4th IOAA jr
ROMÂNIA, PIATRA- NEAMȚ, OCTOBER 2025

4th International Olympiad on Astronomy and Astrophysics

October, 18 – 25, 2025

Piatra Neamț - România



Blind Sky Map Round

Piatra Neamt
ROMANIA

Instructions

1. The Sky Map competition will be 1 hour in duration and is marked out of a total of 60 points.

2. **The last three pages are the skymaps which are to be used as the answersheet. Your student code is already printed on them.**

3. Please write only on the printed side of the sheet. Do not use the reverse side.

4. Please remember that the graders may not understand your language. As far as possible, write in English.

5. You are not allowed to leave your exam desk without permission. If you need any assistance (malfunctioning calculator, need to visit a restroom), please put up your hand to signal the invigilator.

6. The beginning and end of the competition will be indicated by a long sound of a bell. Additionally, there will be a short sound of a bell fteen minutes before the end of the competition (before the nal long sound of a bell).

7. Wait at your table until your envelope is collected. Once all envelopes are collected, your student guide will escort you out of the competition room.
8. This exam has 3 (three) problems on 6 (six) sheets.

OM 1 – Know your sky (40 Points)

Use the sky map ”Map-OM1” to answer the questions below. The projection type of the map is stereographic and planet/moon are present on the map.

OM 1.1 – Marking Stars on the Map (10 p)

Mark all the stars listed in Table 1 with a square (□) drawn around each star on the provided Map-OM1. Label every marked star with its corresponding object number.

Star no.	Star name	Star no.	Star name
1	α Ari (Hamal)	6	β CMi (Gomeisa)
2	δ Cyg (Fawaris)	7	α Lep (Arneb)
3	β Dra (Rastaban)	8	δ UMa (Megrez)
4	α Cet (Menkar)	9	β Tau (Elnath)
5	δ Eri (Rana)	10	α And (Alpheratz)

Table 1: List of stars with their names

OM 1.2 – Messier Objects (8 p)

Using the provided plus signs (+) on the map and label them corresponding to the following 8 Messier objects: M15, M31, M34, M35, M39, M42, M44, M45 from the Messier Catalog.

OM 1.3 – Meridian and constellations (10 p)

The given map is centered at Zenith. Draw the meridian and then draw with star-line patterns the constellations along/near the meridian and note the IAU abbreviations on the sheet.

OM 1.4 – Celestial equator (2 p)

Draw the celestial equator on Map-OM1. Mark it as "EQ".

OM 1.5 – Cardinal Points (2 p)

Mark the cardinal points as N, S, W, and E on Map-OM1.

OM 1.6 – Ecliptic plane (2 p)

Draw the ecliptic on the Map-OM1 and label it with “EC”.

OM 1.7 – Galactic plane (4 p)

Draw the galactic equator on the Map-OM1 and label it as “GE”. Mark either the galactic center (GC) or anticenter (GA), whichever is visible on the map.

OM 1.8 – Circumpolar Circle (2 p)

Draw the circumpolar circle on the Map-OM1 and label it as “CC”.

OM 2 – Chart and time (10 Points)

Use the OM2 – Chart and Time page to answer the following questions. The given map is centered on the Zenith and shows two constellations, C1 and C2, together with the horizon and a coordinate grid. The corresponding answer sheet is the Blind Sky Map – OM2 Chart and Time.

OM 2.1 – Constellation identi cation (2p)

Identify the C1 and C2 constellations and write their latin names or IAU abbreviation in the table below, map "OM2 - Chart and time".

OM 2.2 – Mark the stars (2p)

Draw an arrow each indicating the α stars of the C1 and C2 constellations.

OM 2.3 – Autumnal and vernal equinox (2 p)

One of the equinox points, either the vernal equinox (VE) or autumnal equinox (AE), is present on the map. Mark it with an X and label it with VE or AE.

OM 2.4 – Grid identi cation (4 p)

Identify which coordinate grid is present on the map. Place an X mark in the table below map - OM2 - Chart and time.

OM 3 - Missing stars (10 Points)

Use the OM3 – Missing Stars map to answer the following questions. There are four stars missing (with visual magnitudes ≤ 2.5).

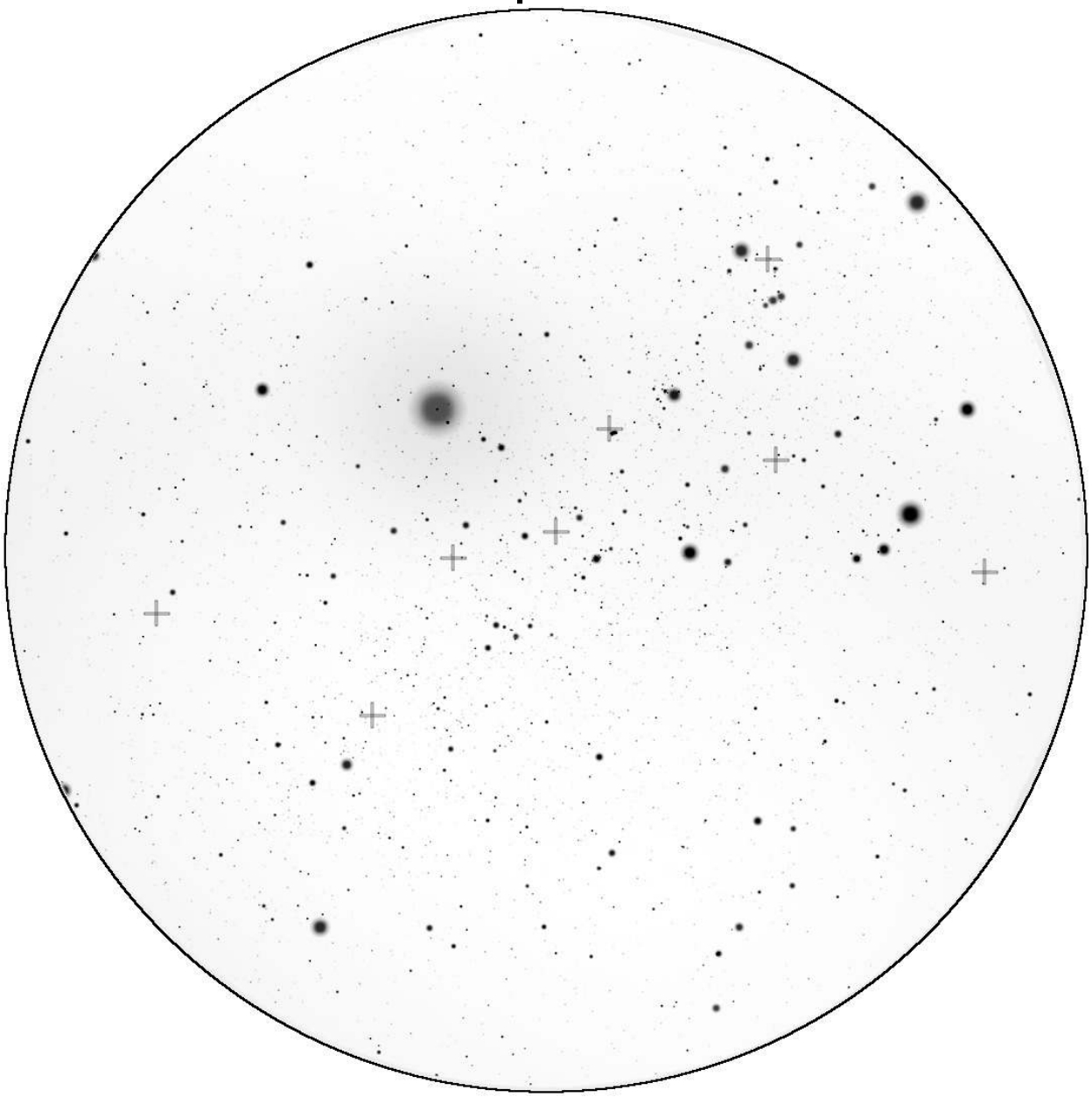
OM 3.1 (4 p)

Find which stars are missing and mark them on the map using a plus sign (+) and label them S1, S2, S3, S4.

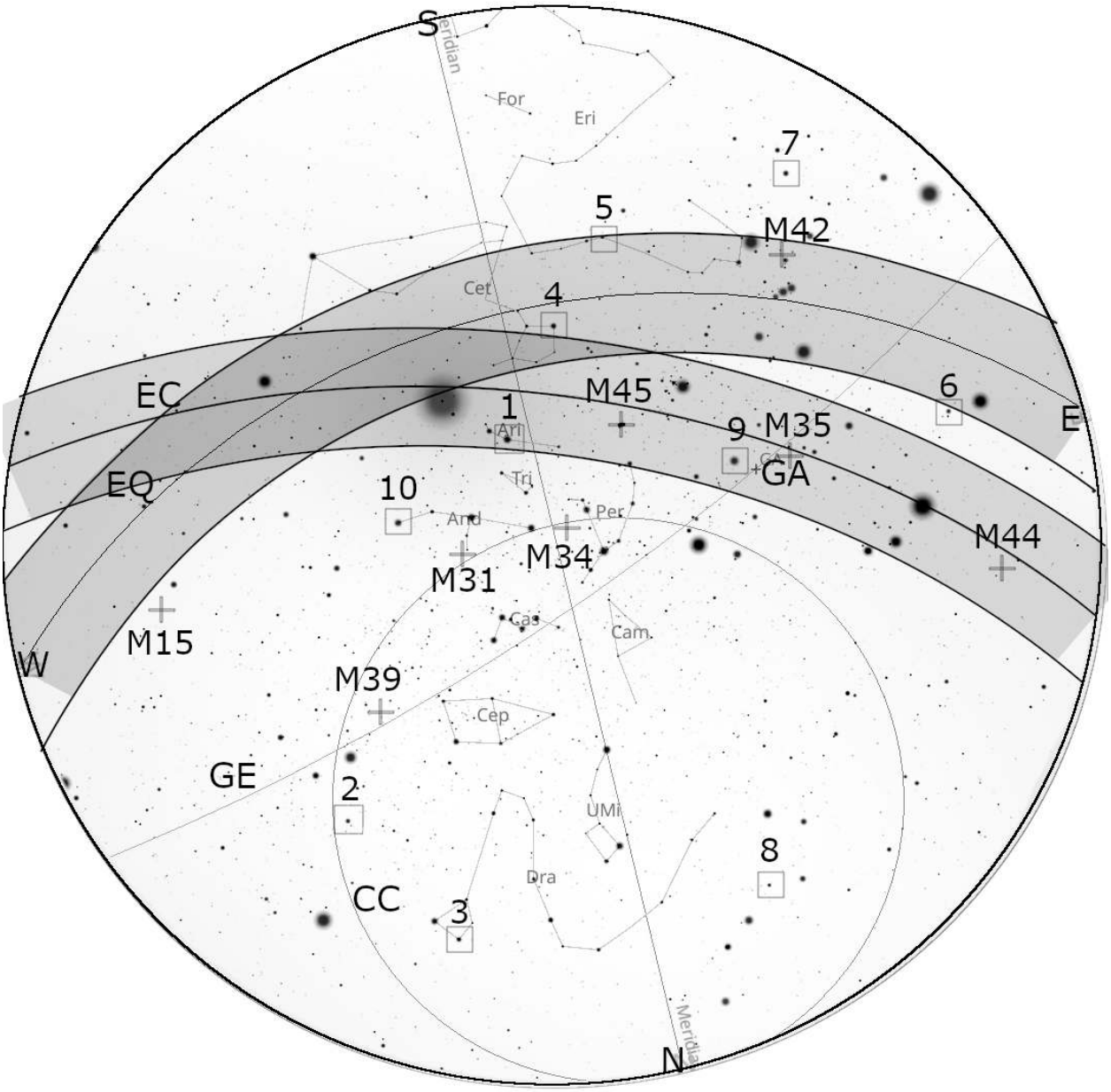
OM 3.2 (6 p)

For each missing star, write on the answer sheet: • The IAU star name or Bayer designation. • Whether the object is a double or multiple star: write Y if it is, or N if it is not. Record your answers in the table below Map OM3 - Missing stars.

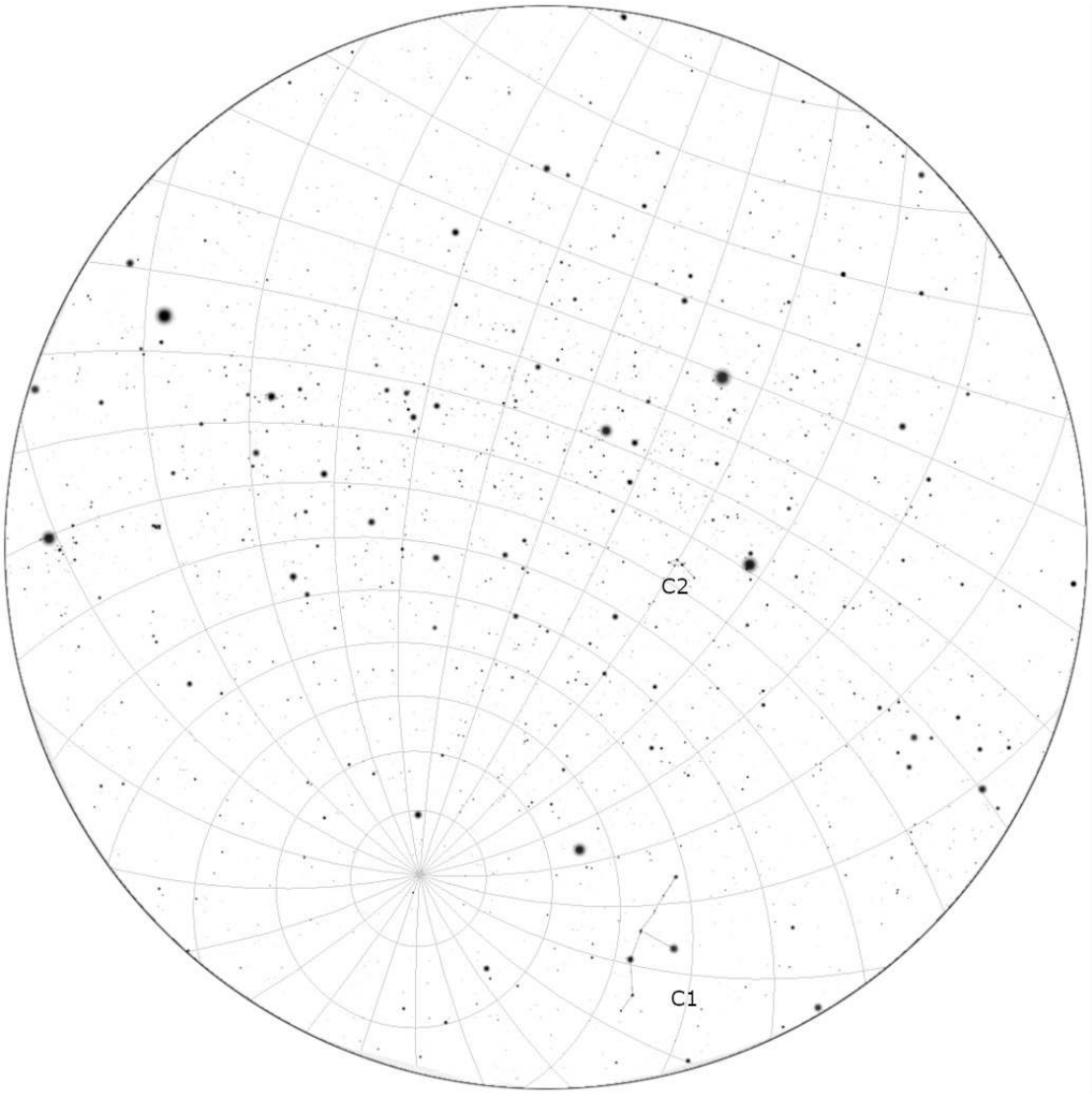
Map-OM1



Map-OM1


S
Meridian
For
Eri
7
5
M42
Cet
4
EC
M45
1
Ari
6
E
9
M35
GA
EQ
10
Tri
And
Per
M34
M44
M31
M15
Cas
Cam
W
M39
Cep
GE
2
UMi
8
Dra
CC
3
Meridian
N

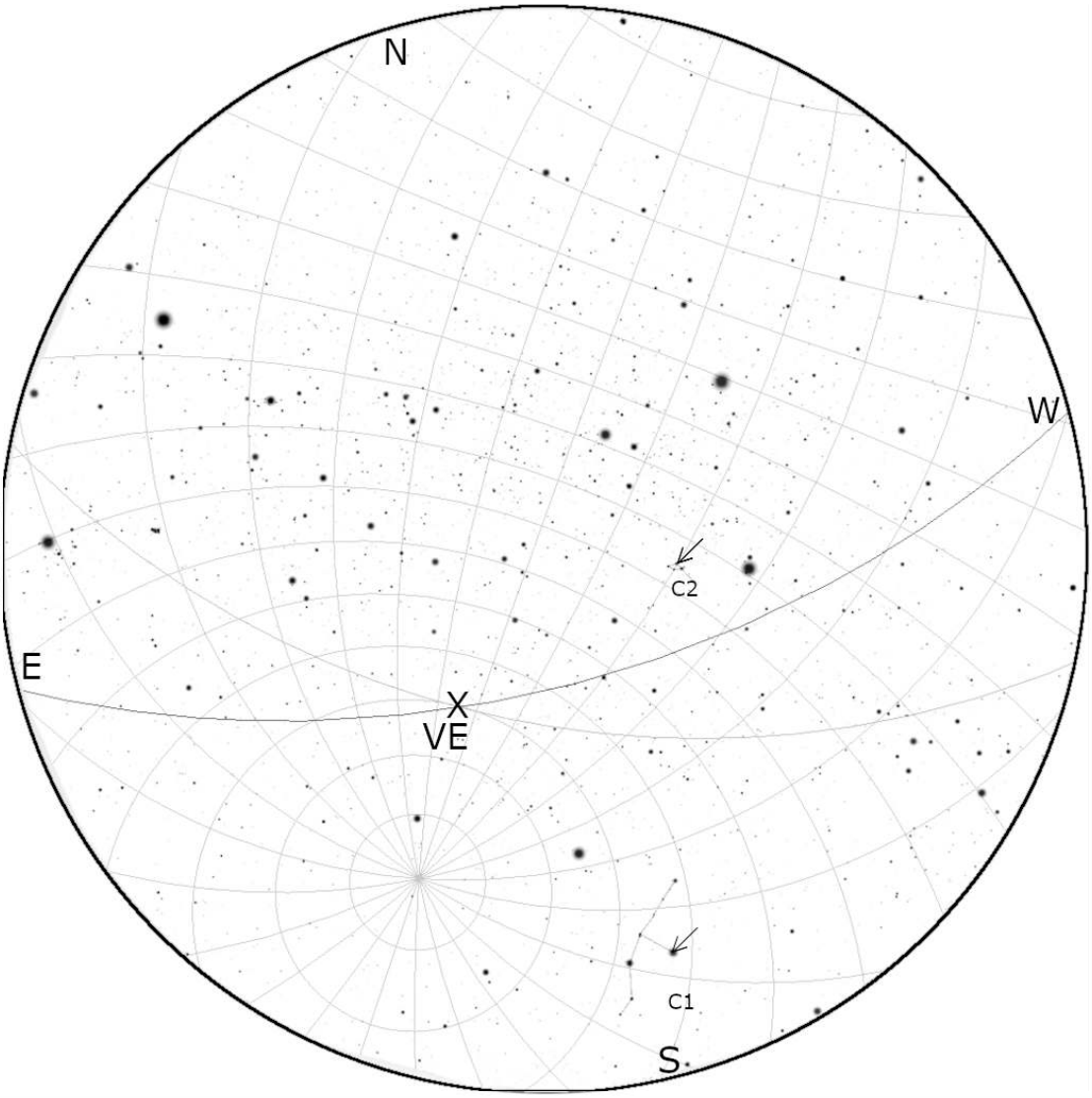
OM2 - Chart and time



2.1	Name of Constellation (Latin name or IAU abbreviation)
C1	
C2	

2.4	ecliptic	azimuthal	galactic	equatorial
Coordinate grid				

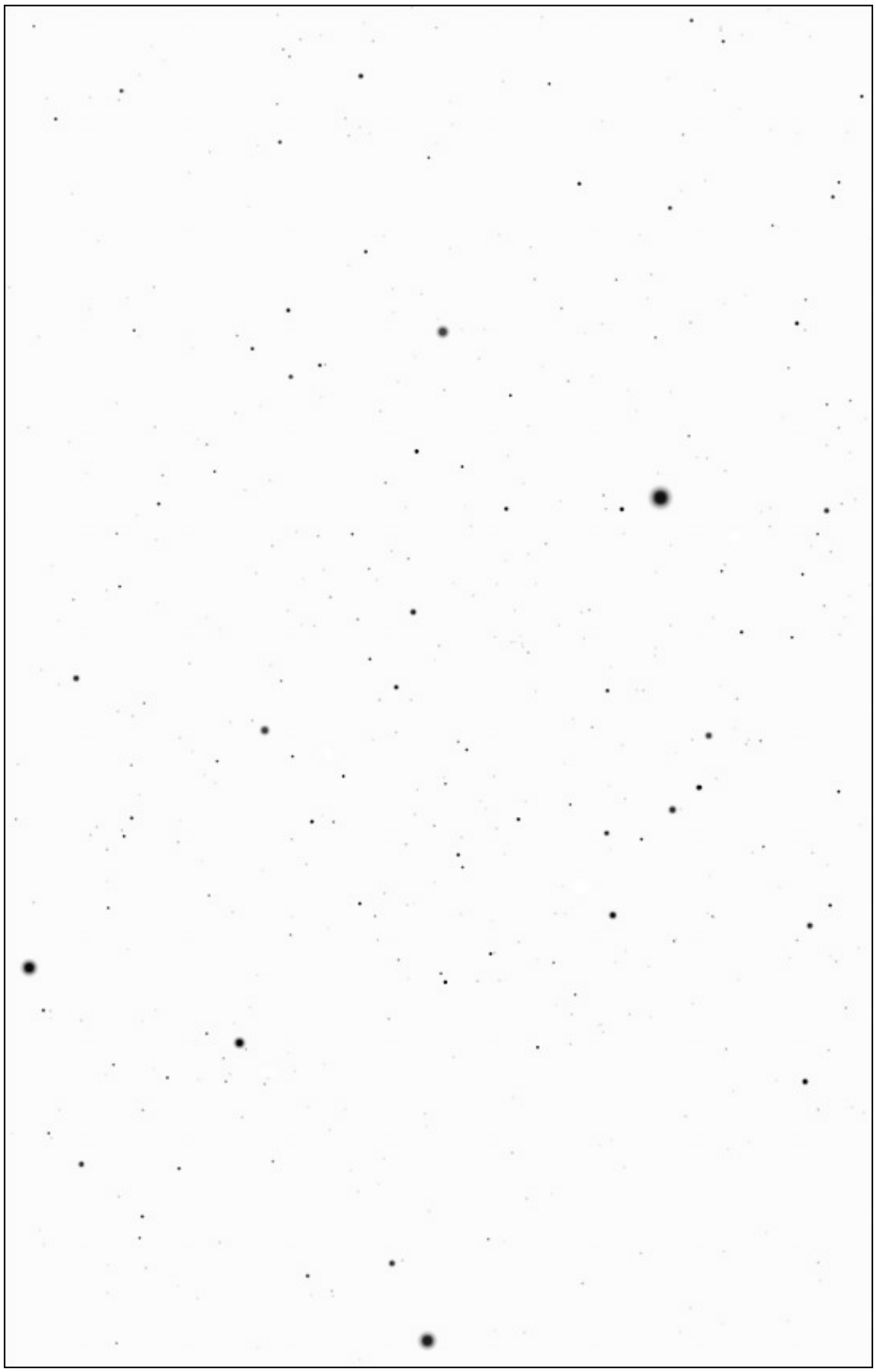
OM2 - Chart and time



2.1	Name of Constellation (Latin name or IAU abbreviation)
C1	Gru / Grus
C2	Del / Delphinus

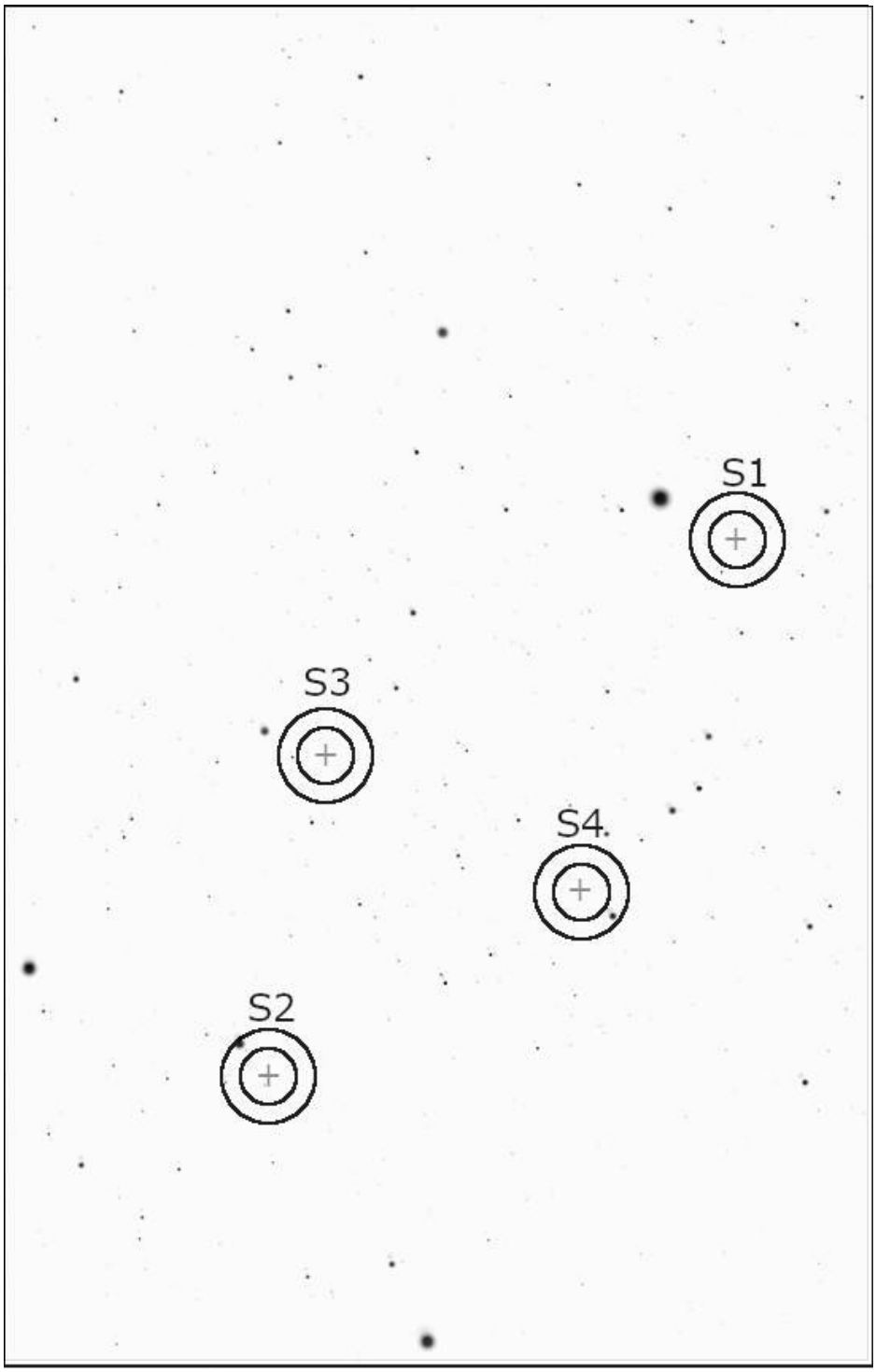
2.4	ecliptic	azimuthal	galactic	equatorial
Coordinate grid			X	

OM3 - Missing stars



Star 1	
Name	
Binary	
Star 2	
Name	
Binary	
Star 3	
Name	
Binary	
Star 4	
Name	
Binary	

OM3 - Missing stars



Star 1	
Name	Izar
Binary	Y/Double Star
Star 2	
Name	Castor
Binary	Y/Double Star
Star 3	
Name	Algieba
Binary	Y/Double Star
Star 4	
Name	Merak
Binary	N/NOT double