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(b. Pittsburgh, Pennsylvania, 19 June 1902; d. Englewood, [New Jersey](#), 24 August 1971)

*celestial mechanic, computation.*

Raised on a dairy farm in Albion, Pennsylvania, Eckert was the second of four sons born to John and Anna Heil. He received his A.B. from [Rutgers College](#) in 1925, his M.A. from Amherst in 1926, and his Ph.D. in astronomy from Yale in 1931. He joined the department of astronomy at [Columbia University](#) as assistant instructor in 1926 and rose through the ranks to become professor of celestial mechanics.

Eckert was familiar with Comrie's adaptation of serial machines to perform scientific computation, and at Columbia he applied this technique to astronomical calculations. In 1928, using punched-card equipment donated by Thomas J. Watson, Sr., of IBM, Ben Wood founded the [Columbia University](#) Statistical Bureau. From 1929 to 1933, with the encouragement of Wood and the philanthropy of Watson, Eckert established the T. J. Watson Astronomical Computing Bureau, which was operated as a joint effort of Columbia University, the American Astronomical Society, and IBM. His equipment consisted of an IBM 601 multiplying punch, a credit-balancing accounting machine, and a summary punch controlled by a pluggable relay box taken from Wood's statistical tabulator. This gave him the capability of mechanical reading, writing, and arithmetic for scientific computation.

From 1940 to 1945 Eckert was the director of the U.S. Nautical Almanac Office at the Naval Observatory in Washington, D.C. It was there that he introduced machine methods in the production of the observatory's *American Ephemeris and Nautical Almanac*. In 1940, as director of the U.S. Nautical Almanac Office, he designed and developed the American Air Almanac, which began continuous publication in 1941 and proved to be a vital navigational aid during [World War II](#).

Watson invited Eckert to join IBM in 1944 as director of a newly created department of pure science. Eckert proposed that the goals of the department could best be accomplished by the establishment of a research center at Columbia University. Watson agreed, and in March 1945 Eckert returned to Columbia as director of the Watson Scientific Computing Laboratory. In the same year Eckert began working on the logical design of a general-purpose computer. Under the engineering supervision of Frank Hamilton, IBM Selective Sequence Electronic Computer (SSEC) was completed and dedicated in January 1948. Using the SSEC, Eckert, Dirk Brouwer (Yale), and G. M. Clemence (U.S. Naval Observatory) computed precise positions of Jupiter, Saturn, Uranus, and Pluto at forty-day intervals over a span of four centuries (1653-2060). In the early 1950s Eckert supervised the design and construction by IBM of the Naval Ordnance Research Calculator (NORC), which was the world's most powerful electronic computer when completed in 1954.

Eckert made some of his most significant contributions in predictive data and theory related to the orbital motion of the moon. In the first two decades of this century E. W. Brown of Yale had laboriously computed the predicted coordinates of the position of the moon. He subsequently published a lunar ephemeris and developed a basic theory and procedure for predictive computation. At the Columbia Computing Laboratory, Eckert used his machine capability to check Brown's tables and found them to be error-free. Later, first on the SSEC and then on the NORC, Eckert returned to Brown's theory to improve the predictive accuracy of data concerning the motion of the moon. This work, which revived Brown's theory and resulted in significantly improved lunar data, provided the basis for the orbital calculations of various NASA moon programs.

Eckert retired from IBM in 1967 and from Columbia University in 1970. He was awarded an honorary doctorate of science by [Oberlin College](#) (1968), and in 1968-1969 he was a visiting professor of astronomy at [Yale University](#). Other honors included the [James Craig Watson Medal](#) of the [National Academy of Sciences](#) (1966) and appointment as an IBM fellow (1967).

## BIBLIOGRAPHY

I. Original Works. Eckert's publications include "The Computation of Special Perturbations by the Punched Card Method," in *Astronomical Journal* 44 (1935), 177-184; "The Astronomical Hollerith-Computing Bureau," in *Publications of the Astronomical Society of the Pacific*, 49 (1937), 249-253; *Punched Card Methods in Scientific Computation* ([New York](#), 1940); "Air Almanacs" in *Sky and Telescope*, 4 (1944), 5-8; "The Printing of Mathematical Tables," in *Mathematical Tables and Other Aids to Computation*, 2 (1947), 197-202, written with R. F. Haupt; "Punched Card Techniques and Their Application to Scientific Problems," in *Journal of Chemical Education*, 24 (1947), "54-58; and" "The IBM Selective Sequence Electronic Calculator," *IBM Publications No. 52-3927-2* (1948).

Other works include *Coordinates of the Five Outer is*, 1653-2060, vol. XII of *Astronomical Papers Prepared for the Use of the American Ephemeris and Nautical Almanac* (Washington, D.C., 1951), written with D. Brouwer and G. M. Clemence; *Faster, Faster* ([New York](#), 1955), written with Rebecca Jones; "Com-puting in Astronomy;" in Preston C. Hammer, edk *The Computing Laboratory in the University* (Madison, Wis., 1957), 43-50; "Planetary Motions and the Electronic Calculator;" in Harlow S hap ley, ed., *Source Book in Astronomy 1900-1950* (Cambridge, Mass.. 1960), 93-102, written with G. M. Clemence and D. Brouwer; "On the Motions of the Perigee and Node and the Distribution of Mass in the Moon," in *Astronomical Journal*, **70** (1965), 787-792; "Transformations of the Lunar Coordinates and Orbital Parameters" *ibid.*, **71** (1966), 314-332, written with M. J. Walker and Doroert; "The Literal Solution of the Main Problem of the Lunar Theory," *ibid.*, **72** (1967), 1299-1308, written with D. Eckert; "The Motion of the Moon" (IBM Watson Laboratory, Columbia University, N.Y., 1967), a fourteen-page MS; and *The Solution of the Main Problem of the Lunar Theory by the Method of Airy* (Washington. D.C., 1970). written with H. F. Smith. Jr.

II. Secondary Literature. Jean Ford Brennan, *the IBM Watson Laboratory of Columbia University; A History* (Armonk, N.Y., 1971), contains considerable information on Eckerfs accomplishments from 1928 to 1970. See also Eleanor krawitz. "The Watson Scientific Computing Laboratory." in *Columbia Engineering Quarterly* (Nov. 1949); Paul Herget, "The Minor Planet Center at the Cincinnati Observatory" in *Bulletin of the Cincinnati Historical Society*, **24** (1966), 175-187, which discusses Eckert's contributions; "Wallace Eckert," a six-page unpublished document (signed by Martin C. Gutzwiller, Watson Laboratory, 18 Sept. 1969), which discusses Eckert's pioneering role in scientific calculations; "Most Precise Computation of Moon's Orbit Completed," a fourteen-page **IBM** press release dated 14 Apr. 1965; [Thomas Watson, Sr.](#)'s speech at the NORC dedication (2 Dec. 1954), 7- 11, which contains a discussion of the early vision and accomplishment of Eckert and Ben Wood; and "Giant Calculator Joins the Navy," in *Business Machines* (23 Dec. 1954), 4-9, a description of NORC, with photographs of the computer and dignitaries, including John von Neumann, who also gave an address on that occasion (see A. H. Taub, ed., *John von Neumann:Collected Works*, V [New York, 1963], 238-247).

See also J. Ashbrook, "A Great American Astronomer;" in *Sky and Telescope*, **42** (1971), 207; "W. J. Eck j ert: In Memoriam," in *Celestial Mechanics*, **6** (1972), 2- 3; William M. Freeman. "Dr. Wallace Eckert Dies at I 69; Tracked Moon with Computer," in *New York Times* (25 Aug. 1971), 41; and *IBM News*, **8** , no. 18 (Sept. 1971), which contains an unsigned obituary notice. Each of these obituaries includes a photograph.

Other sources include Eckert's widow, Mrs. Dorothy Applegate Eckert, who granted a personal interview and also helped in my perusal of her husband's papers, on many of which she had collaborated; and the IBM Corporation, which made available copies of corporate publications, a thirty-five-item bibliography, two taped interviews with Eckert conducted by Larry Saphire on 11 July 1967 and 20 July 1967, and access to the exhibit on Eckert prepared by the office of [Charles Eames](#).

Henry S. Tropp