The Focal Point

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The Atlanta Astronomy Club
Established 1947
August 2003

Editor: Kosmic Kow

In This Issue:

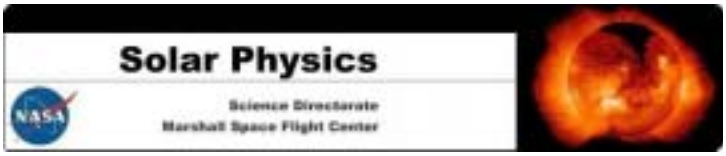
August General Membership Meeting

This month's speaker is Mitzi Adams of the Solar Physics Group of Huntsville. The title of the talk is, "The Sun Through Time". Observations of the Sun over centuries, if not millennia, have resulted in "architectural alignments" of structures, which served calendrical and ritual purpose in many ancient societies throughout the world. This talk will give examples of several well-known archaeological sites and examine two probable purposes for them: the sites marked "special" positions of the Sun and were sites of worship. By studying the ancient cultures who built such sites, we better understand that the science of today is based on simple, but careful, observation, a notion which allows a segue to the modern understanding of the Sun.

Mitzi observing the Christmas Day solar eclipse of 2000.

This month the meeting will take place on the Emory University Campus in the White Hall Building. White Hall is located across the street from the new Math and Science Building. Street access is via North Decatur Road. Take North Decatur to Dowman Drive (5 way intersection). Turn onto Dowman Drive and White Hall is second building on right side of road. Note that Dowman Drive changes names to Dickey Drive but still same road. Parking is available along Dowman Drive and a parking lot is located behind the Admissions Building. Access is via first left after turning onto Dowman Drive from North Decatur Road. The date of the meeting is **Friday August 15th**. Refreshments and general socializing takes place from 7:30 PM to 7:55 PM. Meeting starts at 8 PM sharp.

Picture of Stonehenge located in Britain.



For those interested in finding out more information about the sun, try one of these two websites on the internet.

http://science.nasa.gov/ssl/PAD/solar/

http://science.msfc.nasa.gov/ssl/pad/solar/suntime/suntime.stm

Mars Observing and Open House

Because of a lack of information, I can only provide sketchy details of this event. Saturday August 23rd there will be an open house at our Villa Rica observatory. Daytime solar observing is planned in the afternoon. Durning the evening there will be various activities taking place. Possiblities include star hopping sessions for those who want to learn how and a constellation walk. The planet Mars will be only a few days short of it's closest approach to Earth. Equipment will be setup so you can watch Mars on TV. Don't expect to see it on one of local TV channels. You have to be there in order to see it. Club members are encouraged to come and enjoy the activities planned. The public is also invited to. This event will last til the

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last astronomer has left the field. Contact the Observing Chairman (Dan Llewellyn) if you want more information. His phone number and email address are listed in the contact section of the Focal Point on page 7.

August Deep Sky Session

The August deep sky session has been rescheduled for Saturday August 30th. Location is Roger's field located near Mentone Alabama. Directions to the site are included in the 2003 July issue of the Focal Point. The site does have power. For more information, contact Dan.

Charlie Elliott Chapter

The next meeting of the chapter is Saturday August 23rd, 7:00 PM. Location is the meeting room of the visitor's center. This month there will be a pot luck dinner and get together with no speaker planned. Observing is planned afterward weather permiting at the astronomy field.

The September meeting is planned for Saturday the 20th, at 7:00 PM. Phillip Sacco will be providing a lively talk on Astro Mythology.

There will be no meeting October because of the PSSG 2003 planned for that weekend.

Additional information on the Chapter including pictures, can be seen at the following website. New location for the CEC website is the following. http://www.AtlantaAstronomy.Org/CEWMA

Georgia Astronomy in State Parks

All events start at sunset on Saturday. They begin with a slide presentation on basic astronomy then followed up with an observing session. Club members and guests are encouraged to participate. We only have 2 to 3 scopes on average and can really use the help! You can bring your scope, binoculars or just yourself. It is a lot of fun and a great way to relax and get to know other club members! The state parks and campers really appreciate us being there. If you have any questions, please contact: Joanne Cirincione - starrynights@AtlantaAstronomy.org

The following are the dates for the rest of 2003:

August 30 - FDR State Park, Pine Mountain, Ga.

October 4 - Florence Marina State Park, Omaha, GA.

November 15 - Unicoi State Park, Helen, GA.

http://www.gastateparks.org/

AMAZING MARS

Comparing Earth to Mars.

Diameter: **Earth** 12,756 km, **Mars** 6,779 km

Day: **Earth** 23h, 56m, 4s, **Mars** 24h, 37m, 23s

Orbit: **Earth** 365.25, **Mars** 687 Earth days (1.88 Earth yrs) and 670 Martian solar days

Axial Inclination: **Earth** 23.45 deg, **Mars** 25.19 deg

Distance from Sun: **Earth** 1 AU, **Mars** 1.5 AU

Surface Gravity: **Earth** 1, **Mars** 0.379 (% of Earth's)

Mass: **Earth** 1, **Mars** 0.1074 (% of Earth's)

Inclination to Ecliptic: **Earth** 0.0 deg, **Mars** 1.85 deg

Eccentricity of Orbit: **Earth** 0.017, **Mars** 0.093

Atmospheric Pressure: **Earth** 1 Bar, **Mars** 4 – 9 Milliars

Comparing the Moons of Mars with Earth's Moon.

Diameter: **Phobos** 26x22x18 km, **Deimos** 15x13x11 km, **Earth Moon** 3,476 km

Orbit: **Phobos** 7hr, 39 min, 14 sec, **Deimos** 30 hr, 17 min, 55 sec, **Earth Moon** 27h, 07m, 43s

Mean Distance: **Phobos** 9,378 km, **Deimos** 23,459 km, **Earth Moon** 384,400 km

Now, let us add some flesh to these bare bones statistics…….

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The **Atlanta Astronomy Club Inc**., the South's largest and oldest astronomical society, meets at **8:00 p.m.** on the third Friday of each month at Emory University's White Hall or occasionally at other locations. Membership is open to all. Membership fee's are **$30** for a family or single person membership. College Students membership fee is **$15**. These fees are for a one year membership.

Magazine subscriptions to Sky & Tel or Astronomy can be purchased through the club for a reduced rate. The fees are **$30** for Sky & Tel and **$29** for Astronomy. Renewal forms will be sent to you by the magazines. Send the renewal form along with you check to the Atlanta Astronomy Club treasurer.

Club address is:

Atlanta Astronomy Club
PMB 305
3595 Canton Road A9
Marietta, Georgia 3006

Atlanta Astronomy Club Hot Line: Timely information on the night sky and astronomy in the Atlanta area. Call **770-621-2661**.

Internet Home Page: **http://www.AtlantaAstronomy.Org**

Send suggestions, comments, or ideas about the website to webmaster@AtlantaAstronomy.org. Also send information on upcoming observing events, meetings, and other events to the webmaster.

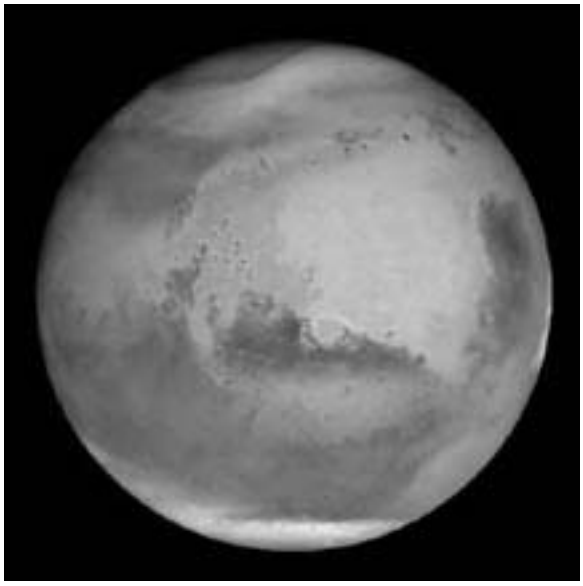
The diameter of Mars is 53% that of Earth's, making it only half the size of Earth and twice the size of our Moon. Its gravity is less than 2/5's of Earth's – a 200 lb man would weigh only about 76 lbs on Mars.

A Martian year is almost two years. As a result Mars comes into opposition (when the Sun, Earth & Mars are lined up) every two years. Opposition years are 2001, 2003, 2005, etc.

However, Mars has the most elliptical orbits of the inner planets (except Mercury). [This was good news for Johannes Kepler, who plotted the orbit of Mars usng data supplied by Tycho Brahae. After 10 years of calculation he concluded that Mars orbited the Sun in an ellipse, not a circle. This became the basis of his 3 laws of orbital motion, thus solving the last mystery of the heliocentric solar system and hammering the last nail in the coffin of Ptolemey's Earth centered Universe.]

This highly elliptical orbit means that Mars is closer to the Sun, and the Earth, during perihelic oppositions, which happens every 15 years (2003, 2018, etc).

Mars Global Surveyor image.



Hubble Space Telescope image of Mars taken in 2001.

On August 27, 2003, Mars will be closet is has been since the time of the Neanderthals (over 50,000 years).

For example:	Mars Diameter	Distance from Earth
June 2001	21"	0.45 AU
Aug 2003	25.1"	0.37 AU
Jan 2010	14"	0.66 AU
July 2018	24.1"	0.38 AU

The moons of Mars are highly irregular in shape (they have been described as looking like "a diseased potato"); and pocked with meteor craters. They are presumed to be captured asteroids.

Phobos orbits only 6,000 miles above the surface of Mars (the Moon is about 250,000 miles away from the Earth); and orbits every 7 hours and 39 minutes - 3 times in a Martian day! The ISS and the Shuttle orbit the Earth every 90 minutes – so Phobos moves across the sky 5 times more slowly than they do, whereas Deimos takes a little more than one day to orbit. Imagine the view from Mars with one moon hurtling through the sky 3 times a day and the other once a day!

At 27 km tall, Olympus Mons is the largest volcano in the solar system. Its peak is frequently wreathed in icy clouds that appear as a white ring in a telescope.

The Valles Marineris is a chain of large rift valleys 4000km long, 500 km wide and 4 km deep. Due to the small circumference of Mars, someone standing on one rim could not see the other rim over 250 miles away as it would be below the horizon. If it were superimposed on the Earth, it would span the USA from coast to coast.

Because Mars is tilted almost same as the Earth, (its Pole star is Deneb in Cygnus), it has seasonal changes, the most obvious being those of the polar caps. In

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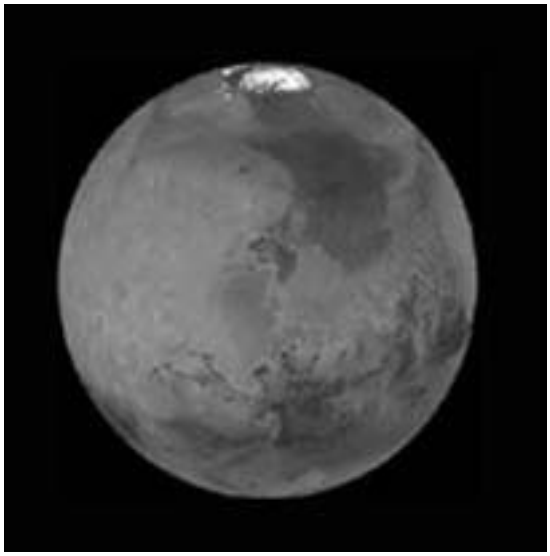

Viking Orbitor image of Mars.

the fall and winter, the caps get covered with a layer of frozen carbon dioxide that extends almost half way down to the equator. In the spring and summer, the frost melts off, leaving only a residual core of frozen water. The south polar cap is tilted towards Earth during perihelic oppositions; the north during aphelic.

Another seasonal change is the apparent darkening of the surface features. Past observers thought this was evidence of vegetation greening in the spring and dying off in the fall. In reality this is one of the many "tricks" of Mars. The "darkening" is actually an optical illusion due to the lightening of bordering regions caused by huge storms that deposit fine light dust on the plains and desert regions. These huge dust storms sweep across the planet in the spring and summer and seem to be the worst during the perihelion as the Sun warms the planet's surface. In other areas, melting frosts uncover either the dark basaltic rock or dunes (the "Lowell Band" that borders the polar cap in the summer is actually an area of dunes composed of heavier, dark sands), which looks like the growth of vegetation.

Another "trick" of Mars is the "greenish" colour of the dark regions – in actual fact they are shades of grey/brown/black. Green and red are complementary colours, and our eyes see "green" against the rusty orange soil.

To determine what surface features you are seeing, turn to the map of Mars on page 112 of the July issue of *Sky & Telescope*. The 'Calendar Notes' on page 109 of the August 2003 issue tell you which meridian line is in the center of the disk for each night of the month of August. Or you can look at an interactive map on the *S&T* website: (http://skyandtelescope.com/observing/objects/planets/article_997_1.asp)

And check out the AAC website for Mar's rising, transit & setting times.

Atlanta Area Astronomy Listserv

If you have email access with a computer, then you can subscribe to the Atlanta Area Astronomy Listserv. This is a source for up to the minute info on observing events. You can also post questions about astronomy. You can talk to fellow astronomers about the hobby.

Subscribe to the Atlanta Area Astronomy Mailing List**:** The name of the new list is: AstroAtlanta. The address for messages is: AstroAtlanta@yahoogroups.com . To add a subscription, send a message to: AstroAtlanta-subscribe@yahoogroups.com . To cancel your membership, send a message to AstroAtlanta-unsubscribe@yahoogroups.com . Messages for the list-owner (me) go to: AstroAtlanta-owner@yahoogroups.com or to LAbbey@mindspring.com . The "home page" for the list, from which you can change your account defaults is: http://www.yahoogroups.com/group/AstroAtlanta. This list is owned by Lenny Abbey.

Star Hopping Redux

By Art Russell

It wasn't too long ago that only the largest telescopes, typically in a permanent installation, had setting circles accurate enough to assist in location of deep sky objects. Certainly, many amateur telescopes had analog setting circles, but because of poor design, poor understanding of their use, and an all too often poor polar alignment, they typically contributed to many hours of frustration, instead of serving as an aide to observation. However, within only the last ten years or so, inexpensive digital setting circles and computer-controlled telescopes have become commonly available. Indeed, its often difficult to find an observing field without some form of computer-assisted telescope. However, I'd like to suggest that the art of star-hopping is not dead. Indeed, if anything, its mastery is more important than ever.

So Why Star-Hopping?

Star-hopping offers the deep sky, and even the outer planet (Uranus, Neptune and Pluto) or comet observer, a convenient method to locate their desired target without computer mediated or "go-to" assistance. More importantly, star-hopping offers the best way to provide the deep sky observer with an understanding and familiarity of the night sky that can only be gained as one moves from one spends time under the stars.

Once learned, star-hopping is much like riding a bicycle, you never forget. As such, it remains a valuable tool long after it was mastered. Never quite forgotten, it is quickly recalled by those whose electronic wonder of a digital setting circle or computer-controlled telescope conveniently fails at just the wrong time as they are enroute to a particularly interesting object. Count on it. Murphy's Law was written by an amateur astronomer.

More over, for many objects in a given evening, the experienced star-hopper has often already found and observed many of prominent deep sky objects before a computer mediated scope can be set up and brought to the proper field of view for the evening's first object in that telescope.

Basic Requirements

Lets be honest. Star-hopping is not for the faint of heart. Like any new skill, it takes time, perseverance and practice. If you aren't a self starter and willing to take the steps necessary to learn how to star-hop, please seriously investigate use of and mastery of the new digital and/or "goto" telescope technologies as they are generally easier to use than analog setting circles. However, star-hopping is certainly not a new technique, having been the subject of numerous articles in any number of astronomy magazines [1, 2, 3].

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The first requirement that any star hopper needs is a basic understanding of each seasons' prominent constellations. If you can find the major constellations and their brighter stars, you can use them to find the lesser known constellations [4]. Interestingly, it appears the Astronomical League has recognized the importance of knowing the constellations in the creation of their forthcoming observing award for identification of constellations, as mentioned at last month's General Meeting of the AAC by South Eastern Astronomical League Representative (SEARL) and AAC member, Philip Sacco. Moreover, its also a pleasure to recognize old friends who've been absent for the season as they first rise from the eastern horizon. At the same time, it provides the opportunity to relearn those constellations we've forgotten during their absence and learn a few new ones each season as well. The bottom line is to use the constellations and bright stars that you do know as a stepping off point to find those constellations and stars that you don't know. Most importantly, its by knowing where the constellations and their prominent stars are located, that you can locate any deep sky object.

Equipment

Naked eye star-hopping. One of the first questions often asked by beginning star-hoppers is "What kind of equipment do I need?" Fortunately, the answer is very simple for most people because we are already prepared to be superlative star-hoppers. All you need is your eyes, arms and fingers to do basic star-hopping. Without optical aides, you can find many naked eye deep sky objects under dark skies. Describing locations of objects to others is often problematic. This is because how I see the sky is not exactly how you see the sky unless we have a common reference. However, using the same references of distance, such as the width of a finger, hand, or fist held at arms length, we can describe the location of objects in terms easily understood by all participants. Determining the direction is also easy if we use a common reference in addition to constellations and prominent stars. One of the most common references is to use a "clock" reference for the direction to or from an object (example: it is located 2 finger widths away at the 7 o'clock position from …). These methods of referencing the night skies are often useful when starting beginners in star-hopping. However, they are of little use when tracking down the many more challenging deep sky objects. This type of star hopping requires the use of viewfinders, telescopes, and other aides.

Common Measures of Distance with the hand held at arm's length [5]. Distance spanned by the little finger is1 degree. Distance spanned by three fingers held together is 5 degrees. Distance spanned by the closed fist is10 degrees. Distance spanned between the little finger in pointing finger when spread apart is15 degrees.

Viewfinders. Most telescopes are equipped with some sort of viewfinder which has been collimated (aligned) to the larger telescope. Where the viewfinder points, so points the telescope. One form may be a zero-power finder typified by the "Telrad" design which projects an illuminated reticule "bulls-eye" pattern against the sky. Where the bull's-eye is pointed, so to the telescope is pointed, allowing for quick acquisition of bright stars and deep sky objects. The other typical viewfinder is a finder scope. Very simply, a finder scope is a small, low power, wide field telescope used to aim a larger telescope at a remote object. As a general rule, most astronomers find it much easier to point a telescope using some form of aide because telescopes typically have very restricted fields of view, even when using a wide-field eyepiece. Without the use of some form of pointing device, astronomers may spend an entire evening gazing through a very capable instrument, but without ever seeing anything of interest.

Very often, the typical finder scope will be a small 6X30 (6X = 6 power = magnifies 6 times, with a 30mm objective) that many amateurs find to be too small to be of much use. Mind you, this is not to say that the 6X30 finder scope is without its uses. I use mine as a paperweight! Indeed, experienced deep sky observers will generally mount the largest possible finders on their telescopes, sometimes several, often with objectives up to and larger than 100mm (4 inches) in order to use fainter stars as an aide to tracking down more difficult deep sky objects [6]. Generally, when star-hopping I'll often use both a Telrad and finder scope to take advantage of the strengths of both view finders. In this way I can quickly orient on a prominent star close to the deep sky or other object of interest with the Telrad, and then switch to the finder scope to help finally zeroing in on my quarry. Stumped as to what size to consider? Nothing less than an 8X50 finder scope should be considered. They are cheap and readily available. However, don't hesitate to move up to larger sizes if you can find and / or afford one.

A final word about finder scopes, and by association telescopes and the orientation of their fields of view - You need to take the time to determine both the field of view of your finder scope and that of your telescope's eyepieces. Knowing the size of your field of view will allow you to know how much of the sky you can see with your particular combination of finder scope, telescope and eyepiece [7]. In star hopping, one typically starts with a finder scope with the wider field of view, finds the correct location, and then zeros in on the selected object with a lower powered (but typically wider field of view) eyepiece before going to higher powers for observation. A key point to note is the orientation of the field of view in your finder scope and telescope eyepieces. Very often they are different and may lead to difficulty in switching between the finder scope and the telescope. Most telescopes (remember that the finder scope is a small telescope, the Telrad not being a telescope is not a problem here) change the orientation of the image as it is magnified and passed through the eyepiece. Generally, refractors

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and catadioptric telescopes (Schmidt-Cassegrains) used with standard star diagonals produce mirror reversed images. Newtonian telescopes typically present inverted images. This is an important fact to remember, and when forgotten or poorly understood, has been the cause of much frustration among even experienced observers [8].

Star Charts. In amateur astronomy, much like driving a car cross-country, you are only as good as your road maps. The better the map, the better the job you'll be able to do when you try to locate your destination. Instead of mapping out terrestrial roads, star charts map out the heavens in greater or lesser detail. In a sense, you might also say there is a hierarchy of star charts. At the lower level of resolution, star charts might map out the constellations and bright stars, and often the Messier objects such as found in "Planning A Messier Marathon" [9] or in several of the popular astronomy magazines such as Astronomy or Sky and Telescope [1, 2]. In greater detail and offering a greater selection of deep sky objects and stars to 6th magnitude as well, is Wil Tirion's "Bright Star Atlas 2000.0 [10]. Stepping up to Wil Tirion's Sky Atlas 2000.0, represents a significant jump in detail with 43,000 stars to 8th magnitude plotted along with 2,500 non-stellar objects on 26 charts [11]. Sky Atlas 2000.0 is often the first "serious" star atlas an amateur moves into when they decide its time to really start chasing down objects beyond the "big and bright" or Messier objects. However, experienced amateurs often quickly find themselves exceeding the limits of Sky Atlas 2000.0 and needing to go farther. The next step, and arguably the current standard, is Uranometria 2000.0 (2nd edition), which in its two volumes, charts some +300,000 stars to magnitude +9.5 as well as +10,300 non-stellar objects[12]. Even larger, the three volume "Millenium Star Atlas" has been published with more than a million stars to 11th magnitude and about the same number of non-stellar objects as Uranometria [13]. However, at $249 for the set, a price which begins to approach that of a used 486 note-book computer, many advanced amateurs have opted instead to use one of the now popular computer sky atlases.

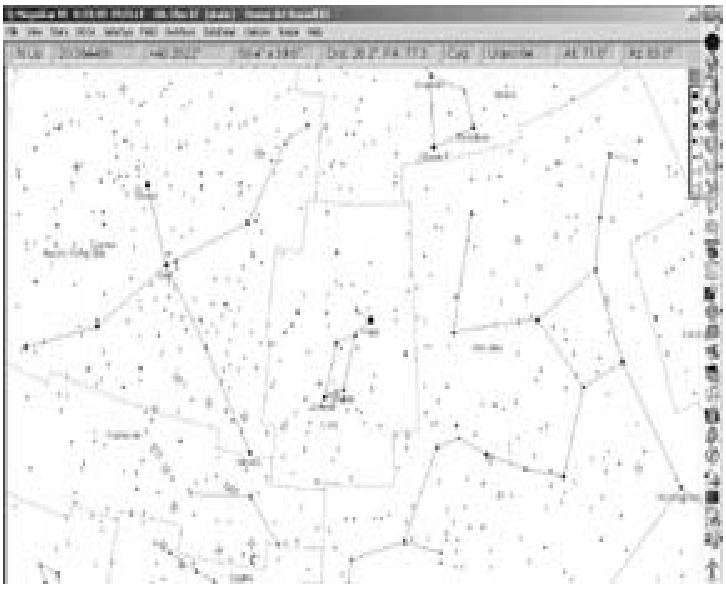
Computer Star Charts. Once the province of only the well heeled or drop dead serious professional astronomer working in UNIX, computer based star atlases have in many ways eclipsed the capabilities of a traditional, paper bound star atlas, in that they can be customized to meet the needs of the user. Need a customized finder chart specifically set up for your telescope and unique selection of eyepieces? Computer based star charts can offer a chart reflecting the "zoomed in" field of view of your favorite eyepiece for those instances wherein you are trying to identify the individual members of galaxy groups and clusters. Popular computer star atlas programs include "Megastar"[14], "The Sky"[15], "Pluto Guide"[16], "Earth Centered Universe"[17], and others.

Putting it all together: Star-hopping to M57

High summer offers a number of interesting and easy targets for star-hopping. Of these, one of the easiest and most interesting is M57, also known as the "Ring Nebula," or NGC 6720, in the constellation Lyra. Most conveniently, M57 is ideally placed for easy location and identification during the month of August as it "culminates" or reaches its highest transit through the night sky, during the early evening.

As with all trips to a new locale, one should typically check for a road map that will take you to your intended destination. It is no different with star-hopping. As mentioned earlier, you should consult your star charts to determine the location of M57. Blowing the dust off my copy of Uranometria, I find M57 on page 117 (or Sky Atlas 2000, page 8) where it is fortuitously located near one of the brightest and easiest of stars in the night sky, Vega.

Chart 1 below illustrates the constellation of Lyra at 10:25PM on the evening of 23 August, 2003, when M57 passes within about one degree of the zenith (the highest point in the sky). At that time, it will be easy to tell that Vega is the brightest star directly overhead. In finding Vega, you've also found the home of the constellation Lyra, and the abode of M57. Chart 1. Lyra and M57 at the Zenith.



Once you find Vega, the star-hop to M57 is straightforward in even a small telescope. There is however, one pitfall along the way. Depending on the type of telescope you may be using, your image may change its orientation because of the telescope's optical design. Chart 2, (shown on the top left of the next page) shows a normal, but highly magnified view of the constellation Lyra and M57. Think of it as the view with super-magnifying eyeballs. Note that Vega is located at the top (north) and right (west) side of the image. Chart 3, shown on the top right of the next page next page shows a mirror reverse image typical of Newtonian telescopes.

Having located Vega and the constellation Lyra, I find the easiest way to star-hop to M57 is to locate the two "finder stars" at

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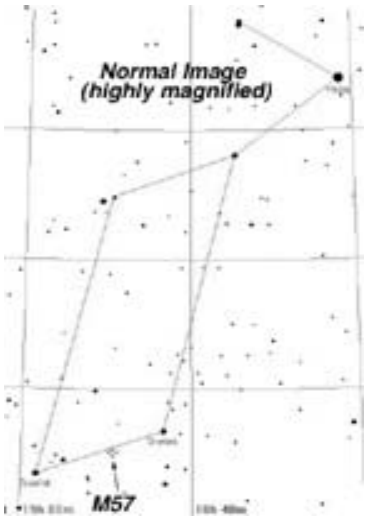

Chart 2 left.

Chart 3 right.

the bottom of the constellation, Sheliak and Sulafat; M57 is conveniently located midway between them and a sweep of the field with a telescope a moderate magnification, say 100X, is typically enough to find the Ring Nebula as a small diffuse smoke ring in space. Alternatively, one can also star-hop starting at Vega (see Chart 4 below) one star at a time. In Step 1 shown below, start at Vega and hop to the small bright star about 2 degrees (twice the distance spanned by you little finger held at arm's length) to the southeast. In Step 2, star-hop about 4 degrees (perhaps a little less than the distance spanned by three fingers held at arm's length) south-southeast to the small bright star Sheliak. In Step 3, star-hop about 1 degree (the distance spanned by you little finger held at arm's length) to the west-southwest and split the difference between Sheliak and Sulafat to find M57.

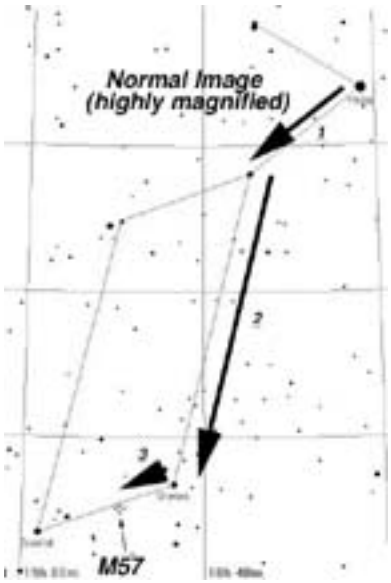

Chart 4. Vega to M57 Starhop.

Chart 4. Vega to M57 Starhop.

Well, there you have it. The nuts and bolts of star-hopping. These same basic techniques can be used to find the "big and bright," or the "dim fuzzies." Most importantly, unlike electronic aides, star-hopping, once mastered, will still be with you when your digital or "goto" scope fails to find its target.

M57, NGC 6720, Ring Nebula, right ascension 18h 53.6m, declination +12d 46.3m, diameter in arc minutes1.4' X 1.0', Magnitude 9.7, Star Chart Uranometria 117 Sky Atlas 2000, p. 8.

References [1] Astronomy Magazine, Kalmbach Publishers. [2] Sky and Telescope Magazine, Sky Publishing Corporation. [3] Veit, K.,: Starhopping, Interstellarum, 11, 1-13, 1997. [4] Dickinson, T.: Nightwatch, Camden House Publishing, 1985.

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Calendar

August 15th: General Membership Meeting. Featured speaker is Mitzi Adams. Topic to be announced. Meeting starts at 8PM sharp. Meeting to be held at Emory University.

August 23rd: Open House Mars Viewing. Walter F. Barber Jr Observatory. Starts in late afternoon. Observatory north of Villa Rica.

August 23rd: Charlie Elliott Chapter Meeting and observing. Potluck Dinner. No speaker. Meeting at Visitors Center. Starts at 7PM. Meeting rain or shine. Observing to follow weather permitting.

August 30th: Deep Sky Session at Mentone, Alabama. Starts at Dusk. Directions in July Focal Point.

August 30th: GASP camping and sidewalk Astronomy. FDR state park near Pine Mountain, Ga.

Sept 1st: Focal Point Article and Information Deadline.

Newsletter Deadline and Info

Please send articles, pictures, and drawings on anything astronomy related. All formats are acceptable. Pictures can be sent as either JPEGs, GIFs, or other formats. I can also scan hard copies of pictures. Articles can either be sent to Kosmic Kow via my spokes person at the following address. Send it to Keith Burns 3740 Burnt Hickory Road Marietta, Georgia 30064 or email my spokes person at **Keith_B@bellsouth.net**. You can submit articles anytime up and including the deadline date. **The deadline for September is Midnight Sept 1st. Submissions will no longer be accepted after the deadline**. Note that the **September issue** will be published **September 1st**. Sometimes it takes me a week to do the newsletter. So don't expect to see it til about the 5th.

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The Focal Point

Newsletter of The Atlanta Astronomy Club, Inc.

FROM:
Kosmic Kow
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Marietta, Georgia 30064

We're here to help! Here's how how to reach us:

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