# GeCAA - Observation

## Constants and materials

Here we provide all links that are inserted for the student:

In theory round there are 4 questions with a sum of 80 points, point value of question should be in accordance with question difficulty level. Solving time is 1:30h
Points for questions are:

1. 15 points
2. 10 points
3. 40 points
4. 15 points

**Correct answers in bold**

## Comets in the “air”

**(5 points)**The figure below shows a star chart of the night sky. The location of comet C/2020 F3 Neowise on July 31st, 2020 is marked by a red dot.

Name the five brightest stars in the field shown. Please use IAU star names in your answer (i.e. like Sirius or Rigel).

### The brightest stars[5]

Sort the brightest stars visible on the figure in descending order of brightness.

A. **1st brightest - Arcturus**
B. **2nd brightest - Regulus**
C. **3rd brightest - Pollux**
D. **4th brightest - Spica**
E. **5th brightest - Capella**

[CATEGORIES]

1. Achernar
2. Acrux
3. Aldebaran
4. Altair
5. Antares
6. Arcturus
7. Canopus
8. Capella
9. Fomalhaut
10. Hadar
11. Pollux
12. Procyon
13. Regulus
14. Shaula
15. Spica

## Where is the Sun? [2]

**(2 points)** Write the latin name abbreviation (you can find accepted abbreviated names here: https://en.wikipedia.org/wiki/IAU_designated_constellations) of the constellation in which the Sun is present on 31st July 2020.

**(Cnc)**

## Point on chart[3]

**(3 points)** Mark the position of the Sun on the chart, in case it is not present on the chart, mark the direction to the Sun at the edge of the image.

[CANVAS] - not graded




1. {"name":"Sun","x":0.57899,"y":0.91937”}

## Tail of the comet Neowise [2]

**(2 points)** Mark which line on the chart corresponds most accurately to the position of the comet’s gas tail  (1, 2, 3 or 4 as indicated on Figure). Write the correct number as your answer.

**[4]**

## In which constellation is comet Neowise [3]

**(3 points)** Name the constellation in which the comet is seen in Figure 1.  Write the answer using the IAU abbreviation

**Com**

# Neowise with MAGIC

The Figure shows the Astronomy Picture of the Day on July 24, 2020 (image credit & copyright: Urs Leutenegger, https://apod.nasa.gov/apod/ap200724.html) taken near the MAGIC telescopes at European Northern Observatory. Comet C/2020 F3 Neowise is visible in the image.



## Photographer's location [5]

Estimate the latitude of the telescope's location. (5 pts)
[NUMBER: 30 (10%)]

## When was this picture taken? [3]

(**3 points**) Is this picture taken in the morning, evening or midnight sky

A. Morning sky
**B. Evening sky**
C. Midnight

## Comet tails[2]

(**2 points**) Two tails of the comet are visible in Figure 2. Which tail is the gas and which one is the dust tail?

A. The Dust tail is on the left and the gas tail is one the right of the image.
**B. The Gas tail is on the left and the dust tail is on the right of the image.**

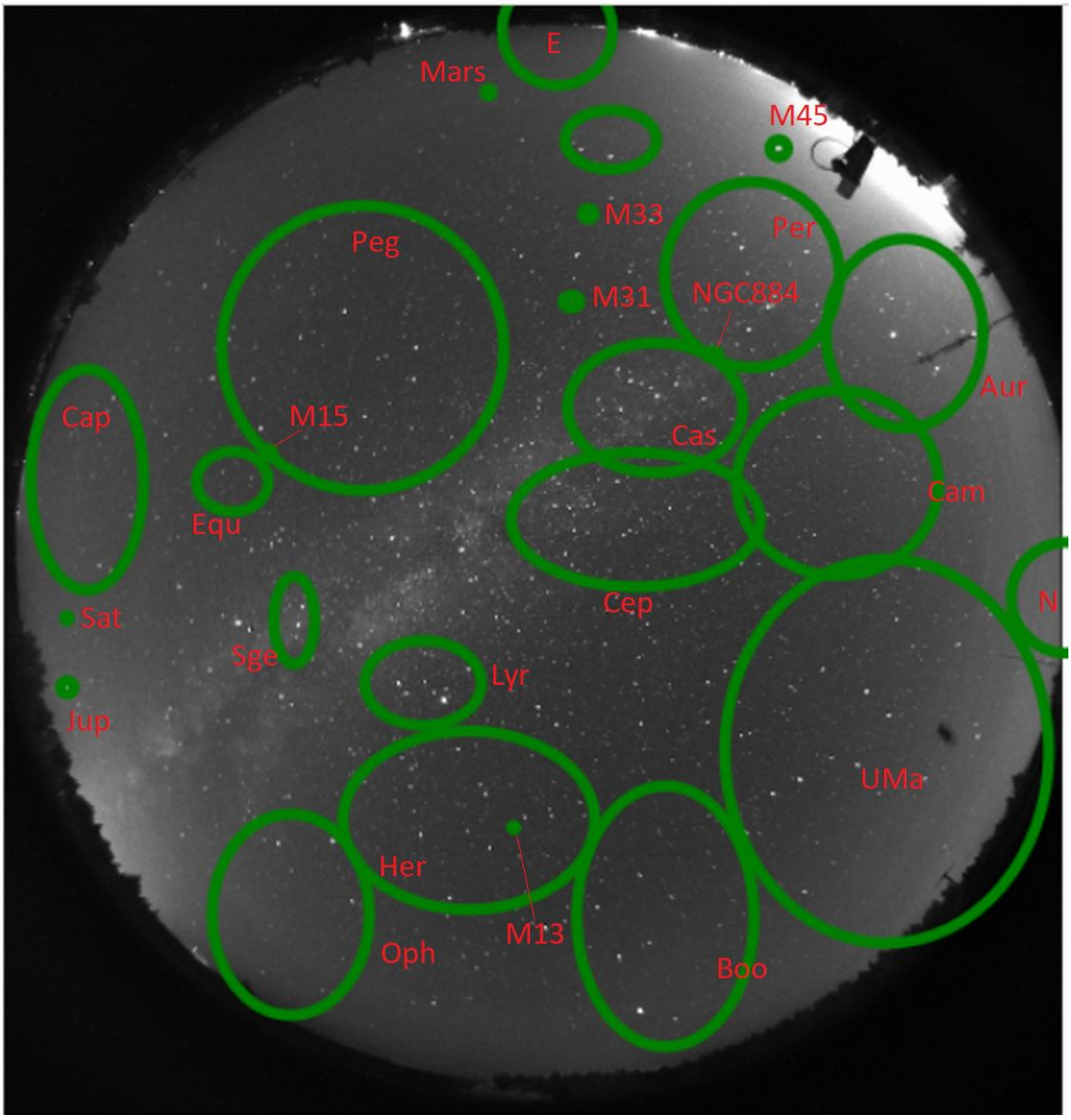
# All sky

The Figure shows an all-sky image taken somewhere at local midnight.

## Directions in the sky

(**26 points**) In this question you are asked to mark the following visible objects or directions

- Mark north and east directions on the horizon by clicking with the mouse. (4 pts)
- Mark all Solar System objects that are visible (3 points)
- Identify and mark on the all-sky image the following deep-sky objects: M31, M13, NGC 884, M45, M33, M15 (6 pts)
- Identify and mark the following constellations by clicking on their approximate center: Pegasus, Ophiucus, Ursa Major, Cepheus, Capricornus, Camelopardalis, Cassiopeia, Lyra, Sagitta, Perseus, Equuleus, Aries, Hercules, Bootes, Auriga (15 pts)




1.

## Geographic latitude of an observatory [4]

(**4 points**) Estimate the geographic latitude of the site where the image was taken. The right ascension of Altair and Capella are $19^h\ 51^m$ and $5^h\ 17^m$, respectively. Write the latitude in integer format.

[**58 (accepted error 5%)]**

## Sidereal time [4]

**(4 points)** Estimate the approximate sidereal time when the image was taken. The right ascension of Altair and Capella are $19^h\ 51^m$ and $5^h\ 17^m$, respectively. Please give your answer using the format HH:MM !

Answer: **20:21 - 20:51 (20:36 +- 15 min)**

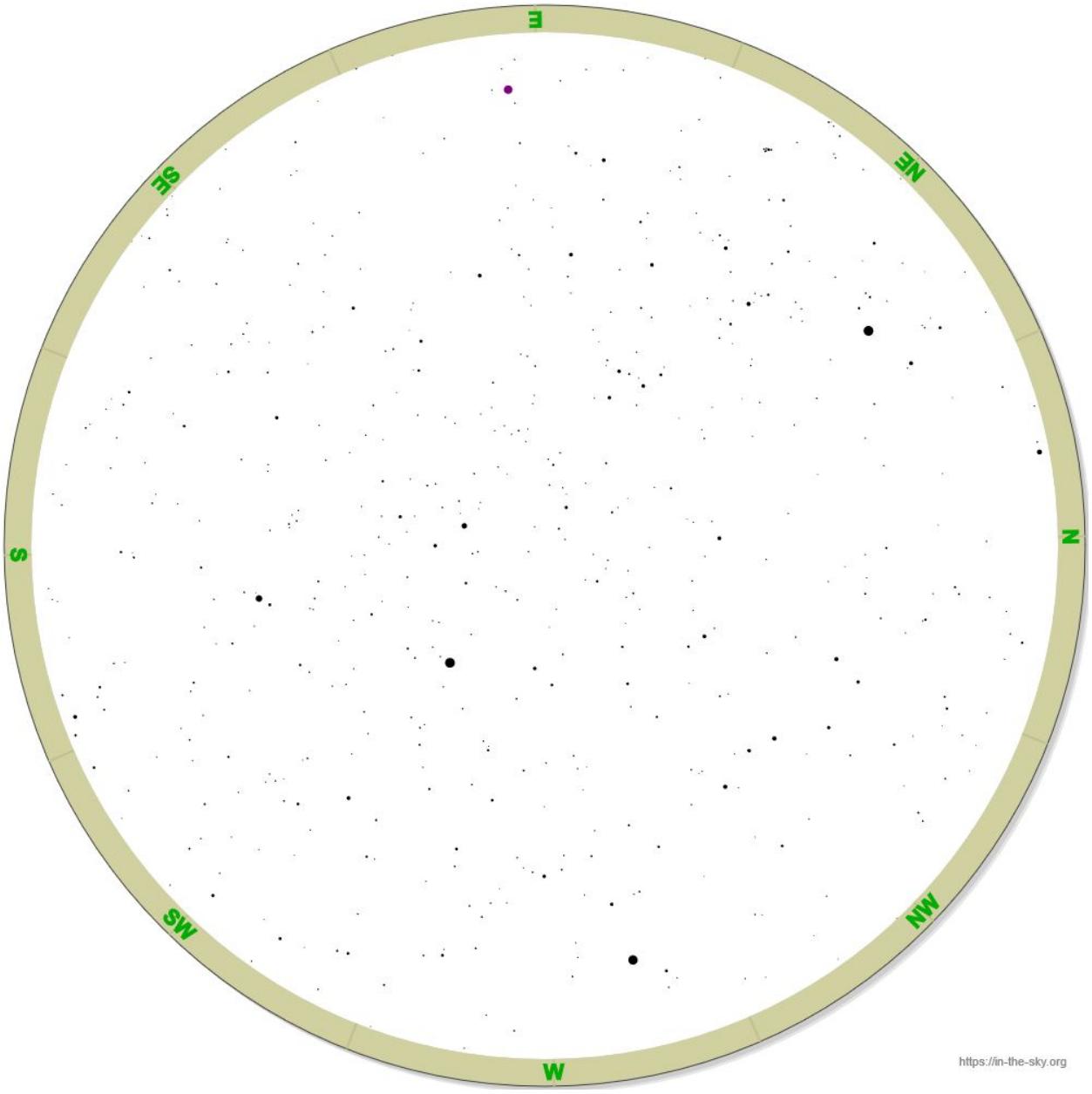
## Galactic equator [6]

(**6 points**) On the Figure, the Galactic Equator passes through 12 constellations. Mark all the constellations that are on the Galactic Equator in this Figure.

Galactic equator: **Aquila, Auriga, Camelopardalis, Cassiopeia, Cepheus, Cygnus, Perseus, Sagitta, Sagittarius, Scutum, Taurus, Vulpecula**

# Skymap

On the Figure, a star chart is shown for Tallinn, Estonia (Lat 59.43 N, Long: 24.75 E) on $14^{th}$ September 2020 at 22:00 (UTC+3). The chart is not distorted and shows all altitudes from $0^o$ to $+90^o$. Stars to magnitude $+4.7^m$ and one planet are shown.




## Planets [4]

(**4 points**) Four relatively bright (about $1.5^m$ - $3.5^m$) stars in well-known constellations or asterisms are missing. Identify them (in any order) using the Bayer classification.

Mark all the planets that should be visible at this time on this chart. Mars is marked as a red dot:

A. Mercury
B. Venus
C. Earth
**D. Jupiter**
**E. Saturn**
**F. Uranus**
**G. Neptune**

**NB! Marking Earth was penalized -2 p  and Venus and Mercury -1point, minum score was 0**

## Missing stars[8]

**(8 points)** Mark the missing stars indicating their rank order as greek letter with IAU Designation

**epsilon Cassiopeiae, gamma Pegasi, beta Tauri, delta Ursa Majoris**

## Mars [3]

(**3 points**) What is the RA of Mars (to nearest 10 minutes, **write in format HH:MMm, where H and M-s are replaced with correct numbers, round answer to nearest 10 minutes, so it must end with "0" for example 12:10**)?

**01:40 - 02:00  (01:50+- 10m)**.