. 109, 1985.
105. "Dependence of the Properties of Magnetic Fluxtubes on Area Factor or Amount of Flux," J. O. Stenflo and J. W. Harvey, *Solar Phys.* **95**, 99, 1985.
106. "Solar Doppler Shifts: Sources of Continuous Spectra," T. L. Duvall, Jr. and J. W. Harvey, in *Seismology of the Sun and the Distant Stars*, (ed. D. Gough), NATO ASI Ser., Reidel, Dordrecht, p.105, 1985.
107. "The Solar Interior Sound Speed," J. Christensen-Dalsgaard, T. L. Duvall, Jr., D. O. Gough, J. W. Harvey and E. J. Rhodes, Jr., *Nature* **315**, 378, 1985.
108. "Temporal Characteristics of the Solar UV Flux and He I Line at 1083nm," R. F. Donnelly, J. W. Harvey, D. F. Heath and T. P. Repoff, *J. Geophys. Res.* **90A**, 6267, 1985.
109. "Speckle Interferometry Technique Applied to the Study of Granular Velocities," C. Aime, J. Borgnino, P. Druesne, J. Harvey, F. Martin and G. Ricort, in *High Resolution in Solar Physics*, (ed. R. Muller), Springer, Berlin, 103, 1985.
110. "High Resolution Helioseismology," J. Harvey, *Future Missions in Solar, Heliospheric and Space-Plasma Physics*, ESA SP-235, 199, 1985.
111. "Instrumentation for Seismology of the Sun and Stars," J. Harvey, *IAU Rep. Astron.* **XIXA**, 51, 1985.
112. "Optical Interferometry of Solar Fine Structure," J. Harvey, in *Workshop on Theoretical Problems in High Resolution Solar Physics*, (ed. H. U. Schmidt), Max Planck Inst. Astrophys. Rep. No. 212, p. 183, 1985.
113. "Advances in solar seismology at the South Pole," M. A. Pomerantz, E. Fossat, B. Gelly, G. Grec, J. W. Harvey and T. L. Duvall, Jr., *Antarctic J. U. S.* **19**(5), 221, 1985.
114. "He I 10830 A Observations of Two-Ribbon Flare-Like Events Associated with Filament Disappearances," K. L. Harvey, N. R. Sheeley, Jr. and J. W. Harvey, *Solar Terrestrial Predictions: Workshop Proceedings Meudon 1984*, P. A. Simon, G. Heckman, M. A. Shea (eds.), NOAA, Boulder, 198, 1986.
115. "Small-Scale Photospheric Magnetic Fields: Observational Methods and Limitations," J. Harvey, *Small Scale Magnetic Flux Concentrations in the Solar Photosphere*, (eds. W. Deinzer, M. Knölker, H. Voigt), *Ab. Akad. Wiss. Göttingen*, No. 38, 25, 1986.
116. "Latitude and Depth Variation of Solar Rotation," T. L. Duvall, Jr., J. W. Harvey and M. A. Pomerantz, *Nature* **321**, 500, 1986.
117. "White-Light Movies of the Solar Photosphere from the SOUP Instrument on Spacelab 2," A. M. Title, T. D. Tarbell, G. W. Simon, L. Acton, D. Duncan, S. Ferguson, M. Finch, Z. Frank, G. Kelly, R. Lindgren, M. Morrill, T. Pope, R. Reeves, R. Rehse, R. Shine, K. Topka, J. Harvey, J. Leibacher, W. Livingston, and L. November, *Adv. Space Res.* **6**, 253, 1986.
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