

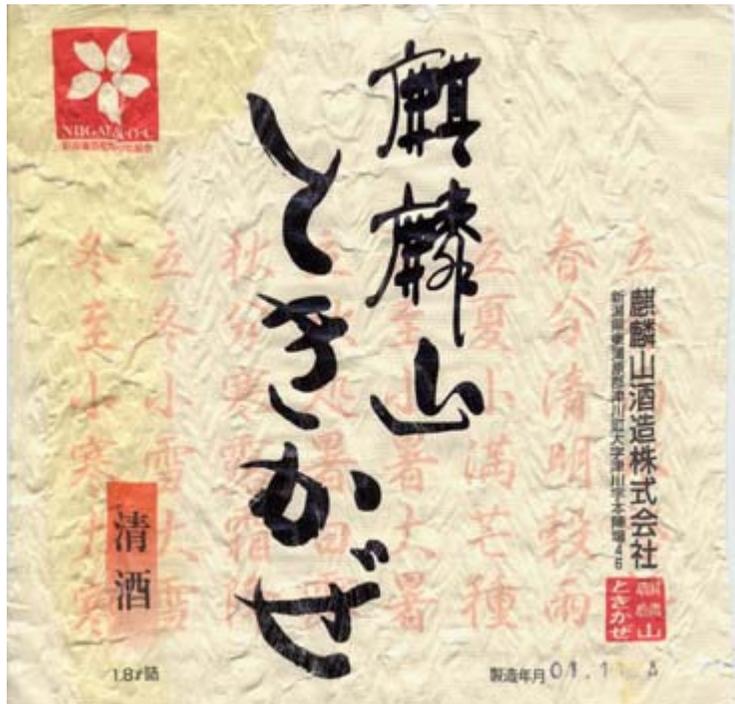
This is a web-page version of my article published in Tsukuba Hoshinokai Newsletter  
 “Hoshizora Tsukuba” (Starry Sky of Tsukuba), No.203 (April 14, 2002).

## A miraculous comet- Comet Snyder-Murakami

### Delicious Niigata sake!

The night before the discovery, I said to myself, “A sip of sake before going to bed will not hurt.” I put the large sake bottle over a Japanese-style teacup intending to have just a small amount. “Darn! I poured too much of it!” Thanks to my stupidity I emptied the cup only to wake up at one thirty in the morning. Looking out, I found the sky clear. As a delinquent comet hunter, I went back to bed, deciding to have a little more sleep and go out for comet hunting, if I could. Bad luck! I woke up at 2.30 this time! I had no choice but to force myself to go out for searching for comets. As it was cloudy before I went to bed and continuing unsettled weather was forecast for the following day, I never thought of searching for comets that evening.

I need to drive for 15 minutes to get to the observing site and another 30 minutes for putting on warm clothes, setting up the 46cm Dobsonian, and getting the navigator ready. Altogether it will take about 50 minutes after getting out of bed to start searching. I began my search at 3.20 on March 12, 2002, the day I made the discovery. I started sweeping vertically with the eastern shoulder of Ophiuchus. Sweeping this particular area of sky was not planned beforehand for that morning; it was decided after I arrived at the observing site.



My discovery owes to this sake “Kirinzan Tokikaze”?

## My telescope

I would like to discuss my telescope here. The idea of building [the 46cm telescope](#) all started when I met Dr. Atsuyoshi Nishina at Kabasan (next to Mt. Tsukubansan) in December 1999. Dr. Nishina owned a home-built 45cm telescope. He built the telescope after reading "The Dobsonian Telescope." He encouraged me to build a telescope, as he learned that I worked for Forestry and Forest Products Research Institute (I worked at the main office of the Institute) having easy access to timber processing. I bought a copy of "[The Dobsonian Telescope](#)" and ordered a mirror from [Galaxy Optics](#) in the U.S. The primary mirror was 46cm (18 inches) with f 2037mm. I have an eyepiece, which I bought from Kasai Trading, when it was for a limited sale. It is a German-made 30mm Planokular. It has an apparent field of 88 degrees, and used with the 46cm mirror, it provides a magnification of 68 with 1.3-degree field of view. The finderscopes are a Telrad as well as Vixen's modified 5cm telescope with a right-angle correct image prism and 7x power. The telescope is also equipped with a Super Navigator (digital setting circle). It was completed in July 2001 taking about one year with a help from staff in Wood Engineering Department at my workplace.

Initially I was not quite keen on using this telescope for comet search. I intended to use it to enjoy stargazing, as I thought there was no point in doing visual search as LINEAR had been in operation. I made 20 observations (excluding comet search) with the 46cm telescope from first light in July 2001 to my comet discovery in March 2002. I observed quasars, Pluto, M31, a globular cluster in M31, M109, the central star of M57, the "ring" of the Saturn Nebula, Stephan's Quintet, the Horsehead Nebula, etc.

After being transferred to Niigata in April 2001, I searched for comets 5 times in April, 3 times in May, once in June, using the 20cm telescope. However, from the 46cm's first light in July to January 2002, I searched for comets only once. Some thought made me resume comet search using the 46cm telescope in February 2002.

## A miracle on my birthday and search by the 46cm telescope

In December the Japan Sea coasts suffer continuous inclement weather, particularly with snow falls. In the winter of 2002 Tokamachi recorded a snow depth of up to 2 meters, though it was just about the average. At the time of my discovery there was still about 2-meter-deep snow around me. In the midst of deep snow, I had been doing soul searching since the end of the year.

I remember that I began watching the stars in my fifth year in primary school . [I "discovered" a comet by accident while observing with 5cm binoculars in the summer of 1975 in my second year of junior high school.](#) I asked Tokyo Observatory (the present National Observatory) and found it was Comet Kobayashi-Berger-Milon. This prompted me to grind a 10cm mirror and a 12.5cm one to start comet search, but my intended search was interrupted by preparation for university entrance examinations until after seeing Comet Hyakutake in 1996.

"Observing by a large-aperture telescope is certainly exciting. But is it really what I originally aspired to do? How can you drop again the comet search you have somehow managed to continue? You have more favorable night skies here than at Tsukuba...Your workload was steadily increasing, but things have changed after the transfer. Visual search for supernovae may be an idea. They sell eyepieces with a built-in image intensifier in America, which make the limiting magnitude two magnitudes fainter... It's no good! It must be comet search!"

The problem is automatic surveys such as LINEAR. Although LINEAR is playing havoc with visual comet hunting, it does not cover the western sky after sunset and the eastern sky before sunrise according to [LINEAR's home page](#). The 46cm telescope must have captured P/2001 Q2 Petriew (10.5–11.0 magnitude), which was discovered by chance at a star party.

It could also have detected C/2001 W2 BATTERS (CCD magnitude 13.8; visual magnitude 12.0) under favorable conditions, which was found at Bisei in August 2001. I observed Comet Petriew by a 20cm telescope at 42x several days after the discovery. I thought my chance of discovering it would be 50–50, even if the comet passed the center of the field of view at an altitude 30–40 degrees because of light pollution.

The skies over this declining town in Niigata are fairly bright affected by light pollution. Sixth magnitude stars are visible at the zenith under normal conditions and with averted vision 6.5-magnitude is possible. The Milky Way is a fine sight in spite of a pale background, but M33 is hardly visible to the

naked eye. Light pollution is quite noticeable at low altitudes.

The 46cm telescope is effective to beat light pollution and 12th–13th magnitude comets can be discovered in the skies described above. Further more, good star atlases such as [Uranometria](#) are available and with a computer you can use star chart software and [Real Sky](#). While thinking about these things, I felt a strong urge:

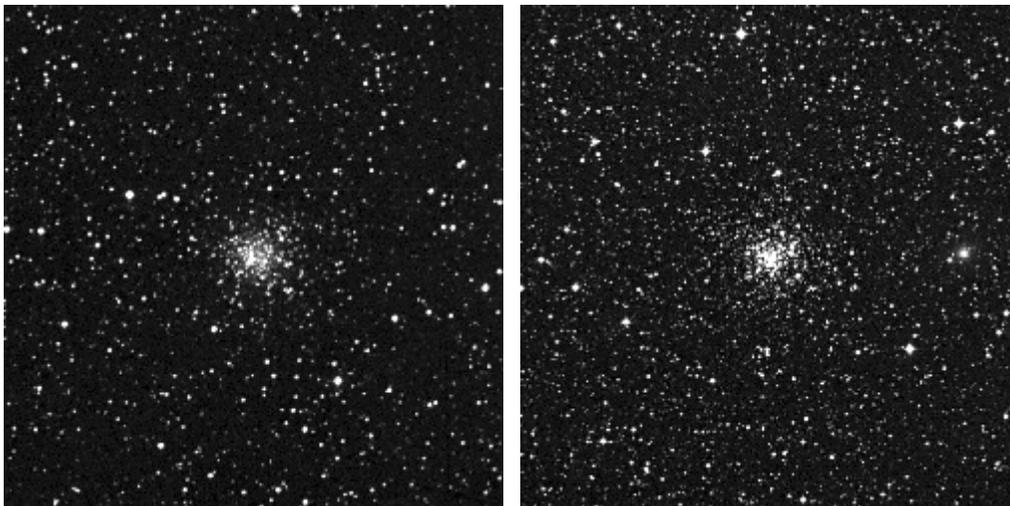
“I’m sure I can find a comet, if I use these resources. Very few people have searched for comets systematically using a large-aperture Dobsonian. I’m sure I can succeed. I should start right now!”

Come to think of it, it was on February 1, my birthday, when I resolved firmly to start searching for comets again. And several days later, I learned that Comet Ikeya–Zhang had been discovered in the evening sky on February 1.

### Already the first discovery!

In January and February there are only a few fine days and March is the first month we can search for comets effectively. After the resolution on my birthday, I searched with the 46cm telescope on February 7 and March 3, and the third search on March 12 was my discovery day.

On March 12 I started searching at 3.20. I captured two globular clusters, NGC 6426, and NGC 6535. I checked them with the coordinates displayed on Super Navigator and confirmed them with Uranometria. Next, I captured C/2000 WM1 LINEAR. Around 4.20 the object in question came roughly to the center of the eyepiece field. I wondered if it was another globular cluster and checked it with Uranometria. There was no object at the displayed coordinates on Super Navigator. I thought Navigator showed wrong positions, an error caused by low batteries. Navigator seemed to be correct, though, when I checked the star patterns in Uranometria. I knew there were a number of known faint comets in that particular region and I thought the possibility of this object being a new comet would be less than 50%. “If I check it with MegaStar (an American star-chart software) when I get home, I will be able to confirm the presence of a comet matching these coordinates.”



NGC 6462 NGC 6535

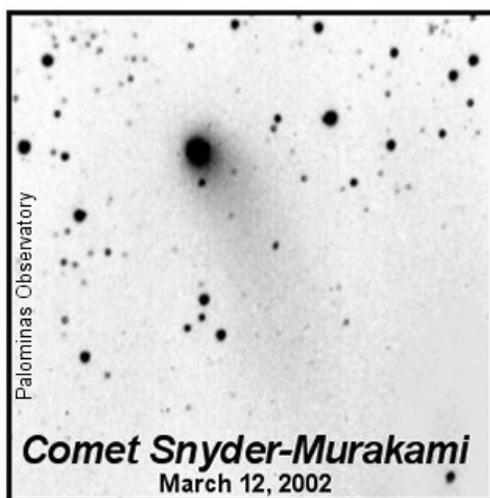
From Digital Sky Survey

Courtesy Association of Universities for Research in Astronomy, Inc.

After plotting the discovery position of the object on Uranometria, I memorized the relative position of the comet against reference stars. I traced the stars back to the object from M11 with 5cm binoculars several times to make sure that there was no error in determining its overall position. I calmed myself down and compared again the patterns of the stars around the object with those in the star chart to confirm the existence of the object. To make absolutely sure there was no error I tried different eyepieces to eliminate the possibility of ghost images in the eyepiece. When I looked more carefully, it seemed to have something like a tail in the southwest. I detected a slight motion, but it was difficult to determine the exact direction of movement, which I decided tentatively to be in the northeast.

Its magnitude was 13, I intuitively estimated. It was slightly brighter than the fainter (NGC 6426) of the two globular clusters I captured a little earlier and clearly fainter than the brighter one (NGC 6535). My final magnitude estimate was 11, which was made after getting home, based on the magnitudes of these globular clusters in the New General Catalog. The diameter of the object was estimated to be 3' judging from my memory of the image of M57. The comet had been visible until it was washed out by twilight at about 5 o' clock.

At 5.30 I arrived home and turned on the computer. MegaStar displayed the region where I found the object in question. It also showed all the known comets visible in that area. This was the moment of truth! "No comet at this position!". The object was definitely a new comet. I increased the scale of the MegaStar chart and clicked at the position of the comet from memory to determine its position as accurately as possible.



C/2002E2 Snyder-Murakami  
Photo by Snyder

### A frustration in reporting the discovery

Just in case, I downloaded the latest orbital elements, had MegaStar display all the known comets, and checked it with [NASA's Comet Observation Home Page](#) and [Mr. Seiichi Yoshida's home page](#). No matter what I checked, there was no known comet that matched the object I had discovered.

I had to report my discovery to Mr. Syu-Ichi Nakano and the National Observatory. I wrote a fax message and sent it to Mr. Nakano and the National Observatory in that order around 7.20. Then I telephoned them. As the recorded message on Mr. Nakano's answering machine said that he would start working at 19.00, I didn't leave him any message. At the National Observatory, again I heard the answering machine. I thought staff would report to work by 9 o' clock and left a message that the call was from Murakami, Niigata Prefecture, who had sent the fax to the Observatory.

I also tried to phone Mr. Osamu Miyazaki of Tsukuba Hoshinokai (Tsukuba Star Club) around that time, because I remembered that he had told me to call Mr. Akimasa Nakamura if there was any trouble with the confirmation of a new comet. I made the call at about 8 o' clock, but the call wasn't answered. I gave up because in Japan confirmation could be made only after about 18 more hours.

I tried the National Observatory a little after 9 again but was redirected to the answering machine. I thought it was odd and called a different department (Public Relations) of the Observatory at 9.30 to find out what was going on. I was told that a staff member in charge of new astronomical objects had not been reported to work yet. I asked if he would come some time in the morning. The answer was "perhaps." I felt it very unsatisfactory. The staff member in question, I suppose, had some reason for not being there yet, but with the use of the Internet so common around the world, any time delay would allow an overseas discovery to be reported and officially announced....Mr. Nakano is not available until 9. That's it! I should directly call Smithsonian's Central Bureau for Astronomical Telegrams.

At 10.16 (according to my computer's clock) I sent email to the Central Bureau, but remembered I had forgotten to provide a description of the comet's motion. I sent second mail adding this information. Soon after, to my surprise, I received a reply to my first email. The sender was Daniel Green, the person Mr. Nakano called Dan in his articles in Tenmon Guide Magazine. His letter was full of questions: my experience in astronomy, occupation, how the object was determined to be a comet, if the object had moved, my mailing address, so on and so forth. It took me a lot of time to answer all the questions but I felt all these questions were to check if Murakami's report was reliable. Anyway, I was relieved that the Central Bureau had been now notified of my discovery. I noted in my email to Dan that I sent the email because the National Observatory staff member in charge was not at work and because Mr. Nakano's phone was redirected to the answering machine. It was not until a little before 12 o' clock that I received a call from the National Observatory. Later I learned from IAUC (International Astronomical Union Circular 7850) that this comet had already been confirmed in Europe a little past 12 o' clock Japan Time.

### **A Notice of Confirmation and an independent discoverer**

As Mr. Nakano was supposed to be working at 19.00, I called him after 19.00 but was forwarded to his answering machine. I left a message: "I am Murakami from Niigata Prefecture who sent you a fax message this morning. The weather forecast is not favorable. Please confirm my observation." I got a phone call from Mr. Nakano around 21.00. He said that the weather was good there and that he had asked a number of people to confirm my discovery. He also said that he had heard a lot about my discovery from Dan. When asked by Mr. Nakano if the motion was fast, I could only say it was not particularly fast. This might not have been adequate for observers who were to confirm it from CCD images. I could have said it was about 1' per 30 minutes or something like that, as it was not entirely unclear.



Media interview . A lot of snow is still on the ground.  
March 14, 2002

At half past one in the morning on March 13, I arrived at the observing site and waited. It was cloudy and after a little while it started to snow. Thinking it would be no use waiting any further, I stayed inside the car. Then my mobile phone rang. "This is Nakano from Sumoto. The comet was confirmed in Europe and U.S.A. An observer in America discovered the comet before you. Congratulations!" I thanked Mr. Nakano and headed home quite relieved.

In the morning Mr. Nakano sent me IAUC 7850 which reported the discovery of the comet and a copy of New Astronomical Objects Information from Oriental Astronomical Society's Astronomical Calculation Section. He told me that the comet would be registered as Comet 2002 E2 and that the name would be Comet Snyder-Murakami. At the dawn of March 14 it cleared up. I went to the observing site to have a look at a post-discovery appearance of the comet. On March 13 and 14 I received about 100 phone calls from mass media and 10 reporters rushed to my place. The whole thing completely exhausted me compounded by deprivation of sleep.

### Mr. Snyder

I received email from Mr. Snyder few days after the discovery. [Mr. Snyder](#) had already been in his retirement. After retirement he moved from California to Arizona where he could observe the stars in better conditions. He built an observatory and was enjoying comet hunting and astrophotography. Before retirement he had been doing computer-related work and had visited Japan a number of times.

Mr. Snyder made this discovery after 70 hours of sweeping. In my case it was after a little less than 30 hours during high school days plus 180 hours since 1996. For both Mr. Snyder and I it was fortunate that we made the discovery in such short periods of time.

### A miracle comet

This comet is a “miracle” comet to me. It came from the southern sky on the Milky Way Railway\*. It moved in a loop near the Large Magellanic Cloud, then entered the Milky Way, and passed the Southern Cross, Scorpius, and Sagittarius. It further traveled north and was discovered in Aquila. It will continue its northward motion along the Milky Way, passing Sagitta, Vulpecula, Lyre, Cygnus, then move out of the Milky Way. Then it will draw a loop near the celestial north pole, while losing its brightness. After that it will be on its journey to eternity, never to be seen again.

A dream becomes no longer a dream at the instant it is realized. It is not the final destination or an end to the dream; it is rather a new starting point. By realizing my dream I feel my life has become more fulfilling, my thought toward life has deepened, and people around me were influenced in a positive way. This little comet will continue its voyage through space to eternity. Just like this comet, I wish to be able to keep my dream and hope forever.

\*This refers to a verse in “Ginga Tetsudo no Yoru (the Night of the Milky Way Train)” written by the 19th-century poet and novelist Kenji Miyazawa. See the detail at <http://www2.gol.com/users/steve/kenji.htm>

This article was translated by Eiji Kato. His contact email address is [twin-star@bigpond.com](mailto:twin-star@bigpond.com) and websites are <http://www.geocities.com/eijikato2001> and <http://www.geocities.com/ballandean2003>

[To discoveries' page](#)

[Home](#)