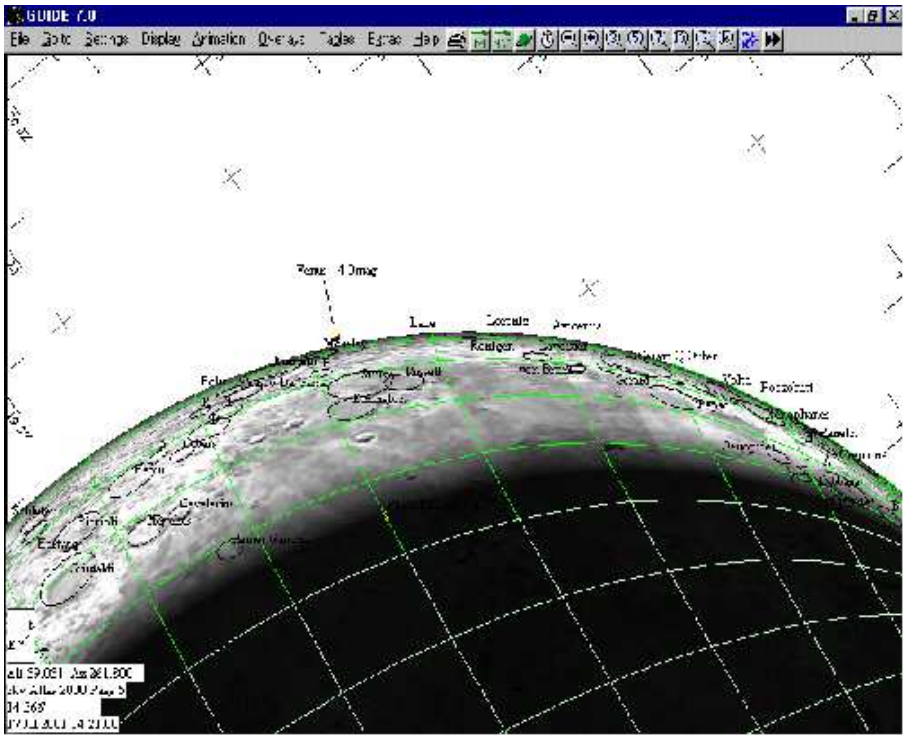
REFLECTIONS REFRACTIONS

of the University Lowbrow Astronomers

July 2001

The University Lowbrow Astronomers is a club of Astronomy enthusiasts which meets on the third Friday of each month in the University of Michigan's Physics and Astronomy building (Dennison Hall, Room 130 or 807). Meetings begin at 7:30 PM and are open to the public. Public star parties are held twice a month at the University's Peach Mountain Observatory on North Territorial Road (1.1 miles west of Dexter-Pinkney Road; further directions at the end of the newsletter) on Saturdays before and after the new Moon. The party may be canceled if it's cloudy or very cold at sunset. For further information call (313) 480-4514.

Daylight Astronomy: The Moon occults Venus!!
Constellation of the Month: Cygnus, The Swan
The Path of Astronomy: An essay by a gifted student!
Comet Linear 2001 A2 makes its northern hemisphere appearance. How bright will it be???



This Month: July 14 Open House at Peach Mt. Mars rises early!
July 17 Daylight Astronomy: Moon occults Venus
July 20 Meeting at 7:30pm in room 130 of the Dennison Bldg. Speaker TBA
July 21 Open house at Peach Mt. The summer Milky Way, Mars, and maybe a Comet!

Next Month: Aug 11 Open House at Peach Mt. Mars' moon, Deimos is discovered 1877 by A. Hall. Can we find it in the 24"?
Aug 17 Meeting at 7:30pm in Rm. 130 of the Dennison Bldg. Speaker John Kirchoff of Ryder's Hobby Shops - shows us the latest astro gadgets.
Aug 18 Open House at Peach Mt. New Moon = Dark Skies

Daylight Astronomy:

Lunar Occultation of Venus

By Mark S Deprest

On July 17th 2001 the Moon will occult Venus, that is to say from our perspective the Moon will move in front of Venus for about an hour. This would be an awesome spectacle if it were happening after the Sun has set or before the Sun has risen, but alas, this will not be the case, at least not from our point of view. Don't lament, its still a very cool and exciting spectacle and should be quite visible with a little help.

Using nothing more than a pair of binoculars and a clear sky and you should be able to witness this rare occultation without any problem. If you have a telescope with a clock drive you should even be able to photograph or video tape the event. The July 2001 issue of Sky & Telescope magazine (page 100) has a very nice article on this event. The last time the Moon and Venus played this little game of hide and seek with us (visible from Ann Arbor, MI) was on April 19th 1993 at a little after noon local time and March 5th 2008 at about 3:25 PM is the next time this event will be visible again from our area, so you might not want to miss this one.

Some of the University Lowbrows are planning to set up a daylight observing session at the Leslie Science Center in Ann Arbor. Kind of like the Mercury transit of the Sun in November of 1999. We will need to be able to show a large group of people what is happening all at the same time. After Venus has disappeared behind the moon we will want to show the public sunspots for about an hour until Venus reappears again. I realize that this event is taking place during normal business hours and a lot of you may not be able to make it to the Leslie Science Center, but you might want to bring your binoculars to work and schedule a late lunch for this date.

The occultation will begin at 14:21 EDT on July 17th 2001. That is when Guide 7.0 predicts that the Moon will begin to cover Venus' dark third (Venus will be approx. 2/3 illuminated). By 14:22 EDT Venus will be completely occulted by the Moon about 22 degrees north of the lunar equator. The first edge of the illuminated portion of Venus should be visible at 15:28 EDT. The Occultation should end and Venus will have totally reappeared by 15:29 EDT about 19 degrees north of the lunar equator. The Moon and Venus will be about 39 degrees above the western horizon at the start of the occultation and will have dropped to 26 degrees by the event's end. The sun is about 42 degrees east of the event and that should make it pretty easy to see. Those with very keen eyesight may be able to watch this occultation without optical aid. (picture on the front page was produced by Guide 7.0)

Those of you who wish to be a part of the "Daylight Astronomy" group should contact me or Bernard Friberg. We will be setting up by 1:30 p.m. and would like to have anyone who wants to help be there then.

The Path of Astronomy

Kristina Nyland

February 1, 2000

On cool, crisp, moonless nights when I shift my gaze towards the heavens and lose myself amidst the vast expanse of stars floating atop a sea of ebony, I often wonder how I chanced to find the path of astronomy. I am not certain whether I will ever fully understand the root of my fascination with the sky. It's haunting beauty is unparalleled and the secrets it holds are as boundless as time itself. The stars seem to have a magical quality and glimmer and twinkle like freshly polished gemstones set out to dry in the warmth of the sun. The sky itself is a canopy of blackness - a dark oblivion into which I beam and dare to dream of my future in astronomy.

The heavens offer a much needed respite from the jaded activities of ordinary life. The sky has simply become a realm that I cannot imagine life without. The stars have become embedded and intertwined within my character nothing could ever wrench them away from me. The resplendency of images of the universe never ceases to be a source of inspiration and hope for me.

Perhaps searching for a reason behind my love of the stars is a futile endeavor. It could be that it was simply my destiny to become an astronomer. Beyond the blue of the earth where the forces of nature play dice with the destinies of the denizens of the cosmos, "lucky seven" was rolled in my honor. And maybe there is no reason at all. But whatever the catalyst for my love of the sky, I am eternally grateful for it.

It's gotten colder now and I should be returning to the world of ordinary life once again. But, before I depart, I will take one final glance at the silvery stars sprinkled across the obsidian sky. As they twinkle at me in the stillness of night I am filled with a sense of wonder and I realize that these tiny treasures in the sky give me serenity, direction and meaning.

(picture by Clayton Kessler, Peach Mt. April 2001)

Constellation of the Month:
Cygnus, The Swan

By Mark S Deprest

This is without a doubt my favorite constellation, for a number of reasons, but the most important one is probably; this constellation is the source of my active participation in astronomy, that's another story entirely. This month's story is about Love, Honor, Foolishness and Friendship. It's a story that explains the reason we see the Milky Way as a faint path across the night sky.

Cycnus was a devoted friend of Phaethon, the mortal son of Helios, the charioteer of the Sun. Phaethon was a bold and head strong teenager, and like most teenagers, he thought he knew more than his "Old-Man." One night his bold nature got the better of him, and despite the advice of his friend Cycnus, and the warnings of his father, Phaethon took out the family car for a bit of a joy ride. The trouble was, the family car was the Sun Chariot and its horsepower was provided by real horses, Phaethon realized very quickly that his joy ride was a mistake, but it was too late. The horses that pulled the Sun Chariot were strong and wild, and only the strength of Helios could control them. Phaethon's wild ride took him dangerously close to the vault of the heavens and threatened to singe the earth and destroy the inhabitants of both. Cycnus pleaded with Jupiter to stop this destruction, and with all of creation endangered, Jupiter sent a thunderbolt toward the rampaging chariot and its occupant. With a terrible explosion Phaethon was thrown from the chariot and the fiery steeds were stopped long enough for Helios to gain control and guide them back to their stables. Phaethon, being mortal could not survive the force of a thunderbolt and fell to earth like a shooting star, his charred and lifeless remains landed in the river Eridanus.

Cycnus could not leave his friend to the creatures of the river to feed on, and wanted to give Phaethon a proper burial. Cycnus dove repeatedly into the river to gather the charred remains of his friend. Jupiter, watching this selfless display of devotion was moved, and when Cycnus had completed his task of love and honor. Jupiter decided to give Cycnus a gift of immortality and changed his name to Cygnus and him into a glorious swan. This swan would be placed forever in the heavens amidst the scorched path of Phaethon's disastrous ride, the Milky Way.

There are other stories that may be related to this constellation, early Christians saw it as the Cross of Cal

vary and it is also known as the Northern Cross. But the story related here is by far a personal favorite.

Transit at Midnight of Alpha Cygni: August 21st

This constellation is stretches across 804 square degrees of one of the richest areas of the Summer Milky Way. It reaches from almost 19 hours in the west to 22 hours in the east and runs from +27 degrees to +60 degrees north declination. The stars that make up the main figure of Cygnus are first, second and third magnitude gems that stand out easily against the ethereal glow of the Milky Way back drop. To list a good representation of the objects worth examining in Cygnus took 30 pages of descriptions, charts, drawings and photos in George Kepple's and Glen Sanner's, "The Night Sky: Observer's Guide." We obviously don't have that kind of room in this newsletter, so, what follows are a few of my favorites, and a suggestion to spend no less than one full evening in feathered regions of Cygnus. I can almost guarantee you won't be disappointed.

Things to Check Out in Cygnus

Multiple Star Systems

Albireo, Beta Cygni, STF43, ADS 12540
RA (J2000): 19h 30m 43.29s dec: +27d 57m 34.9s
Included in the Astronomical League's certificate list of 100 double stars. Included in the Saguaro Astronomy Club's list of 110 best multiple stars. Components show

no relative motion. Colorful double star. Distance: 380 light-years
Component A: magnitude +3.1
Component B: magnitude +5.1
Separation AB: 34.4" at position angle 54 degrees
Discovered by Struve in 1832. Despite the wide separation, the two stars are thought to be physically associated. The best-known of all colored double stars, and considered by many to be the finest in the sky. The colors are yellow or " topaz " for the primary, and blue or greenish for the companion.

61 Cygni, STF2758, ADS 14636
RA (J2000): 21h 06m 52.19s dec: +38d 44m 03.9s
Included in the Astronomical League's certificate list of 100 double stars. Included in the Saguaro Astronomy Club's list of 110 best multiple stars. Visual binary star. Included in Michael R. Feltz's list of the widest visual binaries. Orbital elements and diagram available on Richard Dibon-Smith's website. Distance: 11.4 light-years
Component A: magnitude +5.4
Component B: magnitude +6.0
Separation AB: 30.3" at position angle 150 degrees
The famous "Flying Star". Its unusually large proper motion (5.22 " a year at PA 52) was first noticed by Piazzi in 1792, although the first measurement as a double was by Struve in 1830. Bessel chose 61 Cygni in 1838 for the first successful measurement of the distance of a star using its annual parallax. At 11.4 light-years, this is the fourth nearest star to the Sun, only Alpha Centauri, Sirius, and Epsilon Eridani being closer. Sometimes said to look yellowish or orange, which fits the spectral classes.
The system consists of two orange dwarfs. There is a dark third component known as 61 Cygni C, with a mass only 8 times that of Jupiter.

31 (Omicron) Cygni, STF50, ADS 13554
RA (J2000): 20h 13m 37.90s dec: +46d 44m 28.8s
Included in the Astronomical League's certificate list of 100 double stars. Included in the Saguaro Astronomy Club's list of 110 best multiple stars. Optical double, colorful double star.
Distance: A 1350 light-years B 1700ly C 720ly
Component A: magnitude +3.8
Component B: magnitude +6.7
Component C: magnitude +4.8
Separation AB: 101" at position angle 173 degrees
Separation AC: 338" at position angle 323 degrees
An interesting triple group, although the stars are certainly not physically associated. Star C in this data is actually numbered 30 Cygni in Flamsteed's catalogue. 31 Cygni A has a noticeable yellow color, while B and C (30 Cygni) are bluish.
31 Cygni A is an eclipsing binary of the Algol type numbered V695 Cygni. It ranges between magnitudes 4.9 and 5.3, with a period of 10.4 years. The orbit is very nearly edge-on to us, so that the eclipse of the companion is almost total. It is preceded and followed by a period of partial eclipse as the companion passes behind the extended atmosphere of the primary. Each atmospheric eclipse lasts for 2.5 months, and the total phase for 63 days. The next atmospheric eclipse is due to begin in mid-October 2003.

Delta Cygni, STF2579, ADS 12880
RA (J2000): 19h 44m 58.44s dec: +45d 07m 50.5s
Visual binary star. Included in Michael R. Feltz's list of the widest visual binaries. Orbital elements and diagram available on Richard Dibon-Smith's website. Distance: 171 light-years
Component A: magnitude +2.9
Component B: magnitude +6.5 variable
Separation AB: 2.5" at position angle 221 degrees
First observed by Struve in 1826 (WDS) or 1830 (Burnham). This is a particularly tricky double for a small telescope because the secondary lies on the first diffraction ring of the primary. Muirden (1988) says some people suggest looking during twilight. Star B is variable between magnitudes 6.5 and 8.5 (approximately).

Deep Sky Objects

The area of the sky we are looking into is also known as the Cygnus Star Cloud and is one of the most visually beautiful parts of the northern Milky Way. When you examine this area you are looking down the length of our spiral arm where is begins to curve around the center of our galaxy. So, you might expect to see clusters and nebulae of all types and that is exactly what you find, here are some of my favorites.
NGC 6819
R. A. 19h41.3000m Dec: +40d 10.99'
Angular diameter: 5.0 arc minutes Distance: 2200 parsecs Age 3,400,000,000 years
Brightest star is magnitude 11.0 150 stars 11-16mags
Open cluster, very large, very rich in stars, stars 11...15mag

NGC 6866:
J2000 RA: 20h03.7m dec: +44 00'
Angular diameter: 6.0 Arc minutes Distance: 1200 parsecs Age 230,000,000 years
Brightest star is magnitude 10.0 50 stars 10 - 13mag
Open Cluster, large, very rich in stars, considerably compressed

NGC 6826, Blinking Planetary, PK83+12.1
J2000 RA: 19h44.8m dec: +50 31'
NGC 6826: planetary nebula, bright, pretty large, round, a star of 11th magnitude middle, angular diameter 27"X24 Visual magnitude, integrated over entire object: 9.8

IC5146, Cocoon Nebula
J2000 RA: 21h53.4m dec: +47 16'
Maximum diameter: 540 arcseconds Distance: 1000 parsecs Age 230,000,000 years
Brightness level: 1 (1=brightest, ... 6=faintest)
Emission nebula, pretty bright, very large, irregular figure, star 9.5mag in middle
(shown below)

NGC 6910
J2000 RA: 20h23.1m dec: +40 47'
Angular diameter: 7.0 Arc minutes Distance: 1650 parsecs Age 10,000,000 years
Open Cluster, pretty bright, pretty small in angular size, poor, pretty compressed, 20 stars 10-12mag
(shown below)

NGC 6913
J2000 RA: 20h23.9m dec: +38 32'
Distance: 1250 parsecs, Brightest star is magnitude 9.0, Age 10,000,000 years
Open Cluster, poor, little compressed, stars large and small in angular size; = M29 About 20 stars mags 9-12 angular diameter 7.0'

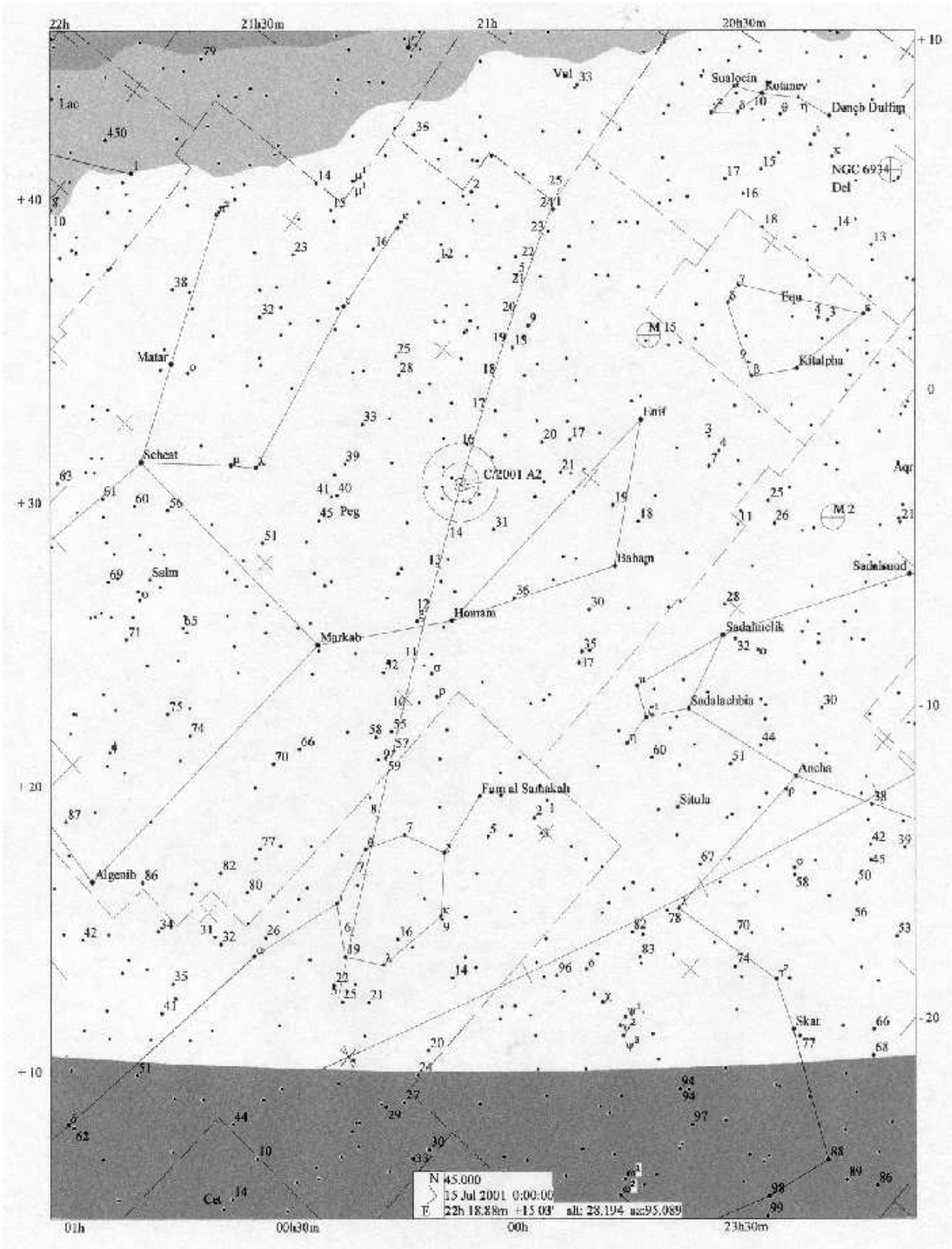
NGC 6960, Veil Nebula Supernova Remnant
J2000 RA: 20h45.7m dec: +30 43'
Angular diameter 70'X6' Magnitude:7.0 Brightness level:4 (1=brightest, ... 6=faintest)
Reflection nebula, very much remarkable pretty bright, considerably large, extremely irregular figure, 52 Cygni involved, Veil Nebula western part

NGC 6992-95, Veil Nebula, Supernova Remnant
J2000 RA: 20h56.4m dec: +31 43'
Angular diameter 60'X8' Magnitude:7.0 Brightness level:4 (1=brightest, ... 6=faintest)
Reflection nebula, very much remarkable, extremely faint, extremely large, extremely extended, extremely irregular figure, bifurcated, Veil Nebula eastern part
(NGC 6992 below and NGC 6995 below right)

NGC 7000, North America Nebula
J2000 RA: 20h58.8m dec: +44 20'
Angular diameter 120'X10' Magnitude: 4.0 Brightness level: 4 (1=brightest, .. 6=faintest)
Reflection nebula, faint, most extremely large, diffused nebulosity, Open Cluster NGC 6997 involved

NGC 7092
J2000 RA: 21h32.2m dec: +48 26'
Distance: 270 parsecs, Brightest star is 7.0mag, Age 270,000,000 years
Open Cluster, very large, very poor, very little compressed, stars 7...10; = M39,angular diameter: 31.0'

Note: all pictures are Digital Sky Survey downloads


22h
21h30m
21h
20h30m
+10
+40
+30
+20
+10
0
-10
-20
01h
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00h
23h30m
Lac
Vul
Sualocin
Rotanev
Dsnch Dulfim
NGC 6934
Del
Equ
M 15
Kitalphu
Matar
Scheat
Enif
C/2001 A2
Aqr
45 Peg
M 2
Salm
Baham
Sadalsuud
Homam
Markab
Sadalmelik
Sadalachbia
Ancha
Fum al Samakah
Situla
Algenib
Skat
Cet
N 45.000
15 Jul 2001 0:00:00
F 22h 18.88m +15 03' alt: 28.194 az:95.089

C/2001 A2 (LINEAR) Orbital Elements

The following orbital elements are taken from *MPC* 42856:
C/2001 A2 (LINEAR)
Epoch 2001 May 11.0 TT = JDT 2452040.5
T 2001 May 24.5204 TT Marsden

q	0.779029	(2000.0)	**P**	**Q**
z	+0.000835	**Peri.**	295.3284	-0.4763961	+0.6952415
+/-0.000003		**Node**	295.1255	-0.4247712	-0.7179677
e	0.999350	**Incl.**	36.4752	-0.7698157	-0.0340839

From 444 observations 2001 Jan. 3-May 31.On June 17th in the southern hemisphere they were estimating this comet's magnitude at 3.5 The chart on the previous page shows the track of this comet at 1 day intervals and the comet is plotted for our July 14th / 15th Open House at 00:00 EDT. (chart was created by GUIDE 7.0)

http://cfa-www.harvard.edu/iau/Ephemerides/SoftwareEls.html

This page lists links to orbital elements suitable for loading into various planetarium-type/sky simulation software packages. At present, the following packages are supported:

- MPC format
- SkyMap (SkyMap Software)
- Guide (Project Pluto)
- xephem (E. Downey)
- Home Planet (J. Walker)
- MyStars! (Relative Data Products)
- TheSky (Software Bisque)
- Starry Night (Sienna Software)
- Deep Space (D. S. Chandler)
- PC-TCS (D. Harvey)
- Earth Centered Universe (Nova Astronomics)
- Dance of the Planets (ARC)
- MegaStar V4.x (E.L.B. Software)
- SkyChart III (Southern Stars Software)
- Voyager II (Carina Software)
- SkyTools (CapellaSoft)
- Autostar (Meade Instruments)

The URL Exchange

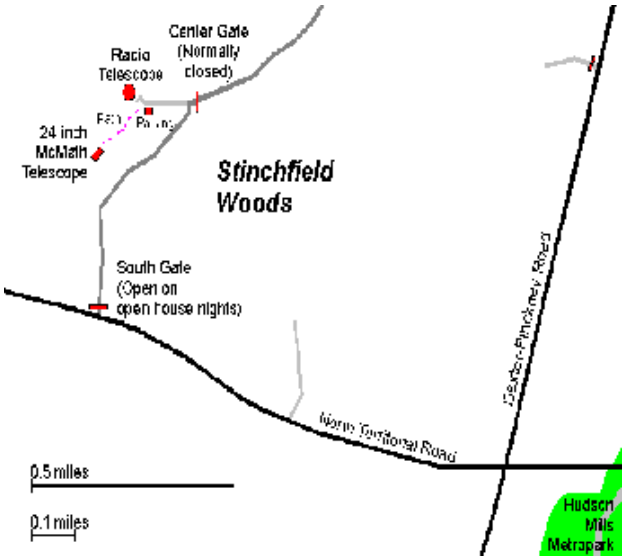
If you know of a "COOL" website that you would like to share with others. Well, here's the place to do it. Just send me an e-mail with the complete URL and a short description of what we will find when we "go there" and I will post it here.
http://users2.ev1.net/~mmccants/tles/index.html
The site listed above provides up to date Two Line Elements (TLE) for just about any satellite you can think of. The files are in zip format and download very quick.

VIEWING SITE FOR GOOD NIGHTS WHEN PEACH MT.. IS CLOSED.

My name is Harry Juday. My wife Anna Scott and I have been Lowbrow members for about 1 1/2 years. Unfortunately we have not made all of the meeting as it seems the third Friday has become the most popular day of the month for family and "can't get out of going" events. At least since we joined.
We are relative newcomers to the pursuit of amateur astronomy (since early 1996). We moved to the Ann Arbor area in 1998, choosing a home in Freedom Twp.. with quite decently dark skies and a great Southern horizon.
The purpose of this article is to invite any interested members to come viewing at our place on good viewing nights when Peach Mt. is not open, and we are home with no great happening occurring. This is about 90+ % of the time, especially during the dark half of the Moon cycle. As I am retired, I plan my schedule around good viewing nights whenever possible. Since we are not blessed with an overabundance of them in this area, and many occur in the week, or on Sunday, it can limit the viewing opportunities for many. This offer is being made to help alleviate that situation. We have 5 acres of land, 4 of which I mow. We are surrounded by farm land, but not farm houses. There are only a couple of objectionable lights, about 1/2 mile away and mostly hidden by leaves in Spring thru Fall. There are several good viewing locations, including a small hill, if you wish to carry your gear up to it. The hill is on the North side of the property and backed by a small woods. Best views are Southeast to Southwest, with the Southwest to Northeast having to contend with some trees and the hill, depending on where you set up to view. The Northeast to Southeast view is destroyed by the light dome from Ann Arbor, Ypsi, Detroit, etc.
I believe we can easily accommodate about a dozen scopes and you can park on the grass in the non-viewing areas. We also offer bathroom facilities and good, cold well water. Our home is located at 5737 S. Parker Road, 1/4 mile South of Pleasant lake Road and the first house on the East side. The house sits back from the road about 350 ft. This is about 5 miles West of Ann Arbor - Saline Rd. The Ann Arbor - Saline Rd and Pleasant Lake Rd. intersection has a light and the Fairgrounds is located on the Southeast corner. We are about 14 driving miles Southwest of downtown Ann Arbor. There is one bad feature to our site, mosquitoes. They are numerous, large, voracious and very aggressive. Protection of some form is seriously advised. I am not quite certain at this point exactly how to work out the procedure to let persons know when I will be viewing, or home and club members welcome to come out. Perhaps we can discuss it at the next meeting, if anyone is interested in the offer. We do not travel or party very often, so if it is a good viewing night, we will probably be at home, and viewers are welcome to give our site a try. As I am not heavily into Moon Viewing at this time, I may not have my scope out during the gibbous phases, but club members who wish to view would still be welcome, if they don't mind a little kibitzing.
Our email address is < **juday1@gte.net** >.
Our phone # is 734 944 8170.
Questions and/or comments are welcome.
Harry L. Juday

Places and Times:

Dennison Hall, also known as The University of Michigan's Physics and Astronomy building, is the site of the monthly meeting of the University Lowbrow Astronomers. It is found in Ann Arbor on Church Street about one block north of South University Avenue. The meeting is held in room 130. Monthly meetings of the Lowbrows are held on the 3rd Friday of each month at 7:30 PM. During the summer months, and when weather permits, a club observing session at Peach Mountain will follow the meeting.



Peach Mountain Observatory is the home of The University of Michigan's 25 meter radio telescope as well as the University's McMath 24 inch telescope which is maintained by the Lowbrows. The observatory is located northwest of Dexter. The entrance is on North Territorial Road, 1.1 miles west of Dexter-Pickney Road. A small maize-and-blue sign marks the gate. Follow the gravel road one mile to a parking area near the radio telescopes. Walk along the path between the two fenced in areas (about 300 feet) to reach the McMath telescope building.

Public Star Parties:

Public Open House/Star Parties are held on the Saturday before and after each new Moon at the Peach Mountain Observatory. Star Parties are canceled if the sky is cloudy at sunset or the temperature is below 10 degrees F. Call 480-4514 for a recorded message on the afternoon of a scheduled Star Party to check on the status. Many members bring their telescopes and visitors are welcome to do likewise. Peach Mountain is home to millions of hungry mosquitoes - bring insect repellent, and it does get cold at night so dress warmly !

Amateur Telescope Making Group meets monthly, with the location rotating among member's houses. See the calendar on the front cover page for the time and location of next meeting.

Membership:

Membership dues in the University Lowbrow Astronomers are $20 per year for individuals or families, and $12 per year for students and seniors (age 55/+). This entitles you to the monthly REFLECTIONS newsletter and the use of the 24" McMath telescope (after some training).
Dues can be paid to the club treasurer **Charlie Nielsen** at the monthly meeting or by mail at this address:
6655 Jackson Road #415
Ann Arbor, MI 48103

Magazines:

Members of the University Lowbrow Astronomers can get a discount on these magazine subscriptions:
Sky and Telescope: $29.95 / year
Astronomy: $29.00 / year

For more information contact the club Treasurer. Members renewing subscriptions are reminded to send your renewal notice along with your check when applying through the club Treasurer. Make the check payable to "University Lowbrow Astronomers".

Newsletter Contributions:

Members and (non-members) are encouraged to write about any astronomy related topic of interest. Call or E-mail to Newsletter Editors at:
Mark Deprest (734)662-5719 msdpressed@mediaone.net
Bernard Friberg (743)761-1875 Bfriberg@aol.com
to discuss length and format. Announcements and articles are due by the first Friday of each month.

Telephone Numbers:

President:	D.C. Moons	
Vice Presidents:	Dave Snyder	(734)747-6537
	Paul Walkowski	(734)662-0145
	Doug Warshow	(734)998-1158
Treasurer:	Charlie Nielsen	(734)747-6585
Observatory Dir.:	Bernard Friberg	(734)761-1875
Newsletter Editors:	Mark Deprest	(734)662-5719
	Bernard Friberg	(734)761-1875
Parking Enforcement	Lorna Simmons	(734)525-5731
Keyholders:	Fred Schebor	(734)426-2363
	Mark Deprest	(734)662-5719

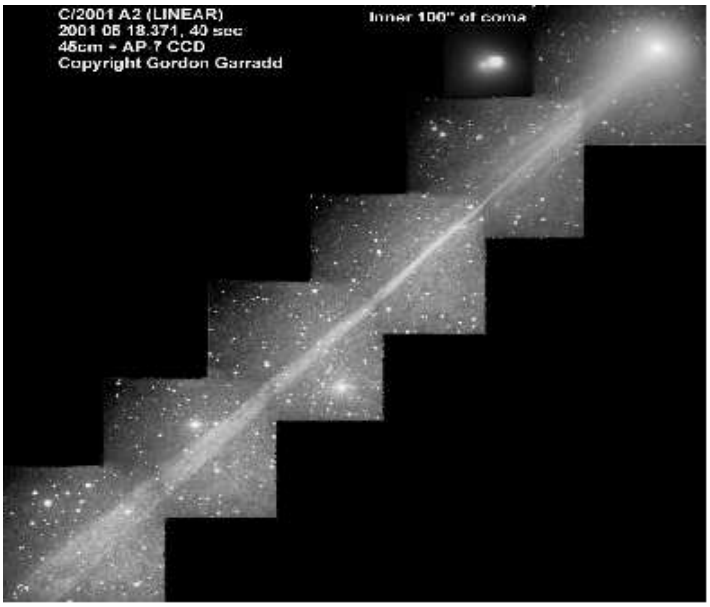
Lowbrow's Home Page:

http://www.astro.lsa.umich.edu/lowbrows.html
Dave Snyder, webmaster
http://www-personal.umich.edu/~dgs/lowbrows/

Comet C/2001 A2 (Linear)

- Moving into the northern hemisphere, the latest reports place this comet at 3.8 magnitude.
- How bright will it be when we see it?
- Check out the finder chart on page 7 and the Orbital Elements on page 8.

(photo reprinted here by permission of photographer Gordon Garradd)http://members.ozemail.com.au/~loomberah/



C/2001 A2 (LINEAR) 2001 05 18.371, 40 sec exposures of coma and tail combined into a mosaic. North is up in this 68 X 73 arcmin field of view. The image has been scaled to represent the view in a large telescope. Approximately 1.5 degrees of ion tail are seen in this image, 5 degrees were visible in 10X50 Binoculars at the time this image was taken and the inset of the inner 100" of the coma shows the split nucleus Taken with a 45cm f/5.4 Newtonian + AP7 CCD from the Gene Shoemaker Planetary Society NEO grant from Loomberah NSW Australia.

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ASTRONOMERS
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Lowbrow's WWW Home Page:
www.astro.lsa.umich.edu/lowbrows.html

Check your membership expiration date on the mailing label !