

SASKATOON SKIES

Volume 23, Number 5

May, 1993

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Please note Centre's new address as shown below!!!

Saskatoon Skies Information

Commercial vendors wishing to advertise in "Saskatoon Skies" may do so at the following rates: \$50.00/page, \$25.00/half page, \$12.50/business card ad. Individual RASC members and other parties (at our discretion) may advertise items and events for free.

Next month's deadline is Friday, May 28, 1993. Please have any submissions in to me by then in order to be included in the next issue. Submissions may be in typewritten form or on a floppy diskette (3.5 or 5 inch size and formatted for MS-DOS), preferably as ASCII files. Electronic submissions are preferred as it saves some typing. Saskatoon Skies is a monthly publication of the Saskatoon Centre of the Royal Astronomical Society of Canada. Submissions may be sent to one of the following:

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422 Edmund Park,
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OR

Saskatoon Centre RASC
Box 317, RPO, University
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EDITOR'S NOTES

1) Perceptive readers will have noticed a slight change in the format of *Saskatoon Skies* this month. As mentioned in last month's newsletter, I (that is, Mike Wesolowski) am publishing the newsletter for Gordon this month, who is on vacation. Since he published the October, 1992 issue for me when I had to go to Ottawa, I guess I owed him a month, so no problem!

2) Our International Astronomy Day activities (on Saturday, May 1) were quite successful this year. This year we had a display at Market Mall, along with both Rick Huziak's solar telescope and Don Friesen's filtered binoculars for outside solar observing. The day ended with a successful star night at Diefenbaker Park. The star night was evidently well publicized; the public started arriving just after Sandy Ferguson and I (we were the first) arrived and before we had even unpacked her telescope. More details next month.

3) Eclipse season is upon us once again. This month, on Friday, May 21, a partial solar eclipse will be visible from Saskatoon. The neat part about this eclipse, as far as public education goes, is that it takes place between about 6:30 and 8:00 AM, so we can observe and show it to the public before going to work in the morning! We are planning to set up some telescopes in a to be determined location; plans should be finalized by the time we have the next General Meeting (May 17). Come on out if you are interested. Details on the eclipse appear elsewhere in this issue.

In addition to the solar eclipse, there is an opportunity to view a total lunar eclipse as well, on Friday, morning, June 4. Unfortunately, the best place to view this eclipse is from a point just east of Australia, where the eclipsed moon will be near the zenith. From Saskatoon, only the initial penumbral phases will be visible before the moon sets. Personally, I am not planning on getting up early to see this eclipse. Make your Australia vacation plans now!

4) A supernova has been discovered in the bright galaxy M81, currently visible almost straight up in the constellation of Ursa Major. When initially discovered, it was at 12th magnitude, brightened to almost 10th magnitude over the next few days, and is currently hovering around magnitude 11.5. At this magnitude it is visible in a 10 cm telescope. An article in the June, 1993 issue of *Sky and Telescope* magazine notes that the progenitor star has been identified, which will allow study of the star's behaviour prior to its eruption.

Rick Huziak observed it on April 15, and made a sketch of the field which he presented at the April General Meeting. The sketch, and finder charts for M81 are reproduced in this issue.

5) Our source for free photocopying of the newsletter, Nobby Katrusiak, is unable to continue providing this service to us. If you have contacts that would allow us to photocopy the newsletter cheaply, please let the editor know. Many thanks to Nobby who has saved the Centre a great deal of money over the years.

OBSERVATORY HOURS

The University of Saskatchewan Observatory will be open to the public on Saturday evenings from 10:00 – 11:30 PM during May, June and July. Visitors will be able to see Jupiter, M13 (the globular cluster in Hercules) and other celestial objects. Observatory assistants will be present to answer questions about astronomy and to assist the public in viewing through the telescope. The observatory is located on campus, one block north of the corner of Wiggins Avenue and College Drive.

GENERAL MEETING

The next General Meeting of the Saskatoon Centre of the Royal Astronomical Society of Canada will take place on Monday evening, May 17, 1993 at 8:00 PM. The location will be room B-111 of the Health Sciences Building on the University of Saskatchewan Campus (across the street [west] of the University of Saskatchewan observatory). The guest speaker will be Dr. Eric Valk, formerly of the Dominion Radio Astrophysical Observatory (DRAO). Dr. Valk's talk will start with a description of the radio telescopes at the DRAO and some of the general concepts of Radio Astronomy. He will then discuss the principles of operation of a radio telescope, and more specific details of the DRAO telescopes. Dr. Valk will present some images obtained using these instruments.

OBSERVER'S GROUP MEETING

The next Observer's Group Meeting is likely to take place on Saturday evening, May 22, 1993, starting at about 9:30 PM at the Rystrom Observatory. The date and time will be finalized at the General Meeting. If you are interested in attending, contact any executive member for details.

THE MAY 21 PARTIAL SOLAR ECLIPSE

On Friday morning, May 21, most of North America will experience a partial solar eclipse. The approximate circumstances for Saskatoon are reproduced below. They are based upon circumstances for Regina published in the May, 1993 issue of *Sky and Telescope* magazine (author's note: For some reason, the *Observer's Handbook 1993* did not publish circumstances for either Saskatoon or Regina. It's unfortunate that we have to go to an American magazine to find out what's happening here. Are we going to stand for this? Revolt!).

Sunrise	- 5:04 AM CST
First Contact	- 6:26 AM CST
Mid-Eclipse	- 7:12 AM CST
Last Contact	- 8:00 AM CST

The moon will take its first nibble out of the sun at the upper right hand corner and slide off towards the left hand edge of the sun. The magnitude of the eclipse (i.e., the fraction of the sun's diameter that is covered by the moon) will be about .34 at maximum eclipse, at which time the sun will be about 18° above the horizon (10° is about the angle subtended by your fist held at arm's length).

If you are planning to observe this event, safety, as always when observing the sun, is the watchword. The best method is always indirect viewing (even if filters and such are available) so consider using solar projection (if you have a telescope) or pinhole cameras. You can make a pinhole camera from a shoebox, or even form a crude pinhole by holding the fingers of your two hands at right angles to each other and letting the sun shine through the resulting gaps.

As discussed earlier, the Centre is planning to conduct a public observing session for this eclipse. The location has not been decided yet and will be announced at the next General Meeting and through the media. See you there!

UPCOMING EVENTS FOR 1993

Sandy Ferguson

- May 21 Partial eclipse of the sun. Rick Huziak is planning to have his solar scope set up at a convenient spot in the city so that those of us plodding to work that morning can stop by and catch a glimpse of the moon biting into the sun. More elsewhere in this issue!
- July 23/24 Public Star Night in Diefenbaker Park. Members will have their telescopes set up in the park so that the citizens of Saskatoon can get a look at the crescent moon, Mars, Jupiter, Saturn and some summer deep sky objects. A few early Perseids should also be around.
- August 12 The annual Perseid meteor shower peaks at 0900 local time this morning so it might be a good idea to have an observing session the night of August 11/12. The moon will be two days past last quarter and a bit of a nuisance in the early morning, but it will still be worth observing the shower. More about this in a future issue.
- September 17/18 Our second public star night of the summer. Location to be announced. Saturn will be the best planet this evening and some of the autumn objects will be available for viewing, as well as the crescent moon

Contact me (Sandy Ferguson) at 382-0898 for further information on the above.

NOVICE'S CORNER

Sandy Ferguson

This is the second article in a series for newcomers to Astronomy. In March we discussed how to find North, as it is important to know your directions when learning the sky. We also introduced you to the spring constellation, Leo, with a number of naked eye objects of interest. Apologies for not having an article in the April issue—I was out of town—but I trust it gave everyone a month to practice finding north and explore Leo.

This month we will take directions a step farther. We will again turn to the constellation Leo, to discover some objects for binoculars and small telescopes.

Getting Your Bearings – Part II

Now that you have managed to find the TERRESTRIAL directions of North, South, East and West (which enable you to find your way around the horizon), we are going to introduce you to CELESTIAL directions, which will enable you to read a star map or chart. When looking at a flat map of the world you see North at the top; South at the bottom; East at the right; and West at the left. However, when you are dealing with the sky, you are looking outward from the earth, rather than looking down on it. This means that you must now treat the sky as a dome, rather than as a flat surface. Directions now change slightly, as shown in Figure 1 (taken from *Burnham's Celestial Handbook, Volume 1*). You see that East is now on your left and West is on your right. This, of course, remains the same no matter what direction you are facing.

Constellation of the Month – Leo (Part II)

Leo the Lion continues to be our feature constellation again this month. It is prominent high in the Southwestern sky after dark (around 2230 hours) and this month we have noted in Figure 2 a few

DIRECTIONS IN THE SKY

As seen from Latitude 35° to 40° North

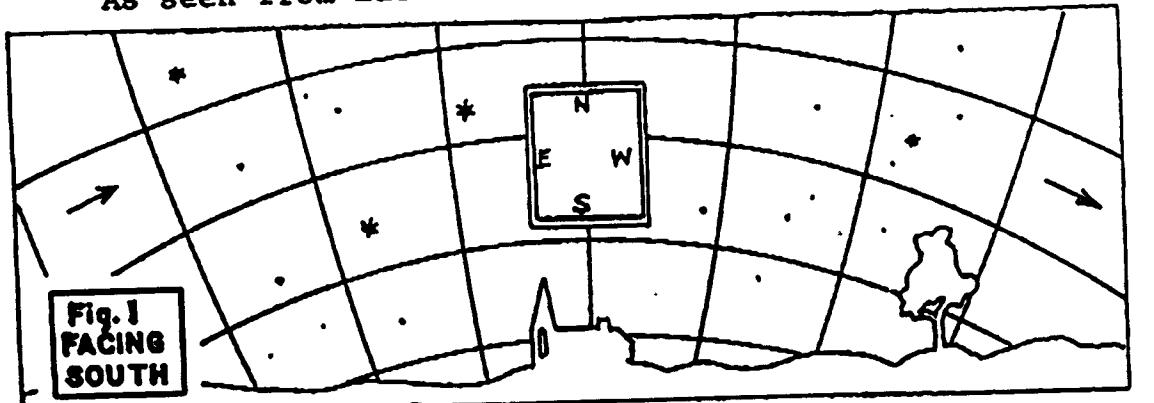


Fig. 1
FACING
SOUTH

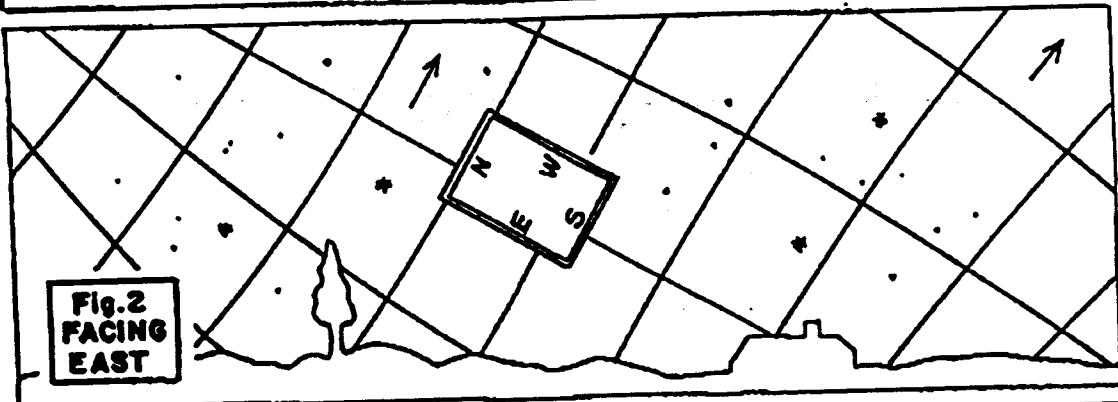


Fig. 2
FACING
EAST

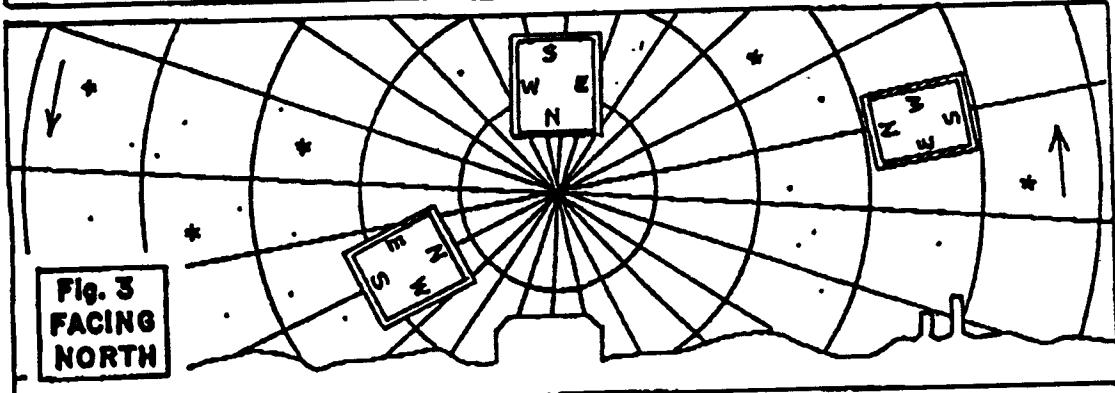


Fig. 3
FACING
NORTH

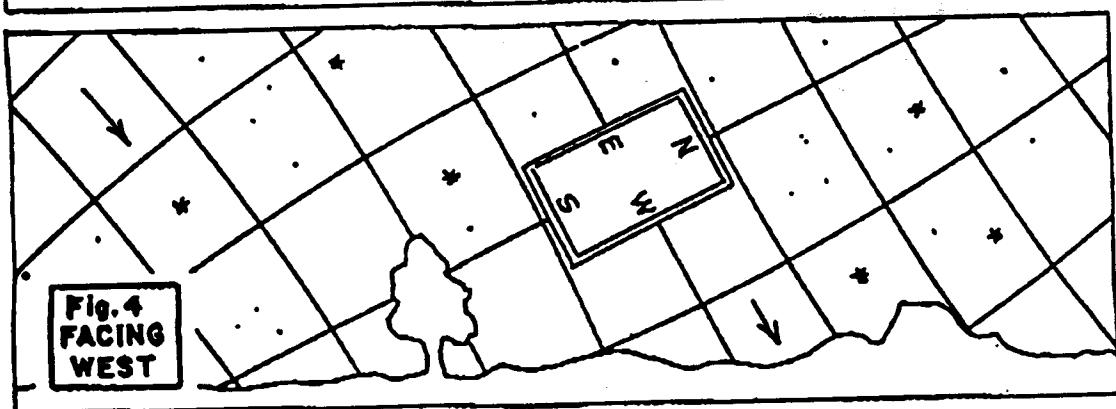


Fig. 4
FACING
WEST

Figure 1

objects that are of interest through binoculars and small telescopes. To help you determine directions, we have also shown a compass. For example, you would describe the variable star R Leonis as being west of Regulus or the star Algelba as being northeast of Regulus. The galaxies M65 and M66 would be roughly south of the star Theta (θ) Leonis.

If you have binoculars, you can use them to locate a few of the objects shown on the chart. M44, the "Beehive" cluster is a naked eye object (see March, 1993, issue), but when you turn binoculars on it, it becomes an impressive collection of bright stars.

R Leonis (the variable star mentioned above) is a long period variable, with a period of approximately 313 days. Right now it's nearing maximum brightness and you may be able to catch it in binoculars at magnitude 7.5. It is expected to reach its maximum brightness of magnitude 5.8 on July 9th, and that would be a good time to start observing it on a regular basis. Many long period variable stars reach naked eye brightness at maximum or can be observed through binoculars for a good part of their cycle before needing a telescope to follow them down to minimum brightness. For a list of naked eye variables, see page 115 of *The Beginner's Observing Guide*, or, for a more detailed list of different variables, pages 197–201 of the *1993 Observer's Handbook*. If you have some observing experience and are comfortable estimating magnitudes (see below for a discussion on magnitudes), and wish to observe R Leonis on a regular basis, please give me a call at 382–0898 and I'll get you started. Variable star observing is a great pastime and AAVSO (American Association of Variable Star Observers) charts are available for many easy stars.

Getting back to Leo, there are a number of bright galaxies to be found, although a small scope will be needed. M65 and M66 and M95 and M96 are all spiral galaxies. The first three are about 9th magnitude while M96 is about 10th magnitude. For you double star observers, Algelba (Gamma (γ) Leonis, which appears as a single star to the naked eye, splits into a double when a small telescope is turned on it. Both components are bright, at magnitude 2.2 and 3.4.

Finally, for those of you with a larger scope, you can spend some time looking for Wolf 359, a 14th magnitude red dwarf star which is the third nearest star to us after the Alpha Centauri system.

Astro-Jargon – MAGNITUDE

Our modern system of measuring star brightness goes back to the days of the early Greek astronomers, long before the invention of telescopes. In those days, the naked eye was the only instrument available to observe the sky and the Greeks determined a star's brightness or *MAGNITUDE* on a scale from 1 to 6. The brightest stars were designated magnitude 1 and the faintest stars visible to the eye were designated magnitude 6. All other stars from the brightest to the faintest fell in between. Each increment of magnitude was about 2.5 times brighter or dimmer than the previous designation. For example, a 1st magnitude star was 2.5 times brighter than a 2nd magnitude star; a 6th magnitude star was 2.5 times dimmer than a 5th magnitude star. On this scale, a 1st magnitude star is therefore about 100 times brighter than a 6th magnitude star.

This system of measurement continues to be used today, with some variations. Modern astronomers have expanded the magnitude system to include the planets and deep sky objects, now that telescopes are available to observe objects fainter than 6th magnitude. Since most planets are brighter than 1st magnitude stars (at one time or another), they have NEGATIVE magnitude designations; stars and other celestial objects dimmer than 6th magnitude have designations from 7th magnitude down to anywhere around the mid-twenties (the faintest objects visible in our modern telescopes). With ordinary binoculars you can usually observe to around 8th magnitude, sometimes 9th if the sky is very dark and steady and your vision is good.

FROM "WINTERWATCH" - TERRANCE DICKINS / COMINEN HOUSE

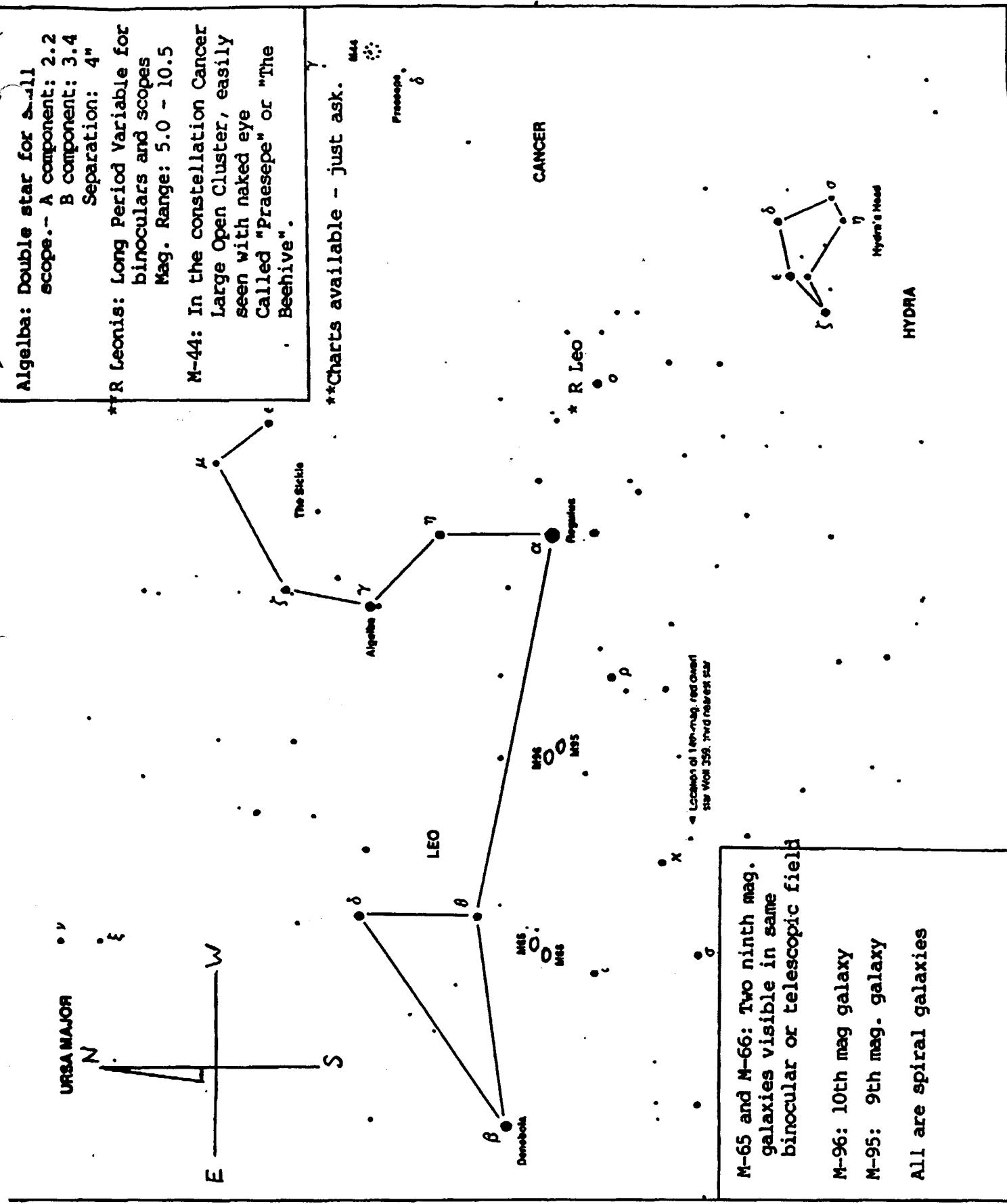


Figure 2

M-65 and M-66: Two ninth mag. galaxies visible in same binocular or telescopic field

M-96: 10th mag galaxy
M-95: 9th mag. galaxy

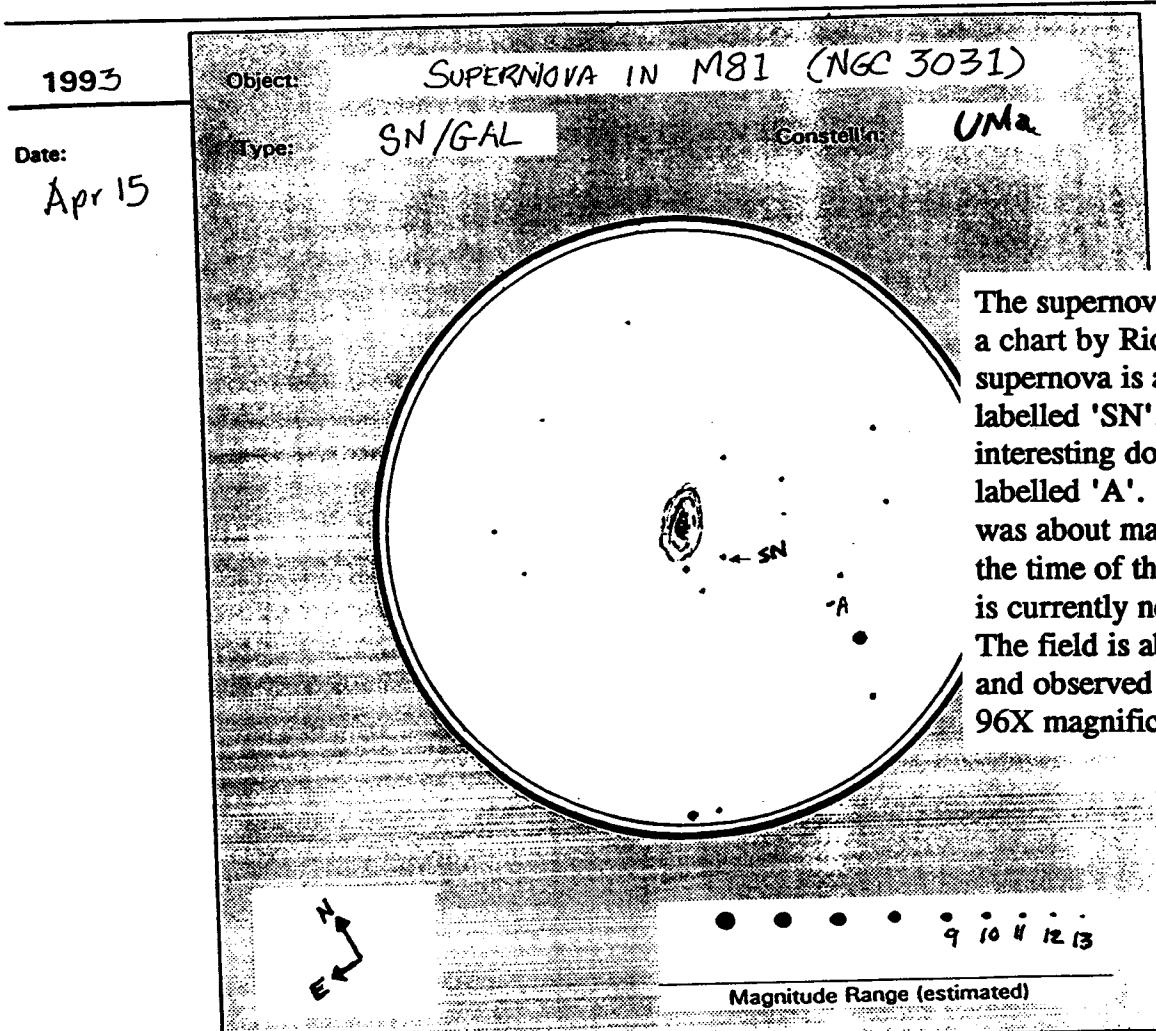
All are spiral galaxies

The magnitudes of some of the more easily observed objects are:

The Sun:	-26
Full Moon	-12
Venus at brightest	-4.5
Jupiter at brightest	-3.5
Sirius (Alpha CMa)	-1.5
Vega (Alpha Lyr)	+1
Polaris (North Star)	+2
Andromeda Galaxy (M31)	+5

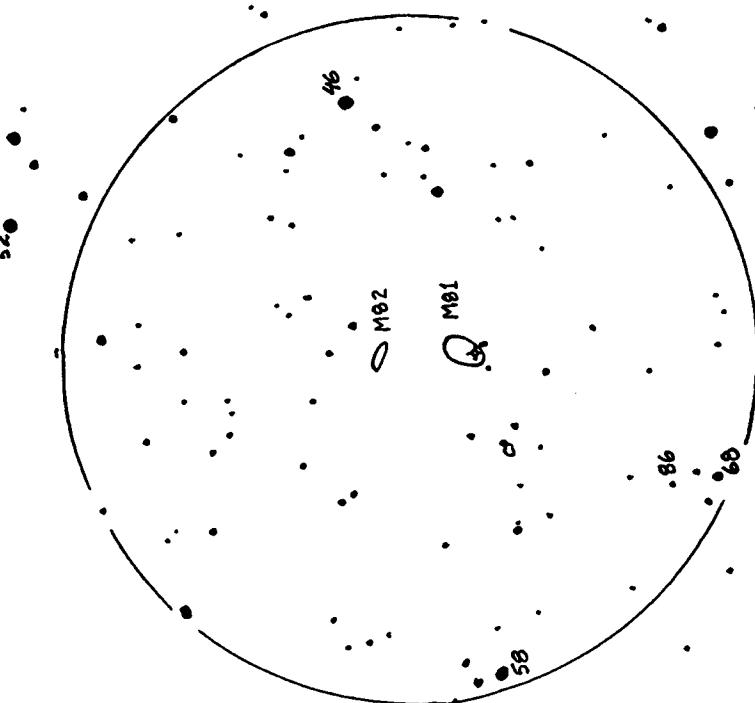
You will note that the BRIGHTER the object, the LOWER the number; the FAINTER the object, the HIGHER the number. In astronomy, you will often find magnitude referred to by two symbols:

- m_v Visual magnitude, or how bright the stars appear to be at their different distances from the Earth.
- M_v Absolute magnitude. Astronomers need to compare stars to each other in terms of a standardized unit of distance. This distance has been selected as 10 parsecs (PARallax of 1 SECond of arc), which is equivalent to 32.6 light years (a light year is the distance that light travels in one year), or about 300 trillion km. At this standard distance, a star's magnitude would be due to its power output rather than a combination of its power output and the effect of the star's distance from the earth.

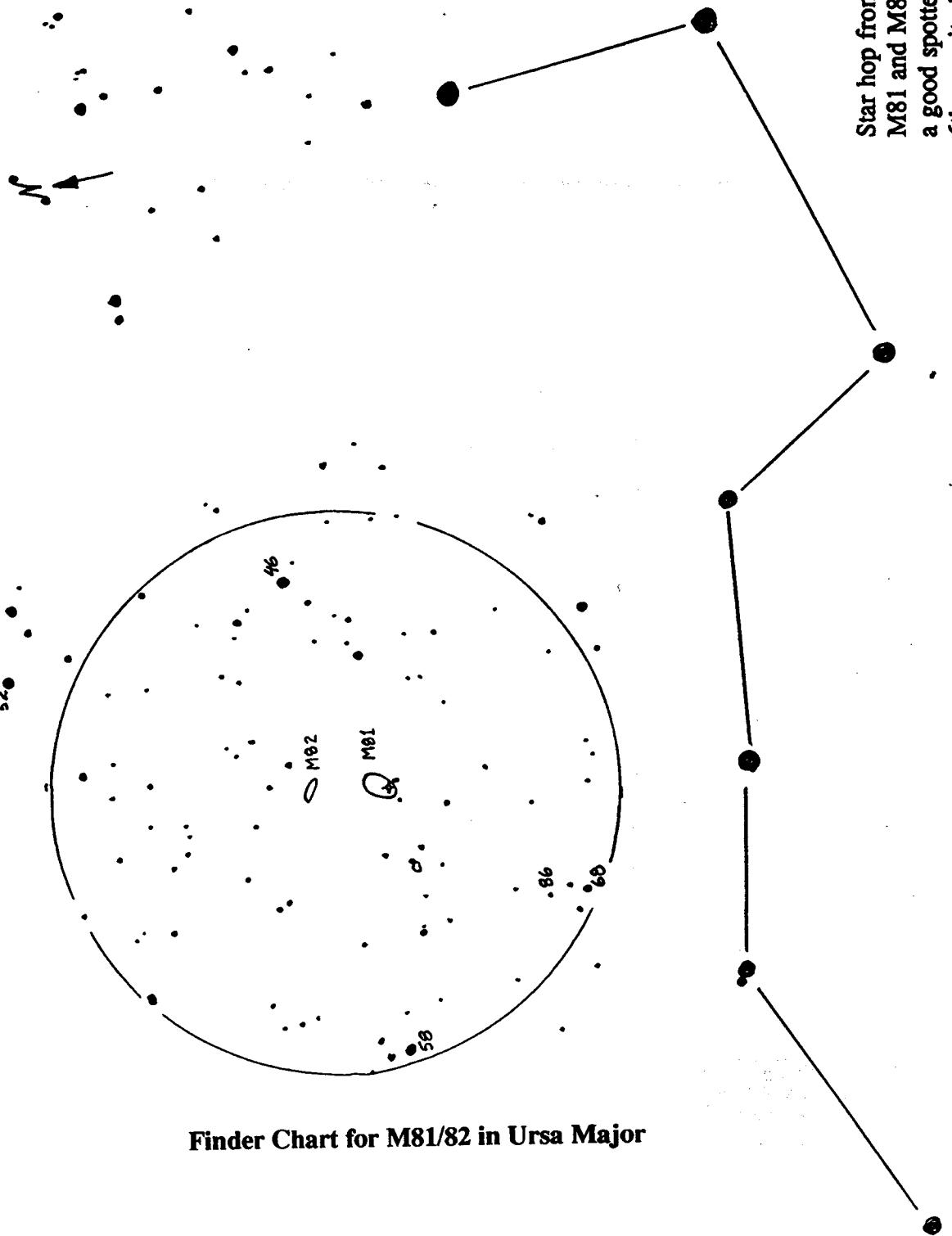


The supernova in M81 from a chart by Rick Huziak. The supernova is arrowed and labelled 'SN'. A faint, but interesting double star is labelled 'A'. The supernova was about magnitude 11.4 at the time of this observation and is currently near magnitude 11.7. The field is about 1/4 degree wide and observed through a 12.5" at 96X magnification.

View shows a 5 degree field around M81 and M82, typical of binocular fields of view. Numbers shown are the magnitudes of nearby stars with the decimal point removed.



Finder Chart for M81/82 in Ursa Major



Star hop from the Dipper to find M81 and M82, which are visible in a good spotter in dark skies. Stars to 6th magnitude are shown.