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Photo courtesy Tor House Foundation

Jeffers, Hamilton Moore

Born Sewickley, Pennsylvania, USA, 13 October 1893

Died Carmel, California, USA, 28 May 1976

Hamilton Moore Jeffers was an astrometrist who measured precise positions of comets, asteroids, planetary satellites, and binary stars. He started his career with visual observations with the meridian circle and long focal-length refractors and ended it with catalogues of double stars, including a record of the world's observations on punched cards.

Jeffers was the second son of William Hamilton Jeffers (1838–1914), a professor of biblical history and Presbyterian minister, and his second wife, Annie Robinson Tuttle (1860–1921). He spent most of his first nine years in Europe, where he and his brother were taught in German or French in a succession of schools. When he was ten, his father retired and moved the family to the Los Angeles area. After graduation from Pasadena High School, Jeffers briefly attended what is now the California Institute of Technology (then called the Throop College of Technology)

and then transferred to the University of California (Berkeley), where he earned his A.B. in 1917 and his Ph.D. four years later.

Spending much of his time at the University's Lick Observatory, Jeffers observed comets and asteroids and computed their ephemerides. Upon receiving his Ph.D., he took a faculty position at Iowa State University, but he was eager to return to California. Lick's Associate Director **Robert Aitken** hired him in 1924 as an assistant astronomer to "... take charge of such comet and asteroid work as may develop and, during the first year, to assist in the radial velocity observations to the extent ... two half-nights a week. ... let me say that Dr. [Richard H.] Tucker will probably retire within a year or two. When he does, we shall have to provide for the continuation of the meridian circle work."

Jeffers did take over the meridian circle work and soon became one of the world's leading practitioners of it, measuring positions of reference stars for **Frank Schlesinger's** photographic cataloguing at Yale. But this kind of measurement was becoming obsolete and was discontinued at Lick in the 1930s. Jeffers became an expert in shortwave radio and in timekeeping, and he showed that the previously adopted longitude of Lick's instrument was off by 145 feet (44 meters).

Jeffers measured the positions of a great many comets and asteroids and computed orbits for some, using the electromechanical calculators of the time. His observations are among the most numerous of those listed in a catalog of comets observed in 1933–1959. Using the 36-inch (0.9-meter) Crossley reflector, he often obtained the crucial recoveries of comets with uncertain orbits and the last position measurements as they went away.

Jeffers used the 36-inch (0.9-meter) Lick refractor to take excellent photos of Mars during its best oppositions and provided them freely to all who asked. He served the Astronomical Society of the Pacific as president in 1938 and as secretary-treasurer in 1965–1968.

Jeffers was an early ham radio operator and pilot, flying a series of his own planes starting about 1930. (An annuity from his father's estate provided an income almost equal to his salary in his early years at Lick.) When he went to a meeting of the American Astronomical Society or to visit observatories in the eastern United States, he asked for train fare but noted that he would be traveling in his own plane to minimize his time away from his observatory duties.

In 1940, Jeffers offered his services to the Navy, preferably as a pilot, but he was rejected as too old. After the United States entered World War II, he spent two years at the Massachusetts Institute of Technology, helping to develop radar and using his own plane as a target for testing. He then secured a position as an operations analyst with the Army Air Force and served in Alaska and in India, where he prepared target plans for visual and radar bombing missions, including the first air strikes over Japan from bases in China. Upon receiving an acknowledgement of services after the war, he replied that his conscience troubled him in accepting it, as he had "thoroughly enjoyed" his war work.

Aitken retired in 1935 but continued for several more years to maintain the enormous collection of observations of double stars started by **Sherburne Burnham**, each observation on a handwritten card. Eventually Jeffers took it over. He added greatly to the collection, and his use of an eyepiece interferometer allowed more precise measurements than Aitken's. Jeffers became, along with **George Van Biesbroeck** at Yerkes, **Ejnar Hertzsprung** at Leiden, and **Willem van den Bos** at Johannesburg, one of the world's leading observers and measurers of double star systems. The work was straightforward. Find a pair of stars close together, measure their separation, and measure the angle between the line joining the two and a line joining the brighter with the north celestial pole. Repeat over the years and hope to find that the stars are a true

binary system, with each orbiting the center of mass of the pair, and not a chance projection with one star far beyond the other. The goal was to determine the orbital parameters of binary systems, and from them the masses of the stars.

By the early 1950s Jeffers had decided to put all of the observations on punched cards, and in 1954 he was awarded a National Science Foundation grant of \$15,500 for four years for “Preparation of a Punched Card File of Double Star Measures.” He supervised the keypunching, most of it done by Frances M. “Rete” Greeby, and he collected observations from the world’s observers. Eventually he extended the catalogue back to 1927, the closing year of Aitken’s famed double star catalogue. He joined forces with van den Bos, with the latter providing similar data for stars south of declination -20° . Van den Bos eventually furnished data for about 50,000 cards, and they were keypunched at Lick in the same format as the 95,000 cards for some 18,000 northern star systems. It became clear that to publish all this on paper would be too much, so Jeffers decided to have two catalogues: an *Index Catalogue* with just basic data and two observations per binary system, to be published as a book, and the collections of cards, to be usable by the few electronic computers available at the time. He envisioned three sets of the cards, one each at Lick and Johannesburg, and one in Europe.

Jeffers wanted the card catalogue to remain at Lick after his retirement, and urged the appointment of another “double star man” as his replacement. When it became clear that new director **Albert Whitford** wanted to take advantage of the recently-completed 120-inch (3-meter) reflector, then the world’s second largest telescope, to emphasize modern astrophysics at the venerable observatory, Jeffers campaigned hard to keep the catalogue out of the hands of **Kaj Strand** of the United States Naval Observatory [USNO]. He lost the battle, but at about this time Strand was promoted to scientific director, and the catalogue was taken over by Charles Worley (1935–1997), who had recently worked at Lick. Worley and his successors at the USNO have stewarded the catalogue and its successors ever since, and today all data are online.

Jeffers retired in 1961, but was hired back part-time to supervise the completion of the *Index Catalogue*, which was published in 1963 as volume 21 of the Publications of the Lick Observatory. His other final project was the preparation for publication of some 900 remaining photographic double star positions, most of which were measured by Hertzsprung, who had retired to Denmark but was eager to continue working. The work was finally completed by Jeffers’ one-time assistant, Stanislaus Vasilevskis, and published two years after Jeffers’ death.

Jeffers was married twice, both times to Lick Observatory secretaries. His 1925 marriage to Gladys Wallace (1898–1961) ended in divorce, but his 1950 marriage to Bobbe De Vore (1918–1991) was a happy one that lasted until his death. He had no children. He was a polite, reserved, and very private person who never sought publicity. Besides flying and ham radio, he enjoyed playing his organ, photography, and puttering around the little house he bought near the beach in Carmel in 1950. It was just a few kilometers from the home of his brother, the well-known poet J. Robinson Jeffers (1887–1962), although the brothers were never personally close. He and Bobbe spent their weekends there, and they lived there in retirement, across the dirt road from photographer Ansel Adams. Jeffers was very conservative both personally—he always wore a coat and tie to the telescope, and most of his colleagues addressed him formally—and politically—in correspondence he railed against the rebellious youth of the 1960s and 1970s.

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