University Lowbrow Astronomers
Ann Arbor, Michigan

REFLECTIONS
REFRACTIONS

of the University Lowbrow Astronomers

September 2000

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 is canceled if it's cloudy or very cold at sunset.. For further information call (734) 480-4514.

This Month:

September 15 - Meeting at 130 Dennison – The Mars Society presents THE MARS ROVER and Daniel Slosberg, U of M Space Physics Presents THE UNMANNED ROVER.

September 23 - Public Star Party at Peach Mountain Observatory – Fall is here. Best observing of the year.

September 30 - Public Star Party at Peach Mountain Observatory – Hey, we get three star parties this month :-).

Next Month:

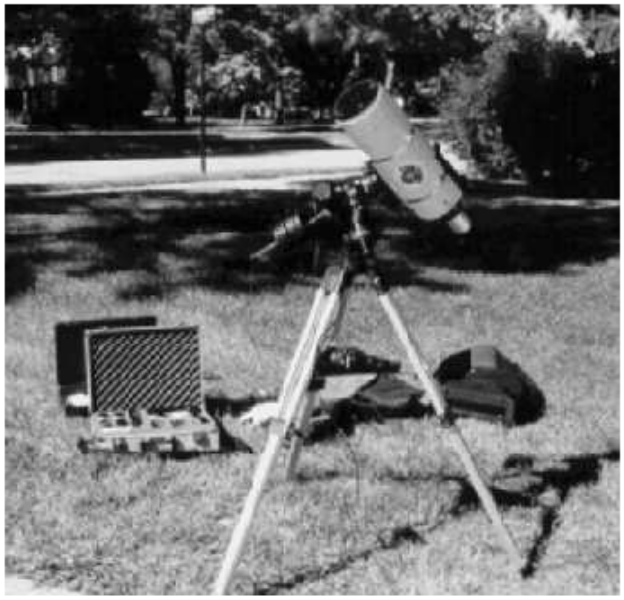
October 20 - Meeting at 130 Dennison - We'll keep you informed just as soon as we figure it out.

October 21 - Public Star Party at Peach Mountain Observatory – Look for Venus setting in the west 7 degrees from Antares.

October 28 - Public Star Party at Peach Mountain Observatory – Three hours after sunset and we get Saturn & Jupiter on the rise!

M15: Dense Globular Star Cluster Credit: H. Bond et al., Hubble Heritage Team (STScI / AURA), NASA

Explanation: Life might get dull at the core of M15 but the sky would always be bright with stars! In fact, only 40,000 light-years away in the constellation Pegasus, M15 is one of the most densely packed globular star clusters in our Milky Way Galaxy. This stunning Hubble Space Telescope image of M15 shows thousands of individual stars across the central 10 or so light-years of the cluster, also cataloged as NGC 7078. Yet even the Hubble's sharp vision can't clearly separate the stars at this cluster's core. Globular star clusters harbor from a hundred thousand up to a million stars and roam the Milky Way halo. Like most globulars, M15 is filled with ancient stars, about 12 billion years old compared to the Sun's estimated 4.5 billion years. Its cool red giant stars appear yellowish in this color composite image. Unlike most globulars, M15 displays a planetary nebula, the briefly visible gaseous shroud of a dying star. Can you pick it out? Cataloged as Kuestner 648, M15's planetary nebula is the round pinkish cloud at the upper left.



The Naming of a View or The Tale of Two Stars

By Mark Deprest

Those of you, who know me, also know that I own 2 telescopes. An 8" f/6 Newtonian reflector on a Dobsonian mount, and a 5" f/5 refractor on a German equatorial mount. The former is a Meade 'off-the-shelf' telescope with excellent optics and the only modifications to the original design being an open back aluminum mirror cell and a Telrad finder. The latter is a home-built telescope with a Jaeger doublet (achromatic) objective, a short piece of thick wall 6" PVC pipe, a 2" Vixen knock-off rack and pinion focuser, and a Sky View deluxe knock-off German equatorial mount. The 5" refractor was originally named "The Cluster Buster" but that name didn't really fit that scope as well as it did the 8". Although the 5" provided incredible wide field vistas, its smaller aperture just didn't prove to be enough to actually bust those clusters, the way the 8" seem to. So the 8" Dob became the true "Cluster Buster" and the search for the perfect name for my 5" began.

Being a short focal length telescope made it a wonderful **RFT** (Rich Field Telescope) and the 5" aperture provided enough light gathering power to bring wealth of deep-sky objects within view. Its real talents were not what one would have expected. When coupled with a 2x barlow placed in front of the diagonal, effectively tripling the telescope's focal length to f/15, made it a nice scope for medium to high powered observations of the planets, the Moon, and double stars. The telescope's achromatic objective did produce a bit of undesirable chromatic aberration, but it was small enough that it could be overlooked and filtered-out. The color in some instances actually enhanced the view, a good example is Beta Cygni (Alberio) which is a beautiful color contrasting double star of slightly yellow and a pale blue, in the 5" it appeared as gold and deep sapphire, a real crowd pleaser. The color could be filtered out with a lunar filter when I observed the Moon, and since I like to use colored filters to help bring out surface detail on the planets any chromatic aberration is all but eliminated.

But the color issue is only a side-bar to the real purpose of this article, I wanted to share with you the story of how this telescope got the name that really fits it, the **Binary Buster RFT**.

In order to appreciate the full scope of this article you need to know a little about what its like to hunt down, verify, 'split,' and record the Position Angle (P.A.) and Separation in arch seconds (Sep.) of binary stars. Chris Sarnecki was the first to turn me on to this particular discipline in observing and I continuously thank him with regular reports of my conquests.

This type of astronomy can be both challenging and rewarding, and is one of few areas of astronomy that amateurs, with rather modest equipment, can and do make valuable contributions to the real science of astronomy. There is a multitude of lists and catalogs dealing with double star observations. The Webb Society has its roots in double stars. The Astronomical League has an observer club dedicated to double stars, and there are many web sites that deal solely with binary stars.

The challenging part of double star astronomy is actually two parts. The first part, once you've decided on which particular double star you want to observe, is to locate the correct star. This exercises not only your ability to read a rather detailed star chart but also your skill as a star-hopper is put to the test, as many of the double stars that you encounter will not be visible with your unaided eye. The second part of the challenge comes after you are pretty sure you have the correct star in your eyepiece. Now you need to determine if this star is actually two stars, which may mean increasing the magnification (power), to your telescope's "practical limit" (approx. 50x per inch of aperture), just to see any separation in the stars. Rarely are the skies transparent or steady enough to permit that high of power observing. But take heart, there are hundreds of stars that are easily separated (split) at medium

powers and hundreds that can be split at low powers, and even many that can be split with the unaided eye. Okay, you've successfully found and split your double star...what now? Well, now you need to determine the Position Angle (P.A.) of the two stars and there apparent Separation (Sep.) in arch seconds. P.A. is fairly straight forward once you've determined which way north/south and east/west are oriented in your eyepiece. Using North as 0 degrees, then using the primary (brightest) star as your starting point draw line extending through the secondary star and estimate the number of degrees from 0. East is 90 degrees, South is 180 degrees and West is 270 degrees. Apparent separation is a little more difficult to explain here and lets just say that without some special equipment your best estimates come from lots of experience. I generally can come within an arch second or a second and a half when observing without my micrometer reticule eyepiece, and can measure to within 2/10th of an arch second with the micrometer. When you consider that the real scientists measure these separations down to the 1/100th arch second, I am not even in their league.

Okay, you are now saying, "what's the point? What does all of this technical hoopla have to do with naming a telescope? Well, actually nothing...I just need some filler for this article and I wanted to tell you about another kind of observing besides deep-sky and planetary. It can be very rewarding and beautiful, especially when you come across a nice contrasting double. But, back to naming my telescope. As I said earlier when I placed my 2x barlow in front of the diagonal it effectively increases the focal length of the scope by a factor of 3, turning my 5" f/5 into a 5"f/15 which is an excellent scope for busting binaries. Hence, the name: **Binary Buster RFT** and it does live up to its name very admirably. To date I have been able to bust (split) binary stars as close as 1.1 arch seconds, which is only 2/10th shy of the telescope's Dawes Limit. Oops, here comes some more technical stuff. Dawes Limit is the theoretical resolving power of a telescope. In other words, how close can two stars be to each other and still be seen as two distinct stars? A relatively simple formula gives us the answer. Resolution (sec) = 4.56/diameter of the objective in inches. For a 5" scope the Dawes Limit is .912 arch seconds. In order to achieve this theoretical limit, you need two stars of very similar magnitude; very transparent and steady skies, an optically perfect (or darn close) telescope and you need to have pretty good eyesight yourself. Dawes Limit aside, in the land of the real people (you and sometimes me) it's difficult to get much better than 1 arch second consistently, and the largest scopes have trouble getting much below .5 arch seconds.

Well, I've rambled on long enough to eat up a lot of the newsletter. So let me just say that the next time you see me out with my little scope, and I'm pointing it in an area of the sky that doesn't seem to hold any spectacular deep-sky sight, as far as you can recall, take a wander over and check out one of my Busted Binaries.

*Observing buddy Capella Joe or "Cappy Joe" ,the sock chimp, is seated atop to optical tube assembly of the **Binary Buster RFT**. Question – Does Mark have enough eyepieces? - Ed*

T-Shirts Anyone?

Club Treasurer and Apparel Manager, Charlie Nielsen, informs us that the long awaighted T-shirts and Sweatshirts are in and will be available at the September meeting. Please plan on picking up your t-shirt or sweatshirt at that time. (Any pre-paid clothing not collected will be donated to the editorial staff of this newsletter).

The University of Michigan's Student Astronomical Society

Home Page
http://www.astro.lsa.umich.edu/sas/Public

Observing Nights:
The Student Astronomical Society will be holding six Public Observing Nights at the Angell Hall Observatory during the Fall 2000 term. The dates and times are as follows:

September 15th 9:00 to 11:00 PM
October 6th 10:00 to 12:00 Midnight
October 20th 10:00 to 12:00 Midnight
November 3rd 9:00 to 11:00 PM
November 10th 9:00 to 11:00 PM
December 1st 8:00 to 10:00 PM

Nights that are cancelled due to bad weather may be rescheduled so check back here for the latest dates. We will announce cancellations on the website by 9 AM the morning of an event or you can call 936-3626. For more information such as how to get to the observatory, visit the Open House (http://www.astro.lsa.umich.edu/sas/openhouse.html) of the web site by selecting it from the navigation bar at the top of the page.

Subject: So, Do We All Have a Similar Perspective?

Retrieved from e-mail, Text courtesy of Beloit College in Wisconsin

Each year, the staff at Beloit College in Wisconsin puts together a list to try to give the faculty a sense of the mindset of that year's incoming freshmen.

Here is this year's list:

The people who are starting college this fall across the nation were born in
1982.

They have no meaningful recollection of the Reagan Era and probably did not even know that he had ever been shot.

They were prepubescent when the Persian Gulf War was waged.

Black Monday, 1987 is as significant to them as the Great Depression.

There has only been one Pope.

They were 11 when the Soviet Union broke apart and do not remember the Cold War.

They have never feared a nuclear war.

They are too young to remember the space shuttle blowing up.

Tianamen Square means nothing to them.

Their lifetime has always included AIDS.

Bottle caps have always been screw off and plastic.

Atari predates them, as do vinyl albums. The expression "you sound like a
Broken record" means nothing to them.

They have never owned a record player.

They have likely never played Pac Man and have never heard of Ping-Pong.

They may have never heard of an 8 track. The Compact Disc was introduced when they were 1 year old.

As far as they know, stamps have always cost about 33 cents.

They have always had an answering machine.

Most have never seen a TV set with only 13 channels, nor have they seen a black-and-white TV.

They have always had cable.

There have always been VCRs, but they have no idea what BETA is.

They cannot fathom not having a remote control.

They were born the year that the Walkman was introduced by Sony.

Roller-skating has always meant "inline" for them.

Jay Leno has always been on the Tonight Show

They have no idea when or why Jordache jeans were cool.

Popcorn has always been cooked in the microwave.

They have never seen Larry Bird play.

They never took a swim and thought about Jaws.

The Vietnam War is as ancient history to them as W.W.I, W.W.II, and the Civil War.

They have no idea that Americans were ever held hostage in Iran.

They can't imagine what hard contact lenses are.

They don't know who Mork was or where he was from.

They never heard: "Where's the beef?", "I'd walk a mile for a Camel", or "De plane, de plane!"

They do not care who shot J.R. and have no idea who J.R. is.

The Titanic was found? They thought we always knew where it was.

Michael Jackson has always been white.

Kansas, Chicago, Boston, America and Alabama are all places, not groups.

McDonalds never came in Styrofoam containers.

There has always been MTV.

They don't have a clue as to how to use a typewriter.

Do you feel old yet? Pass this on to all the other old fogies.

The Abrams Planetarium *Sky Calendar* and Star Chart on the following pages are reprinted with permission of Abrams Planetarium. A full-year subscription is $9.00. To subscribe send name and address to:

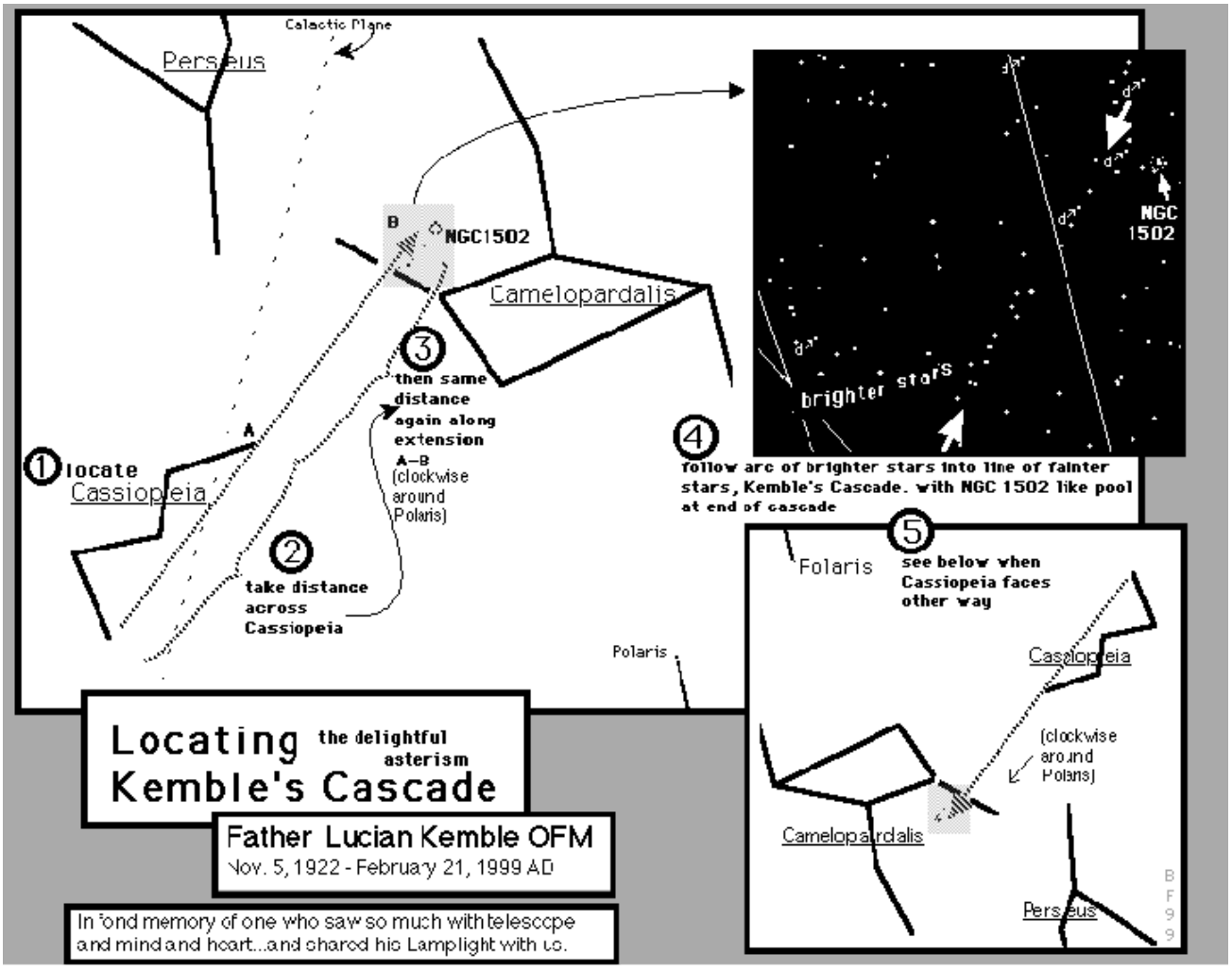
Sky Calendar
Abrams Planetarium
Michigan State University
East Lansing, MI 48824

Be sure and check out their web site at: http://www.pa.msu.edu/abrams/

Kemble's Cascade
Photo Credit: Walter MacDonald

Explanation: A picturesque chain of unrelated stars is visible with strong binoculars towards the constellation of Camelopardalis. Known as Kemble's Cascade, the asterism contains about 20 stars nearly in a row stretching over five times the width of a full moon. Made popular by astronomy enthusiast Lucian Kemble (1922-1999), these stars appear as a string only from our direction in the Milky Way Galaxy. The above photograph of Kemble's Cascade was made with a small telescope in New Mexico, USA. The bright object near the bottom left is the relatively compact open cluster of stars known as NGC 1502.

Graphic Credit: R. A. S. C. , Calgary Center
And re-printed here with permission.



Planets at dusk: Venus is very low in WSW to SW at dusk, noticeably higher at month's end. On Oct. 1, from lat. 40° N, Venus sets in twilight, within 1½ hours after sunset. By Oct. 31, Venus sets in a dark sky, more than 1¾ hours after sunset. Against background stars this month, Venus moves eastward 1.2° per day. Binoculars will help you observe any stars which happen to appear near Venus in twilight. On Oct. 6 Venus passes 0.8° S (lower left) of 3rd-mag. Alpha Librae and is 25° W (lower right) of reddish first-magnitude Antares, heart of the Scorpion. Watch Venus close in on Antares over the following three weeks. See Oct. 1-2, 5, 9, 14, 20, 27, 28, 29, 31. The Moon forms pretty groupings with Venus and Antares on the evenings of Oct. 29 & 30. Mercury is at 5.4° lower right of Venus on Oct. 1, and farther from Venus thereafter. See Oct. 1, 5, 8. Mercury is very low in twilight and hard to see from N states but can be followed until mid-month from S states as it fades from mag. 0.0 to +0.6.

Later in evening: Bright Jupiter (mag. −2.5 to −2.9) and Saturn (mag. 0.1 to 0.3) are 11° apart in Taurus all month. They rise in ENE within 3 hours after sunset on Oct. 1, and within 1½ hours after sunset on Oct. 31, as seen from lat. 40° N. When these giant planets are in the eastern sky, Saturn appears to upper right of Jupiter; see chart, October Evening Skies, over, which shows the sky three hours after sunset on Oct. 15, from lat. 40° N. The Moon appears near Saturn on the night of Sunday Oct. 15, and near Jupiter on the following night, as shown in the first two boxes for that week.

Planets at dawn: Jupiter, brightest morning "star," is in SW to W, getting lower as month progresses. In western sky, Saturn is 11° to lower right of Jupiter. The two planets together are a striking sight in Taurus. Jupiter near the V-shaped formation of Aldebaran (the bull's eye) and the Hyades, and Saturn not far from the tiny dipper-shaped Pleiades star cluster. Faint reddish Mars (mag. +1.8 to +1.7) is low in E to ESE, gaining nearly 10° in altitude Oct. 1 to 31, if observed at the same stage of morning twilight. On Oct. 2 Mars appears 10° lower left of Regulus, heart of Leo. Mars moves eastward against the stars by 0.8° per day, and by Oct. 31 the red planet is 22° lower left of Regulus and 11° S of Denebola, Leo's tail. On Oct. 31, near alignment of Mars, Regulus, Moon, Jupiter, and Saturn, 112° long across the sky. In Nov., Mercury-Mars-Jupiter-Saturn will align in morning sky, and in Jan.-Feb. 2001, Mercury-Venus-Saturn-Jupiter will align in morning. Future issues of our *Sky Calendar* will cover these alignments. Stay with us!

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Planetarium business office:
(517) 355-4676
Skywatcher's Diary on World Wide Web:
http://www.pa.msu.edu/abrams/diary.html

SKY CALENDAR OCTOBER 2000

An aid to enjoying the changing sky

Use this scale to measure angular distances between objects or diagrams below.

0° 10° 20°

SUNDAY

Monday 2

Antares · Sunday 1 · Beta in Libra · Alpha in Libra · Venus in WSW · Mercury · SW

SCORPIUS

Sunday October 8

Alpha Cap · Beta · Neptune · Sigma · Gamma · Delta · Iota · Uranus · Sat Oct 7 · Friday Oct 6 in South

3¾ hours after sunset. Oct 14-15

Pleiades · Moon Sat 14 · Saturn · Sunday 15 · Jupiter · Hyades · Aldebaran · ENE · Moon 16 · E

Oct 22-24, one hour before sunrise

Scale · Sunday 22 · Regulus · Moon · Monday 23 in ESE · Denebola · Tuesday Oct 24 · Mars

Sunday October 29

Meet Mercury at inferior conjunction; see November.

Moon & Venus at dusk: See next box.

MONDAY

October 1 & 2 at dusk

Antares · Sunday 1 · Beta in Libra · SCORPIUS · Alpha in Libra · Venus in WSW · Mercury · SW

Oct 5-8, 1¼ hours after sunset

Alpha Cap · Beta · Neptune · Sigma · Gamma · Delta · Iota · Uranus · Sat Oct 7 · Friday Oct 6 in South · Sunday Oct 8

Wait until Moon gone (Oct 15), then use this chart west of north to locate Uranus & Neptune.

Moon Tues 17 high in SW

Jupiter · Aldebaran · Pleiades · Hyades · Monday 16 · Saturn (rings 24° from edge-on) · 1½ hours before sunrise, Oct 15-17 · Sunday 15 in WSW

Monday, October 23, predawn and late evening hours: Jupiter passes within 4.5° N of Aldebaran today through Nov 2. Compare to Pollux, Castor, 4.5° apart.

Sunday, October 29 at dusk: Binoculars help you spot Antares.

Venus · Moon · Antares · SW · WSW

Monday Oct 30, 1½ hours before sunrise

Mars · Beta · 0.6° apart · VIRGO · Zeta · Gamma · E

TUESDAY

Monday October 2, 1½ hours before sunrise

Scale · Bull's horns · Jupiter high in SSW · 11° apart · Pleiades · Aldebaran · Hyades · Saturn

Sunday October 8 at dusk

Mercury lower right of Venus, by 7° tonight, 8° on Oct. 11, 10° on Oct. 14.

Antares · Beta Lib · Alpha Lib · Venus · Mercury · SW · WSW

Wed & Thurs, Oct 18 & 19, 5¾ hours after sunset

Wed 18 · Castor · Pollux · Thurs 19 · ENE

Tuesday 24, 1½ hours before sunrise

Denebola · Mars · Beta in Virgo · E

WEDNESDAY

Monday October 2, 1½ hours before sunrise

Scale · LEO · Regulus · Mars · Denebola, Leo's tail · E

One hour after sunset

ARIES · Alpha · Beta · Thursday 12 approaching Full · Friday 13 past full · ENE · E · ESE

Thur & Fri, Oct 19 & 20, one hour before sunrise

Castor · Pollux · Thurs 19 high in S · Fri 20 Last Quarter

Wednesday Oct 25, 1¾ hours before sunrise

Denebola · Mars · Beta · Last easy-to-see Moon · E

Wed Nov 1 at dusk

Tues Oct 31 · Monday Oct 30 · Venus · Antares · Scorpion's tail · SSW · SW

THURSDAY

October 3-5, one hour after sunset

Mars · Thurs Oct 5 just past First Quarter · Wed 4 · Tues Oct 3 · Saturn · Scorpion's tail · Saturday 15 · SSW

Thursday October 12 at dusk

Mercury at greatest elongation, 26° from Sun and 8° from Venus.

Antares · Beta · Alpha in Libra · Mercury in WSW · Venus · SW

Friday Oct 20

Last Quarter 3:59 a.m. EDT. Look for Orionid meteors in predawn Oct 20-22.

One hour after sunset, Oct 20: Binoculars show 2nd mag Delta Sco 1° S (lower left) of Venus.

Thursday October 26, 40 minutes before sunrise: Old Moon, 8° S of E, just risen; only about 21 hours until New Moon from eastern U.S. Use binoculars.

Old Moon · E

FRIDAY

Sat Oct 21, 1½ hours before sunrise

Denebola, Leo's tail · Mars (Regulus is 22° to Mars' upper right) · Alignment: See left margin. · E

Thursday Oct 26, at dusk: Venus is 3.2° N of Antares this evening and Friday.

Venus · Antares · SW

SATURDAY

Saturday October 14, one hour after sunset

Tues 10 · Wed 11 · Antares · Beta Lib · Delta Sco · Venus · SW · WSW

Saturday October 21, one hour after sunset: Antares is 7° left of Venus, see Oct 26.

Antares · Venus · Delta · SW · WSW

Friday October 27

New 2:58 a.m. EDT.

20-25 min after sunset across southern U.S.: Young Moon may be observed with binoculars. Look very low (<5° S of W. Moon's age is ~16 hours in S Florida, 17½ hours in S California. The 20-hour Moon in Hawaii may be observed with unaided eye. First easy Moon will be Sat evening; see box below.

Saturday October 28, at dusk

Venus · First easy young Moon in WSW · SW

Robert C. Victor, Patti Toivonen
ISSN 0733-6314

Subscription: $9.00 per year, starting anytime, from *Sky Calendar*, Abrams Planetarium, Michigan State University, East Lansing, MI 48824

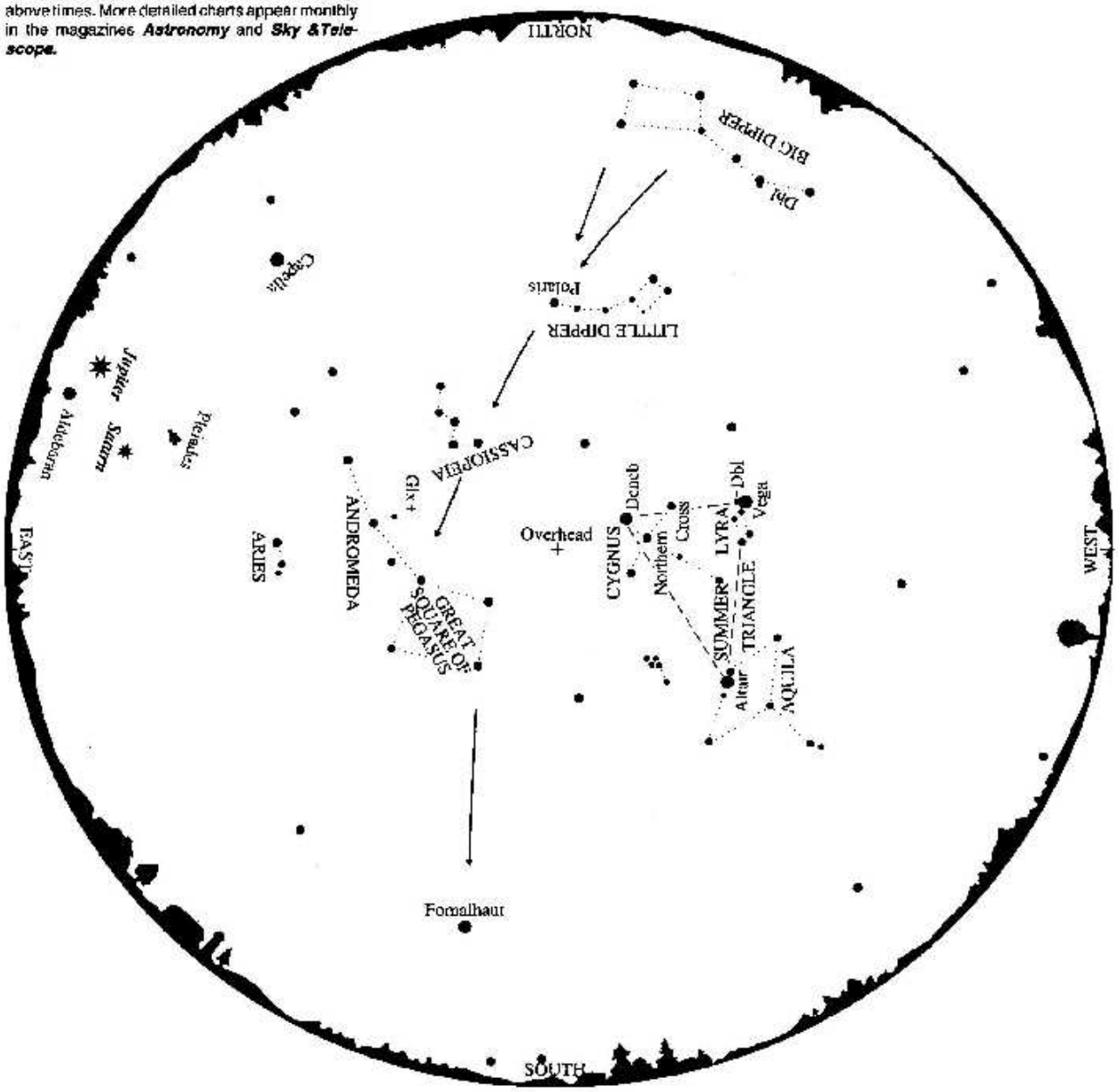
October Evening Skies

This chart is drawn for latitude 40° north, but should be useful to stargazers throughout the continental United States. It represents the sky at the following local daylight saving times:

Late September	11 p.m.
Early October	10 p.m.
Late October	9 p.m.

This map is applicable one hour either side of the above times. More detailed charts appear monthly in the magazines ***Astronomy*** and ***Sky &Telescope.***

Subscription: $9.00 per year, from ***Sky Calendar,*** Abrams Planetarium, Michigan State University, East Lansing, MI 48824-1324.

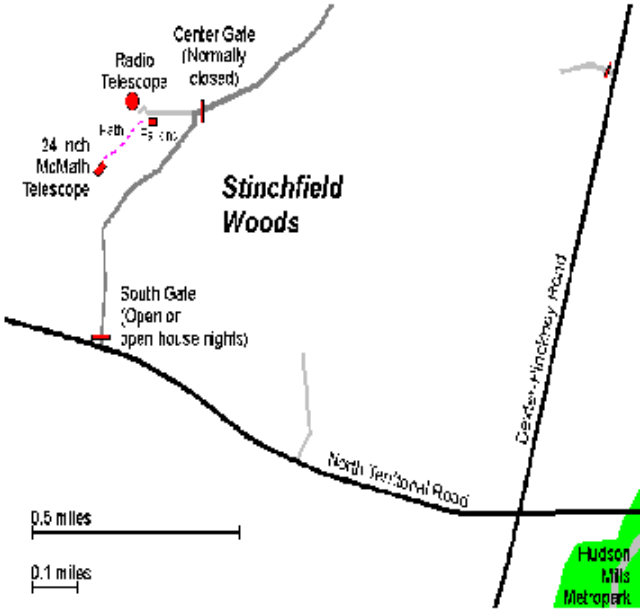


The planets Jupiter and Saturn are plotted for mid-October 2000. Eight objects of first magnitude or brighter are visible. In order of brightness they are: Jupiter, Saturn, Vega, Capella, Altair, Aldebaran, Fomalhaut, and Deneb. In addition to stars, other objects that should be visible to the unaided eye are labeled on the map. The double star (Dbl) at the bend of the handle of the Big Dipper is easily detected. Much more difficult is the double star near Vega in Lyra. Low in the east northeast, the Pleiades is a very attractive open or galactic star cluster. The position of an external star system, called the Andromeda Galaxy after the constellation in which it appears, is also indicated (Gbx). Try to observe these objects with unaided eye and binoculars.

D. David Batch

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 the 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:

Bernard Friberg (743)761-1875 Bfriberg@aol.com
Chris Sarnecki (734)426-5772 chrisandi@aol.com

to discuss length and format. Announcements and articles are due by the first Friday of each month.

Telephone Numbers:

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Vice Presidents: Dave Snyder (734)747-6537
Paul Walkowski (734)662-0145
Doug Warshow (734)998-1158
Observatory Director: Bernard Friberg (734)761-1875
Treasurer: Charlie Nielsen (734)747-6585
Newsletter Editors: Chris Sarnecki (734)426-5772
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/

Monthly Meeting
September 15, 7:30 pm
Room 130 Dennison Hall
Physics & Astronomy Building
The University of Michigan

The Mars Society presents
THE MARS ROVER
&
Daniel Slosberg
(Space Physics) Presents
THE UNMANNED ROVER

Mars Rocks, Sojourner Rolls – Credit: IMP Team, JPL, NASA - **Explanation:** This sharp color image featuring Mars rock Yogi and the rolling Sojourner robot shows off Yogi's two-toned surface. Yogi appears to be leaning into the prevailing winds causing some to suggest that its color contrast may be caused by the accumulation of rust colored dust on its windward face. The Pathfinder spacecraft, now the Sagan Memorial Station, has ended the primary mission phase after returning a scientific bonanza from the surface of Mars. The Sojourner robot rolled hundreds of feet on the martian surface, circumnavigated the lander, and produced a wealth of data and images. Mars Pathfinder and Soujourner landed on July 4, 1997 and lasted about 3 months, well beyond their designed lifetime.

University Lowbrow Astronomers
Ann Arbor, Michigan

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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 !