

Curriculum Vitae

Principle Investigator: Dr. Paul R. Gazis

Education

Ph.D., Physics, Massachusetts Institute of Technology, Cambridge, MA, 1983. Thesis title: "Solar Wind Evolution". Thesis advisor: A. J. Lazarus

B.S., Physics, California Institute of Technology, Pasadena, CA, 1976

Professional Experience

NASA Ames Research Center, Moffett Field, CA, (1985-1990, Mycol Inc; 1990- 2004, SJSU Foundation; 2004-present, SETI Institute).

NASA Research Activities: Analyzed data from multiple spacecraft to characterize the morphology, evolution, and solar cycle variation of solar wind parameters and stream structure between 0.72 and 55 AU. Set limits on the longitudinal asymmetry of average solar wind parameters. Examined quasi-periodic long-term variations in solar wind parameters, cosmic ray intensity, solar EUV flux, and coronal structure. Examined structure and evolution of interplanetary shocks. Participated in workshops on coronal mass ejections, corotating interaction regions, the Solar Probe Mission, the termination shock, the Space Physics Data System, and the Interstellar Probe Mission. Developed and evaluated a broad range of AI techniques to conduct large-scale surveys of space science data.

Data Analysis Activities: Designed formats and standards for Pioneer Plasma Analyzer data. Developed software to generate, read, validate, and translate data in these and other common data formats. Built, revised, and maintained the Pioneer Plasma Analyzer Data set and associated documentation. Developed simulations and other techniques to account for instrumental effects, determine uncertainties, and identify bad data. Worked with the National Space Science Data Center, the Space Physics Data System, and the Planetary Data System to make these data available to the general scientific community. Built and maintained the ARC Plasma Group WWW site. Adapted a variety of AI techniques to conduct large-scale surveys of solar wind spectra and parameters. Developed algorithms and techniques for onboard science analysis of IR reflectance spectra by autonomous spacecraft.

MIT Lincoln Laboratory, Lexington, MA (1984-1985). Applied Artificial Intelligence and a broad range of image processing techniques to analyze range and Doppler images from infra-red laser radars.

NASA Ames Research Center, Moffett Field, CA (NRC Resident Research Associate, 1983-1984). Compared Pioneer, Voyager, and IMP observations to study the evolution of interplanetary shocks, the evolution of solar wind streams, and the large-scale structure of the heliosphere at low heliographic latitudes.

Honors and Awards

Tau Beta Pi, Sigma Xi, NRC Research Associateship

Recent Related Publications

Gazis, P. R., and A. J. Lazarus, The radial evolution of the solar wind, 1-10 AU, in *Solar Wind Five*, ed. M. Neugebauer, *NASA Conf. Pub. CP-2280*, p. 509, 1983.

Gazis, P. R., Observations of plasma bulk parameters and the energy balance of the solar wind between 1 and 10 AU, *J. Geophys. Res.*, *89*, 775, 1984.

Gazis, P. R., A. J. Lazarus, and K. Hester, Shock evolution in the outer heliosphere: Voyager and Pioneer observations, *J. Geophys. Res.*, *90*, 9454, 1985.

Gazis, P. R., Pioneer Venus and IMP 8 observations of the latitude dependence of the solar wind, *J. Geophys. Res.*, *98*, 9391, 1993.

Woo, R. and P. R. Gazis, Large-scale solar-wind structure near the sun detected by Doppler scintillation, *Nature*, *366*, 543, 1993.

Lindsay, G. M., C. T. Russell, J. G. Luhman, and P. R. Gazis, On the sources of interplanetary shocks at 0.72 AU, *J. Geophys. Res.*, *99*, 11, 1994.

Gazis, P. R., A. Barnes, J. D. Mihalov, and A. J. Lazarus, Solar wind velocity and temperature in the outer heliosphere, *J. Geophys. Res.*, *99*, 6561, 1994.

Woo, R. and P. R. Gazis, Mass flux in the ecliptic plane and near the Sun deduced from Doppler scintillation, *Geophys. Res. Lett.*, *21*, 1101, 1994.

- Gazis, P. R., Pioneer and Voyager observations of solar cycle variations in the outer heliosphere, *Geophys. Res. Lett.*, 21, 1743, 1994.
- McDonald, F. B., A. Barnes, L. F. Burlaga, P. R. Gazis, J. D. Mihalov, and R. S. Selesnick, The effects of the intense solar activity of March/June 1991 observed in the outer heliosphere, *J. Geophys. Res.*, 99, 14,705, 1994.
- Gazis, P. R., A. Barnes, and J. D. Mihalov, Pioneer and Voyager observations of large-scale spatial and temporal variations in the solar wind, *Sp. Sci. Rev.*, 72, 117, 1995.
- Woo, R., J. W. Armstrong, and P. R. Gazis, Doppler scintillation measurements of the heliospheric current sheet and coronal streamers close to the Sun, *Sp. Sci. Rev.*, 72, 223, 1995.
- Gazis, P. R., Synoptic Maps of Solar Wind Parameters from in situ spacecraft observations, , *J. Geophys. Res.*, 100,, 3383, 1995.
- Gazis, P. R., J. D. Richardson, and K. I. Paularena, Long term periodicity in solar wind velocity during the last three solar cycles, *Geophys. Res. Lett.*, 22, 1165, 1995.
- Gazis, P. R., Limits on Deceleration and Asymmetry of Solar Wind Speed, *Geophys. Res. Lett.*, 22, 2441, 1995.
- Barnes, A., P. R. Gazis, and J. L. Philips, Constraints on solar wind acceleration from Ulysses plasma observations: The first polar pass, *Geophys. Res. Lett.*, 22, 3309, 1995.
- Gazis, P. R., Long-term enhancements in Solar Wind Speed, *J. Geophys. Res.*, 101, 415, 1996.
- Gazis, P. R., Solar cycle variation in the heliosphere *Rev. Geophys.*, 34(4), 379, 1996.
- Richardson, J. D., J. W. Belcher, A. J. Lazarus, K. I. Paularena, and P. R. Gazis, Statistical properties of the solar wind, in *Solar Wind Eight*, ed. D. Winterhalter, J. T. Gosling, S. R. Habbal, W. S. Kurth, and M. Neugebauer, AIP Press, Woodbury, N. Y., p. 483, 1996.
- Gazis, P. R., J. D. Richardson, and K. I. Paularena, Long-term velocity enhancements in the solar wind, in *Solar Wind Eight*, ed. D. Winterhalter, J. T. Gosling, S. R. Habbal, W. S. Kurth, and M. Neugebauer, AIP Press, Woodbury, N. Y., p. 490, 1996.
- Richardson, J. D., J. W. Belcher, A. J. Lazarus, K. I. Paularena, P. R. Gazis, and A. Barnes, Plasma in the outer heliosphere, in *Solar Wind Eight*, ed. D. Winterhalter, J. T. Gosling, S. R. Habbal, W. S. Kurth, and M. Neugebauer, AIP Press, Woodbury, N. Y., p. 586, 1996.
- Gazis, P. R., Limits on longitudinal asymmetries and deceleration of the solar wind in the outer heliosphere, in *Solar Wind Eight*, ed. D. Winterhalter, J. T. Gosling, S. R. Habbal, W. S. Kurth, and M. Neugebauer, AIP Press, Woodbury, N. Y., p. 642, 1996.
- Gazis, P. R., The Latitudinal Structure of the Solar Wind in the Vicinity of the Solar Equator Near Solar Minimum: 1986 and Predictions for 1997, *Geophys. Res. Lett.*, 24, 627, 1997.
- Gazis, P. R., Limits on the asymmetry of solar wind temperature in the outer heliosphere , *J. Geophys. Res.*, 102, 24,195, 1997.
- Mihalov, J. D. and P. R. Gazis, Interstellar pickup hydrogen observations at large heliocentric distances, *Geophys. Res. Lett.*, 25, 241, 1998.
- Gazis, P. R., CIRs in the outer heliosphere, in *Solar Wind 9*, ed S. H. Habal, R. Esser, J. V. Hollweg, *AIP Conference Proceedings 471*, 767, 1999.
- Gazis, P. R., and F. B. McDonald, Corotating interaction regions in the outer heliosphere: Report of Working Group 4, *Sp. Sci. Rev.*, 89, 269, 1999.
- Gazis, P. R., CIRs and their successors in the outer heliosphere, *J. Geophys. Res.*, 105, 19, 2000.
- Gazis, P. R., and T. Roush, Autonomous identification of carbonates using near-IR spectra, *J. Geophys. Res.* 106, 7765-7773, 2001.
- Gazis, P. R., Artificial intelligence techniques for the onboard analysis of space science data , in *Proceedings of the 2000 COSPAR Colloquia on "The Outer Heliosphere: The Next Frontiers"*, Elsevier, Netherlands, 2001.
- Gazis, P. R., A. Balogh, S. Dalla, R. Decker, B. Heber, T. Horbury, A. Kilchenmann, J. Kota, H. Kucharek, H. Kunow, D. Lario, M. S. Potgieter, J. D. Richardson, P. Riley, L. Rodriguez, G. Siscoe, and R. Von Steiger, ICMEs at High Latitudes in the Outer Heliosphere: Report of Working Group G, , *Sp. Sci. Rev.*, 123, 417-451, 2006.