Resources

World Wide Web Resources

Dust
Model of interstellar dust grains
http://antwrp.gsfc.nasa.gov/apod/ap961119.html

Infrared Light
Excellent infrared light resource and activities
http://www.spitzer.caltech.edu/EPO/

Spitzer Space Telescope
http://www.spitzer.caltech.edu/

Metric information and conversions
National Institute of Standards and Technology
http://ts.nist.gov/ts/htdocs/200/202/metrsty3.htm

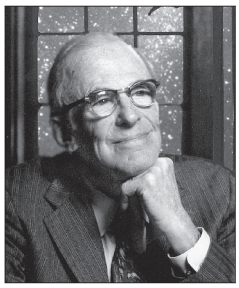
Books

The Secret Life of Dust: From the Cosmos to the Kitchen Counter, the Big Consequences of Little Things by Hannah Holmes, ISBN: 0471377430

Grades K - 2
The Planets in Our Solar System (Let's Read and Find out About Science, stage 2) by Franklyn Branley, ASIN: 006027770X
The Planets by Gail Gibbons, ISBN: 0823410404
What is the World Made of?: All about Solids, Liquids, and Gases by Kathellen Weidner Zoehfeld, ISBN: 0060271442

Grades 3 - 6
How the Universe Works by Heather Couper and Nigel Henbest, ISBN: 089577576X
Universe (Eyewitness Books) by Robin Kerrod
ISBN: 078949549X
Nebulae by Gregory Vogt ISBN: 0739831089

About Lyman Spitzer



Lyman Spitzer, Jr. (1914-1997) was one of the twentieth century's great scientists. A renowned astrophysicist, he made major contributions in the areas of stellar dynamics, plasma physics, thermonuclear fusion, and space astronomy. He was the first person to propose the idea of placing a large telescope in space and was the driving force behind the development of the Hubble Space Telescope.

Born June 26, 1914 in Toledo, Ohio, Spitzer attended Yale University. He earned a PhD in astrophysics from Princeton University in 1938, and joined the Yale faculty in 1939.

In 1946, more than a decade before the first satellite was launched into space and 12 years before NASA was formed, Spitzer proposed that an observatory be placed in space where it would be able to detect a wide range of wavelengths and not have to deal with the blurring effects of our atmosphere. He proposed that a telescope in space would reveal much clearer images, of even far-off objects, than any ground-based telescope. He worked for the next 50 years to realize his vision.

With the development of the U.S. space program in the 1960's, Spitzer's idea was finally beginning to look more promising. In 1962, he led a program to design an observatory which would orbit the Earth and study the ultraviolet light from space, which is normally blocked by our atmosphere. This observatory became NASA's successful Copernicus satellite.

In 1965, the National Academy of Sciences established a committee to define the scientific objectives for a proposed Large Space Telescope. Spitzer was chosen to head this committee. Many astronomers did not support the idea of a space telescope and were concerned that the cost would reduce support for ground-based astronomy. Spitzer put great effort into convincing the scientific community, as well Congress, of the great value of placing a large telescope into space. In 1968, Spitzer's dream began to come true, with the launch of the highly successful Orbiting Astronomical Observatory.

The Hubble Space Telescope was delivered into space in 1990, 54 years after Spitzer first proposed placing a large telescope into space. Lyman Spitzer, Jr. passed away on March 31, 1997 at the age of 82. On August 25, 2003, NASA launched the Spitzer Space Telescope.

About the Poster Image

Some of the most massive stars in our galaxy are forming in this stellar nursery, called DR21, located 6,200 light-years away in the constellation Cygnus, the swan. These young stars are hidden behind a shroud of dust — they can't be seen in visible light. Images from NASA's Spitzer Space Telescope allow us to peek behind the cosmic veil and pinpoint one of the most massive newborn stars yet seen in our Milky Way galaxy. The never-before-seen star is 100,000 times as luminous as the Sun. Also revealed for the first time is a powerful outflow of hot gas emanating from this star and bursting through a giant cloud of gas and dust.

The image was assembled from data collected at a variety of wavelengths. Views at visible wavelengths (from The Digital Sky Survey) appear blue, near-infrared light is depicted as green (from the Two-Micron All-Sky Survey), and mid-infrared data from the InfraRed Array Camera aboard Spitzer Space Telescope is portrayed as red. The result is a contrast between structures seen in visible light (blue) and those observed in the infrared (yellow and red). A quick glance shows that most of the action in this image is revealed to the unique eyes of Spitzer.

Image Credits: NASA/JPL-Caltech/A. Marston (ESTEC/ESA) **Exposure Dates**: October 11, 2003 & November 22, 2003