

THE ROYAL ASTRONOMICAL SOCIETY OF CANADA



SASKATOON CENTRE

PRESIDENT: *Halyna Kornuta*

EDITORS: *Dave Pristupa & Greg Towstego*

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OCTOBER, 1975

NEWSLETTER

81

EVENTS FOR THIS MONTH

THE GENERAL MEETING TO BE HELD TUESDAY OCTOBER 21, 1975 AT 8:00 PM
IN ROOM B110, HEALTH SCIENCES BUILDING, WILL HAVE AS ITS MAIN OBJECTIVE
THE SELECTION OF YOUR NEW EXECUTIVE COUNCIL. THESE PEOPLE WILL HAVE THE
TASK OF GUIDING THE CENTRE FOR THE COMING YEAR, SO COME TO THE MEETING AND
HAVE A SAY IN THE PROCEEDINGS.

*** **

ANNUAL MEMBERSHIP FEES ARE DUE AS OF THE OCTOBER MEETING !!!

RASC MEMBERSHIP ADULT \$15.00

STUDENT \$10.00

*** **

Some Personal Reflections

August 31st, 1975. It was another beautiful summer evening. The saffron glow of twilight was beginning to give way to the deeper shades of night; the mood being augmented by the twitter of horned larks and the occasional plaintive cry of night birds.

I was standing on the sidewalk leading to Gordon Patterson's observatory. It was Saturday night; the Centre's active members had arrived and were "setting up" for the evening's observing. Highest priority of course was to be given to checking the latest position of the comet Lil Wilcox recently discovered, (alias Comet Kobayashi et. al.), followed by chasing of Messier Objects, and of course, Astrophotography.

"Have you seen the Nova?" asked Wendel Frenzel as he hurriedly walked by.

His question recalled an item on the 7:00 am newscast that morning about a nova being discovered. Through the sleep-drunk fog that always grips me this time of day, I had dismissed it as another 14th magnitude, or dimmer, object.

The brighter stars were just beginning to appear high in the east.

--- Vega, Altair, Deneb, ---

DENEB !

Oh my God !

Cygnus has two Denebs !

The click of Wendel's footsteps indicated he was returning from the observatory.

"Have you seen the Nova?". He repeated his question.

"Yes".

* * * * *

Gordon had discovered the Nova the previous night while pointing out Constellation Cygnus to some young people. Wendel had found it while doing some routine sky-scanning. Our president, Halyna, had noticed it while coming home from a date ! (?)

Next Tuesday night after the General Meeting of the Saskatoon Centre, Vice-president Jim Young kindly invited me to his residence for tea. While in his back yard we glanced up hoping to see how the Nova was progressing, the previous nights being overcast. It was still clouded over but the clouds were fast-moving and there were open patches. We stood and waited for a clearing to drift across Cygnus. Finally it came,

What's this!

Cygnus looked just as it always did. The big firecracker had gone.

One final word in closing: Laugh if you will at the introduction, but the evening really was that nice. Too bad you missed it; perhaps next time - - -

* * * * *

The Nova and Supernova Phenomenon

The internal processes involved in a nova and supernova explosion are extremely complex; it is quite beyond the scope of this article to discuss detailed theory behind the nova phenomenon. This is examined in depth by the following books:

Variable Stars - Glasby

The Dwarf Novae - Glasby

For advanced amateurs and professional astronomers

The Galactic Novae - Payne-Gaposchkin

Variable Stars - Strohmaier

Supernovae and Supernova Remnants - Cosmovici

Supernovae and their Remnants - Brancaccio and Cameron

The Crab Nebula - I.A.U. symposium no. 46 (Jodrell Bank)

Variable Stars and Stellar Evolution - I.A.U. symposium
no. 67 (Moscow)
(Just Released)

* * *

One question often arises; just how does one tell the difference between a nova and a supernova?

Professional astronomers utilising the worlds finest technology sometimes find this difficult. A degree of speculation existed for Nova Cygni 75. Some reports on the

The Nova and Supernova Phenomenon - cont.

spectral analysis gave a velocity of the expanding gas shell near 3000 km/sec; together, with the shape of the light curve, was somewhat indicative of a supernova but the consensus now seems to indicate a nova of extreme range.

Generally, supernovae are extremely bright objects. In 1885, there was a supernova in the Andromeda Galaxy. Even at that enormous distance of 2,200,000 light years, it was visible to the naked eye (mag. 5.5); itself radiating as much light as the rest of the galaxy. If this star were within 300 light-years of us, it would appear brighter than the full moon!

A classification system for novae exists in which they are classified according to the duration of the outburst but it is seldom referred to.

There are also a number of nova-like variable stars.

Recurrent Novae- Novae which have been known to erupt more than one time. (T Coronae Borealis)

Dwarf Novae- A remarkable group of variable stars that erupt somewhat irregularly; at one time were thought to be some type of novae. The famous SS Cygni is the most observed star of this type.

Symbiotic Variables- Stars possessing characteristics similar to that of novae; could possibly be old novae. (Z Andromedae)

P Cygni stars- Stars which continuously eject streams of gas similar to the nova phenomenon but at lower velocities.

Unfortunately space does not permit going into this most fascinating field of stellar astronomy more fully.

Although the novae and supernovae are generally the most spectacular of the variable stars, they represent only a small portion of them. Including the 1974 supplement, the General Catalogue of Variable Stars lists over 25,000 of these objects. (This figure includes all variable objects; Pulsars, optically variable quasars, nuclei of galaxies, etc.)

COMPARISON OF ORDINARY NOVAE WITH SUPERNOVAE

	Ordinary Novae	Supernovae Type I	Supernovae Type II
Relative amount of energy released	1	1,000	10,000,000
Peak luminosity (erg per sec)		10^{43}	10^{50}
Absolute magnitude at maximum	-7 to -8	-18 to -19	-17 to -18
Mass ejected (1 = mass of sun)	$\frac{1}{1000}$	$\frac{1}{10}$ to 1	1 to 30
Velocity of gas shell (km per sec)	1000	3000	7000
Rate per galaxy per year	50	0.005	0.025

Three other types of supernovae have been proposed with ejected shells as large as 100 solar masses.

One of the basic differences between novae and supernovae is the extent of stellar involvement.

In a nova explosion, only the outer portions of the star are blown away; the star itself remains pretty much intact.

A supernova explosion virtually wrecks the star, stripping it down into the central core. The Crab Nebula and the Cygnus Loop are perhaps the most commonly known supernova remnants.

ADDENDUM TO PAGE 5

Re: "Credit for discovery - - -"

This conclusion may have been erroneously drawn. While it appears M. Honda was the first to report on his findings, given at 29.57 U.T., Kentaro Osada had apparently sighted the nova at 20.48 U.T., 2 hrs. 10 min earlier. (Reference - I.A.U. Circular no. 2826)

My apologies for a statement in which the meaning is unclear.

The author

THE ROYAL ASTRONOMICAL SOCIETY
OF CANADA
SASKATOON CENTRE
SUB P. O. No. 6, BOX 317
S7N 0M5

NOVA CYGNI 1975

General

Credit for discovery seems to have been given to Minoru Honda of Japan; a name fairly well known in the field of astronomy. The magnitude at that time was given at about 3.

The nova's peak magnitude occurred about 31.3 U.T. with a value of about 1.9 (Deneb is given at 1.3). By the 6th of Sept. it had dropped to the 6th magnitude and at the time of this writing it had passed 8.

So far to date this nova cannot be identified with any known object. Reports state that on the Palomar Sky Survey plates there is a 19th magnitude object near by but it is very unlikely it has a proper motion that could account for it being at this position at this time.

A preliminary calculation gives the nova's distance at somewhere near 5000 light years. As a comparison, the Orion nebula is given at about 1500; The Crab Nebula (a supernova remnant) at 4000; the Ring Nebula at 1400.

The expanding nebulosity is expected to reach 0.1" in 4 to 9 months hence. (as a comparison the minimum resolution of the Celestron 14 is 0.28"; of the Celestron 8 - 0.5".)

Observation and Data Reduction

Although Nova Cygni 1975 is now passed the 8th magnitude, it is still quite bright when compared to other current novae. For example their magnitudes are; (very roughly)

Nova Souti 1975 - 12

Nova Monocerotis 1975 - 12

Nova Aquilae 1975 - 16

Nova Persei 1974 - 16

Nova Cygni 1975 presents an excellent object for groups to ourselves to gain experience on since such a wealth of information is available to evaluate observational accuracy. As an example, several of us made independent estimates a few weeks ago at

Observation and Data Reduction - cont.

at Gordon Pattersons using 7x 50mm binoculars, We were within 0.2 mag. and were also within that range when compared with published data.

Everyone who has (or has access to) a telescope is urged to try a few magnitude estimates on his own. Use binoculars to familiarize yourself with the star field. Memorize the short-dashed line configuration on star chart no. 1 preferably using a red flashlight so you won't have to wait so long for your eyes to dark adapt. Now begin at Deneb and follow the imaginary dashed line in the sky. The star field will seem to fly out and hit you. Note especially the double star in the centre of the small cross. It acts as a handy pointer when you're determining which way to move the larger telescope.

Now repeat the procedure using the finder. On the telescope, use a low power eyepiece. Choose the correct chart for your imaging system. Now follow the imaginary dotted line till you see the small quadrilateral of stars. You can tell which way to move the telescope by the relationship of the double star. Once you've found the quadrilateral, finding the nova is a snap since it will be within the same field of view.

Now choose two comparison stars from the chart; the next one brighter and the next one dimmer than the nova. Divide the difference in brightness of these 2 stars into 10 imaginary steps, the brightest star = 0. Using this as a scale, make an evaluation of what step the Nova is equal to. This really isn't as hard as it sounds. Record it as follows:

Mag. bright star (step) γ (step) mag. dim star

Magnitude reduction is simple arithmetic.

$$\frac{1^{st} \text{ step (Dim star - Bright)}}{10} + \text{Bright star} = \text{Mag. of Nova.}$$

Suppose you chose 90 and 97 as comparison stars. You estimated the Nova to be 6/4. Then the entry in your records should be:

$$90 \frac{6}{4} = 91.5$$

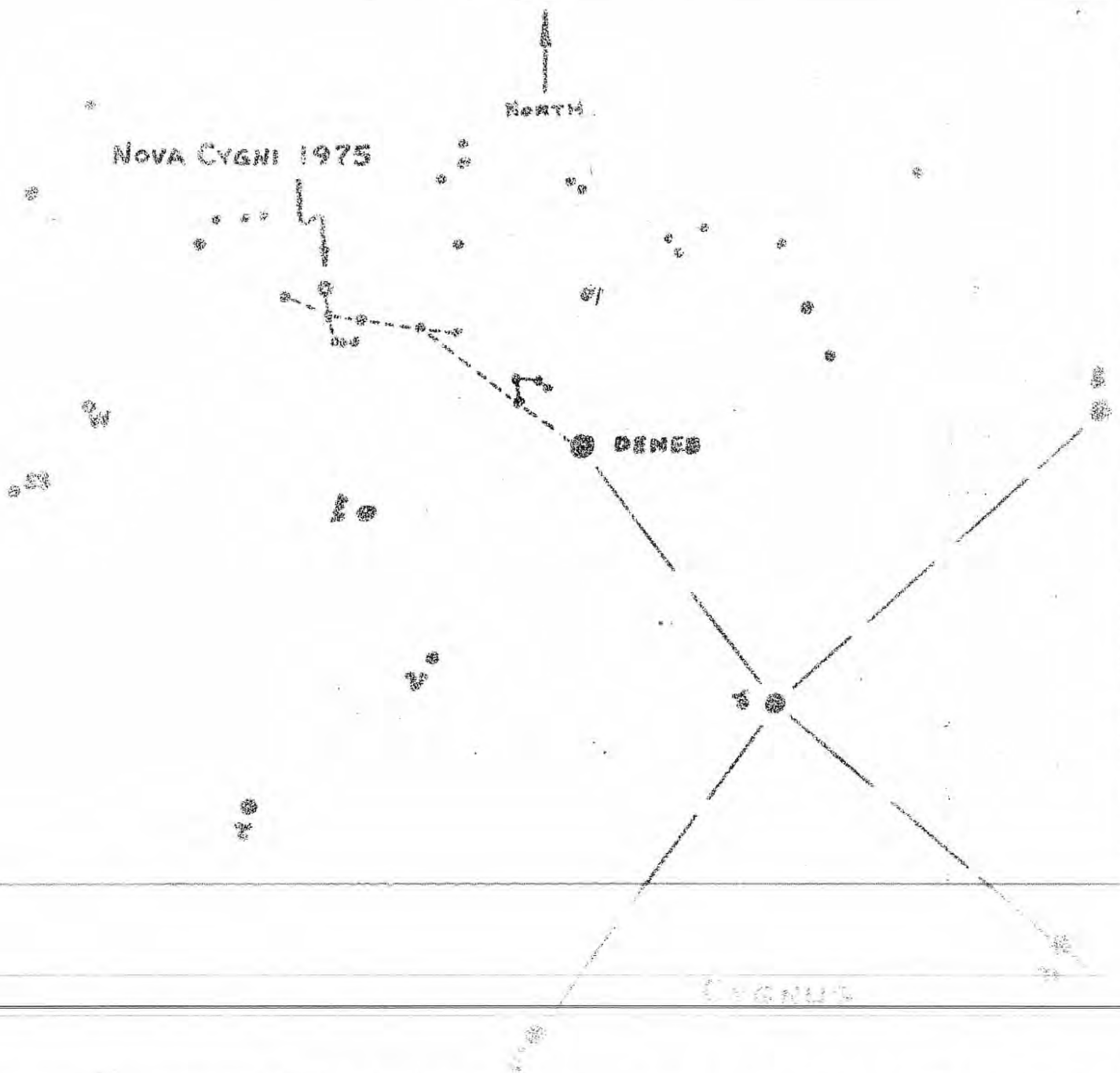
If you like you could also enter the magnitude:

$$\frac{6(9.7 - 9.9)}{10} + 9.0 = 9.42$$

Now all that's left is the action.

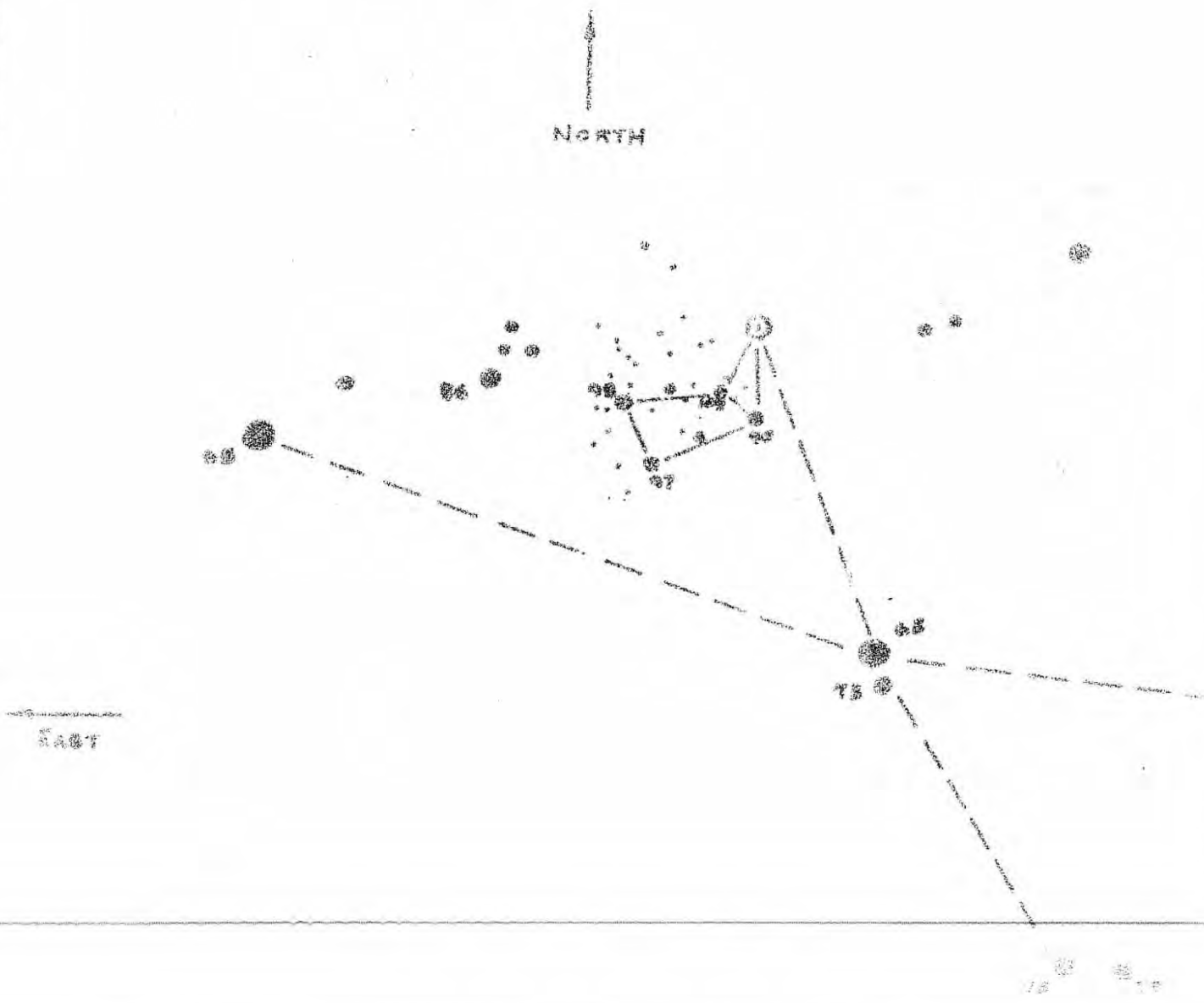
NOVA CYGNI 1975

Position (epoch 1950) $21^{\text{h}} 09^{\text{m}} 53^{\text{s}}$ $+47^{\circ} 56' 17''$



Note: The short dashed lines are for aiding in star field associations and not to be confused with "Constellation" lines.

Finder and sequence chart for erect
imaging system.



NOVA CYGNI 1975

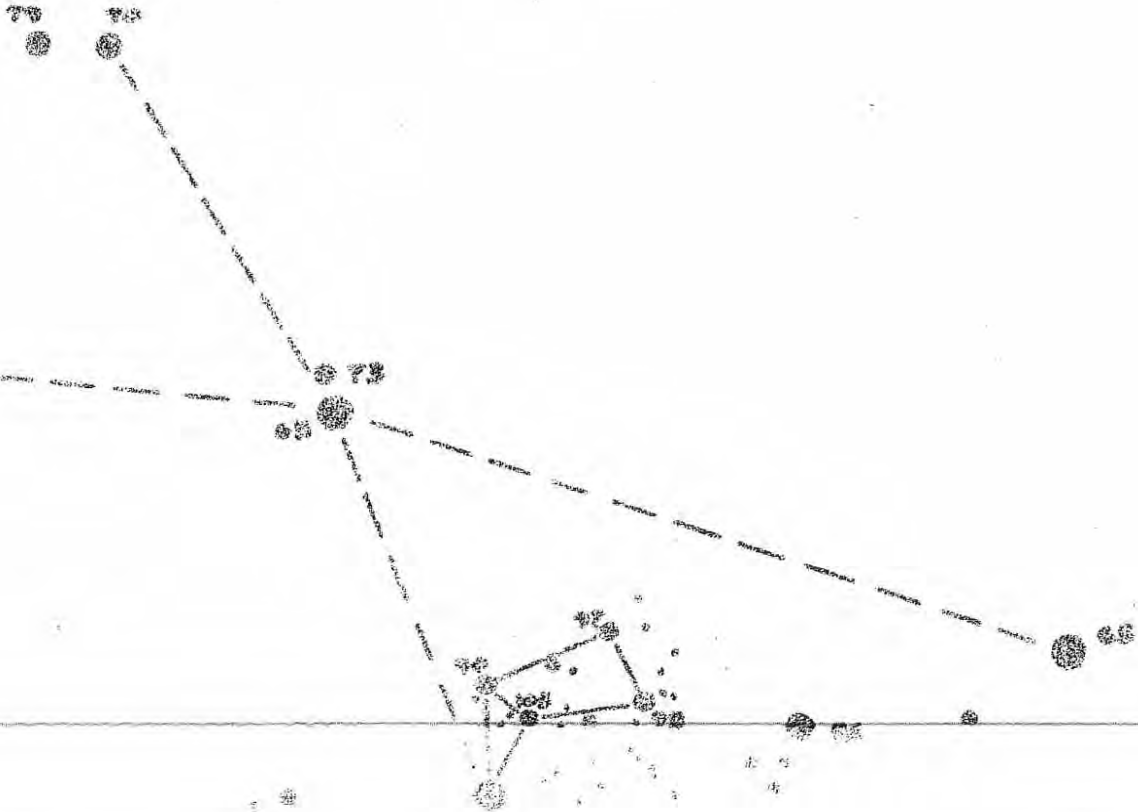
NOVA CYGNI 1975

Chart No. A

Finder and sequence chart for inverted
imaging systems

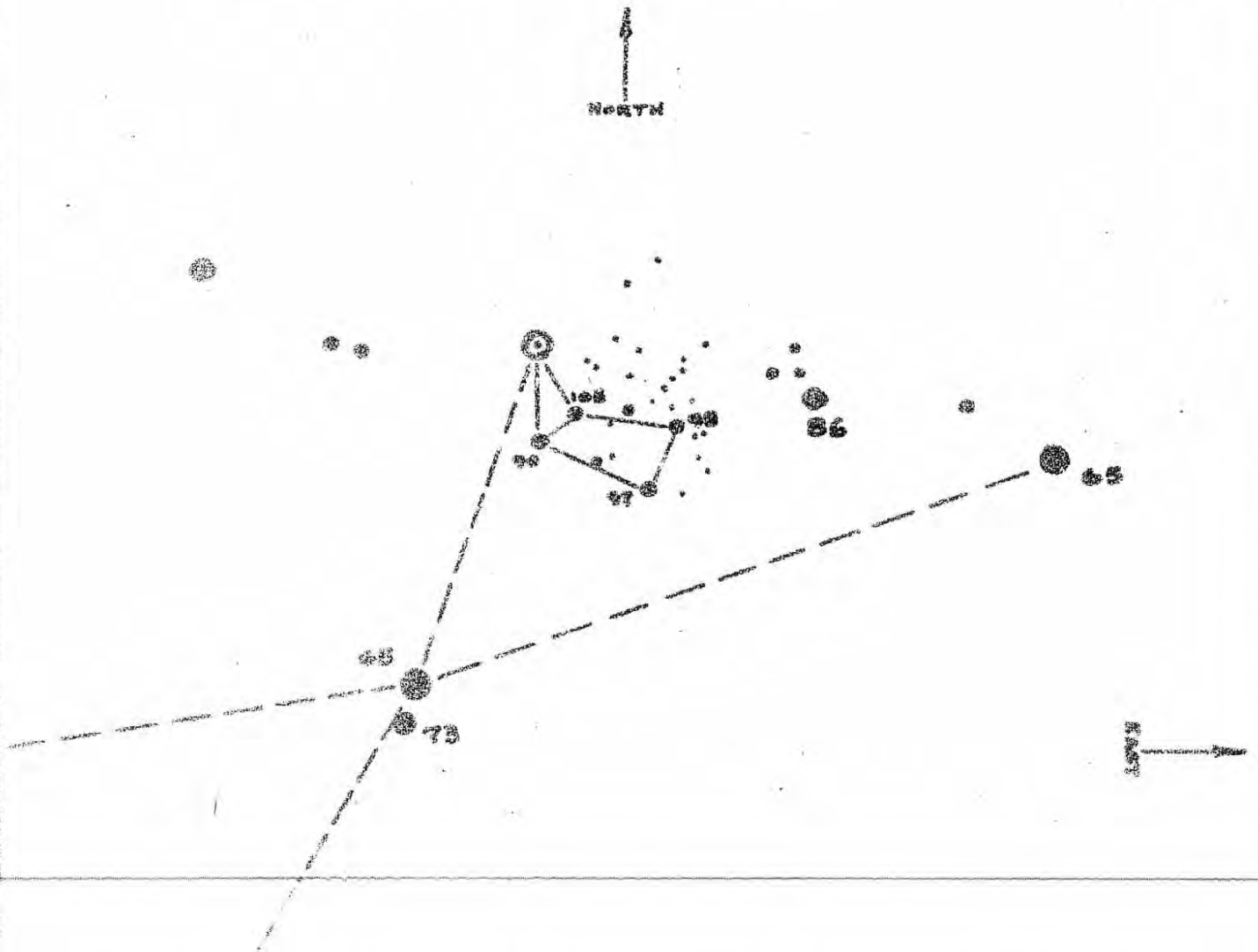
North

East



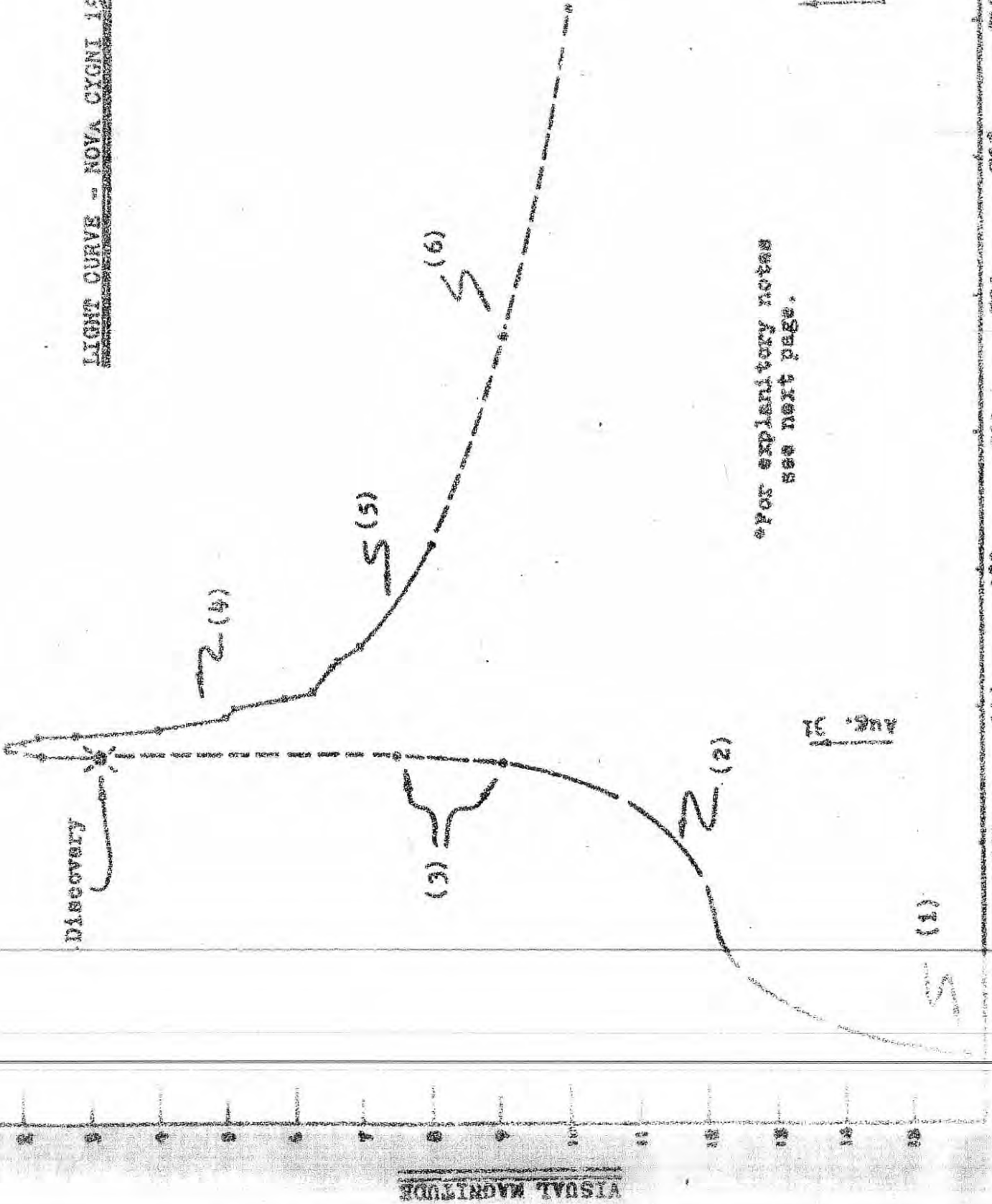
For astronomical refractors, newtonians, cassegrains, and
catadioptric systems.

Finder and sequence chart for reversed
and erect imaging systems.



For use with a star diagonal. This can be used to find the large star cluster directly overhead and you face due south when looking into the eyepiece, the field will appear as shown.

LIGHT CURVE - NOVA CYGNI 1975

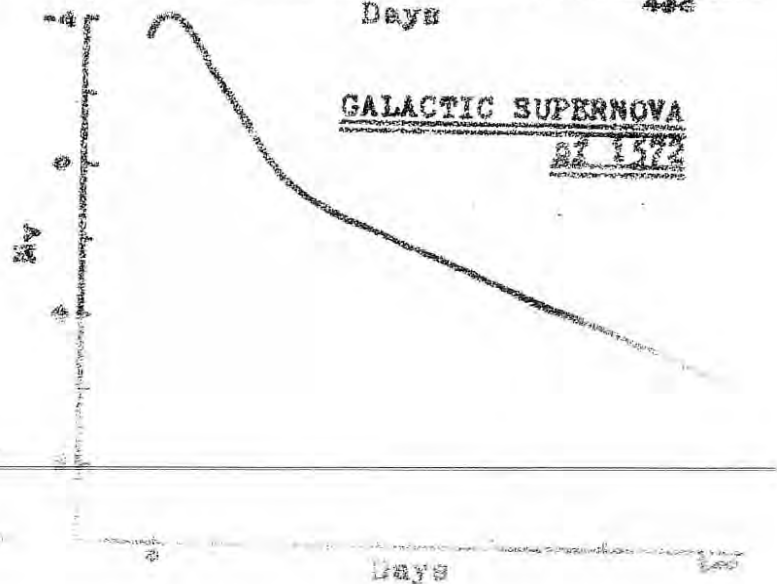
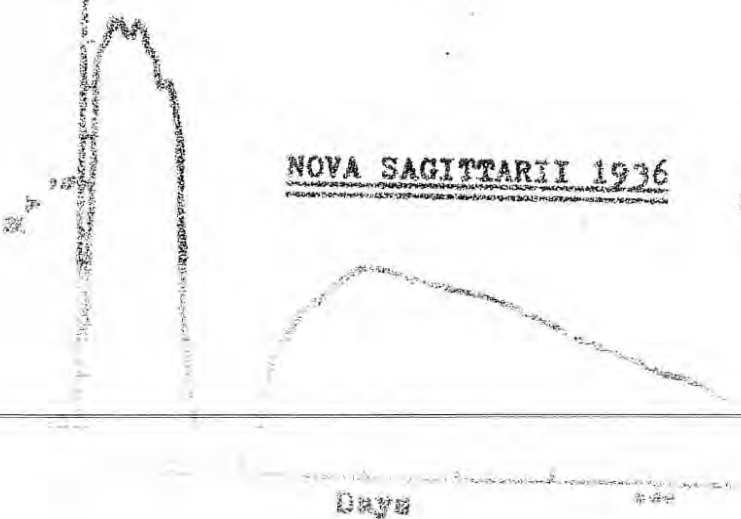
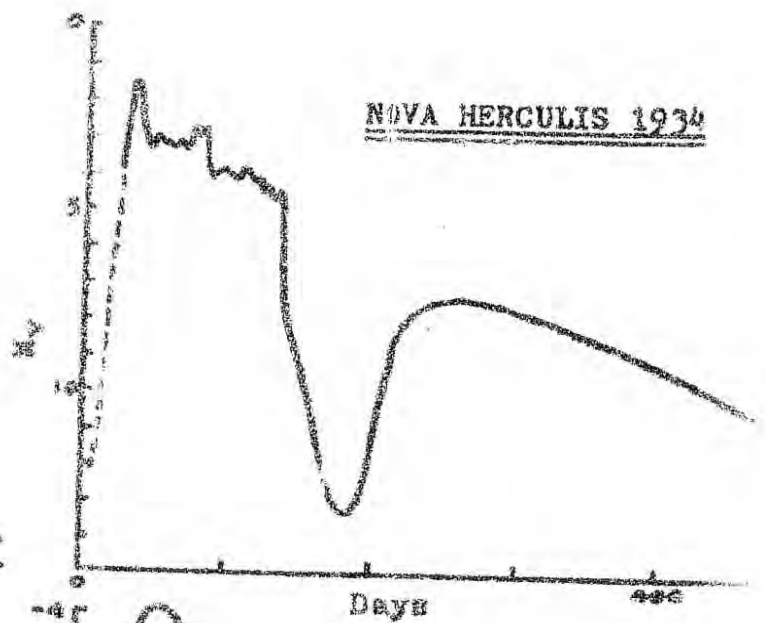
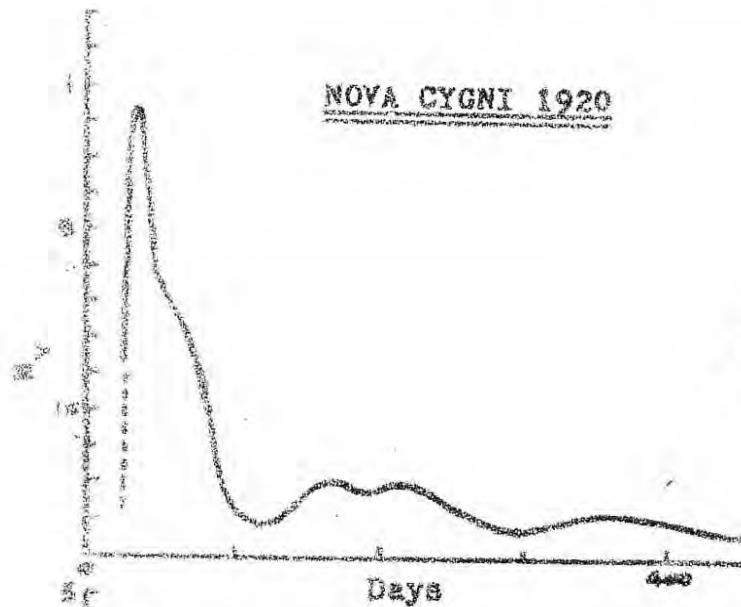


0.00 0.40 0.80 1.20 1.60 2.00 2.40 2.80 3.20 3.60 4.00 4.40 4.80 5.20 5.60 6.00 6.40 6.80 7.20 7.60 8.00 8.40 8.80 9.20 9.60 10.00 10.40 10.80 11.20 11.60 12.00 12.40 12.80 13.20 13.60 14.00 14.40 14.80 15.20 15.60 16.00 16.40 16.80 17.20 17.60 18.00

LIGHT CURVE - NOVA CYGNI 1920

Explanatory notes-

- (1) Given by Sternberg Astronomical Institute, U.S.S.R.
- (2) This portion of curve inserted for continuity and is not based on observational data.
- (3) Given by American Association of Variable Star Observers' Circular no. 59.
- (4) Given by I.A.U. Circulars, Smithsonian Astrophysical Observatory.
- (5) Compiled partially from my own data.
- (6) Extrapolation given by G. de Vacouleurs, I.A.U. Circular no. 2839.



SOME OTHER LIGHT CURVES

NOTICE TO ALL MEMBERS

All members are advised that their membership in the RASC, Saskatoon Centre, is up for renewal as of the October General Meeting. Membership dues are as follows:

- Adult (19 years of age and older) \$15.00
- Student (18 years of age and less) \$10.00

All people, either new or old members, who attend the next General Meeting can pay their dues at that time to the Treasurer and get their new membership cards and receipts at that time. Those, who by distance or for other reasons, cannot attend the meeting can mail their fees to the Secretary, PO Box 317, Sub 6, Saskatoon, Sask., and their new cards and a receipt will be mailed to them in the next Newsletter. If you do not have your dues immediately available, get a reservation in fast, so as not to hold up the Centre order for the 1976 Handbooks.
Do not delay - do it now

A slate of possible executive members will be presented at the General Meeting, and if no objections are made by members as to the positions, these people will then be voted in by acclamation. Your present executive feels that this will be the fastest and easiest way of choosing next years executive. The proposed Executive is as follows:

- HONOURARY PRESIDENT DR BW CURRIE
- PRESIDENT HALYNA KORNYTA
- VICE PRESIDENT JIM YOUNG
- SECRETARY MELODIE ANDREWS
- TREASURER ALAN BLACKWELL
- EDITOR GREG TOWSTEGO
- ACTIVITIES MERLYN MELEY
- CENTRE REPRESENTATIVE GN PATTERSON
- LIBRARIAN HUGH HUNTER
- SUB-COUNCILLORS DOUG BECK & LILLIA WILCOX
- PROGRAMMING NOT YET DECIDED

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PLEASE MAKE IT A POINT TO BE AT THIS MEETING, AND BRING A FRIEND IF HE OR SHE WANTS TO JOIN.

Minutes of the Executive Meeting
 Saskatoon Centre R.A.S.C.
 Held in the Observatory 7:00 p.m.
 Tuesday September 2, 1975

Present: Halyna Kornuta President Jim Young VP/PR
 Melodie Andrews Secretary Greg Towstego Editor
 Merlin Melby Sub-Councillor

Absent: Wendel Frenzel Activities Dr. Holden Programming
 Dave Pristupa Ast. Editor Hugh Hunter Librarian
 Alan Blackwell Treasurer

Item	Detail	Action
126.	The meeting was opened at 7:00 p.m.	
127.	It was put forward to ask Prof. Kennedy to give a talk at the September meeting about the General Assembly.	
128.	Motion put forward to have the missing R.A.S.C. journals volume no. 38 to 41 (years 44 to 47) bound.	
129.	It was decided to have a motion put forward to make available for lending extra copies of Sky and Telcopy.	
130.	The observing site outside the city is again available for our use.	
131.	Meeting adjourned.	Jim Young Merlin Melby Carried

Minutes of the General Meeting
 Saskatoon Centre R.A.S.C.
 Held in the Health-Sciences Bld. Rm B110
 Tuesday September 16, 1975

Present: Jim Young VP/PR Greg Towstego Editor
 Melodie Andrews Secretary Dave Pristupa Ast. Editor
 Hugh Hunter Librarian Merlin Melby Sub-Councillor

Absent: Halyna Kornuta President Alan Blackwell Treasurer
 Wendel Frenzel Activities Dr. Holden Programming

Item	Detail	Action
132.	The meeting was opened at 8:00 p.m.	
133.	Adoption of June minutes.	Gordon Patterson Greg Towstego Carried
134.	The Wiener Roast during the summer was small this year due to the cool weather. Outings at Gordon Patterson's have been turning out well. The Meteor Shower at Acklands farm went well except the weather was poor.	
135.	Motion for extra issues of unbound issues of Sky and Telescope to be made available for lending	Doug Beck Lee Warner Carried
	Motion for R.A.S.C. journals to be bound at the approx. cost of \$10.00 per Volume. (4 Volumes.)	Dave Pristupa Hugh Hunter Carried
	Election positions open for October executive	
	President VP/PR Secretary Treasurer Editor	
	Activities Programming Librarian Councillor	
138.	Prof. Kennedy talked about the R.A.S.C. General Assembly in Halifax.	
139.	Meeting adjourned.	Tory Wilcox Blair Petterson Carried