Title.
  Tukey, John Wilder

Dates.
  Born: New Bedford, Mass. 16 June 1915
  Died: New Brunswick, N. J. 26 July 2000

Biographical Details.
  Parents: Adah M. Tasker and Ralph H. Tukey
  Spouse: Elizabeth Rapp

Education.
  Brown University (B.Sc., M.Sc. Chemistry) 1933-1937
  Princeton (M.A., Ph.D. Mathematics) 1937-1939

Major awards.
  1938-39 Jacobus Fellowship, Princeton University
  1949-50 Guggenheim Fellow
  1958 Wald Lecturer, Institute of Mathematical Statistics ``The mathematical foundations of fiducial inference''
  1961 Member, National Academy of Sciences
  1962 Member, American Philosophical Society
  1964 Member, American Academy of Arts and Sciences
  1965 S. S. Wilks Medal, American Statistical Association ``... for his contributions to the theory of statistical inference, his development of procedures for analyzing data, and his influence on applications of statistics in many fields.''
  1956 Statistician of the Year, American Statistical Association Chicago Chapter
  1967 Fisher Lecturer, ``Some perspectives on data analysis''
  1973 National Medal of Science ``For his studies in mathematical and theoretical statistics, and for his outstanding contributions to the applications of statistics to the physical, social and engineering sciences.''
  1975 Hitchcock Lecturer, University of California, Berkeley
  1975 Scott Lecturer, Cambridge University, England
  1977 Shewhart Medal, American Society for Quality Control
  1982 Medal of Honor of the IEEE, ``For his contributions to the spectral analysis of random processes and the fast Fourier transform algorithm.''
  1982-3 Deming Medal, American Society for Quality Control
  1984 James Madison Medal, Princeton University
  1991 Foreign Member, Royal Society of London
  1989 Monie A. Ferst Award, Sigma Xi
  1990 Educational Testing Service Award ``Distinguished service to measurement''
  1999 M. Zelen Leadership Award, Harvard

Honorary Doctorates..
  1962 Case Institute of Technology
  1965 Brown University

1968 Yale University
1969 University of Chicago
1978 Temple University
1998 Princeton University
1999 University of Waterloo

Professional societies.
  National Academy of Sciences
  American Philosophical Society
  American Academy of Arts and Sciences
  American Statistical Association
  Institute of Mathematical Statistics
  Royal Statistical Society
  Royal Society of London

Astronomical Contribution and Significance

  Abstract
The entry provides a brief description of John Tukey's impact on astronomy via a paper with Lyman Spitzer and his development of statistical methods particularly suitable to astronomy.References that are typical of those in the literature are provided.

  John Tukey was renowned for research and service to each of academia, industry, and government and in particular worked with \and influenced renowned astronomers. A literature search displays that Tukey's statistical methods are continually employed in astronomical data analyses. He re-energized the field of descriptive statistics, for example as presented in Trumpler and Weaver.

   An apt beginning is to note that the Princeton Professors M. Schwartzschild, L. Spitzer, and J. Wheeler met regularly with Tukey for lunch in the 1950s to share their ideas on science. They called their group the "Chowder and Marching Society" There is a 1951 Spitzer and Tukey paper on the polarization of interstellar waves.
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   That last is perhaps the one paper appearing in the astronomy literature, but Tukey reached out to astronomers though his statistical work. Amongst other things he created and publicized: robust methods, exploratory data analysis, dynamic graphics, boxplots, stem and leaf plots, a fast Fourier transform, and an effective numerical spectrum estimation procedure that extends to multivariate and higher order cumulants. Tukey's spectrum analysis shows its importance itself through the many citations to the Blackman-Tukey book and to the Cooley and Tukey version of a Fast Fourier Transform.

Selected References.

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Feigelson, E. D. and Babu, G. J., eds. (1992). Statistical Challenges in Modern Astronomy. Springer, New York.

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Muller, R. A. and McDonald, G. J. (2002) Ice Ages and Astronomical Causes: Data Spectral Analysis and Mechanisims. Springer (Blackman-Tukey)

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Spitzer, L. Jr. and Tukey, J. W. (1951). A Theory of Interstellar Polarization," *Ap.J.* **114**, 187-205
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Trumpler, R. J. and Weaver, H. F. (1953). Statistical Astronomy. Dover, New York. (descriptive statistics).

Wood, J. H., Irwin, M. J. and Pringle, J. E. (1985) A digital technique for the separation of the eclipses of a white dwarf and an accretion disc. Mon. Not. R. astr. Soc.  214, 475479. (median filtering)

Author.
   David R. Brillinger

Affiliation.
   Statistics Department, University of California, Berkeley

John W. Tukey



http://www-history.mcs.st-andrews.ac.uk/BigPictures/Tukey.jpeg

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