

James Gilbert Baker

1914-2005

Dr. James Gilbert Baker, renowned astronomer and optical physicist, died June 29, 2005, at his home in Bedford, N.H., at the age of 90. In addition to making scientific contributions to the field of astronomy, Jim designed hundreds of optical systems that supported astronomy, aerial reconnaissance, instant photography and the U.S. space program.

Jim was born in Louisville, Ky., on Nov. 11, 1914. He attended the University of Louisville, where he majored in mathematics. While at the University, he built mirrors for his own telescopes and helped form the Louisville Astronomical Society in 1931. He did his graduate work in astronomy at the Harvard Col-

lege Observatory. After receiving his Master's degree, he was appointed a junior fellow in the prestigious Harvard Society of Fellows from 1937 to 1943. He received his Ph.D. in 1942.

During the first stage of his career at the Harvard Observatory, Jim collaborated with Donald H. Menzel, Lawrence H. Aller and George H. Shortley on a landmark set of papers on the physical processes in gaseous nebulae. He helped design astronomical instruments with ever greater resolving powers and wide-angle acceptance. He is well known for helping design the Baker-Schmidt telescope and the Baker Super Schmidt meteor camera. In 1945, he co-authored with George Z. Dimitroff a book titled *Telescopes and Accessories*. In 1948, he received an honorary doctorate from the University of Louisville.

With the start of World War II, the U.S. Army Col. George W. Goddard recruited Jim on the recommendation of Dr. C.E. Kenneth Mees of Eastman Kodak. Goddard was impressed by Jim's originality in optical design and provided him a small army research contract in early 1941 for a wide-angle camera system. Goddard's "Victory Lens" project began on May 20, 1942. Jim risked his life operating cameras on test flights with aircraft that

Jim with his 40-inch f/5 telephoto lens, 1944. About 500 of these lenses were made.



Baker in 1948, the year he received the Presidential Medal for Merit.

carried the camera systems in unpressurized compartments.

He directed the Observatory Optical Project at Harvard University from 1943 to 1945—the same time he began his long consulting career with the Perkin Elmer Corporation. When the war ended, Harvard ceased defense-related projects and Jim's lab was moved to Boston University. However, Jim remained an associate professor and research associate at Harvard from 1946 to 1949. In 1948, he received the Presidential Medal for Merit for his work during World War II.

In 1948, he moved to Orinda, Calif., and became a research associate of Lick Observatory. He returned to Harvard in 1950. He had spent thousands of hours doing ray trace calculations on a Marchant calculator to produce his first aerial cameras. He introduced numerical computers in optics to obviate the need to perform tedious calculations by hand.

For most of his career, Jim was involved with large system concepts covering not only the camera, but camera delivery systems. As the chairman of the U.S. Air Force Scientific Advisory Board, Jim recognized that, in order to conform with national security requirements, he



would need to create optical designs of even greater resolving power using aircraft at extreme altitudes. Consequently, he developed the U-2 system, which consisted of a plane and camera functioning as a unit to create panoramic high-resolution aerial photographs. By 1958, he was almost solely responsible for all cameras used in photoreconnaissance aircraft. He continued to serve on the President's Foreign Intelligence Advisory Board and on the Land Panel.

Before the launch of Sputnik, he designed the Baker-Nunn satellite-tracking camera to support the Air Force's early satellite tracking and space surveillance networks. Because of his foresight, cameras were in place to track the satellite in October 1957. The cameras allowed the precise orbital determination of orbiting spacecraft for more than three decades.

Jim continued to advise top government officials as reconnaissance

systems evolved during the 1960s and 1970s. He received a Space Pioneer Award from the U.S. Air Force and the Pioneers of National Reconnaissance Medal in 2000.

Around 1968, he undertook a consulting contract with the Polaroid Corporation after Dr. Edwin Land persuaded him to design the optical system for his new SX-70 Land Camera. He also developed the Quintic focusing system for the Polaroid Spectra Camera, which used a revolutionary combination of non-rotational aspherics to achieve focusing function.

He became a fellow of the Optical Society of America (OSA) in 1958. In 1960, he was elected president of the Society for one year in 1960, and he helped to establish the journal *Applied Optics*. He has been honored with the Adolf Lomb Award, Ives Medal, Fraunhofer Award and Richardson Award. He was made an honorary OSA member in 1993. He

also received the 1978 Gold Medal—SPIE's highest award—and the Franklin Institute's Elliott Cresson Medal.

Jim was a member of the National Academy of Sciences, the American Philosophical Society, the American Academy of Arts and Sciences and the National Academy of Engineering. He was also a member of the American Astronomical Society, the International Astronomical Union and the Astronomical Society of the Pacific. He authored numerous professional papers and has more than 50 U.S. patents.

He maintained his affiliation with Harvard Observatory and the Smithsonian Astrophysical Observatory until he retired in 2003. Even after his retirement, he continued work at his home on a new telescope design. He is survived by his wife, his four children and their families.

— Neal K. Baker and Stephen D. Fantone

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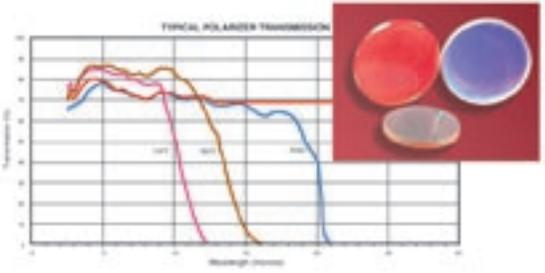
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