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Visiting Research Scientist  
Lunar and Planetary Laboratory  
University of Arizona  
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**Citizenship:** USA

**Education:** Caltech: BS Physics 1960

PhD Physics 1965–Thesis: “Observations of Solar Magnetic Fields”

Advisor: R. B. Leighton

**Employment:** Kitt Peak National Observatory (1965-1973)

-Used the McMath Telescope to study solar Doppler and magnetic fields

-Helped visitors and mentored summer students

Naval Research Laboratory (1973-2016)

1973-1974: at JSC/Houston, Skylab mission operations

1975-1976: at KPNO/Tucson, Skylab & KPNO data analysis

1977-2016: at NRL/Washington DC (Retired Nov. 30, 2016)

**Activities:**

1. Co-I for the XUV Slitless Spectrograph on Skylab : 1973-2016
2. Co-I for the SOLWIND White-Light Coronagraph on P78-1: 1977-2016
3. PI for Accelerated Research Initiative and NRL funded projects: ~1986-2016
4. Scientific Officer for ONR Contract Research Program in Solar Physics: ~1986-1990
5. Co-I for the LASCO coronagraphs on SOHO: 1995-2016
6. Science Team Member for SECCHI instruments on STEREO-A & -B: 2006-2016
7. Science Team Member for Wide Field Imager for Solar Probe (WISPR): -2016
8. Mentor for summer students (10 at KPNO; 37 at NRL)
9. Visiting Research Scientist at LPL/UA: 2017-present

**Professional Societies:** AGU, IAU, AAS (Treasurer of Solar Physics Div. 1974-1977)

**Refereed Publications:** 257

**Book:** “Transient Magnetic Fields”, Neil R. Sheeley, Jr., Springer Nature, 2020.

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**Caltech Heritage Project Oral Interview (Jan. 13, 2023):**

<https://heritageproject.caltech.edu/interviews-updates/neil-sheeley>

**Awards:** Caltech Regional Prize for New England (1956)

Caltech Earle C. Anthony Scholarship (1960)

Caltech Institute Scholarships (1961-1965)

James Arthur Prize (Harvard/Smithsonian Center for Astrophysics: 1995)

E. O. Hulburt Award (NRL: 2004)

George Ellery Hale Prize (AAS Solar Physics Division: 2009)

NRL Annual Res. Pub. Awards (1975, 1978, 1982, 1986(2), 1996, 2002, 2005)

Legacy Fellow of the American Astronomical Society (2019)

N.R. Sheeley, Jr. Publications

1. "Polar Faculae During the Sunspot Cycle", Sheeley, Jr., N.R.: 1964, *Astrophys. J.* 140, 731.
2. "Measurements of Solar Magnetic Fields", Sheeley, Jr., N. R.: 1966, *Astrophys. J.* 144, 723.
3. "The Average Profile of the Solar K-Line During the Sunspot Cycle", Sheeley, Jr., N.R.: 1967, *Astrophys. J.* 147, 1106.
4. "Observations of Small-Scale Solar Magnetic Fields", Sheeley, Jr., N.R.: 1967, *Sol. Phys.* 1, 171.
5. "Correlations Between Brightness Fields and Magnetic Fields On the Sun", Sheeley, Jr., N.R., & Chapman, G.A.: 1968, in "Structure and Development of Solar Active Regions", K.O. Kiepenheuer (ed.), Reidel, Dordrecht, p161.
6. "The Photospheric Network", Chapman, G.A. & Sheeley, Jr., N.R.: 1968, *Sol. Phys.* 5, 442.
7. "The Evolution of the Photospheric Network", Sheeley, Jr., N.R.: 1969, *Solar Phys.* 9, 347.
8. "Simultaneous Measurements of Magnetic Fields and Brightness Fields Using a 4-Image Spectroheliograph", Sheeley, Jr., N.R. & Engvold, Ø.: 1970, *Solar Phys.* 12, 69.
9. "The Reduction of the Solar Velocity Field into Its Oscillatory and Slowly-Varying Components", Sheeley, Jr., N.R. & Bhatnagar, A.: 1971, *Solar Phys.* 18, 195.
10. "Measurements of the Oscillatory and Slowly-Varying Components of the Solar Velocity Field", Sheeley, Jr., N.R. & Bhatnagar, A.: 1971, *Solar Phys.* 18, 379.
11. "The Time Dependence of Magnetic, Velocity, and Intensity Fields in the Solar Atmosphere", Sheeley, Jr., N.R.: 1971, in "Solar Magnetic Fields", p. 310, R. Howard (ed.), Reidel, Dordrecht.

12. "Two-Dimensional Observations of the Velocity Field in and Around Sunspots", Sheeley, Jr., N.R. & Bhatnagar, A.: 1971, *Solar Physics* 19, 338.
13. "Using CN 3883 A Spectroheliograms to Map Weak Photospheric Magnetic Fields", Sheeley, Jr., N.R.: 1971, *Solar Physics* 20, 19.
14. "A Comparison of the Intensity Variations of the CN Photospheric and K-Line Chromospheric Network with Time", Liu, S.Y. & Sheeley, Jr., N.R.: 1971, *Solar Physics (Research Note)* 20, 2825.
15. "New Observations of Solar Magnetic and Brightness Fields", Sheeley, Jr., N.R. & Liu, S.Y.: 1972, in "Line Formation in the Presence of Magnetic Fields", p. 285, Conference Proceedings Issued by the High Altitude Observatory, Boulder, Colorado, August 30 – September 2, 1971.
16. "Time Behavior of Ca II K2v Spectral Features in Non-Magnetic Regions of the Solar Disk", Liu, S.Y., Sheeley, Jr., N.R., & Smith, E. vP.: 1972, *Solar Physics (Research Note)* 23, 289.
17. "Observations of the Horizontal Velocity Field Surrounding Sunspots", Sheeley, Jr., N.R.: 1972, *Solar Physics* 25, 98.
18. "A Preliminary Study of the Extreme Ultraviolet Spectroheliograms from Skylab", Tousey, R., Bartoe, J.-D., Scherrer, V.E., Sheeley, Jr., N.R., Schumacher, R.J., and Van Hoosier, M.E.: 1973, *Solar Physics* 33, 265.
19. "Patient Repositioning and Motion Detection Using a Video Cancellation System", Conner, W.G., Boone, M.L.M., Veomett, R., Hicks, J., Miller, R.C., Mayer, E., and Sheeley, Jr., N.R.: 1975, *Journal of Radiation Oncology, Biology, and Physics* 1, 147.
20. "Preliminary Results from the NRL/ATM Instruments from Skylab 2", Tousey, R., Bartoe, J.-D., Bohlin, J.D., Brueckner, G.E., Purcell, J.D., Scherrer, V.E., Schumacher, N.J., Sheeley, Jr., N.R., and Van Hoosier, M.E.: 1974, in "Coronal Disturbances", p. 491, ed. G. Newkirk, Jr., Reidel, Dordrecht.
21. "XUV Observations of Coronal Magnetic Fields", Sheeley, Jr., N.R., Bohlin, J.D., Brueckner, G.E. Purcell, J.D., Scherrer, V.E., and Tousey, R.: 1974, in "Flare-Related Magnetic Field Dynamics", Conference Proceedings Issued

- by the High Altitude Observatory, Boulder, Colorado, September 1974.
22. "Structure of the Sun's Polar Cap in the Wavelengths 240–600 Å", Bohlin, J.D., Sheeley, Jr., N.R., and Tousey, R.: 1975, in "Space Research XV", p. 651, ed. M.J. Rycroft, Akademie-Verlag, Berlin.
  23. "XUV Observations of Coronal Magnetic Fields", Sheeley, Jr., N.R., Bohlin, J.D., Brueckner, G.E., Purcell, J.D., Scherrer, V.E., and Tousey, R.: 1975, *Solar Physics* 40, 103.
  24. "The Reconnection of Magnetic Field Lines in the Solar Corona", Sheeley, Jr., N.R., Bohlin, J.D., Brueckner, G.E., Purcell, J.D., Scherrer, V.E., and Tousey, R.: 1975, *Astrophysical Journal (Letters)* 196, L129.
  25. "A Newly Observed Solar Feature: Macro-Spicules in He II 304 Å", Bohlin, J.D., Vogel, S.N., Purcell, J.D., Sheeley, Jr., N.R., Tousey, R., and Van Hoosier, M.E.: 1975, *Astrophysical Journal (Letters)* 197, L133.
  26. "Coronal Changes Associated with a Disappearing Filament", Sheeley, Jr., N.R., Bohlin, J.D., Brueckner, G.E., Purcell, J.D., Scherrer, V.E., Tousey, R., Smith, Jr., J.B., Speich, D.M., Tandberg-Hanssen, E., Wilson, R.M., deLoach, A.C., Hoover, R.B., and McGuire, J.P.: 1975, *Solar Physics* 45, 377.
  27. "The Calculation of Force-Free Fields from Discrete Flux Distributions", Sheeley, Jr., N.R., and Harvey, J.W.: 1975, *Solar Physics* 45, 275.
  28. "High Latitude Observations of Solar Wind Streams and Coronal Holes", Rickett, B.J., Sime, D.G., Sheeley, Jr., N.R., Crockett, W.R., and Tousey, R.: 1976, *Journal of Geophysical Research* 81, 3845.
  29. "Polar Faculae During the Interval 1906–1975", Sheeley, Jr., N.R.: 1976, *Journal of Geophysical Research* 81, 3462.
  30. "Coronal Holes, Solar Wind Streams, and Recurrent Geomagnetic Disturbances: 1973–1976", Sheeley, Jr., N.R., Harvey, J.W., and Feldman, W.C.: 1976, *Solar Physics* 49, 271.
  31. "Energy Released by the Interaction of Coronal Magnetic Fields", Sheeley, Jr., N.R.: 1976, *Solar Phys.* 47, 173. (Proc. Flare Buildup Study Workshop, Falmouth, MA, September 1975.

32. "A Pictorial Comparison of Interplanetary Magnetic Field Polarity, Solar Wind Speed, and Geomagnetic Disturbance Index During the Sunspot Cycle", Sheeley, Jr., N.R., Asbridge, J.R., Bame, S.J., & Harvey, J.W.: 1977, Solar Phys. 52, 485.
33. "An Improved Measurement of a Spectrogram of a 'Gap'", Chapman, G.A. & Sheeley, Jr., N.R.: 1977, Solar Phys. 51, 61 (Research Note).
34. "A Comparison of He II 304 A and He I 10830 A Spectroheliograms", Harvey, J.W. & Sheeley, Jr., N.R.: 1977, Solar Phys. 54, 343.
35. "Extreme Ultraviolet Observations of Coronal Holes: II. Association of Holes with Solar Magnetic Fields and a Model for Their Formation During the Solar Cycle", Bohlin, J.D. & Sheeley, Jr., N.R.: 1978, Solar Phys. 56, 125.
36. "A Survey of Coronal Holes and Their Solar Wind Associations Throughout Sunspot Cycle 20", Broussard, R.M., Sheeley, Jr., N.R., Tousey, R., & Underwood, J.H.: 1978, solar Phys. 56, 161.
37. "The Equatorward Extent of Auroral Activity During 1973-1974", Sheeley, Jr., N.R.: 1978, Solar Phys. 58, 405.
38. "Coronal Holes, Solar Wind Streams, and Geomagnetic Activity During the New Sunspot Cycle", Sheeley, Jr., N.R. & Harvey, J.W.: 1978, Solar Phys. 59, 159.
39. "Coronal Holes and Solar Magnetic Fields", Harvey, J.W. & Sheeley, Jr., N.R.: 1979, Spa. Sci. Rev. 23, 139.
40. "Impulsive Phase of Solar Flares", Kane, S.R., Crannell, C.J., Datlowe, D., Feldman, U., Gabriel, A. Hudson, H.S., Kundu, M.R., Matzler, C., Neidig, D., Petrosian, V., & Sheeley, Jr., N.R.: 1980, in "Skylab Solar Flare Workshop", P. Sturrock (ed.), Colorado Assoc. Univ. Press. Chapter 5, pp 187-229.
41. "Rapid Changes in the Fine Structure of a Coronal 'Bright Point' and a Small Coronal Active Region", Sheeley, Jr., N.R. & Golub, L.: 1979, Sol. Phys. 63, 119.

42. "The Evolution of Polar Coronal Holes", Sheeley, Jr., N.R.: 1980, Sol. Phys. 65, 229.
43. "The Contraction and Disappearance of the Polar Coronal Holes", Sheeley, Jr., N.R.: 1980, in R. Thomas (ed.), Symposium on the Study of the Solar Cycle from Space, Wellesley, MA, June 14–15, 1979, NASA Conf. Pub. 2098, pp 219–231.
44. "The Equatorial Latitude of Auroral Activity During 1972–1977", Sheeley, Jr., N.R. & Howard, R.A.: 1980, Sol. Phys. 67, 189.
45. "The Overall Structure and Evolution of Active Regions", Sheeley, Jr., N.R.: 1981, in F.Q. Orrall (ed.), "Solar Active Regions", Skylab Active Regions Monograph, Colorado Assoc. Univ. Press, Boulder, CO, Chapter 2, pp17–42.
46. "Temporal Variations of Loop Structures in the Solar Atmosphere", Sheeley, Jr., N.R.: 1980, Sol. Phys. 66, 79.
47. "Satellite Observations of the Outer Corona Near Sunspot Maximum", Michels, D.J., Howard, R.A., Koomen, M.J., & Sheeley, Jr., N.R.: 1980, in M.R. Kundu & T.E. Gergely (eds.), "Radio Physics of the Sun", IAU Symp. 86, College Park, MD, August 7–10, 1979, p439.
48. "Solar Observations with a New Earth-Orbiting Coronagraph", Sheeley, Jr., N.R., Howard, R.A., Michels, D.J., & Koomen, M.J.: 1980, in M. Dryer & E. Tandberg-Hanssen (eds.), "Solar and Interplanetary Dynamics", IAU Symp. 91, Cambridge, MA, August 27–31, 1979, p55.
49. "The Solar Mass Ejection of May 8, 1979", Michels, D.J., Howard, R.A., Koomen, M.J., Sheeley, Jr., N.R., & Rimpolt, B.: 1980, in M. Dryer & E. Tandberg-Hanssen (eds.), "Solar and Interplanetary Dynamics", IAU Symp. 91, Cambridge, MA, August 27–31, 1979, p387.
50. "Initial Observations with the Solwind coronagraph", Sheeley, Jr., N.R., Michels, D.J., Howard, R.A., & Koomen, M.J.: 1980, Astrophys. J. 237, L99.
51. "The Observation of a High-Latitude Coronal Transient", Sheeley, Jr., N.R., Howard, R.A., Koomen, M.J., Michels, D.J., & Poland, A.I.:

- 1980, *Astrophys. J.* 238, L161.
52. "The Equatorial Latitude of Auroral Activity During 1972-1977".  
Sheeley, Jr., N.R., Howard, R.A., & Dandekar, B.S.: 1980, World  
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  53. "Coronal Transient Near Sunspot Maximum", Poland, A.I., Howard, R.A.,  
Koomen, M.J., Michels, D.J., & Sheeley, Jr., N.R.: 1981, *Sol. Phys.*  
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  54. "Coronal Holes, Solar Wind Streams, and Geomagnetic Disturbances  
During 1978 and 1979", Sheeley, Jr., N.R. & Harvey, J.W.: 1981,  
*Sol. Phys.* 70, 237.
  55. "The Influence of Differential Rotation on the Equatorial Component  
of the Sun's Magnetic Dipole Field", Sheeley, Jr., N.R.: 1981,  
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  56. "The Great Solar Eruption of May 24, 1979", Sheeley, Jr., N.R.,  
Michels, D.J., Howard, R.A., & Koomen, M.J.: 1981, *Trans. Amer.*  
*Geophys. Union (EOS)* 62, 153.
  57. "The Coronal Field Lines of an Evolving Bipolar Magnetic Region",  
Sheeley, Jr., N.R.: 1982, *Astrophys. J.* 255, 316.
  58. "Magnetic Measurements of Coronal Holes During 1975-1980", Harvey,  
K.L., Sheeley, Jr., N.R., & Harvey, J.W.: 1982, *Sol. Phys.* 79, 149.
  59. "Observations of a Comet on Collision Course with the Sun", Michels,  
D.J., Sheeley, Jr., N.R., Howard, R.A., & Koomen, M.J.: 1982, *Science*  
215, 1097.
  60. "Observations of Coronal Structure During Sunspot Maximum", Sheeley,  
Jr., N.R., Howard, R.A., Koomen, M.J., Michels, D.J., Harvey, K.L.,  
& Harvey, J.W.: 1982, *Spa. Sci. Rev.* 33, 219.
  61. "The Observation of a Coronal Transient Directed at Earth", Howard,  
R.A., Michels, D.J., Sheeley, Jr., N.R., & Koomen, M.J.: 1982,  
*Astrophys. J.* 263, L101.

62. "A Magnetic Cloud and a Coronal Mass Ejection", Burlaga, L.F., Klein, L., Sheeley, Jr., N.R., Michels, D.J., Howard, R.A., Koomen, M.J., Schwenn, R., & Rosenbauer, H.: 1982, *Geophys. Res. Letters* 9, 1317.
63. "Simultaneous Radio Scattering and White Light Observations of a Coronal Transient", Woo, R., Armstrong, J.W., Sheeley, Jr., N.R., Howard, R.A., Michels, D.J., & Koomen, M.J.: 1982, *Nature* 300, 239.
64. "Coronagraph Observations of Two New Sungrazing Comets", Sheeley, Jr., N.R., Howard, R.A., Koomen, M.J., & Michels, D.J.: 1982, *Nature* 300, 239.
65. "A White Light Fe X/H-Alpha Coronal Transient Observation to 10 Solar Radii", Wagner, W.J., Illing, R.M.E., Sawyer, C.S., House, L.L., Sheeley, Jr., N.R., Howard, R.A., Koomen, M.J., Michels, D.J., Smartt, R.N., & Dryer, M.: 1983, *Sol. Phys.* 83, 153.
66. "Associations Between Coronal mass Ejections and Soft X-Ray Events", Sheeley, Jr. N.R., Howard, R.A., Koomen, M.J., & Michels, D.J.: 1983, *Astrophys. J.* 272, 349.
67. "Associations Between Coronal Mass Ejections and interplanetary Shocks", Sheeley, Jr., N.R., Howard, R.A., Koomen, M.J., Michels, D.J., Schwenn, R., Muhlhauser, K.H., & Rosenbauer, H.: 1983, in "Solar Wind 5", M. Neugebauer (ed.), NASA Conf. Pub. 2280, p693.
68. "A Quantitative Study of Magnetic flux Transport on the Sun", Sheeley, Jr., N.R., Boris, J.P., Young, Jr., T.R., DeVore, C.R., & Harvey, K.L.: 1983, *Proc. IAU Symp.* 102, "Solar and Stellar Magnetic Fields: Origins and Coronal Effects", J.O. Stenflo (ed.), August 2-6, 1982, p 273.
69. "The Correlation of Coronal Mass Ejections With Energetic Flare Proton Events", Kahler, S.W., McGuire, R.E., Reames, D.V., von Rosenvinge, T.T., Sheeley, Jr., N.R., Howard, R.A., Koomen, M.J., & Michels, D.J.: 1983, *Proc. 18th Int. Cosmic Ray Conf., Bangalore, India, Vol. 4*, p 6.
70. "The Solar Corona on 31 July 1981", Fisher, R.R., Lacey, L.B., Rock, K.A., Yasagawa, E.A., Sheeley, Jr., N.R., Michels, D.J., Howard, R.A., Koomen, M.J., & Bagron, A.: 1983, *Sol. Phys.* 83, 233.



71. "The GLE-Associated Flare of 21 August 1979", Cliver, E.W., Kahler, S.W., Cane, H.V., Koomen, M.J., Michels, D.J., Howard, R.A., & Sheeley, Jr., N.R.: 1983, Sol. Phys. 89, 181.
72. "Characteristics of Flares Producing Metric Type II Bursts and Coronal Mass Ejections", Kahler, S., Sheeley, Jr., N.R., Howard, R.A., Koomen, M.J., & Michels, D.J.: 1983, Sol. Phys. 93, 133.
73. "Coronal Transients Observed During Solar Occultation of the Helios Spacecraft in STIP Interval VIII", Bird, M.K., Volland, H., Howard, R.A., Koomen, M.J., Michels, D.J., Sheeley, Jr., N.R., Armstrong, J.W., Seidel, B.L., Stelzried, C.T., & Woo, R.: 1984, STIP Symp. on Solar/Interplanetary Intervals, M.A. Shea, D.F. Smart, & S.M.P. McKenna-Lawlor (eds.), Book Crafters, Inc., Chelsea MI, p101.
74. "Evidence For Directivity of Coronal Transients", Michels, D.J., Howard, R.A., Sheeley, Jr., N.R., & Koomen, M.J.: 1984, STIP Symp. on Solar/Interplanetary Intervals, M.A. Shea, D.F. Smart, & S.M.P. McKenna-Lawlor (eds.), Book Crafters, Inc., Chelsea MI, p319.
75. "Radio and Visible Light Observations of a Coronal Arcade Transient", Gergely, T.E., Kundu, M.R., Erskine III, F.T., Sawyer, C., Wagner, W.J., Illing, R., House, L.L., McCabe, M.K., Stewart, R.T., Nelson, G.J., Koomen, M.J., Michels, D., Howard, R., and Sheeley, N.: 1984, Solar Phys. 90, 161.
76. "The Concentration of the Large-Scale Solar Magnetic Field By a Meridional Surface Flow", DeVore, C.R., Sheeley, Jr., N.R., and Boris, J.P.: 1984, Solar Phys. 92, 1.
77. "Associations Between Coronal Mass Ejections and Metric Type II Bursts", Sheeley, Jr., N.R., Stewart, R.T., Robinson, R.D., Howard, R.A., Koomen, M.J., and Michels, D.J.: 1984, Astrophys. J. 279, 839.
78. "Magnetic Field Measurements in Tokamak Plasmas", Feldman, U., Seely, J.F., Sheeley, Jr., N.R., Suckewer, S., and Title, A.M.: 1984, J. Appl. Phys. 56, 9.
79. "Associations Between Coronal Mass Ejections and Solar Energetic Proton Events", Kahler, S.W., Sheeley, Jr., N.R., Howard, R.A., Koomen, M.J., Michels, D.J., McGuire, R.E., von Rosenvinge, T.T., and Reames, D.V.: 1984,

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  81. "Synoptic Observations of Coronal Transients and Their Interplanetary Consequences", Michels, D.J., Sheeley, Jr., N.R., Howard, R.A., Koomen, M.J., Schwenn, R., Muhlhauser, K.H., and Rosenbauer, H.: 1984, Adv. Space Res. 14, 311.
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  83. "Doppler Scintillation Observations of Interplanetary Shocks Within 0.3 AU", Woo, R., Armstrong, J.W., Sheeley, Jr., N.R., Howard, R.A., Koomen, M.J., Michels, D.J., and Schwenn, R.: 1985, J. Geophys. Res. 90, 154.
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  85. "Characteristics of Coronal Mass Ejections Associated With Solar Front-Side and Back-Side Metric Type II Bursts", Kahler, S.W., Cliver, E.W., Sheeley, Jr., N.R., Howard, R.A., Koomen, M.J., and Michels, D.J.: 1985, J. Geophys. Res. 90, 177.
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