Bulletin of the AAS • Vol. 52, Issue 2

Yoshio Fujita (1908–2013)

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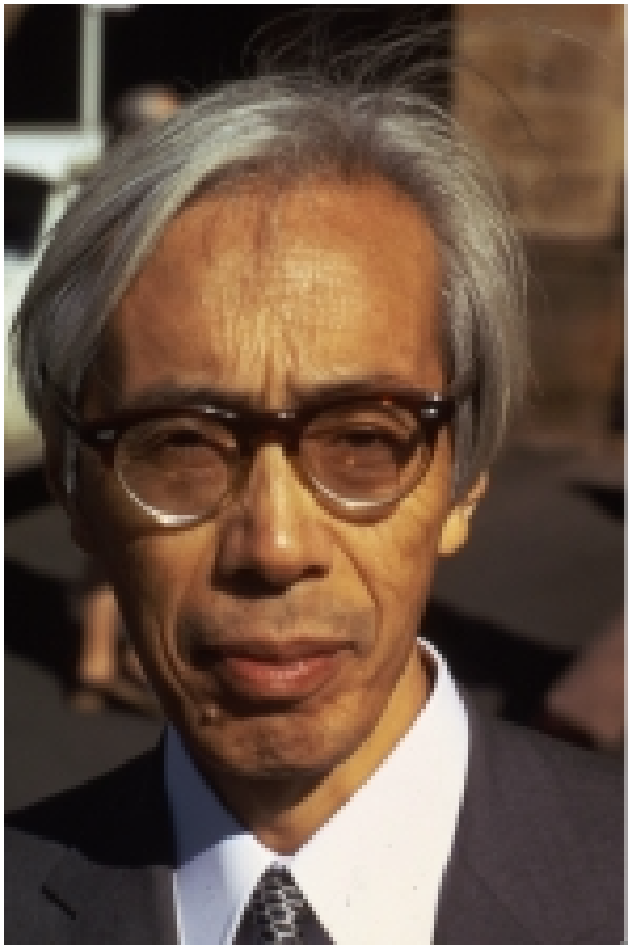
Published on: Dec 28, 2020

DOI: 10.3847/25c2cfeb.882ccaaf

Yoshio Fujita died on Wednesday, January 9, 2013.



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Fujita was born 1908 in Fukui Prefecture in a small town then named Mikuni. His father worked at a local newspaper as a writer/editor and was proficient in the Japanese poetry style of Waka. The eldest of five children, young Fujita became fascinated by the night sky as a child and carried this fascination through school, where he excelled and was admitted to the University of Tokyo, concentrating in mathematics and astronomy.

The well-known celestial mechanician Yusuke Hagihara was his primary inspiration, and his primary texts were Russell, Dugan and Stewart for general astronomy and Tisserand for celestial mechanics. Between the years 1928 and 1931, Hagihara, who had studied under Arthur Eddington, also exposed his students to problems in theoretical astrophysics such as equilibrium theory in stellar interiors using a 1929 Japanese translation of Eddington.

During the years 1930–1931, under the guidance of Kiyotsugu Hirayama, Fujita carried out an observational study of the spectrum of *Eros* at its close approach, using a small astrograph equipped with an objective prism. He was trying to determine if *Eros* has a residual atmosphere and might be an exhausted comet nucleus. With his PhD in hand he became an assistant to Hagihara at the Tokyo Astronomical Observatory, no longer financially dependent on his family. He especially recalls this as a watershed, but even more valuable because he became exposed to other assistants who had physics backgrounds. Indeed, throughout his observational career, the majority of his work centered on spectroscopic studies of the Sun, late-type stars, and carbon stars. He also was devoted to improving instrumentation at the Tokyo

Astronomical Observatory. One of his first projects and publications was on improvements to a high dispersion prism spectrograph for the Tokyo Tower Telescope, reminiscent of the Einstein Tower in Potsdam. He also participated in vacuum-ultraviolet laboratory studies of heavy water. Most of his work during his 6 years as assistant was delegated, but he also had some freedom to pursue personal interests in molecular spectra of late-type stars.

Fujita was promoted to university lecturer in 1937 and enjoyed more freedom of action, collaborating with Toshio Takamine and others in weekly seminars where they debated papers appearing in the ApJ and Monthly Notices. He continued to teach and write during the war, even after he and his family, among faculty families, were all evacuated inland first to Suwa, Nagano Prefecture, and then to Fukui, his ancestral home. After the war, Fujita's goal was to obtain high-dispersion spectra of late-type stars based upon his studies of the equilibrium states of diatomic molecules under the conditions presumed to hold in late-type stellar atmospheres. He also wanted to secure data that would help determine relative carbon abundances. In the late 1940s, with recommendations from Gerard Kuiper and S. Chandrasekhar, he obtained support to work first at Lick Observatory in 1950 with a Martin Kellogg Fellowship, and then at Yerkes Observatory. At Lick, working with C. D. Shane and George Herbig, Fujita used the 36-inch refractor to obtain spectroscopic data, and followed up at Yerkes, where he spent part of the time blinking plates for Kuiper looking for asteroids.

His research visit to the United States, lasting some 15 months, convinced him that it was critical that Japan obtain a large spectroscopically equipped telescope. Upon returning to Japan as a full professor at the University of Tokyo he advised Hagihara that what was needed was a large-aperture reflector. They chose a 74-inch Grubb-Parsons design, essentially a copy of the one at the Dominion Astrophysical Observatory in Victoria, British Columbia. It was completed in 1961 on Mt. Chikurin-Ji in the Okayama Prefecture.

In the interim, through the 1950s, Fujita's work was primarily theoretical, exploring dissociation equilibrium in late-type stars, exploiting the data he gathered from his United States tour, and data he received from others. He and others from Tokyo visited Dominion in 1960 to get familiar with the Grubb-Parsons design, so by the time it was completed he immediately scheduled observing runs to increase his understanding of the physics of carbon stars.

In 1955 Fujita won the Imperial Prize of the Japan Academy for his life work on low temperature stars, and starting in 1957 he became very active in astronomical matters

within the Science Council of Japan. In 1961 he was elected the Administrative Director of the Astronomical Society of Japan, and by 1965 was a member of the Japan Academy. He retired in 1969 but continued research and publishing through the 1980s. Fujita authored *Interpretation of Spectra and Atmospheric Structure in Cool Stars* (University Park Press, 1970), and his life work was collected and published as *Collected Papers on the Spectroscopic Behaviour of Cool Stars* in 1997.

Fujita married Kazuko Nezu in 1941. They had three children.

Sources

- Yoshio Fujita Oral History Interview, 26 August 1997. American Institute of Physics Niels Bohr Library and Archives https://www.aip.org/history-programs/niels-bohr-library/oral-histories/33555
- “Astrophysicist Yoshio Fujita Passes Away” https://www.nao.ac.jp/en/notice/20130115-fujita.html