East Valley Astronomy Club

March Newsletter 1996

EVAC MEETING HIGHLIGHTS

The February meeting started late. Several officers and members had attended a dinner with Paul Scowen as guest of honor. The meeting started at 7:45 pm. There were 55 people in attendance, with 4 of them visiting.

Robert Kerwin opened the meeting with club business. A motion was made and accepted for the new Florence Junction site. A map is included in this issue for members. The bylaws were made available. Talk to any of the club officers if would like a copy.

Bernie Sanden received three responses from newbies. Beginners' Lecture series would include telescope, binocular and eyepiece basics. The lectures will, hopefully, be starting in April. Bernie, also, had charts of Comet Hyakutake (See charts in this issue).

Sylvio Jaconelli (655-2976) is interested in organizing a "Field Trip" to the Riverside Telescope Makers Conference on Memorial Day (3/24-3/27).

Don Wrigley (982-2428) is looking for volunteers on March 20 to give a Star Party to Black Mountain School fifth graders up at Cave Creek.

Tom Polakis passed out charts for Comets Szczepanski, Hyakutake and Hale-Bopp. Comet Hyakutake will pass an incredible 1/10th of an AU to the Earth (app. 10 million miles) It should be 0-1st mag. It is already showing a tail. The comet will pass by the Little Dipper on 3/25 and 3/26.

Pierre Schwarr showed eclipse photos and spoke about a January 20 young moon sighting. Pierre showed chart on extinction, disputing Tucson members sighting. Pierre's sighting was 12 hrs, 33 min. Several other people were there to verify Pierre's sighting. Pierre would like to video the upcoming comets. He needs a light intensifier. Does anyone have or know where to get a used light intensifier?

FEATURED PRESENTATION

Dr. Paul Scowen gave a lecture on Bipolar Nebulaes. He discussed some theories as to what is the cause of these nebulaes. He showed us several examples of Bipolar nebulaes. A Bipolar nebula can occur at any stage in the life of a star. From its formation, at its birth, and to its death. He showed us examples of Herbig-Haro objects, in which there were bipolar outflows of material from the object as it was condensing into a star. The outflows occur along the symmetry axis. He then showed us examples of bipolar nebulaes occurring in planetary nebulaes and supernova remnants. Many of the photos were taken by Hubble last May.

The presentation ended at 10:15 pm and members were then treated to a special cake made by Sheri Cahn. The was decorated with the Hubble picture of M16.

MARCH GUEST SPEAKER

The March speaker is EVAC member Don Wrigley, who will talk about lunar observing.

COMET HYAKUTAKE
- The Great(?) Comet of 1996

For the first time in 20 years, it appears that we will have a truly great comet - C/1996 B2 (Hyakutake). With C/1995 O1 (Hale-Bopp) coming to perihelion in 1997, the drought of bright comets is finally over.

IN THIS ISSUE

Astronomers Prepare for a Rare Event

In the early morning of January 31, 1996, Japanese amateur astronomer Yuji Hyakutake made his second comet discovery within five weeks. He found the new comet near the border between the southern constellations of Hydra (The Water-Snake) and Libra (The Scales), amazingly just three degrees from the position where he detected another comet on December 26, 1995.

After two weeks of hectic activity among amateur and professional astronomers all over the world, much interesting information has now been gathered about the new comet which has been designated C/1996 B2 (Hyakutake). In particular, it has been found to move in a near-parabolic orbit that will bring it unusually close to the Earth this month. It is then expected to become bright enough to be seen with the unaided eye and to remain so during several weeks thereafter.

Preparations are now made to observe the celestial visitor with a large number of telescopes, on the ground and in space. This event offers a rare opportunity to study the immediate surroundings of a cometary nucleus in detail and the specialists intend to make the most of it.

Discovery and orbit

Yuji Hyakutake, of profession photoengraver and a well-known amateur astronomer, announced his new discovery without delay, and within 24 hours, it had been sighted by several other observers in Japan and Australia. Experienced comet-watchers described its appearance as 'diffuse with central condensation and of magnitude 11-12', i.e. a little more than 100 times fainter than what can be seen with the unaided eye.

This brightness is not unusual for a comet discovered by an amateur, although it would probably have been missed, had it been just a little fainter. In the present case, the decisive factors for Hyakutake's success were undoubtedly his very powerful equipment (25 x 150 binoculars) and the advantageous combination of the comet's southern position in the sky and his location in Kagoshima, the southernmost prefecture of Japan.

Within three days only, nearly 120 positional measurements of the comet were obtained, mostly by amateur observers in Australia, PR China, the Czech Republic, France, Japan, Spain and the U.S.A. This allowed Brian Marsden of the Central Bureau for Astronomical Telegrams of the International Astronomical Union (Cambridge, Mass., U.S.A.) to compute a preliminary orbit. It showed that the comet moves along a parabola - or at least an extremely elongated ellipse - and that it must therefore have come from far away and may never have been near the Sun before. At the time of discovery, the comet was about 280 million km from the Earth and outside the orbit of Mars.

Moreover, the motion of the comet is such that it will continue to approach the Earth with a speed of about 58 km/sec during the next weeks and will pass within 15 million kilometers of our planet in late March. This corresponds to one tenth of the distance between the Earth and the Sun (0.1 AU) and, in cosmical terms, the passage is therefore a very close one. Information about some earlier comet encounters may be found in the Appendix at the end of this Press Release.

Continued observations have confirmed this and have also allowed to fix the moment of closest passage as Monday, March 25, at about 7h UT. At that time, the comet will be moving northwards through the northern constellation of Draco (The Dragon) at the exceptional rate of 0.77 deg/hour. The event will be best observable from the northern hemisphere. Two days later, the comet passes within a few degrees of the northern celestial pole.

The perihelion (the orbital point closest to the Sun) is reached on May 1, 1996, at a distance of 35 million kilometers from the Sun, far inside the orbit of the innermost planet, Mercury. From then on, the comet will rapidly move south, crossing the celestial equator in mid-May and reaching 70 degrees south in late July.

Recent observations

Comet Hyakutake obviously comes from far away, maybe even from the very distant 'Oort Cloud' of comets that surrounds the solar system. In this sense it is different from the periodical comets which move in closed orbits around the Sun with revolution periods between a few years and some decades. Its 'dirty snowball' nucleus of ices and dust has therefore not been heated by the Sun for a very long time, perhaps never, if this is its first visit to the inner regions of the solar system. Hence it is particularly difficult to predict its future performance. Nevertheless, the available observations seem to indicate that it is a quite 'active' comet and that it may therefore become comparatively bright when it approaches the Earth and later at perihelion. But how bright ?

Imaging as well as spectroscopic observations have been performed in order to better characterize Comet Hyakutake. On CCD-frames obtained of the comet in early February with telescopes at the ESO La Silla Observatory and elsewhere, an elongation is clearly visible (cf. ESO Press Photo 11/96) in the anti-sunward direction of the coma (the cloud of gas and dust that surrounds the cometary nucleus). A real tail has not yet developed, but this is expected to happen soon. The size of the coma was measured as at least 7 arcmin, corresponding to a projected diameter of nearly 500,000 kilometers.

It is also of interest that until recently the coma otherwise appeared absolutely symmetrical - there was no indication of 'jets', i.e. no large vents on the surface of the nucleus had yet become active. However, on images obtained with the ESO 3.6-meter telescope in the morning of February 13, a 'jet'-like feature is seen which emerges south-east of the nucleus (i.e. From the sunlit side) and curls counter-clockwise towards the opposite side (the 'tail'-direction). This is probably the first evidence of localized dust production on the surface of the nucleus.

CCD observations were made on February 9 at the Lowell Observatory (Flagstaff, U.S.A.) through special optical filters which isolate the light from different components of the coma, e.g. the light emitted by the OH-, C2- and CN-molecules in gaseous form and also the reflected sunlight from the dust grains. They show that the gas production rates are almost as high as those measured at famous Comet Halley when it was at about the same distance from the Sun during its approach in late 1985. The dust production of Comet Hyakutake also seems to be quite impressive.

The first spectra of the new comet were obtained at La Silla with the DFOSC instrument at the Danish 1.54-meter telescope of February 8; they show comparatively strong emission of CN, C2 and C3 molecules (cf. ESO Press Photo 12/96). This is not unusual for a comet at the corresponding heliocentric distance. In conclusion, the recent observations show Comet Hyakutake to be an 'active' comet. The evaporation of the ices on the surface of its nucleus, due to the heating of the Sun, is well underway and much dust is being ejected during this process. It is quite likely that this comet will put on a fine display, starting in mid-March and lasting until soon after the perihelion passage in early May. Nevertheless, there have been some cases [1] in recent times when the activity level of new comets did not develop as expected, so some caution is necessary.

The encounter on March 25

By a straightforward extrapolation of the current brightness, it would appear that Comet Hyakutake will reach magnitude 1 on March 25, 1996, at the time of the closest approach to the Earth. This is almost as bright as the brightest stars in the sky. However, it is important to consider that this is the 'integrated' brightness of the entire comet head which may fill an area of several degrees in diameter in the sky. Thus the comet will appear as a moderately bright, very diffuse object that is best visible in binoculars. There will be a central point of enhanced brightness, corresponding to the innermost part of the coma around the nucleus. The motion is sufficiently fast to be easily perceptible on the stellar background.

We do not know the size of the nucleus yet, but assuming - optimistically, from the measured gas and dust production - that the diameter is 10 kilometers, i.e., about as large as that of Comet Halley, then the magnitude of the nucleus alone should be about 11 at the time of the closest encounter. It may therefore be well visible in even small telescopes, as a bright point near the center of the diffuse coma. However, it will most probably not be possible to obtain resolved images of the nucleus with ground-based telescopes; even if the size turns out to be this large, the nucleus will only subtend an angle of about 0.15 arcsec and thus appear point-like.

The comet's extremely rapid motion across the sky at the encounter will constitute a major technical-observational problem for most telescopes. Moreover, it cannot be excluded that the coma is so dense that the nucleus will be completely hidden from view. The only telescope which could possibly image the nucleus as an extended object is the Hubble Space Telescope, for which observations are now being planned.

Still, there is no doubt that the upcoming event offers very bright prospects for the investigation of the near-nucleus environment of a comet. Another technique which will most likely be attempted is that of radar soundings; the return time for a signal will only be 100 seconds. In the past, only a handful of comets have been investigated in this way and none in great detail. However, in view of the recent, great technological advances in this field, it should in principle be possible to 'image' the nucleus of Comet Hyakutake with some of the largest radio telescopes. Predictions for the appearance of the tail(s) at the encounter are still very uncertain, since their development has not yet started. In the best case, the dust tail may become quite impressive and reach a length of many degrees, and the expected ion tail could also be quite long.

The perihel passage

The brightness at perihel on May 1 will probably exceed that at the Earth encounter and Comet Hyakutake could then become a very spectacular object. How bright it will actually be is much dependent on the amount of dust released from the nucleus as it approaches the Sun. Unfortunately, the viewing conditions will not be

UPCOMING CLUB EVENTS

- **EVAC Club Meeting, Mar 13, 7:30 pm**
  SCC, Physical Science Bldg., Room 172
- **1996 All-Arizona Messier Marathon**
  Mar 16, Sunset, Arizona City Site
- **Local Star Party, Mar 23, Sunset**
  The New Florence Junction Site
- **EVAC Club Meeting, Apr 10, 7:30 pm**
  SCC, Physical Science Bldg., Room PS 172

very good and the full moon on May 3 will also adversely influence the sight.

Appendix: Comet encounters with the Earth

There is no doubt that the close encounter with C/1996 B2 (Hyakutake) is a relatively rare event. According to Brian Marsden (Central Bureau for Astronomical Telegrams of the International Astronomical Union, Cambridge, Mass., U.S.A.): The approach of C/1996 B2 to the Earth on March 25 (0.10 AU) [2] is the closest for any comet since 1983 (when there were two comets coming to 0.06 AU and 0.03 AU within a month of each other), and it is the fifth closest approach of any comet during the past century. What is unique about this comet is that no other comet is known then to have gone on to pass anything like as close to the Sun as this one does (0.23 AU on May 1). One of the 1983 comets had about twice this comet's perihelion distance, but the approach to the Earth was well after perihelion. There was possibly a comet with a perihelion distance comparable to this one that came closer to the Earth after perihelion in the year 400, but that is very uncertain. The time interval between passage near the Earth and subsequent passage near the Sun is longer for C/1996 B2 (37 days) than for any closer Earth approach since that of the famous Lexell comet in 1770 (43 days), that comet holding the record confirmed approach to the Earth (0.015 AU or 2.2 million kilometers). C/1996 B2 is intrinsically the brightest Earth-approacher since the early eighteenth century, and the 55 days between discovery and Earth approach is a record for a pre-perihelic Earth approach.

More information about other close encounters and collisions of comets with the Earth may be found in an article by Zdenek Sekanina and Don Yeomans (Jet Propulsion Laboratory, CALTECH, Pasadena, U.S.A.) which appeared in 1984 in the American journal The Astronomical Journal, Volume 89, page 154.

Notes:

[1] Prominent examples are Comet Kohoutek in 1973 and Comet Austin in 1990.

[2] 1 Astronomical Unit (AU) = 149.6 million kilometers (the mean distance between the Earth and the Sun).

Note also that ESO has set up a special Home Page for the Comet Hyakutake event (http://www.eso.org/educnpubrelns/comet-hyakutake.html) where new information from ESO will be brought.

INTERNET E-MAIL

History and Origins of Astronomy
- some VERY NEW ideas

Dear East Valley Astronomy Club,

For some interesting NEW IDEAS on the origins of Astronomy in the Fertile Crescent, please examine the following NON-Commercial WEB site http://members.aol.com/akaulins/expak/expak1.htm (expak one, not the letter l)

We recommend you start at Kings and Dynasties on the Home Page. These pages are quite serious in nature and scope but, if we are right, it will revolutionize our assessment of ancient cultures and the origins of Astronomy. Feel free to print out any page and include its contents in your publications.

Thank you.- Andis Kaulins (Stanford University, 1971)

Date: Mon, 12 Feb 1996 11:22:46 +0700
From: rhill@LPL.Arizona.EDU (Rik Hill)

Yesterday, and again today, Rep. Jim Kolbe's office has been under assault by "Earth First!" for his support for the Mt. Graham project. He and future astronomical projects in our area need your support now. I urge you to call his office now and express your feelings on his support for astronomical and scientific research.

Call: 881-3588.

-Rik

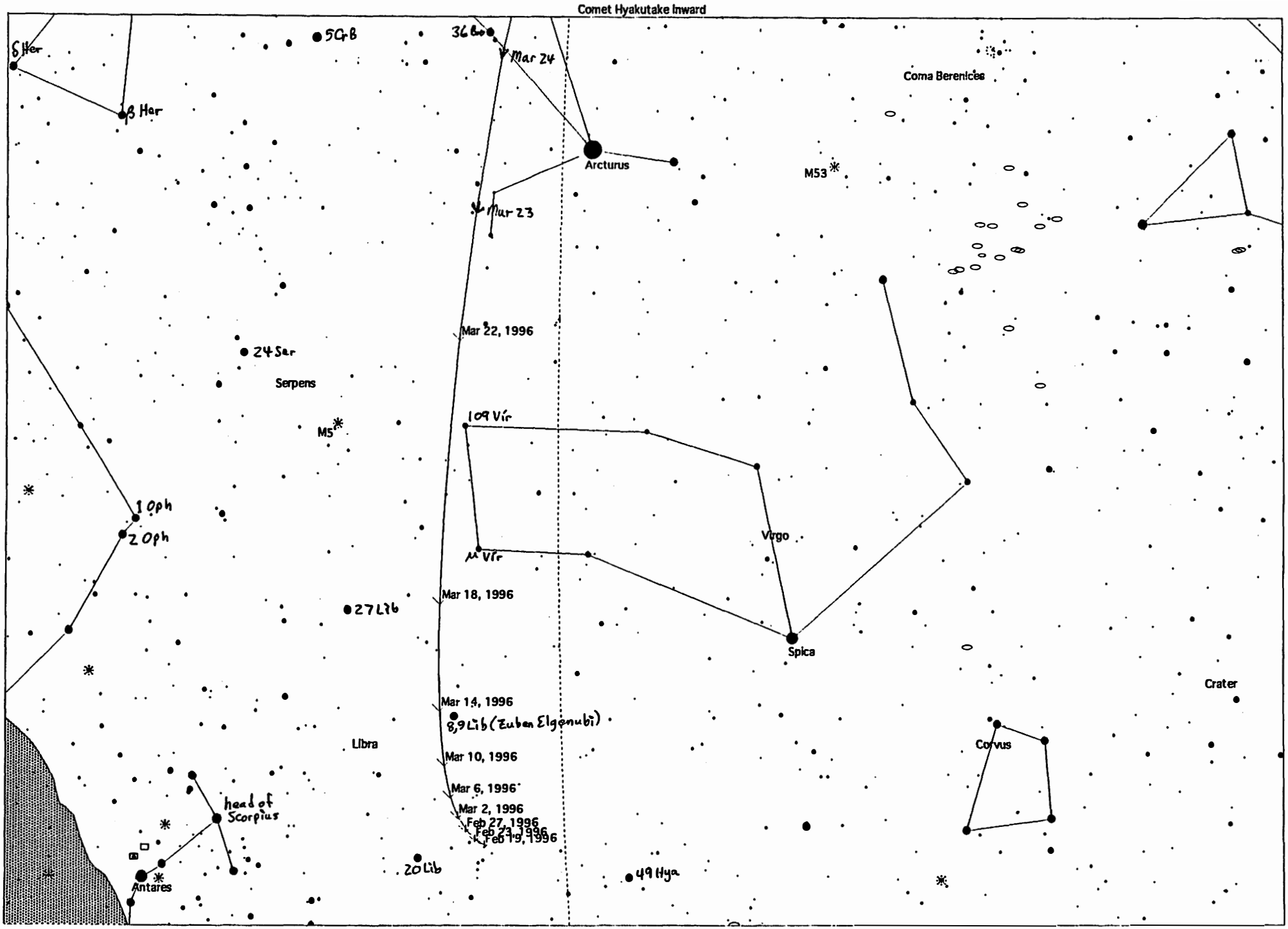
HUBBLE OPENS DOORWAY TO SYSTEMATIC SEARCH FOR BLACK HOLES

Hubble Space Telescope's ongoing black hole hunt has bagged yet another supermassive black hole in the universe. The compact object -- equal to the mass of two billion suns -- lies at the heart of the edge-on galaxy NGC 3115, located 30 million light-years away in the constellation Sextans.

This result promises to open the way to systematic demographic studies of very massive black holes that might once have powered quasars -- objects that are incredibly small, yet release a gusher of light and other radiation.

Although this is the third black hole confirmation for Hubble, it is the first time the space telescope has demonstrated the feasibility of a powerful black hole identification technique that allows astronomers to directly observe the motions of stars orbiting the black hole.

This technique has previously been used on ground-based telescopes, but its accuracy in detecting and measuring a large central mass is severely limited by the limited resolution of telescopes viewing the galaxy through the Earth's >> (ctnd. inside last page)


Comet Hyakutake Inward
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Mar 24
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Mar 23
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24 Ser
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M5
10 Oph
20 Oph
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Mar 18, 1996
27 Lib
Spica
Crater
Mar 14, 1996
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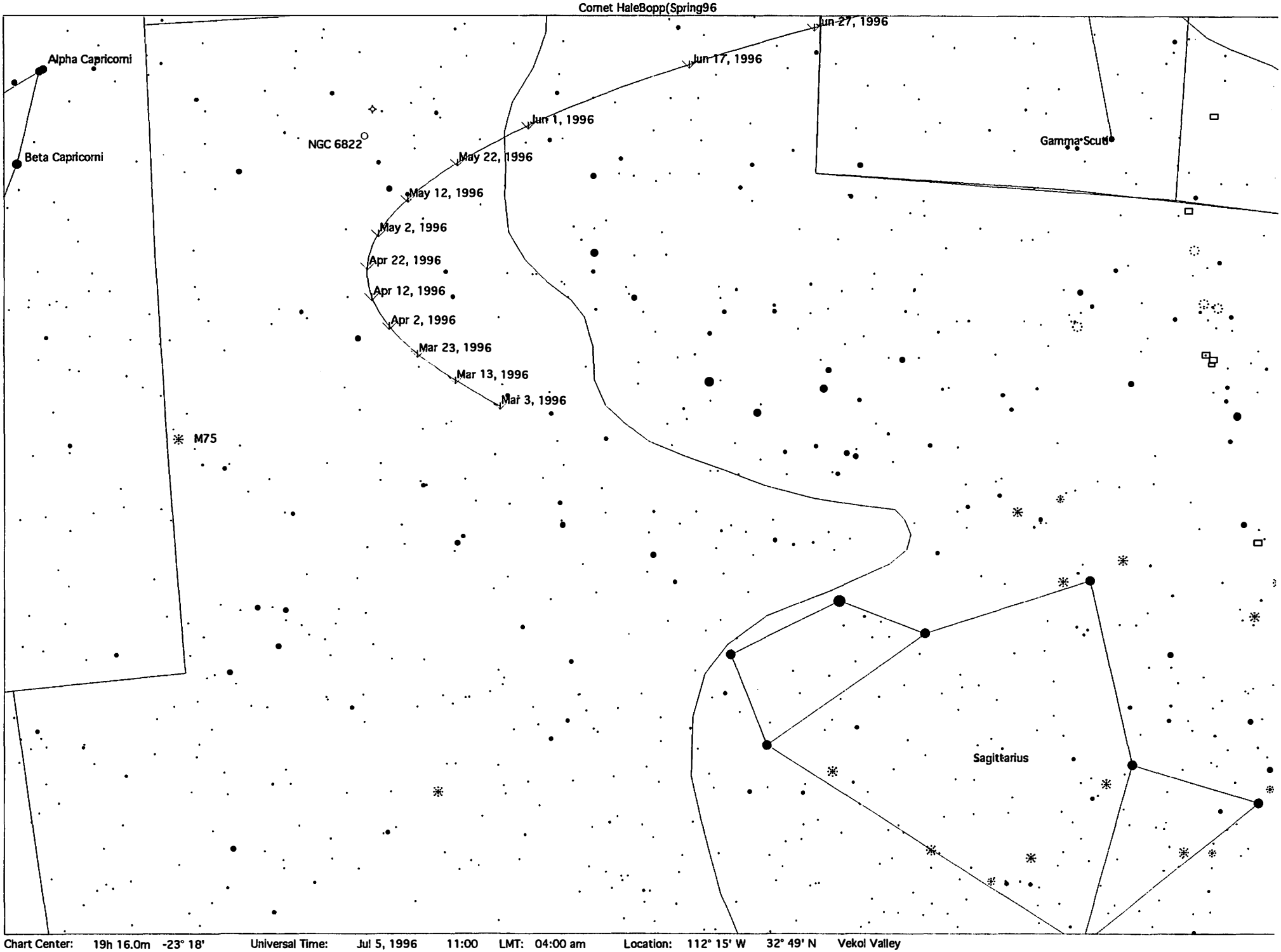
Comet HaleBopp(Spring96
Alpha Capricorni
Beta Capricorni
NGC 6822
Jun 27, 1996
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Jun 1, 1996
May 22, 1996
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May 2, 1996
Apr 22, 1996
Apr 12, 1996
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Mar 23, 1996
Mar 13, 1996
Mar 3, 1996
Gamma Scuti
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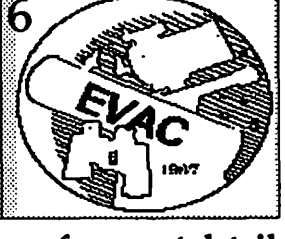
Sagittarius
Chart Center: 19h 16.0m -23° 18' Universal Time: Jul 5, 1996 11:00 LMT: 04:00 am Location: 112° 15' W 32° 49' N Vekol Valley

East Valley Astronomy Club

March1996

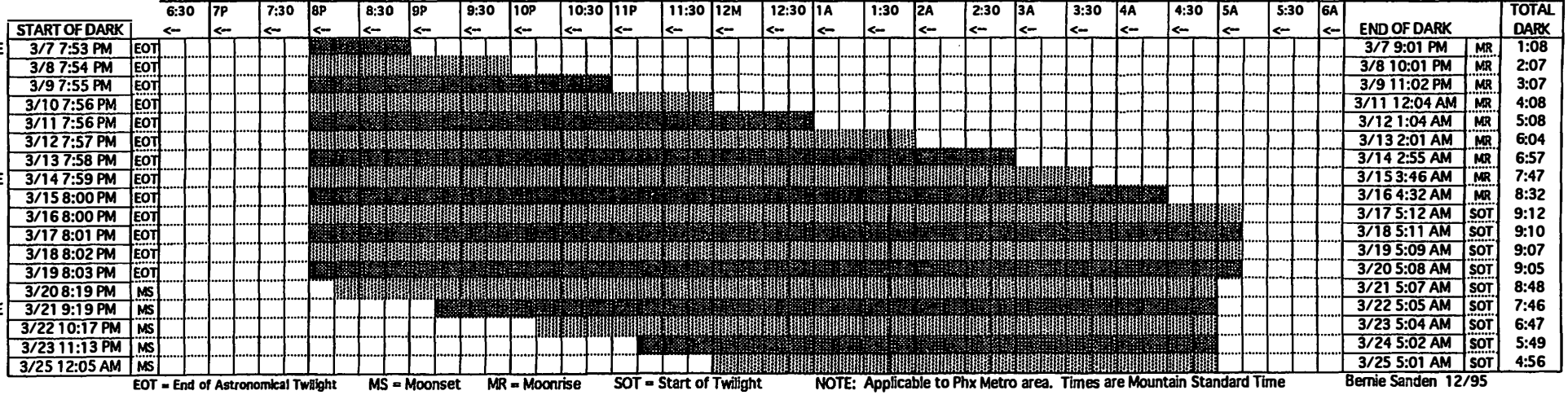
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
25 ◐	26 *12:31 AM Occ	27	28	29	1 *ALL MONTH NOTES	2 *12:46 AM Occ
3	4 *Mars Conjunction w/Sun Sunset 6:28 PM	5 ○ Sunrise 6:52AM	6	7 *5:00 AM STS-75 *7:00 PM PAS Mtg	8 *West Lunar Libration *7:30 PM SAC Mtg	9
10	11 ◑ *9:17 PM Algol at min	12	13 7:30 PM EVAC Mtg *Excellent SW Lunar Lib.	14	15	16 Messier Marathon
17 *Saturn Conjunction w/Sun	18 Sunset 6:39 PM	19 ● *2:22, 3:35, 4:15, 4:35, and 5:49 AM Galilean Moons Sunrise 6:34AM	20 *Vernal Equinox	21 *East Lunar Libration	22	23 Local S Party
24	25 *Comet Hyakutake close!	26 ◐ *8:50 PM Occ *2:45, 3:08, 4:11, 4:15, 5:21, and 5:31 AM Galilean Moons	27 *North Lunar Libration	28 *8:33 PM Occ *Mercury at Superior Conj. *2:05 AM Asteroid Edith Occ	29 *7:46 PM Occ	30 *8:21 PM Occ
31 *Venus at max Elongation	1	2	3 ○	4 *7:00 PM PAS Mtg	5	6 

All times are LOCAL - add 7 hrs for Universal Time

Flip over for event details

Date	Start	Title	Description
3/1/96	12:00 AM	ALL MONTH NOTES	CALENDAR NOTES: See 1996 EVAC Occultation Predictions in the February newsletter for details on lunar occultations (Occ). Algol min refers to minimum magnitude of the naked eye variable star. Galilean Moons refer to events of Jupiter's satellites. See Sky&Telescope (S&T) and Astronomy (Astro) for more details. PLANETS: MERCURY is very difficult, low in the East at dawn. Reaches superior conjunction with Sun on the 28th. VENUS is bright (-4 mag) and unmistakeable in the SW evening sky. Reaches greatest apparent distance from Sun on the 31st. MARS reaches conjunction with the Sun on the 4th and cannot be observed. JUPITER rises about 2:30 AM at mid-month and is easy to spot at -1.9 mag in the SE. SATURN reaches conjunction with the Sun and cannot be observed. URANUS and NEPTUNE both rise about 4 AM and can be found with a finderchart like in the Mar S&T. PLUTO rises about midnight and can be found with a moderate size scope (+13th mag) and a good finderchart. OBJECTS OF INTEREST: COMET HYAKUTAKE–don't miss it! Variable stars Algol and Mira (Feb S&T) Peculiar object Chiron (Feb Astro)
3/4/96	2:00 AM	Mars Conjunction w/Sun	Mars in conjunction with the Sun and not visible.
3/7/96	5:10 AM	5:00 AM STS-75	Possible sighting of Space Shuttle during scheduled rentry for Kennedy Space Center landing. Look low in the southern sky.
3/7/96	7:00 PM	7:00 PM PAS Mtg	Phoenix Astronomical Society meeting, Brophy Prep, 4701 N. Central Ave. Turn off Highland into Main entrance, follow signs upstairs to Physics lab.
3/8/96	7:30 PM	7:30 PM SAC Mtg	Saguaro Astronomy Club meeting, Grand Canyon University, Fleming Bldg, Rm 105. Camelback and 33rd Ave.
3/17/96	12:00 AM	Saturn Conjunction w/Sun	Saturn in conjunction with the Sun and not visible.
3/20/96	1:03 AM	Vernal Equinox	Sun's apparent path crosses the celestial equator northbound. Sun rises and sets today at exact East and West points on horizon. Time Sun spends above and below the horizon should both be 12 hrs, but my program shows that occurs on the 17th–sunrise and sunset both at 6:37. Atmospheric refraction?
3/25/96	12:00 AM	Comet Hyakutake close!	Comet Hyakutake approaches within 9 million miles of Earth. Very fast motion is obvious relative to background stars–over one half degree per hour!
3/28/96	1:00 AM	Mercury at Superior Conj.	Mercury at Superior conjunction with Sun (opposite to Earth) and not visible.
3/28/96	2:05 AM	2:05 AM Asteroid Edith Occ	Minor planet 517 Edith will possibly occult SAO 184113. See Mar S&T for details.
3/31/96	6:00 PM	Venus at max Elongation	Venus at greatest eastern elongation–46 degrees away from Sun in our sky.

MAR 1996



EOT = End of Astronomical Twilight MS = Moonset MR = Moonrise SOT = Start of Twilight NOTE: Applicable to Phx Metro area. Times are Mountain Standard Time

Bernie Sanden 12/95

turbulent atmosphere. However, Hubble's detection demonstrates that it is the preeminent telescope for conducting a systematic inventory of normal galaxies to learn how common supermassive black holes are in the universe.

It may turn out that most, if not all galaxies, harbor quiescent black holes at their cores. These black holes may have been active long ago, explaining the abundance of quasars in the early universe.

In 1994, Hubble discovered a 2.4 billion solar mass black hole in the elliptical galaxy M87 by measuring the velocity of a spiral-shaped disk of gas swirling around the galaxy's core. Hubble later found a 1.2 billion solar mass black hole embedded in a gas disk in galaxy NGC 4261. However, because gas disks are rare, other search and detection strategies had to be demonstrated before Hubble could be used to survey other galaxies.

This new technique doesn't rely on the presence of gas disks, but instead looks directly at stars, which occupy the core of all galaxies. Though this technique can be applied to many galaxies, it is also very challenging because it requires careful interpretation of the data because stellar orbits are more complex than a simple rotating disk.

Through careful observations with Hubble's Faint Object Spectrograph, a team of astronomers, led by John Kormendy of the Institute for Astronomy, Honolulu was able to measure the velocities of stars in the galaxy's nucleus which are swirling around the black hole. Follow-up spectroscopic observations were made with the Canada-France-Hawaii Telescope at Mauna Kea, Hawaii. Hubble's high resolution allows astronomers to probe closer in toward the galaxy's nucleus, to obtain definitive data favoring a black hole's presence.

The results show there is far more gravity than would be expected just from stars alone -- supporting the notion that an extremely massive, dark, and compact object is present. Hubble can't view the black hole directly. Rather, it's presence must be inferred by the effects of its intense gravitational field on the surrounding space. A central black hole will cause stars to orbit the galaxy's core much more rapidly the closer they are to the black hole (just as the orbits of the planets in our solar system can be used to estimate the mass of the Sun).

The team's results will appear in the March 10 issue of the Astrophysical Journal Letters.

CONTACT: Ray Villard - STSCI, Baltimore, MD
(Phone: 410-338-4514)

Doug Richstone - U of M, Ann Arbor, MI
(Phone: 313-764-3466)

OBSERVING REPORTS

Subj: Comet Hyakutake
Date: Feb 25, 1996 11:54 AM EST

FINALLY we had a clear morning to observe the possible super comet. I got up about 5:00 this morning and used my 11x80mm binoculars and 8 inch from my back yard. The comet was easily found in its proper place in Libra. It appeared as about a 7 to 8 magnitude fuzz ball about 6 arc minutes in diameter. With the 8 inch at about 70x I believe I saw a "slight" tail. Considering my light polluted location, I was impressed with the images. Has anyone else observed it recently from a dark location?

Frank Honer

THE 1996 ALL-ARIZONA MESSIER MARATHON

March 16, 1996

The 1996 All-Arizona Messier Marathon is a one night - all night - observing session held during the new moon of March. The goal is to observe as many entries in Charles Messier's magnificent catalog as possible; limited only by your observing skills, stamina, and the weather.

Certificates will be awarded to participants observing 50 or more objects. A plaque, suitable for mounting on your telescope, will be awarded for first, second and third highest totals achieved, with duplicate awards for ties.

The marathon is being held at a new site near Arizona City, which is nearly equidistant from Phoenix and Tucson (Members see and read attached map). This is the same site as the 1995 All-Arizona Star Party last October.

Invitations have been sent to all known Arizona astronomy clubs and a large turnout is expected. Even if you don't plan on taking part in the marathon, this will be a good star party to attend. There will be a lot of people there all night long. Last year was the largest turnout so far, let's see if we can top it.

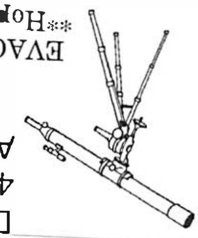
For more information, contact A.J. Crayon at 938-3277 or E-mail: a.crayon@az05.bull.com.

NEWS FLASH

In case you missed it, Tom Polakis had another article published. It is in the April 96 issue of Sky & Telescope. The article is about Edge-on Galaxies. Well done, Tom.

EAST VALLEY ASTRONOMY CLUB
Robert G. Kearney, Jr., Editor
2120 W. 8th Ave.
Mesa, AZ 85202

Don Wrigley
423 W. 5th Ave.
Apache Junction, AZ 85220



EVAC member since 1/17/92!
**Hope to see you at the meeting Mar. 13th

EAST VALLEY ASTRONOMY CLUB

President:	Vice-President:	Treasurer:	Secretary:	Properties:
Robert Kerwin	Tom Polakis	Sheri Cahn	Sam Herchak	Steve O'Dwyer
837-3971	967-1658	246-4633	924-5981	926-2028

MEMBERSHIP&SUBSCRIPTIONS: $20.00 annually. Reduced rates available to members for *Sky&Telescope* and *Astronomy*. Contact Sheri Cahn, 4220 W. Northern #116, Phoenix, AZ 85051, (602)-246-4633.

CLUB MEETINGS: Second Wednesday of every month at the Scottsdale Community College, 7:30 PM. Normally Room PS 170 or 172 in the Physical Sciences Building.

NEWSLETTER: Published and mailed out the week before the monthly Club meeting. Send your thoughts and stories for publication to: Robert G. Kearney, Jr., 2120 W. 8th Ave., Mesa, AZ 85202, (602)-844-1732. Email to: JRKearney@aol.com.

CHANGE OF ADDRESS: Notify Bill Smith, 1663 S. Sycamore, Mesa, AZ 85202, (602)-831-1520. Email to: bsmithaz@aol.com.

EVAC LIBRARY: The library contains a good assortment of books, downloaded imagery, and helpful guides and is usually brought to the Club meetings. Contact Steve O'Dwyer for complete details, (602)-926-2028.

BOOK DISCOUNTS: Great savings for members through Kalmbach and Sky Publishing Companies. Contact Sam Herchak, 145 S. Norfolk Cir, Mesa, AZ 85206-1123, (602)-924-5981.

EVAC PARTY LINE: Let other members know in advance if you plan to attend a scheduled EVAC observing session. Contact Robert Kerwin, (602)-837-3971. Email to: p24493@gegpo7.geg.mot.com.