



National Aeronautics and  
Space Administration  
**Jet Propulsion Laboratory**  
California Institute of Technology  
Pasadena, California

# Lyman Spitzer, Jr.

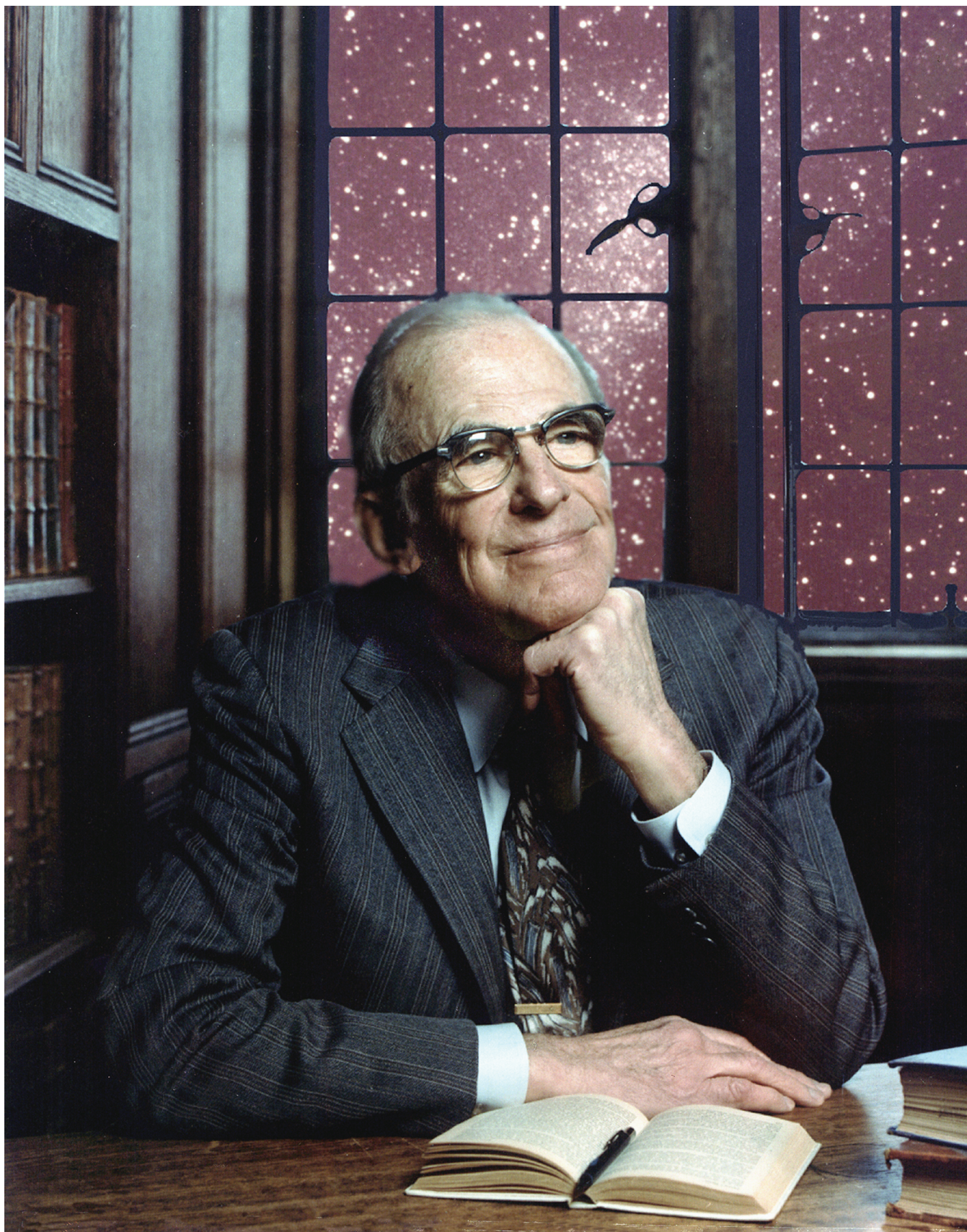


Photo: Denise Applewhite, Princeton University



Lyman Spitzer, Jr. (1914-1997) was a world-renowned theoretical scientist whose research spanned such broad areas as interstellar matter, star clusters, and plasma physics. However, his most enduring legacy may be his vision of placing large astronomical telescopes in space, more than a decade before any payload had been placed in Earth orbit.

Spitzer was born on June 26, 1914 in Toledo, Ohio. He earned his Bachelor's degree in physics from Yale University, and his Master's and Doctorate degrees in astrophysics at Princeton University while working under the direction of the noted astronomer Henry Norris Russell. Spitzer joined the Yale faculty at the age of 25.

In 1946, more than a decade before the first satellite was launched into space and twelve years before the birth of the National Aeronautics and Space Administration (NASA), Spitzer proposed that an astronomical observatory be placed in space. Such an orbiting telescope would be above the obscuring effects of our atmosphere, and be capable of detecting a wide range of wavelengths. Another advantage of an orbital telescope is that it could yield much clearer images, of even very distant celestial objects, than any ground-based telescope. Spitzer wrote a paper entitled "Astronomical Advantages of an Extra-Terrestrial Observatory" which described in detail the advantages of placing a telescope in space. He would work for the next 50 years on making this vision a reality.

In 1947, Spitzer Jr. was appointed chairman of Princeton's astrophysical sciences department and became the director of the Princeton Observatory. He was instrumental in building the department into a major research facility. While at Princeton, Spitzer made many contributions to the field of astrophysics. He was among the first researchers to investigate the interstellar medium – the gas and dust between the stars from which new stars are formed. Spitzer studied interstellar dust grains and magnetic fields, as well as the evolution and

motions of star clusters. He studied regions of star formation and was among the first to suggest that bright stars in spiral galaxies formed recently from gas and dust. He also accurately predicted the existence of a hot galactic halo surrounding our Milky Way galaxy.

With the development of the U.S. space program in the 1960's, the promise of Spitzer's vision could start to be realized. In 1962, he led a program to design an observatory to orbit the Earth and study the ultraviolet light from the cosmos, which is normally blocked by our atmosphere. This observatory, NASA's successful Copernicus satellite, operated from 1972 to 1981.

In 1965, the National Academy of Sciences established a committee to define the scientific objectives for a proposed Large Space Telescope. Spitzer was selected to head this committee. He worked tirelessly to convince the scientific community, and Congress, of the advantages of placing a large telescope in space. His work and advocacy were essential in efforts to convince Congress, in 1977, to approve funding for the design and development of a large orbiting telescope. The Hubble Space Telescope was launched into space aboard a Space Shuttle in 1990, and has since become one of the most productive scientific instruments in history. More than half a century after Spitzer's vision, dozens of telescopes have been placed in space and opened our eyes to the splendors of the Universe.

On August 25, 2003, NASA launched into space the final element of its Great Observatories program. The observatory consists of a large and lightweight telescope, and three cryogenically-cooled science instruments capable of studying the Universe at near- to far-infrared wavelengths. Incorporating state-of-the-art infrared detector arrays, and launched into an innovative Earth-trailing solar orbit, the observatory is orders of magnitude more capable than any previous space-borne infrared telescope. NASA has named this new facility the Spitzer Space Telescope to honor the vision and contributions of Lyman Spitzer, Jr.