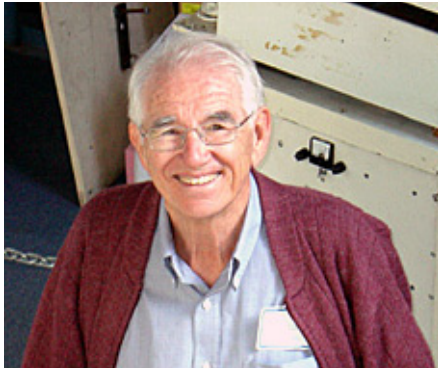


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# Frank J. Low Wins Two Major Awards

By Richard Poss



Frank J. Low, Regents Professor Emeritus at the University of Arizona, has recently won two significant awards. The Astronomical Society of the Pacific has awarded him the 2006 Catherine Wolfe Bruce Gold Medal for lifetime achievement. In addition, Associated Universities, Inc., and the National Radio Astronomy Observatory announced that he has been awarded the 41<sup>st</sup> annual Karl G. Jansky Lectureship.

A familiar face around Steward Observatory, Frank is a pioneer in the development of infrared and millimeter astronomy. After earning a bachelor's degree in physics at Yale and a doctorate in physics at Rice University, he went to work for Texas Instruments during a period of unusual creative ferment, "at a time when you could rub elbows with people like Gordon Teal (inventor of the silicon transistor), the grandest of chemists."

In the midst of this ferment Frank invented the gallium-doped germanium bolometer that initiated the era of infrared astronomy. "I was eager to come up with something people could use." This idea grew from using semiconductors to make a sensitive thermometer at very low temperatures. He left Texas Instruments and joined the National Radio Astronomy Observatory to further develop the bolometer and related instruments.

At NRAO he undertook a series of millimeter wavelength experiments, using the low temperature bolometer detector mounted on a relatively small dish. The success of this early research resulted in his proposal to continue with a larger instrument at a drier site, and eventually led to the NRAO millimeter wavelength 36 Foot Telescope at Kitt Peak.

Frank Low joined the University of Arizona faculty in 1965. He founded Infrared Laboratories, Inc., a

Tucson-based firm that makes infrared detectors and cryostats for observatories and infrared microscopes, in 1967. "Now we are imaging in the infrared beautifully, exquisitely, but they are expensive," he says. "I have done a lot to bring the cost down."

In the 1970's, he became the first astronomer to use aircraft carrying a closed-port telescope. The first experiments involved mounting a small telescope on a U.S. Navy bomber. Then he mounted a 12-inch telescope on a Lear jet. Because it flew above most of the water vapor in Earth's atmosphere, this small telescope made important far-infrared observations of Jupiter, Saturn and Venus as well as star-forming regions and galaxies. The next step was to pioneer the Kuiper Airborne Observatory (KAO), which carried a 35-inch telescope to altitudes higher than 8 miles in research flights from 1974 to 1995.

Frank was able to determine for the first time the temperature of the surface of the moon. He proved that the two giant planets, Jupiter and Saturn, generate and emit internal energy. He showed that molecular clouds and galactic nuclei were sources of infrared radiation. Frank was a primary organizer of the joint American-British-Dutch infrared Astronomy Satellite (IRAS), the first satellite to survey the universe in the infrared.

The impact of Frank's work on infrared detectors and cryostats is still being felt on the frontiers of astronomy. He developed instrumentation for the Spitzer Space Telescope, which included his prize-winning work in shrinking the cooling system for the detectors. "The Spitzer is a treasure," he says with pride, "it will be mined for many years, and it is finding great results."

He is also involved in a different type of project – he is writing a history of modern infrared astronomy. "It's going to have a mountain of interesting stuff that you don't learn by reading books in the library."

His Jansky Lectures are entitled, "How the Spitzer Space Telescope was Designed, Tested and Built," and will be delivered in Charlottesville, Virginia on October 18, in Green Bank, West Virginia on October 20, and in Socorro, New Mexico in early November.

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