

Japanese Mars observer donates observing log books to Lowell Observatory

By William Sheehan

The Putnam Collection Center of Lowell Observatory is pleased to announce that it has received in gift the collection of personal observing logs of the famous Japanese Mars observer Dr. Masatsugu Minami, one of the world's leading authorities on Martian dust storms. These observing logs, which have been denoted by Dr. Minami's wife Tomoko, will be a great resource for Mars researchers, and build on the Lowell data-base regarding Martian dust storms that began with A.E. Douglass and Percival Lowell's pioneering work on these phenomena in the early 1900s.

A biographical note: Masatsugu Minami (1939-2019)

Masatsugu MINAMI was born on 2 January 1939 (during one of Mars's perihelic opposition years) in Fukui City, Japan, and in 1954, while still in high school, he and his great friend Takashi NAKAJIMA made their first Mars observations with the 15-cm refractor of the Observatory of the Fukui City Museum of Natural History. (Since 1985, this instrument has been replaced with a 20-cm f12 refractor.) The observatory, founded in 1952, is located on top of a hill and commands a fine view of Fukui City, and Minami and Nakajima observed most of the oppositions of Mars together there for over sixty years.

The 1954 opposition was celebrated by all Japanese Mars observers because on 1 July of that year Tsuneo SAHEKI observed a flare at Edom Promontorium. In 1956, Minami and Nakajima's lifelong interest was sealed by the great dust storm appeared in September and eventually completely shrouded the planet and masked its surface features. The 1956 dust storm was dramatically different in scale from any that had been witnessed previously (though it has since had rivals, such as in 1971, 1973, and 2018), and it changed the view of many astronomers about the reasons for the long-observed changes in the intensity of the dark markings on the planet. Instead of being due to vegetative changes as commonly thought since Percival Lowell's time, an alternative view, first proposed by University of Michigan astronomer Dean B. McLaughlin, began to gain ground. McLaughlin accounted for these changes in terms of the effects of windblown dust. Among those won over to his view was the famous American planetary astronomer G.P. Kuiper, then at Yerkes. The idea has been much refined over the years but it has proved to be fundamentally correct.

Despite studying for his Ph.D. in particle physics at Kyoto University and, from 1966, working for the Research Institute for Mathematical Sciences, Mars remained, for the rest of Minami's life, his chief preoccupation. Not only did he carefully plan his vacations in advance in order to take advantage of the times of Mars's oppositions, so that he could continue his long series of observations at the Fukui Observatory, in 1986, when Mars was far south of the equator, he traveled to Okinawa and Taiwan in quest better seeing conditions. It was in 1986 that Minami, long a member of the Oriental Astronomical Association, began to publish the *Communications in Mars Observations* (CMO) largely in English and appearing semi-monthly during opposition years and monthly in in-between

years, providing predictions, observations, and expert analysis to Mars observers in Japan and throughout the world. It was published for a remarkable 32 years—at first in a paper edition that was sent postpaid to anyone interested in receiving it, in recent years, owing to increased cost of postage, only in an electronic edition, published by the International Society of the Mars Observers (ISMO), another organization he co-founded. (The ISMO advisory board included distinguished Mars observers such as the late Donald C. Parker of the United States, Christophe Pellier of France, and his Japanese colleagues Tadashi Asada and Reicchi Konnai; the editorial board consisted of Asada, Masami Murakami, Nakajima, and Akinori Nishita.) However, Minami was obviously the driving force behind it. In addition to straightforward reporting of Mars observations and interpretations, Minami—who was something of a Renaissance man, with keen interests in literature, art, history, and politics—liked to stir up controversy in his bulletin, which required a high level of understanding of written English and a strongly developed sense of humor which was not always apparent beneath his studied reserve and Japanese politeness. He once wrote an article about two Patrick Moores (in reference to work published by the prolific but sometimes careless British astronomy popularizer), one of whom predicted a global dust storm in 1973, and the other who predicted (in a different publication) that there would be none.

Minami was, along with the late Leonard J. Martin of Lowell Observatory, one of the last classical Mars observers (i.e., one who observed the planet through a telescope as opposed to from spacecraft) concerned with Martian dust storms. A fine artist and possessed of a very keen eye, he had the ability to spot even minor changes in surface markings and small atmospheric events. He maintained that at least at ground-based resolution the dust cores of major storms did not change during the Martian day, which was an important insight at the time. Only in 2018 did high-resolution data qualify this result by showing detectable diurnal changes in at least some cases. He also championed the idea that the famous Blue Clearing (first described by E.C. Slipher of Lowell Observatory) was an effect due to the Martian surface not the atmosphere, and so there is no longer any mystery to this intriguing but no longer exotic phenomenon. An atmospheric effect Minami was first to describe as imaging techniques improved in the 1990s, was the so-called violet hole. These 'holes' are darker patches or streaks visible in violet images where a local absence of water vapor produces a locally lower albedo, while the area is seen in integrated light as a much redder color. Minami's own term for them was 'wine red' areas. Some of these were observed in 2005 in association with the initial dust clouds that later developed into the southern regional storm of that apparition (which Minami observed from Lick Observatory). They have been observed at every successive approach of the planet.

Another of Minami's Martian interests was in the so-called "flares" on Mars, because historically many of the most celebrated of these had been made by Japanese astronomers.

Thus a bright flash seen by Saheki at Tithonius Lacus in December 1951 attracted worldwide attention (and there was even speculation at the time it might be an atomic bomb blast set off by the Martians!), while Saheki saw another one, larger and not as intense on July 1, 1954 at Edom Promontorium (in the area now known as Schiaparelli

crater). My own close friendship with Minami actually began in 2001 when, with another American colleague, Thomas Dobbins, I predicted another flare would appear at Edom Promontorium on or about June 7 of that year. The prediction was published in *Sky & Telescope*, and a flare was indeed successfully observed and imaged by a group of observers including Dobbins, Don Parker and several others in the Florida Keys. Minami was delighted that the work of Japanese astronomers had been confirmed in such dramatic fashion, and generously nominated Parker, Dobbins, and me for the OAA's gold medal—it was the first time it had ever been awarded to a non-Oriental. My two colleagues were unable to do so, but I traveled to the OAA meeting in Nagasaki, Japan in the spring of 2004 to receive it in person. (I have never been more warmly received, and felt like a celebrity *du jour*; for some strange reason everyone seemed to want to have their picture taken with me!)

It was in 2004 that I also learned that, in addition to his work on Martian dust storms, Minami was one of the world's leading experts on Percival Lowell's Japan period, and as soon as the Nagasaki meeting ended, Minami led a meticulously planned tour in which he, Tadashi Asada and me retraced the route that Lowell took to the Noto peninsula in May 1889, as described in his book *Noto* (published 1891). I was surprised to discover the many Lowell plaques along the way recording points he had visited, and to see how well he had described the scenes, many little changed in a hundred years, that reeled before me.

I reciprocated Minami's kindness by helping arrange, in collaboration with Lick friends Rem Stone, Tony Misch, and Laurie Hatch, a visit to Lick Observatory on Mt. Hamilton for Mars's opposition of November 2005. The visit was not without mishap, and involved a personality clash between Minami and a British visitor. Eventually they simply had to avoid each other. But Minami, though "chicken on Mt. Hamilton" in that he remained sequestered during the daytime in his (private) dormitory, did manage to get some excellent observations with the Great Refractor, including of the early phases of the development of what became a regional dust storm, together with the characteristic "wine dark areas" which he had been first to describe. (The full development of the dust storm, alas, took place only after he had returned to Japan, when he and Nakijima began to keep it under close surveillance with the Fukui refractor.)

I last saw him in September 2009, at a meeting at the Paris Observatory and Meudon Observatory co-sponsored by the International Society of Mars Observers and the Société Astronomique de France. The occasion of the meeting was to celebrate the centennial of the mythical night of misty skies (20 September 1909) on which E.M. Antoniadi, using the Henry Brothers refractor, beheld Mars as if he were gazing at it from one of its satellites, and saw "the planet ... covered with a vast and incredible amount of detail held steadily, all natural and logical, irregular and chequered, from which geometry [canals!] was conspicuous by its complete absence." There were talks about Antoniadi and other aspects of the history of Mars observations, and Minami's presentation, "A History of Mars Observations in Japan," was singularly valuable in treating in detail a subject that was little known. He showed, among other things, that it was not Percival Lowell as might be

expected but W.H. Pickering who had the greatest influence on Japanese Mars observers, through his influence on the seminal, and tragic, figure Kanamé Nakamura.

Already at that time Minami was suffering from various ailments, including Parkinson's, high blood pressure, and atrial fibrillation, so I knew then that it was unlikely that he would ever fulfill his long-cherished dream of visiting Lowell Observatory, something we had often discussed. Nevertheless, with great courage and determination, he continued to observe Mars from Fukui City, right up through the opposition of May 2016, and also carried on the time-consuming and laborious editorial work (assisted by Masami Murakami) on the CMO right up to May 25, 2018, when the latest—and in all likelihood the last, #469--appeared. Its appearance coincided with the emergence of a new dust storm on Mars, which went on to become one of the most intense and longest-lived ever observed on the planet (and killed the Opportunity Rover which was resting in one of the most dust-affected areas). The fact that no more issues of the CMO appeared despite these developments showed how strongly Minami had effectively controlled it, even during periods of earlier illness, which had led to brief interruptions in the continuation of the series, and that his health problems must have become particularly serious, as indeed proved to be the case. It must have broken his heart to be unable to make any observations during this unusually interesting period of dust storm activity. (Nakajima, suffering from diabetes, was also unable to climb the stairway to the dome; thus their long collaboration in Mars observations came to an end at the same time.)

In November, Minami suffered a fall at his home in Midori-ga-Oka, Mikuni, Fukui Prefecture, after which he experienced swelling in his hands. An orthopaedist was consulted and predicted his recovery, but it was not to be. In January he collapsed at home, and was taken by ambulance to hospital. After 13 days in the ICU he passed away, of interstitial pneumonia, on 28 January 2019. He is survived by his wife Tomoko, and two sons.

On a personal note, I deeply regret that I was never able to get him to Lowell Observatory for a visit. He would certainly be very pleased, however, that his observing books will be preserved here.

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