NOVA

IN THIS ISSUE
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MARCH, 1980
VANCOUVER, CANADA

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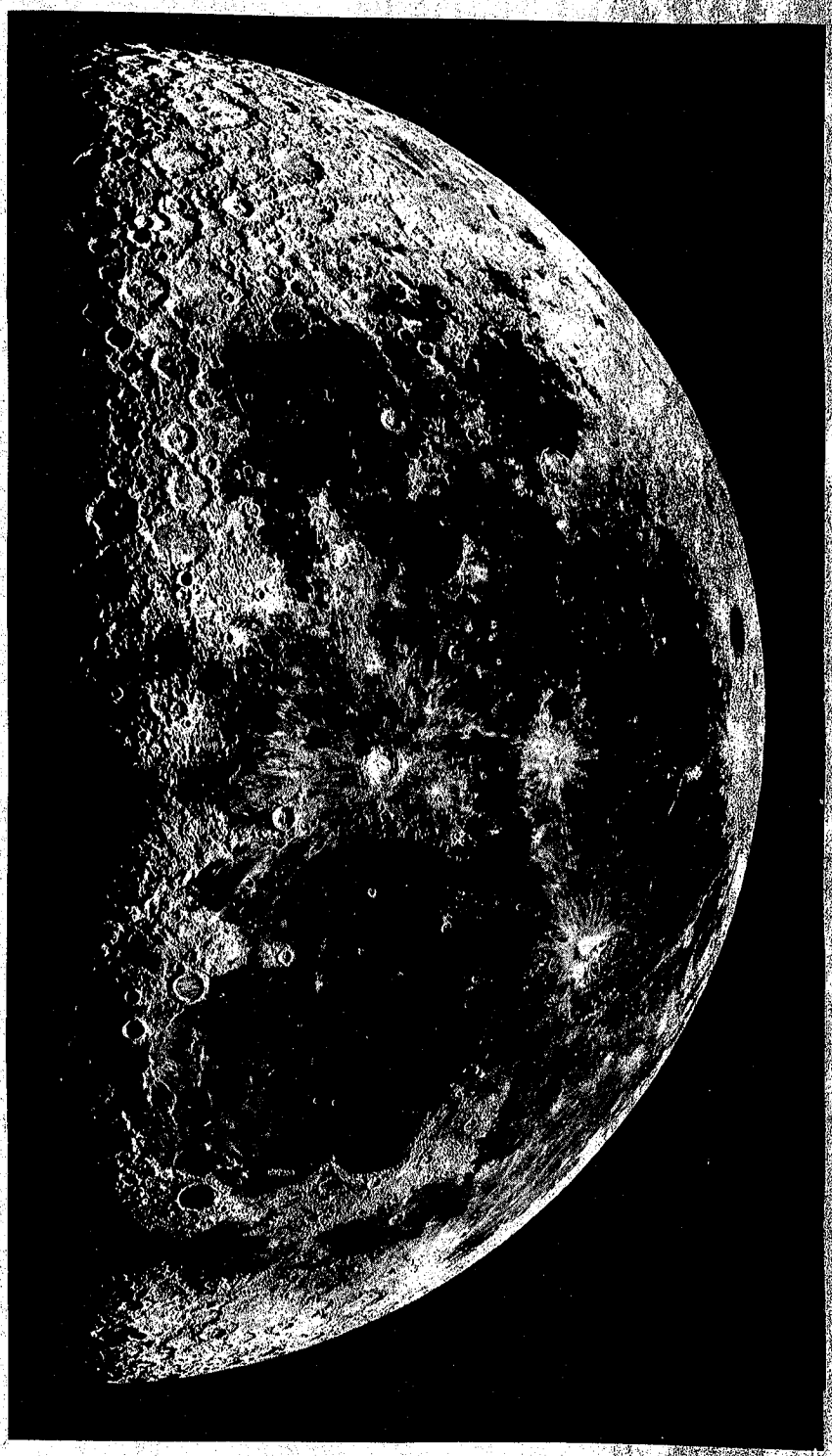

March NOVA 1980

A NEWSLETTER OF THE VANCOUVER CENTRE
ROYAL ASTRONOMICAL SOCIETY OF CANADA

Allen Stoneberg, Gregg Winter and Gordon Herke ..... Editors

EDITORIAL

If you have read this year's financial report, you'll realize that the centre is almost four thousand dollars in the black. This rather abundant situation is primarily due to the sale of "Solar Viewers". So amazing was the report that Tom Tothill announced that it warranted an invigorated look into the field of observatory building. The very thought of such a project conjures up immense amounts of confusion. Observatory projects are more often than not forced into political black-holes by the need for external funding. All skeptism aside, there are two projects in B.C. that have received or hope to receive government gold. A group of hard working astronomers in the Prince George area have received a sizeable grant from the Provincial government and the MRAA is in the process of obtaining financial and real estate support from their municipal council. Unfortunately there is usually a string attached. The string being that the facility must be available to the public. This seemingly innocent demand can cause many problems in the building design. Anyway, its about time this centre got off its butt and did something with its talent. We have engineers, technicians, construction workers and just plain able bodies. We are positive that this centre is capable of almost anything with a little planning and co-operation. Let's get moving!!!

If you haven't read of received the March issues of SKY & TELESCOPE or ASTRONOMY, there are a few nights in mid-March (new moon) that will allow the 'speedy' amateur astronomer to view at least 80% of all the Messier objects in a single night. If you are interested in a "Messier Marathon," please see Gregg Winter at next month's (March) meeting so he can get your name and phone number and do some organizational (oh nooo) work. Gregg wants dark skies, do you?

We'd like to take this opportunity to thank a few people for their unseen work. First we would like to thank Thelma Stoneberg (mother of A.S.) for her persistant work in organizing and typing the immense mailing list. If not for her you probably wouldn't be reading this (nor would I be typing this). Also, special mention goes to Jacine Herke and Barbara Curry for providing indispensible amounts of help and for putting up with innebriated editors. And thanks to all the contributors who helped make this the record largest NOVA. Keep it coming people!!!

GOLDEN ANNIVERSARY 1981

Tom Tothill

The Vancouver Centre will reach its Golden Anniversary in November 1981. The question immediately arises - what should we do to mark the occasion? It seems that we have or will have an unusual amount of money in the till, thanks to Dave Hurd's idea for viewers, the sale of the McKelvay materials, and the coming sale of the McKelvay telescope and books.

So that removes any excuse we might have had for sitting back and letting the Anniversary pass us by.

The question is, what should we do? It is not hard to see some pretty obvious things that our Centre lacks. First and foremost is a place we can call our own under fairly dark skies from which we can observe. Perhaps this should include a simple hut in which we can brew a cup of coffee and look up the star atlases. Perhaps it should go further and include a Centre telescope of greater aperture than any of us can lug around, housed in an observatory on a permanent pier. Perhaps it should be none of these things but something new and different and imaginitive.

The point is that if we want to do something serious there is no time to waste. If we want something ready by November 1981 we have got to make a real start about September 1980 at the latest, and that means that by then we have to have all the arguments behind us and the plans definite and finished.

So we have the luxury of about one month to kick around ideas, a couple more to look for sites, and a couple for planning. I think we have a number of able people in the Centre who would welcome a project they can get their teeth into. If we can agree on a project, it would be broken into as many small, distinct pieces as possible, each piece to be handled by a Committee of Two. The beauty of Committees of Two is that they can hold meetings by phone and reach a concensus very quickly, while still having someone to talk to in solving the problem.

Please let yourself be heard on the 50th Anniversary Project at the March and April meetings of the Centre. After that, it may be too late.

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SALE OF THE MCKELVAY CELESTRON 8

The policy determined by Council is that this beautiful telescope is too valuable to be used as a loaner to members. It should have an owner to treat it with the tender loving care every telescope deserves. We want it to go to a member if possible, but want at least $2000 from a member or $2500 to an outsider. As there may be several members interested, sealed bids over $2000 will be accepted and opened at the March Meeting, highest bid takes.

The telescope will be on view, with all accessories, at the Meeting.

THE ROYAL ASTRONOMICAL SOCIETY OF CANADA

VANCOUVER CENTRE

Statement of Revenue and Expenditures
for the year ending December 31, 1979

Revenue

Membership Fees		$ 1,728.00
Life Member Grants		89.60
Donations		109.00
General Assembly Grant		211.00
Sale of Solar Viewers	$ 3,190.75	
less cost of Solar Viewers	840.98	2,349.77
Sale of Observers' Handbooks		21.00
Annual Dinner	371.50	
less cost of Dinner	327.50	44.00
Interest		310.48
Miscellaneous		226.80
Total Revenue		$ 5,089.65

Expenditures

Fees Remitted to National Office	$ 1,036.80	
Library	25.43	
Nova Expenses	654.49	
General Expenses and Rent	481.25	
General Assembly Travel Expenses	211.00	
Miscellaneous	91.92	
Total Expenditures		2,500.89
Surplus for the year		$ 2,588.76
Bank balance from 1978		1,154.21
Bank balance December 31, 1979		$ 3,742.97

Doreen McLeod
Treasurer

I have examined the records of the Vancouver Centre of the Royal Astronomical Society for the year ending December 31, 1979, and the Statement of Revenue and Expenditures for the year ending on that date.

In my opinion, based on my examination and the information and explanations given to me, the accompanying Statement presents fairly the financial position of this Centre as at December 31, 1979.

Jim Wright
Auditor

LETTERS

Editors, NOVA

Onions to yuse guys. Last fall you were eager for articles, so I wrote you one. You said you'd print it but you never did. Then you said you'd print it in January; but you didn't. Where is my wonderful article from three months ago?? No place - For shame.

I have held back from the advice of my seconds to duel you with cream puffs at twenty paces; or to strike you 30 lashes with a wet noodle, but have instead conjured up an Astronomers Curse which I hereby cloud you with: May you be caught in tremendous meteor showers without your umbrellas; and may your efforts to see a total eclipse of the sun be ruined by the shine from a full moon; verily, may the constellations of your birth rise three months out of date.

Best Regards, Jim Bernath

Sorry Jim, please recall your curse as we have decided to print your article hereunder in its entirety:

Hurray For Our Side

Last February Sky & Telescope re-printed some Amateur Notes humourously put together by our Jim Bernath concerning the Leonid Meteor Shower. Now its happening again. In the new book,"UFO's - Sightings, Landings & Abductions" there is a picture of a scorched landing circle in an Ontario tobacco field. This turns out to be Jim's work too, and it occupied a good part of one of our meetings at the Planetarium in 1975, complete with snaps, movie, interview & sample of the purple streaked tobacco.

TAURUS MAJORUS

* Every year at this time I get inquiries from members who joined last autumn and still have not received their journals. Don't worry, you will get your first Journal sometime this month. The membership goes from October 1st of one year to September 30th of the following year, whereas the Journals run on the calendar year basis. You will receive six issues during the year starting with the February issue which arrives about a month after publication. Now you know.

Doreen McLeod

* Since nobody guessed when the last non-full-moon-February-of-a-leap-year occurred, this month's question will be easier. For two complimentary tickets this month, tell us when the next transit of Venus occurrs simultaneously with an eclipse of the sun, in the opposite direction (total, of course), and visible from North America.

* Allen's Testimonial: Yes, the wine was very good.

SPACE PUZZLE II

Philip Marshall

I have sent this Astronomical Word Search to NOVA in the hope that it could provide some enjoyment to a disgruntled astronomer on some cold and cloudy night.

(We would like to emphasize that this is not, repeat not the dreaded killer word search threatened in the event of no NOVA articles being submitted. This menace lingers on. Ed.)

B E T E L G E U S E R E T N A A
E S O L S U N E B A L G O L J L
T O U B D F U C O R I O N U T E
A L N P L U T O Y T O O P G O V
S A U C E E P M A H B I N O H E
C R S T A R E E G A T I D L C P
O S A T U R N T E E K K I L Y O
R Y V M O O N O R I J A O O T C
P S U N A R U O V I H N R P E S
I T I T A N N A V A G O E A H E
U E O B I C E R A A E R T N A L
S M E R C U R Y L M E O S U R E
H E R S C H E L O H K C A L B T
P U L S A R S U K A E P T T I K
Y X A L A G S U R U A T N E C R
A P S O Q U A S A R S E R E C Q

Word list:

Algol
Anteres
Apollo
Asteroid
Arecibo
Black hole
Beta
Brahe,Tycho
Betelgeuse
Comet
Corona
Centaurus
Ceres
Earth
Galaxy
Herschel
Io
Jupiter
Kitt Peak
Luna
Lyra
Mars
Moon
Mercury
Neptune
Novae(2)
Orion
Pluto
Pulsars
Quasars
Saturn
Scorpius
Sol
Solar System
Star
Sun
Supernovae
Titan
Telescope
Uranus
Vela
Viking
Voyager
Venus

LETTER TO THE EDITORS

Dear Sir,

I had a chance to take a glimpse of Comet Bradfield on February 5th through the guider of the Steward Observatory's James Reflector. The telescope is located on the campus of the University of Arizona in Tuscon. The comet appeared as a diffuse patch of light similar in appearance to that of an unresolved globular cluster. It seemed to be much fainter than the 6.5 magnitude prdicted for that night. For obvious reasons the comet was too faint to be viewed through the 21 inch main scope. The man from the Flandrau Planetarium Observatory just across the street was also searching for the comet with the planetarium's 16 inch Wickman Reflector but failed to find it.

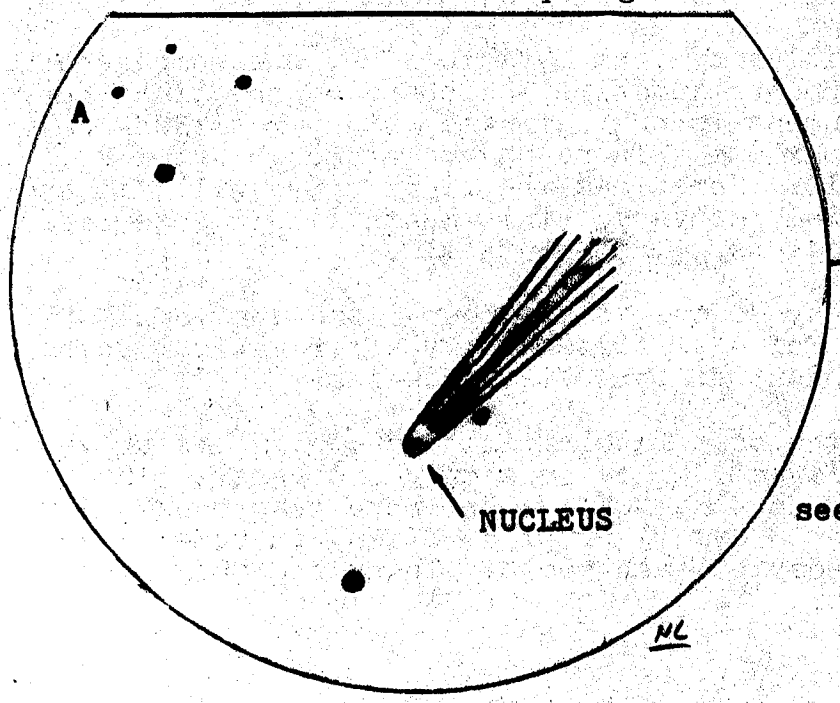
Flandrau Planetarium is open everyday except Monday and the Steward Observatory is open every Tuesday night. No one visiting southern Arizona should miss the opportunity of looking through and comparing the two telescopes by running back and forth between the two observatories.

Yours sincerely,
Basil Chiu.

* * * * * *

SPEAKING OF COMETS — Samurai Comet Sketcher

Something resembling the drawing presented below was submitted by Neil Laffra and Bill Phillips. The original was truly a work of art (compared with ours) and only restrictions due to printing methods kept us from using it. We felt that even this representative version would be of interest. The lines in the tail of the comet represent the boundaries of the visible tail. So with most humble apologies..... HHIIIIYAAAAAAAAAA!!



COMET BRADFIELD 1979L

Feb. 2, 1980, 8:00 PM
Position RA 3h 17.6m
DEC -1 42'

E

Celestron 8 at 125X

*nucleus similar in magnitude to star "A"

*bright patch of tail seemed detatched from nucleus

*seeing was poor

NOVAE Samurai Editors Inc.

For many centuries, the Literary sphere was regarded as being fixed and unchanging. Quite often though, a new newsletter would suddenly appear and slowly fade away. Some of these newsletters were so bright that they outshone the brightest magazines.

One of these new newsletters was called NOVA after the latin word for 'new', since it was thought to be a newsletter which had just been created. Today, astronomers know that these are hardly new newsletters; in fact they are newsletters which have attained a not-so-healthy old age.

The Nova Phenomenon

For decades, astronomers could only speculate about a NOVA outburst. Some thought that drunk editors collided, annihilating each other. Others argued that a dark newsletter was being heated to incandescence as it passed through a dust cloud.

The first real clue about the nature of these newsletters came when it was discovered that many post-NOVAe editors were close binary systems. Spectroscopic data indicated that these systems consisted of a cool, late-type newsletter and a white dwarf primary. Later investigations showed that the white dwarf was drawing money from its companion. This money formed a ring around the dwarf from which it would accrue into its pocket.

Most of the money drawn from the white dwarf's companion is counter-hydrogen, and its influx is what causes NOVA eruption. The white dwarf is composed mainly of helium (or some heavier periodicals) with a relatively thin 'skin' of energy producing counter-hydrogen. The white dwarf, being quite small, cannot radiate this extra energy away efficiently. It becomes unstable, and eventually blows away the outer pages of its atmosphere in a violent ripping and tearing eruption.

The Light Curve

The light curve will vary from NOVA to NOVA, but some generalizations can be made. Understandably, the shape of the light curve before maximum enlightenment is not definate, since most NOVAe are discovered at or after maximum. There may be a smooth decline, interupted by standstills. Sometimes the light curve will dip and then rise again to partial recovery. (this month's) In some cases there are marked fluctuations. (last month's)

From studies of many NOVAe, it has been found that all NOVAe have absolute magnitudes of -5.2 fifteen days after maximum readership, a value which is independent of the rate of fading.

NOVAe are one of the most fascinating objects in the universe because each one is different. They pose many problems to the astronomer. For example, why do some NOVAe erupt more than once? Why do the dwarf NOVAe (such as SS Cygni) erupt so often, in some cases as often as the second Tuesday of each month? These and many other questions await an answer.

STAR TREK: THE MOVIE — Walter Dnes

The easiest question about STTM is why. Answer: the studio wanted to make a pile of money. How to do it. Answer: the K-TEL method, namely "ORIGINAL HITS - ORIGINAL ARTISTS". Take a posthumously successful TV series with a loyal following and bring the original cast together to do a movie. The movie has a few limitations; it has to stick with the original series.. For instance, the starship Enterprise has to be retained, although other scipfi movies feature much more sophisticated looking vehicles. The plot is at once both the strong point and the main disappointment.

Earth is threatened by a large cloud containing unimaginable forces. The Enterprise is sent to investigate. The origin of the cloud is surprising because the core was put together by 20th century earth technology. One of the early Voyager space probes was sucked into a space-time warp and ended up on the other side of the galaxy. There it met a civilization of machines which recognized it as a "brother". The machines took pity on their poor relative and repaired all the meteor damage it had sustained, not to mention refitting it with equipment that enabled it to take on any Federation or Klingon starship. However, Voyager's original instructions were not altered, namely to explore and then relate all that it finds back to earth. Before that it seeks to find "The Creator". Voyager intends to eventually get rid of all "carbon-based life forms " that it encounters, including any that it finds onearth.

The main part of the movie deals with how our heros save earth. This ensures that both earth and our heros stick around long enoughto possibly do a sequel movie. Star Trek keeps up its ever present theme of human conflict, and there is more character developement than most sci-fi movies. Of course, it helps to have 79 TV episodes preceeding the movie, to set things up. The plot itself is good, but try to remember the TV episode of Star Trek entitled "The Changling". Consider the plot: Earth is threatened by a small but unimaginably powerful machine which calls itself "Nomad." It seems that late in the 20th century, a deep-space probe of the same name was sent out from earth to explore and report all it sees. In its travels it collides with an alien space probe which has been programmed to collect and sterilize soil samples from planets. After the collison Nomad attempts to repair itself, but ends up scrambling both probes together and the composite probe goes around "sterilizing all biological infestations." This happens to include several civilizations it has encountered as it heads back to earth in search of "The Kirk." Nomad mistakenly assumes that our hero is the same person. This grants Jim a respite while he figures out howto stop Nomad. This episode should sound remarkably similar to the movie. In other words, $4.00 for a movie is one thing but $4.00 for a rerun of a tv episode is a bit much.

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FOR SALE: One Cave 6" F/4 RFT, one year old and lightly used. Comes with 25mm ortho, 6" Meade equatorial mount with motor and cradle rings, and Telrad reflex sight. Asking $600. Contact Brian George at 669-0963.

OCCULTATION OBSERVERS? (EXTINCT OR IN THE CLOSET)

Neil Laffra

Since it is traditional (if not manditory) for the Moon to be well up and and very bright during periods of clear skies in the Lower Mainland area ,it would seem that there should be several occultation observers in our midst. However, we never seem to hear much (if anything) from them. Since this year we have the opportunity to watch several disappearances of Aldebaren, plus several bright stars in the Hyades cluster, in addition to other stars along the Moon's orbit, this makes for several timings that could be made by almost anyone with even a small telescope. The reason for getting some communication between observers of events is to check reported times and to confirm observations.

At present, I have been checking my few sightings against those of Art Holmes. He does his observing in south Langley, while I did mine up in Maple Ridge. There has been differences in time of over 10 seconds! This is probably due to my being new at this game, but it is also due to the distance between us. There was also some notable event detail disparities; one star (magnitude 6.4) that we both watched disappear February 22 at 23:11:20.9 PST in Maple Ridge (23:11:19 in Langley), was gone in an instance for Art but to me it seemed to go "out" gradually, over a one second period! If only I could get someone to confirm either sighting, the reports we send in to the Greenwich Observatory would be much more significant. (Since the Moon's apparent movement at its distance is equivalent to about 1 kilometre per second, and the mountains of this size are not uncommon on the Moon, its possible that my view was of the star being cut off along the edge of such a steep slope.)

If our Centre could come up with an occultation group (being more than two members!!0, there will be something constructive to do on a luminous lunar evening.

NOTE: This October 10, 1980, early in the morning (00:03PDT) there should be an occultation of a faint star by an asteroid visible only in the coastal regions of Oregon, Washington and the lower parts of B.C. (see Sky and Telescope Jan. 1980, pg 38). With some practice this could turn out to be an excellent chance to contribute to the study of this asteroid. Aside from that, there are several bright star events all year long.

Any other star watchers out there who do participate, lets hear from you, preferably in NOVA but otherwise in person.

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FOR SALE: Meade Model 826: 8" f/6 with motor drive & equatorial mount, 6X30 viewfinder, one 25mm Mod. Achro., one 6mm Series 2 eyepiece, one Meade Model 210 PG 2" photoguide refractor (mounted). Asking $1000. Contact John King at 734-4689 (cash or cert'd cheque)

Pentax SP1000 35mm SLR, 50mm f/2 & 135mm telephoto(f/2.8) $150. Also, Meade 60mm f/11 guidescope with mounts, star diagonal and crosshair, 30.00. Contact Bill Hodgson at 462-9157.

OBSERVATIONS OF A YUKONER — Ron Richards

In a virtually frozen wasteland where temperatures drop to -80'F and refuse rise above -40'F for four months at a time, not much appears to be alive. Too cold to snow the ice fog settles in at times so thick that you can't see a friend 20 feet ahead of you. The 18 - 20 hour nights are unending and when the skies are clear those long cold nights are a blessing and a gift to a budding or experienced astronomer (as long as you keep warm).

Absolutely free of any type of pollution and a total dark sky area at 62½ degrees N. latitude, the Yukon sky is the host of amazing views of the stars and their configurations. The fainter magnitudes being more easily seen, the Milky Way is truly more splendid. The Hyades and the Pleiades,as well, appear richer and fuller. The constellations become easier to define and the planets seem brighter with no disturbances from the atmosphere. But by far the most awesome sight of all offered by the gracious host of the North isthe spectacular light show. The Aurora Borealis, more commonly called the "Northern Lights" is a stunning show of ever changing and unending beauty. They are caused by charged particles from the Sun bombarding the rarified gases in the atmosphere causing them to glow. The phenomenon takes place more than 60 miles above the surface and is observed most frequently at 70' latitude.

If you are fortunate enough to be living in a dark sky area keep an eye in the sky this spring as solar activity is at a maximum and the two are related. You are best to check as often as possible for the aurora as they can appear as suddenly as a meteor or brighten gradually and gracefully. They may dissappear and then suddenly return intensified ten-fold. The show can last minutes or hours and there is no way of knowing when the "big attraction" is on stage.

Constantly moving, sometimes racing from one section of the sky to another, they cover more than 100' in a second and at other times waving and bending, gently and serenly, as seductive as the hips of a young Polynesian dancer. Often times they light up the sky with shimmering reds, greens, yellows and white. More common are the paler shades stretching across the zenith in the form of a band and common also is the band beginning at one horizon and reaching unbroken to the other. The auroral shapes and colours differ from night to night, hour to hour, and minute to minute. They are less predictable than the wolverine or the grizzly and definately more beautiful than any sunset. Sometimes they imatate the clouds and form shapes recognizable to the eyes and imagination of the observer.

I remember an evening early in November last, gazing into the sky and seeing the most beautiful reproduction of a fox tail I have ever seen. Pink, yellow and white and approximately 25' wide at the base, it curled inside itself until it formed a

perfect tip as would the tail of a sleepingfox. The outside edges shimmered in a manner suggesting fur being swept by a gentle breeze. Several nights later I saw a beautiful set of green and white moose antlers set in Ursa Major. The racks bases began on each side of the bowl stars in the dipper, washing outthe stars in the handle. The most amazing thing about the auroral rack was it's perfect symmetry. From each side of the bowl they swept downwards perhaps 40 degrees and the ends "shooting" providing the appearance of the antler tips.

Both of these nights I was floored or should I say star struck. Puns aside, there is one other evening I will remember more vividly than either of the others. I was hiking along an exploration road and the light show began. At first pale and faint I continued my hike pleased and feeling part of the whole experience then suddenly its intensity and brightness increased fantastically. The aurora began to shoot across the sky so fast I had to stop and try to catch as much of it as I could. Then I heard it! It was a faint crackling and hissing like cellophane and steam. It was one of the eeriest moments of my life - listening to the aurora alone in the bush, miles away from town. And when I'm away from the Yukon I miss the light show, the sky seems somehow empty and I feel a part of my life has been taken away. But I'm not sad because I know I'll see them again and all of you should have the good fortune of seeing the Northern Lights because if you do you will never either.

Remember keep an eyein the sky and look north as you may get lucky in the coming months.

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PREDICTING THE SURFACE TEMPERATURE OF MERCURY Dr. Iken Schovsky

A simple method of determining the surface temperature of Mercury has recently been discovered by my collegues and I. The beauty of the method is that it only used five physical factors of the planet. Take an ordinary pocket calculator and set it to show no decimal places. Then enter the mean distance from the Sun in Astronomical Units (0.387 a.u.). Multiply the number by the orbital inclination in degrees (7.0). Again, multiply that number by a correction factor, derived from the albedo (surface reflectivity) and percentage of heat radiance (0.98). Next divide by the eccentricity (temperature varies slightly with distance changes along the orbital path) (0.206). Finally, multiply this value by the period of rotation (siderial) in days (88.0). The final answer, read to zero decimals, is then read BY PLACING THE CALCULATOR IN AN INVERTED POSITION so as to equate the image with that of the telescopic view...

For further information, please send a self-addressed, stamped plastic bag to: Novastarsk Kosmos Acadamie
Slowviet Onion

IN PRAISE OF BINOCULARS (Part 4) J. Karl Miller, C.E.T.

The points mentioned in the preceding issues of NOVA show that binoculars can be used for scientific or aesthetic reasons. The latter usually are the cause for the novice to delve a little deeper into matters astronomical. For the owner of binoculars, especially, there are a multitude of "heavenly bodies" within reach. These include binary and multiple stars, the milky way, variable stars (which require a bit of observational dedication), star clusters, nebulae, the moon and planets (including the brighter asteroids - minor planets). If nothing else, they provide interesting, and (to me) often awe-inspiring vistas.

I'm including here a few maps of the sky which contain the location of some of these objects. These maps are meant primarily for the casual observer; for more detail, the field edition of "Atlas of the Heavens" will be of greatest use. Another excellent reference is, "A Field Guide to the Stars and Planets" by the late Dr. Donald H. Menzel (approx. $9.00), which contains beautiful "maps" of the sky, as seen by an observer facing north, and south. The white stars on a black background simulate the actual sky nicely, and look very natural. The book also contains a photographic atlas on a scale which makes it very useful to the binocular user. Any objects noted in the accompanying maps is located in the "Fieldguide" on far more detailed charts. A wealth of other astronomical topics, as well as the fact that this is a pocketbook, make the "Fieldguide" ideal for novice and seasoned observer alike.

The "maps" included in this issue of NOVA are spread over two pages and consist of three general sky maps and twenty "miniature" maps, which contain several "binocular-oriented" objects, galaxies, nebulae and starclusters. There are also two "dark and clear sky" objects, which are more difficult to see.

The miniature maps are related to the general maps by means of the co-ordinate system; for instance, miniature map $20^h + 10^o$ is located on the general map at approximately $20^h + 10^o$, which puts it into the area of the constellation Aquila, the "eagle". In this instance, 20^h represents the "rectascension" of twenty hours and $+ 10^o$ is the "declination" of plus ten degrees. Declinations of more than $+ 40^o$ are located on the circular map.

Areas rich in Stars:

(Perseus)	Map	$3^h + 40^o$
(Orion)	"	$5^h \pm 0^o$
(Taurus) Hyades	"	$4^h + 20^o$

Star Clouds in the Milky Way:

Cygnus	Map	$20^h + 40^o$
(See also North America Nebula map)		
(Aquila)	Map	$20^h + 10^o$
(All the way to the horizon, see also "cave" map)		

Star Clusters:

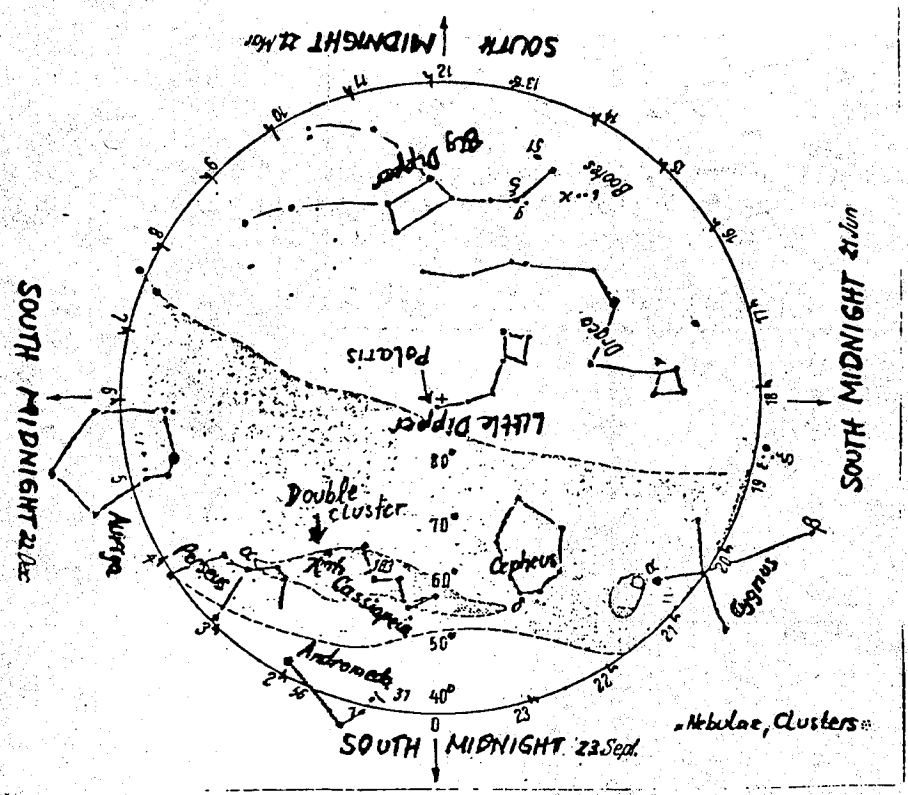
(M = Number in Messier's Catalog, NGC = New General Catalog by Dreyer, O.St = Open Starcluster, d = Diameter, and D = distance in lightyears, l.y.) The Designations M and NGC are omitted on the maps.

WINTER SKY

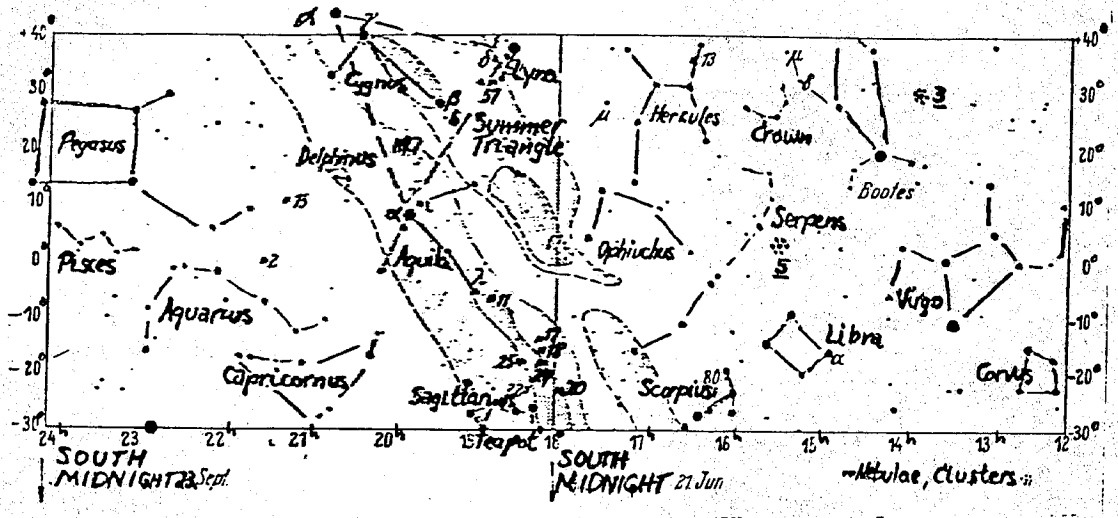
		MAP
Pleiades	In Taurus, O.St., approx. 230 stars, d = 18 l.y. D = 500 l.y.	4^h + 20^o
Hyades	In Taurus, O.St., 150 stars, the Dominion Astrophysical Observatory in Victoria has used this cluster to establish basic distances in the universe.	
M 44, "The Manger"	Also called Praescepe, O.St., In Cancer, 500 stars, d = 13 l.y., D = 250 l.y.	9^h + 10^o
M 67	In Cancer, O.St., 60 stars, d = 101.y., D = 2200 l.y.	
M 35	In Gemini, O.St., 130 stars, D = 4000 l.y.	7^h + 20^o
χ and H	In Perseus, double cluster, O.St. several hundred stars, d = 40 l.y. each, D = 4500 l.y.	3^h + 40^o
M 34	In Perseus, O.St.,145 stars, d = 12 l.y., D = 1500 l.y.	
M 46	In Moneceros, O.St., 175 stars, d = 20 l.y., D= 2200 l.y.	7^h - 10^o
M 50	" " " 40 stars, d = 12 l.y., D= 2800 l.y.	
NGC 2422	" " " 50 stars, d = 13 l.y., D= 1600 l.y.	
NGC 2244	In Monoceros, O.St., loose stars 6th to 10th magnitude, embedded in nebulosities (dark sky object).	7^h + 20^o
NGC 2301	In Monoceros, O.St., 80 stars, D= 3000 l.y.	7^h - 10^o
M 36	In Auriga, O.St., 70 stars, d = 20 l.y.,D = 4400 l.y.	5^h + 40^o
M 37	" " " 200 " d = 25 l.y.,D = 5200 l.y.	
M 38	" " " 120 " d = 15 l.y.,D = 4000 l.y.	
	M 36, M 37 and M 38 are contained in the same field of view in 6 - 8 power binoculars of the "wide angle" type, since they are located within 7^o of each other.	
M 103	In Cassiopeia, O.St., Fainter stars, D = 8000 l.y. (circular map)	2^h + 60^o

Gaseous Nebulae, Other Galaxies:

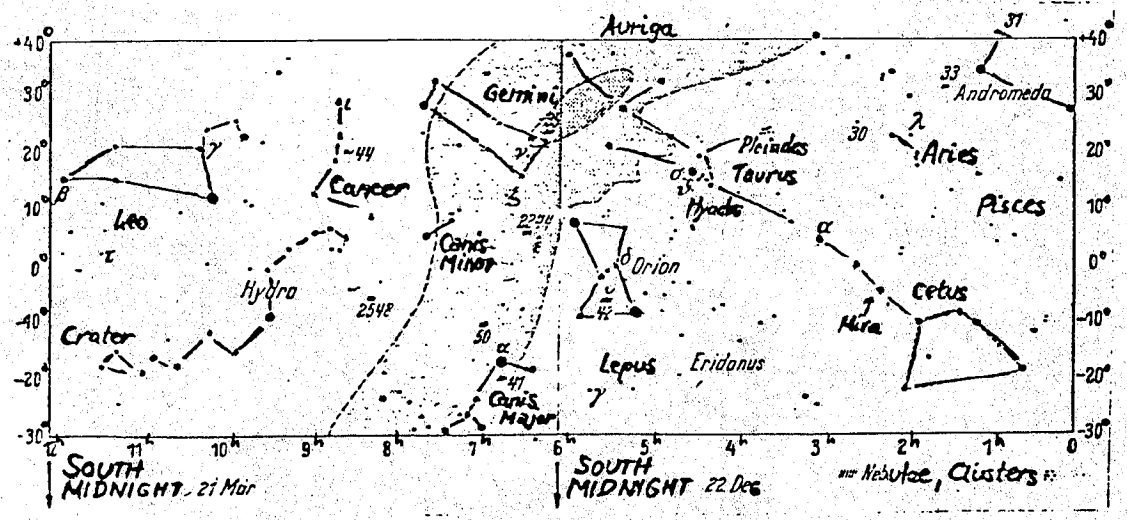
M 42	The "Great Orion Nebula", which covers all of the constellation of Orion (you'll really need extra-ordinary sky darkness and clarity for that). However, the "core" of this nebula is visible even in bad conditions, D = 1000 l.y.	5^h ± 0^o
M 31	Spiral Galaxy, in Andromeda, the brightest visible, d = 110,000 l.y., D = 2,100,000 l.y.	1^h + 40^o
M 33	Spiral Galaxy, in Triangulum, between β (Andromeda) and α (Triangulum), large, but faint, dark sky needed, an ideal "binocular galaxy".	



"ALL YEAR" MAP

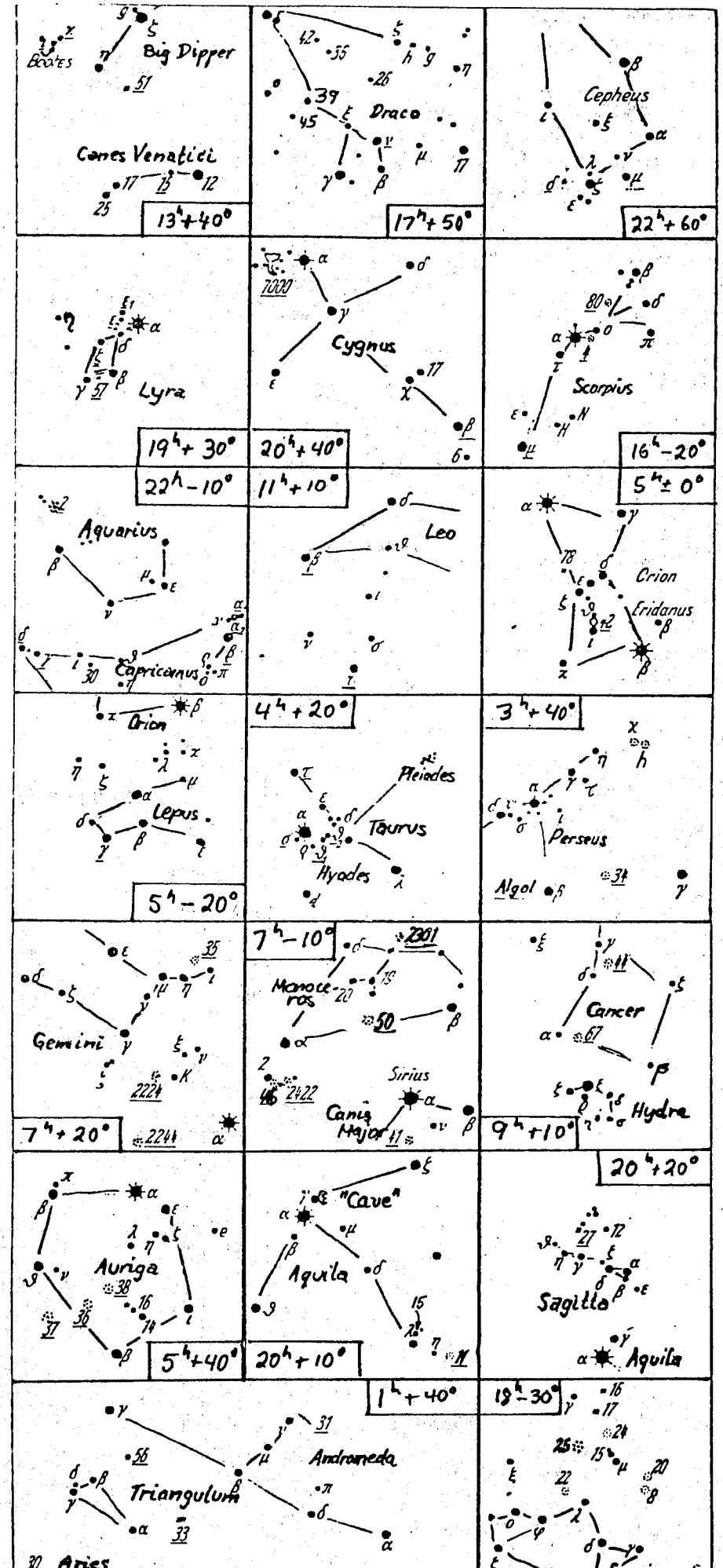


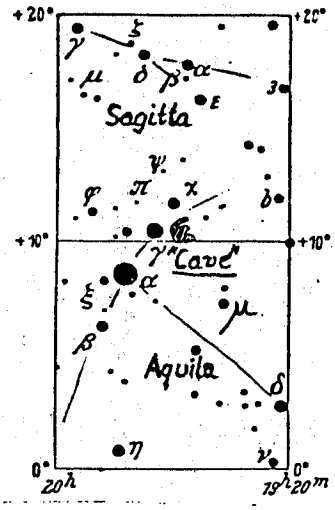
"SUMMER" MAP



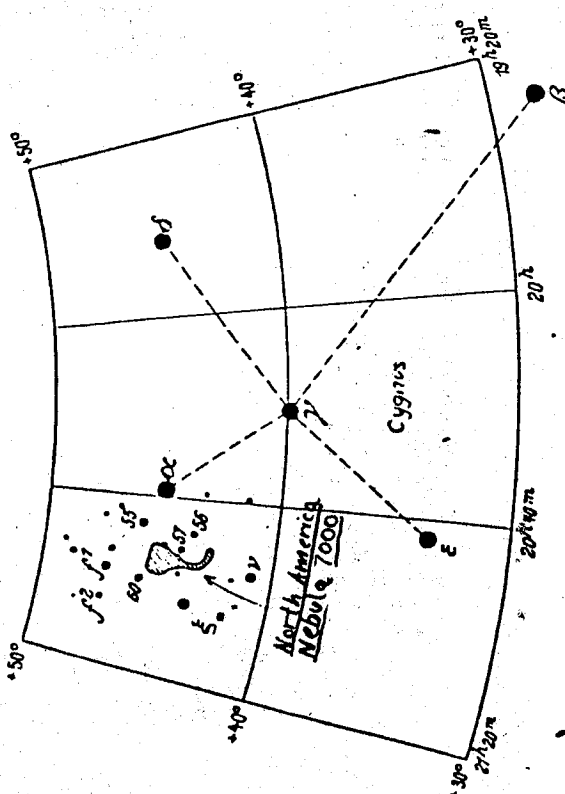
"WINTER" MAP

THE SKY AS SEEN FROM ABOUT LATITUDE 50° NORTH





MAPS FOR DARK AND CLEAR SKY AWAY FROM CITY LIGHTS



SUMMER SKY

		MAP
		"summer"
M 11	In Scutum, S.W. of Aquila, O.St., at the N.E. edge of a bright star cloud in the milky way, approx. 480 stars, d = 18 l.y., D = 6500 l.y., one of the richest clusters.	19^h - 10^o

The sky in the constellation Sagitarius offers particularly splendid views to the user of binoculars, not only because of the extremely impressive milky way clouds, but also because you can find a multitude of clusters and nebulosities. The brightest of these are listed in the "summer" map (18^h - 20^o area) and on map 18^h - 30^o.

Open Starclusters:

M6, M7 — Far to the south.

M8 — Irregular nebulosity and cluster, D = 3600 l.y.

M 16, M 18, M 23, M 24, M 25; The "Omega Nebula" M 17,

M 20 — The "Trifid Nebula" and

M 22 — The Globular cluster.

The following globular clusters, consisting of several tens of thousands of stars and at a distance of 20,00 to 40,000 l.y. appear in binoculars only as nebulous stars (none-the-less very impressive). To resolve these into individual stars, a telescope of at least 4 inch aperture is needed.

M 13	In Hercules, "summer" Map (16^h + 30^o area)
M 2	In Aquarius, Map 22^h - 20^o
M 15	In Pegasus, "summer" map (21^h + 10^o area)
M 5	In Serpens, "summer" map (15^h + 0^o area)
M 4, M 80	In Scorpius, Map 16^h - 20^o
M 3	In Canes Venatici, "summer" map (14^h + 30^o area).

Some Nebulosities:

M 27	Planetary Nebula, map 20^h + 20^o, The "Dumb-bell Nebula"
M 57	In Lyra, the "Ring Nebula", visible as a nebulous star (use some binocular support) Map 19^h + 30^o.
NGC 7000	The North-America Nebula in Cygnus, Map 20^h + 40^o, also "dark sky" map.

Some "dark" areas in the Milky Way:

Near α , and the North America Nebula, Map 20^h + 40^o.
Near γ , in Aquila, the famous three-part "cave", Map 20^h + 10^o, and "dark sky" map.
The Milky Way from Aquila to Sagittarius (towards the "centre" or the Milky Way), "summer" map 20^h + 10^o to 18^h - 30^o.

A Galaxy:

M 51 — The "Whirlpool", in Canes Venatici, D = 10 million l.y. Map 13^h + 40^o, faint disc, a bit more difficult.

Some Binary Stars:

Object	Separation	Map	Brightness
ε_1 and ε_2 in Lyra	207"	$19^h + 30^\circ$	5.0 - 5.0
ζ in Lyra	44"	$19^h + 30^\circ$	4.3 - 5.9
ν in Draco	61"	$17^h + 50^\circ$	5.0 - 5.0
η Taurus	63"	$4^h + 20^\circ$	4.3 - 7.0
γ Lepus	95"	$5^h - 20^\circ$	3.8 - 6.4
ζ Cepheus	41"	$22^h + 60^\circ$	(var.) 3.7/4.6 - 7.5
γ Leo	90"	$11^h + 10^\circ$	5.4 - 7.0
ζ (Alkor) Big Dipper	660" "all year"	$13^h + 60^\circ$	2.4 - 5.0
β Cygnus	35" (use support)	$20^h + 40^\circ$	3.2 - 5.4

I'll have to admit that the foregoing compilations were made with a mind to "enticing" some of our "armchair" members into looking at the sky more often. On the other hand, speaking for myself as a somewhat "seasoned" amateur astronomer, I "re-visit" these, and other heavenly bodies (ahem!) as often as I get a chance (I travel a lot - my binoculars have given me many a pleasant evening in areas away from the cities). Try it - you'll like it!

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DEADLINE FOR THE APRIL EDITION OF NOVA IS FRIDAY, MARCH 28, 1980 !!

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JIM BERNATH
[redacted]

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