MARCH 2004 ISSUE #135

PeGASus
Newsletter of the
Royal Astronomical Society of Canada
Prince George Centre

the

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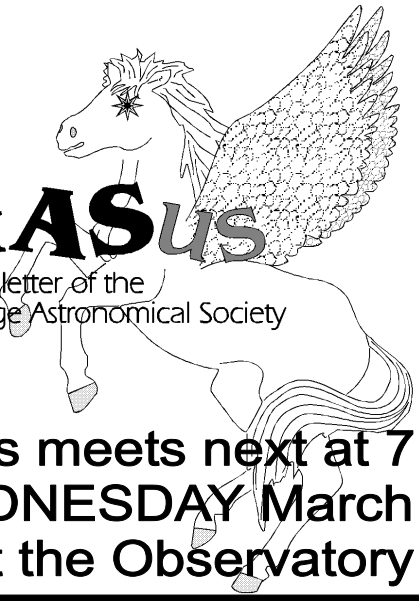
The Prince George Astronomical Society



The pgas meets next at 7:30 pm WEDNESDAY March 31 at the Observatory

INSIDE :

2 *the PeGASus*

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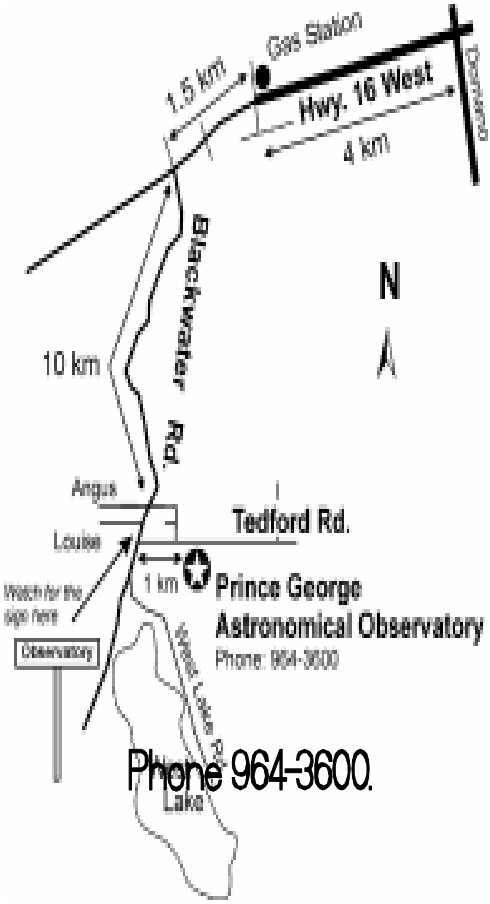
Royal Astronomical Society Canada
Prince George Centre

Our pursuits are out of this world.
Our activities are astronomical.
Our aim is the sky.



Contributions to the newsletter are welcome.

Deadline for the next issue is

April 16

PeGASus Editor
Gil Self

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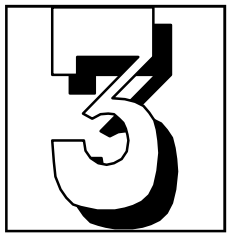

Editorial

by Gil Self

While I think this newsletter is an important part of the Prince George Astronomical Society, I'm not sure how you feel.

I don't want to forget to mention all the excellent articles that we read in these pages each month. The people that have contributed are taking a few moments to share some of their ideas, knowledge and especially their enthusiasm. The articles are excellent, as good as any I've read in other newsletters, we've got a good thing going here. The problem is, I'm not sure there's anyone else interested. I don't remember the last time I had too much material for an issue.

I know your out there, you paid good money to sign-up. I can safely speak for the executive when I say that we genuinely don't want this group to be an old-boys club or an elitist few on the inside. The executive meetings are open to any member who cares to attend. This newsletter has invited letters to the editor. —— none yet. As I recall I've only ever not included two items, one was a bit off colour and one I didn't understand. Overall if you write it , I'll use it! Long ,short or spread over three issues, I would like to hear what you have to say. For now I will "adjust" the size of the newsletter to fit our needs.

There is a lot happening this coming month, tours, open house, members night and of course the visit by the RASC national president on April 20th , hope to see you at some of these events.

Coming Events

If you are involved with any astronomical or otherwise scientific activity on behalf of the PGAS, please list the activity here.

PGAS Meets next March 31
7:30 pm at the observatory

Rajiv Gupta National President RCAS to visit Prince George on April 20th
Rajiv will offer a presentation at UNBC followed by a visit to the PGAO
Don't miss it
Bring a friend

Astronomy Day 2004 is scheduled for Saturday, April 24
And of course
Regular Open house and members nights every Friday and Saturday night through the end of May

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The Night Sky for April 2004

by Bob Nelson, PhD

Hi Folks,

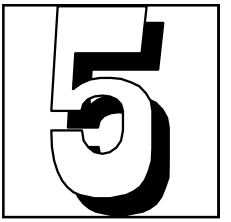
By the time you read this, spring will have arrived!!! With the start of milder weather, our new season has been underway for a few weeks now. Public observing, tours, and members' nights are now in full swing. There is also some progress to report on the flip secondary that I and Wayne have been working on. More later.

Anyway, here is what is happening in our sky next month:

MERCURY is an evening object at month's start, but is fading rapidly as it races toward inferior conjunction (lying between us and the Sun) on April 17.

VENUS sets at mid-month at 01:00 PDT, some 4 hours after the Sun. It's now a 40% illuminated 29" crescent at magnitude -4.4, roughly the brightest it can get, visible -- as everyone knows -- before sunset (and very good for telescopic viewing then, as it will be very high in the sky).

MARS, in Taurus all month, sets at mid-month at 1.14 PDT, so you can still see it. It's now a 4.8" disk of magnitude 1.4 and is definitely in the 'blob' (gibbous) phase, lying as it does on the other side of the solar system.



JUPITER, in Leo until August, transits at mid-month at 22:18 PDT and is still well placed for evening viewing. It's faded and shrunk slightly after last month's opposition – it's now a 42" disk of magnitude -2.3.

SATURN, in Gemini until 2005, transits at mid-month at 18:06, PDT, an hour before sunset, and should still be well-placed for evening viewing. Go for it! It's a 18" disk of magnitude 0.1.

URANUS, in Aquarius until 2009, rises at mid-month at about 05:00 PDT , about an hour before sunrise, for the early risers. As usual, it's a 3.6 deg disk at about magnitude 5.7.

NEPTUNE, in Capricornus until 2010, rises at mid-month at.04:16 PDT, if anyone's up then. As usual, it's a 2.3 deg disk at about magnitude 8.0.

PLUTO, in Serpens until August, rises at mid-month at 01:21 PDT. As usual, it's a 0.1 deg disk at magnitude 13.8

Daylight savings time returns on the night of March 27 / 28 (Blaaaat!).

CONSTELLATIONS to look for in April (at 10 PM, PDT) are Central Hydra, Crater (Crt), Sextans, Leo and Leo Minor.

Central Hydra ("The Sea Serpen"), not to be confused with Hydrus, "The Water Snake" - WAY to the south, hence the 'As' at the end of the constellation name) is out of the Milky Way and contains two galaxies: NGC 3923 and 3621. The former is a 2.0' x 1.2' ellipse of magnitude 10.7; the latter, a 12' ellipse of magnitude 10.0. One of the catalogues in Guide 7 tells me that NGC 3923 is travelling away from us at some 1400 km/s and is therefore about 20 megaparsecs (64 million light-years) away, using Ho = 70 km/s/Mpc for the Hubble constant.

Crater ("The Cup") contains galaxies NGCs 3672, 3962, and 3887 plus the 6th magnitude variable star SY Crt. (The Hipparcos catalogue -- available in Guide 7-- tells us that it's a slow irregular variable of spectral type M3 III (that makes it a cool red giant) and is 570 times as bright as the Sun and lies 570 light years away.)

Sextans ("The Sextant") contains the galaxies NGCs 2974, 3115, 3166, and 3169.

Leo ("The Lion") is familiar to most of us. It's a constellation that actually resembles what it's supposed to be. The head of the beast, on the right, contains at its base the first magnitude star Regulus. It also contains numerous galaxies (almost to many to mention) M65, 66, 95, 96, 105, plus NGC 3628, 3384, 2903. Those from the first group are typically 10th magnitude and 5-10' in size. The latter group are generally fainter, typically 11th magnitude (NGC 2903 is 9.5) and smaller 3-5' (NGC 2903 is 12.5'). Note that M65 and 66 is a famous pair visible in the same field of view.

Leo Minor ("The Little Lion") contains galaxy NGC 3344 (10.4 mag, 7.2' in size).

Clear skies,

-Bob

Rajiv Gupta National President RCAS to visit Prince George on April 20th

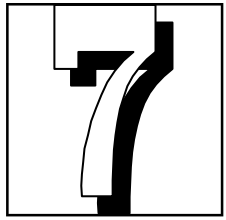
Dr. Rajiv Gupta is a mathematics professor at the University of British Columbia. He served as Treasurer of the RASC from 1994 to 1998, as Second Vice-President from 1998 to 2000, and as First Vice-President from 2000 to 2002. He is currently national president for the 2002 to 2004 term. . Rajiv also edits the RASC's two major revenue-generating publications, the Observer's Handbook and the Observer's Calendar.

His primary astronomical interest is film-based digital astrophotography; arising from this passion he co-developed software that automates the process of aligning astronomical images. Auriga Imaging (Composite Digital Techniques for High-Resolution Astrophotography with Film). Over the past 8 years has been developing methods to produce finely detailed colour images using the black-and-white wonder film of astrophotography, Kodak's black-and-white Technical Pan. Rajiv is co-developer of RegiStar software. .His images have appeared in Astronomy and Sky & Telescope magazines and in the Observer's Calendar, and his articles on digital imaging have appeared in the RASC Journal and Sky & Telescope.

The best deep-sky images now being produced are composites, formed by combining two or more individual exposures into a single image. Thanks to various powerful computer programs on the market, composite imaging is now easy. With several examples Rajiv will demonstrate some of these exciting techniques as applied to film.

Web link to Registar software site
http://www.aurigaimaging.com/

10 years Ago in PeGASus
Issue #46 March 1994



A n n o u n c e m e n t s

Setting Circles

Our new digital setting circles came and went. Bob noticed that the display elements were faulty, so they were sent back to the manufacturers.

Hubble Images Available

Dale Jepsen, one of CNC's Astronomy students, has retrieved more images over the electronic network. In addition to more of the latest Hubble images from NASA, he has also retrieved some Magellan and Voyager images. The images are presently located on the PC in CNC' physics laboratory. If you would like to see some of these images, or obtain GIF files of these images, give Orla a call at work (562-2131 local 307) or at home (964-9626).

Observatory Helpers Needed

Work at the observatory is progressing, but slowly. Bob Nelson has a crew out every Saturday trying to get our facility ready for upcoming events. If you have any time to spare on Saturdays, please come out and lend a hand. Contact Bob at 563-6928 for details.

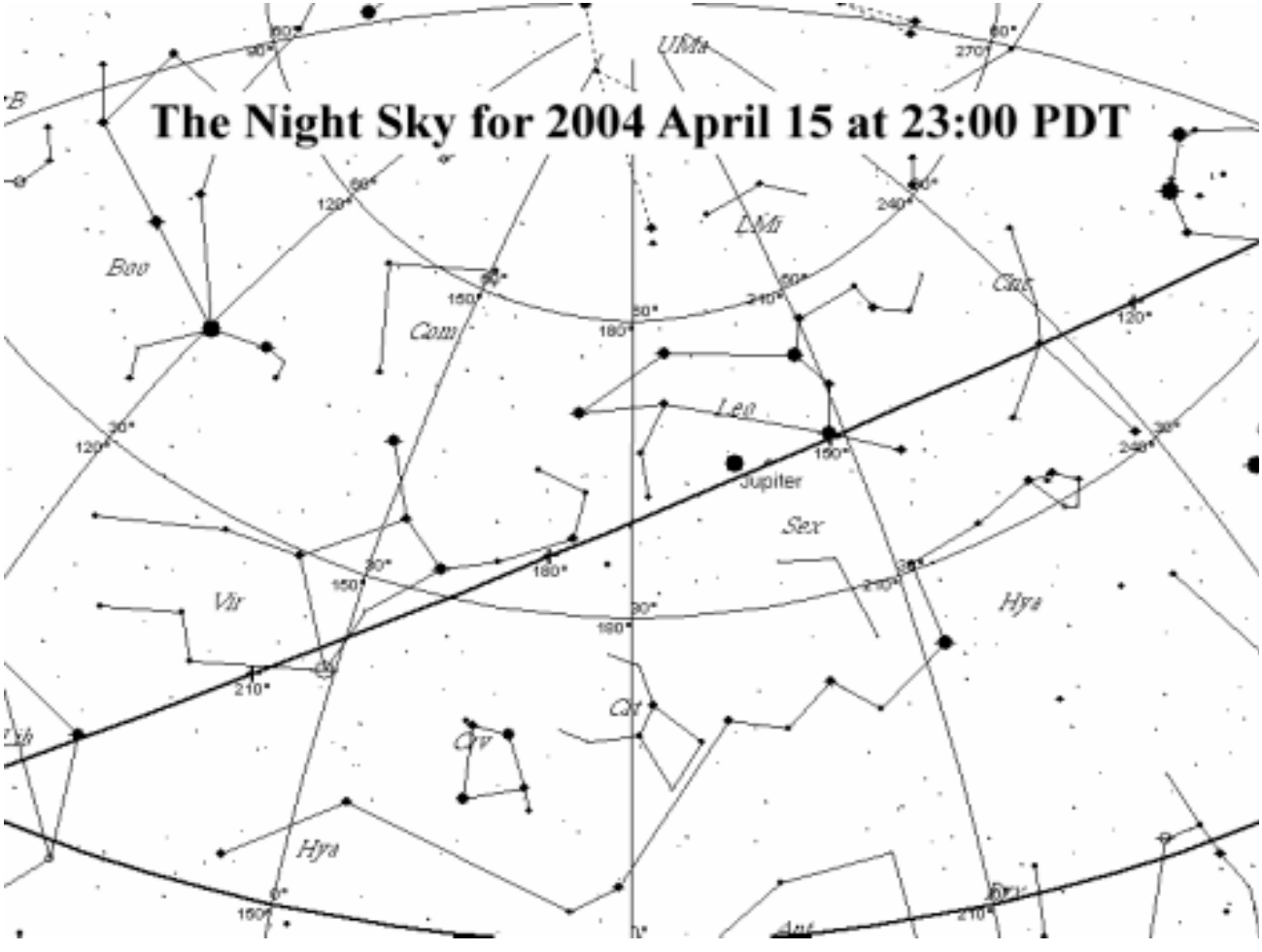
WANTED

Brian Thair is looking for a 210 mm f/5.6 view camera lens with shutter. Image circle at f/22 not less than 200 mm. (Fujinon, Nikon, Rodenstock or Schneider). Call 561-5848: CNC box 277

Photographs Wanted

The PGAS needs photographs for our portfolio. If you have any which show the construction of the observatory or of our public activity, please contact Jon Bowen or Orla Aaquist.

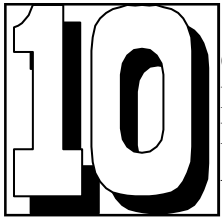
If you have anything to announce or advertise, consider this space of the PeGASus.



Sky Map courtesy Dr Bob Nelson

SOUTH

View from P.G.A.O.
April 15, 2004
10:00 pm



CUREA 2004 TO OFFER IN-RESIDENCE EDUCATIONAL PROGRAMAT MOUNT WILSON OBSERVATORY AUGUST 8-21

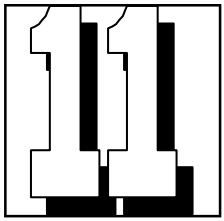
The Consortium for Undergraduate Research and Education in Astronomy (CUREA) will repeat its highly successful in-residence educational program at Mount Wilson Observatory for the 15th time this summer, from August 8 through 21, 2004. The program is aimed at undergraduate physics and astronomy majors, with junior or senior standing, who are considering a career in science or science teaching.

Staff and students will pursue a short on-site course in astrophysics and observational astronomy using the historic facilities at Mount Wilson. Instruments available to the students will include the Snow Horizontal Solar Telescope, used in conjunction with a high-resolution spectrograph and a unique atomic-beam solar oscillation spectrometer; a 16-inch Meade LX200 Schmidt-Cassegrain telescope with CCD camera and SBIG stellar spectrograph; and the historic 60-inch reflector, used by Harlow Shapley to discover the size of the Milky Way Galaxy.

The CUREA program will emphasize how our present understanding of the Sun has been achieved and how it relates to the astrophysics of all stars. The emphasis will be on hands-on experience, using the horizontal solar telescope and the other instruments. Attention will be devoted to many observable solar phenomena, such as sunspots, granulation, limb darkening, important spectral lines, Zeeman splitting of solar lines, the measurement of solar rotation using the Doppler shift of a spectral line, and observation of the solar 5-minute oscillations. Nighttime observing will extend to celestial objects such as the Moon, planets, variable stars, clusters, galaxies and other deep-sky objects. Students will learn how to process CCD images and spectra from the 16" telescope. Discussions led by staff members will deal with topics in astrophysics as well as the design and use of the available telescopes and their accessories. During the second week of the program, each student will work on a special project she or he has chosen.

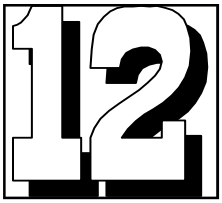
Additional activities will include an introduction to ongoing Mount Wilson research projects, short presentations on important contemporary and historical astronomical topics, special lectures by distinguished astronomers, tours of research facilities on the mountain, and field trips to JPL, Caltech and Palomar Observatory. The tuition fee of $1550 covers all expenses during the two weeks of the course, including room and board on the

mountain. Students will reside in Mount Wilson's famous "Monastery," home of resident astronomers since the days of Hale and Hubble.



Mount Wilson Observatory is the home of a group of telescopes that have, for many decades, made important contributions to astronomy. The Snow Telescope was the first major solar telescope in the world and the first telescope to be installed on Mount Wilson when George Ellery Hale founded the Observatory in 1904. The 100-inch telescope was used by Edwin Hubble to discover the expansion of the Universe. The 60-inch telescope for many years explored how other stars that look like the sun also behave like the sun in its 22-year-long magnetic activity cycle. The 150-foot and 60-foot solar tower telescopes are still in daily use to study the magnetic field and atmospheric motions of the Sun. Following the early tradition of Michelson and interferometry at Mount Wilson, scientists from the University of California at Berkeley have built an interferometer for very high angular resolution studies of bright stars at infrared wavelengths, and Georgia State's Center for High Angular Resolution Astronomy (CHARA) has built the world's largest optical interferometer array at Mount Wilson.

For more information about CUREA 2004, see
http://www.curea.org
or contact: program director
Dr. Paula Turner. E-mail: turnerp@kenyon.edu, phone: (740) 427-5367.
The application deadline for the 2004 program is May 1.



April Star Hop in Leo

by Doug Wayland

Just look for the small bold numbers on the map and match them to the corresponding numbers in the text. It is very important that you know the directions in your eyepiece. You can do this by nudging your scope in a known direction while looking in the eyepiece, note which part of the field the stars are appearing, that is the direction in which you were pushing the scope. You may have to do this for both finder and telescope

This month we will be trying to see several galaxies, some easy Messier ones and some more difficult NGC ones. Also we will see some nice multiple stars and one variable star. Finding your way around Leo is not too hard because there are lots of bright guide stars to hop from. I have plotted stars down to Mag 8 to make star hopping in your finder easier. With this chart I was able to find all the targets.

1) Our starting target is Alpha Leonis or **Regulus.** This star is a wide bright and dim double. The primary is mag 1.4 and the secondary mag 7.7. Separation is 177 arc seconds (") at a position angle of 307 degrees. Steadily held binoculars will resolve the pair. They are about 85 ly away.

2) Our next target is **R Leonis**, a long period variable. It has a period of 312 days and goes from mag 4.4 down to mag 11.3. If you look just above a line about 2/3 of the way from Regulus to Omicron Leonis, or about 5 degrees W of Regulus you will find two fairly bright stars, 19 and 18 Leonis. R Leo is situated just south of those two. On our map R Leo is the one right on top of the 2, 19 an 18 immediately above that. As of March 12 when I viewed this, R Leo was at minimum, judging from the dim red appearence of it. It is easy to locate in the eyepiece on the E point of a triangle of stars. When I saw it, it was dimmer than the other two triangle stars which are mag 9.2 and 9.9. When it is near max brightness, it is brighter than the 19 and 18 stars. By the time you use this chart to see it, it may have brightened up.

3) Now if you go up to Epsilon Leonis, the star on the end of the sickle of Leo and look 3 1/2 degrees W you can see a dim naked eye star. Put that in your finder or eyepiece and drop 1 1/2 degrees straight S to the first E-W pair you see on the chart. Just below the E star of the pair you will see a N-S oblong glow that is galaxy **NGC 2903.** This is brighter than some Messier galaxies and from resonably dark skies can be viewed in binoculars of

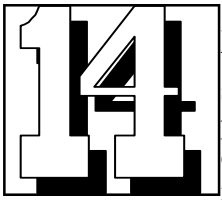
50mm apperature or more. In my 15 x 70 Skymaster binos, it was easy at a dark sky site. NGC 2903 is 20 to 30 million ly away, so seeing it in binos is a cool feat.

4) The next target is much harder, requiring about an 8 inch scope to see. Start at the top or most northern star of the sickle, hop 5 degrees or a finder field NNW to the pair of stars indicated on the chart.
Position your cross hairs about 1 degree to the NE of the next brighter star above the pair on the chart. With a medium to low power eyepiece and a little patience you should see two soft glows oriented NE-SW of each other. These are **NGC 2964 and NGC 2968**, with 2964 being the brighter and the one at the SW. Moving the eyepiece a little and averted vision may help bring them out. Dark skies are a must here. These are about 55 million and 68 million ly away.

5) Next set your finder on Zeta Leonis and hop about 2 degrees south, about 1/2 way toward Gamma. Stop just below the three stars straddling the line to Gamma, as shown on the chart, and look in the eyepiece. I used a 57x eyepiece. You should see a couple of faint galaxies oriented NE-SW of each other. The NE one, **NGC 3193**, appears to hang off a 9th mag star. The SW one, **NGC 3190**, is a little brighter. You may pick up a third faint galaxy along the same line SW and about twice the spacing of 3193 and 3190. These are all around 50 million ly away. Incidentaly, it was NGC 3190 that myself, Glen and Rob observed a nova in, two years ago. I had heard about it through Astro-alert, so we looked for and found it. It was about mag 13.9, so tough in my LX 10, but easy in the club 24". Glen took a few images of it with the 24".

6) Just stay at the eyepiece and drift another 2 degrees south to **Gamma Leonis** or **Algieba**. This is a nice tight double of almost equally bright yellow stars that look good at around 100x. The primary is mag 2.2 and the secondary is mag 3.5 and spaced 4.4" ESE. This double is about 90 ly away. Go back to about 57x and while looking in the eyepiece slide about one degree E of Algieba and you should see two close galaxies, **NGC 3226** and **NGC 3227** come into view. It may look like one oriented NW-SE at first. Increase the power up to about 100x and the glow should separate into two. These may require at least a 6 inch scope. The galaxies are around 50 million ly away.

7) There are a few ways you could hop to the next set of galaxies, but I found the easiest was to start at Upsilon Leonis, the one that sort of looks like a written v on the chart. Follow the pattern of stars a little over 6 degrees WSW of Upsilon until you see the fairly bright star situated about 1/3 of the way to Regulus. From this star slide 2 degrees S to the pair of stars that appear left of the 7 on the chart. Just below that in the 57x eyepiece **M 105** should be easy to pick up. Center that and you should also see NGC 3384 and dimmer NGC



3389 to the E. The three form a nice little triangle. Just to the E of dimmer 3389 is a N-S line of three equally bright stars that are recognizable, to confirm you are in the right place. From M 105 slide one degree SSW and **M 96** will come into view. It is a nice bright ball of a galaxy. Position it on the E side of your low power field and **M 95**, another roundish galaxy should be visible on the W side.

8) Go back to Upsilon Leonis and hop about 2 1/2 degrees S to the fairly bright star as shown on the chart. Position your finder a degree to the E and look in a low power, wide field eyepiece. **M 65** and **M 66** are a nice pair of oval galaxies oriented E-W from each other. Another dim, thin line of a galaxy, **NGC 3628**, fits into the same wide field to the N of 65 and 66, forming a triangle of galaxies. A 6 inch or larger scope is most likely needed for 3628, but M 65 and 66 are easy in a smaller scope.

9) Again from Upsilon Leonis put your finder N about 1/2 way to Delta Leonis. There is a pair of faint galaxies, **NGC 3607** and **NGC 3608** visible there, but an 8 inch or larger scope may be needed. I found them very faint in my LX 10 and a 57x eyepiece. Increasing power may bring them out a little better. They are oriented N-S of each other.

10) Now for a change we will finish off with a couple multiple stars. Start at Beta Leonis, at the E end of the hind triangle stars of Leo. Move 1/3 of the way to Delta Leonis to the fairly bright star there. This is **90 Leonis**. In a low power eyepiece, you will see a wide double, the primary being bright White and the secondary a dimmer blue 63" away to the SW. Now increase the power to 100x or more and the bright primary will split into two, close, equally bright yellow-white stars, 3.3" apart at a PA of SW as well. A very nice system indeed!

11) For the last target, set your finder just S of 1/2 way on a line between Beta and Upsilon Leonis. You will pick up **88 Leonis** there. At low power, it is an attractive, close, double of mag 6.4 and mag 8.4 stars 15" apart at a PA of 328 degrees or NW.

I hope you have fun on this long tour around Leo.
Doug Wayland, e-mail: djwayland@hotmail.com

Technical information from Night Sky Observers Guide by George Robert Kepple and Glen W. Sanner and from Sky Atlas 2000 Companion by Robert A. Strong and Roger W. Sinnott.

stars to mag 8.0
North is Up, West to the Right
Map Courtesy Your Sky
web: www.fourmilab.ch/yoursky/