OBSERVATIONAL ROUND – QUESTION SHEET

Telescope: 150/750 Newton
Eyepieces: 25 mm, 10 mm, Barlow lens: 2x

Note:

- Telescope is already polar aligned.
- In case of bad sky conditions at low altitudes, task 1 and 2 will be replaced by alternative tasks 1 and 2 (see page 3). In this situation, the telescope assistant will cross out Tasks 1 and 2.
- You have to use 25 mm eyepiece for tasks 1, 3 and 4.
- For these tasks, if you finish before the allotted time, you must keep tracking the object with the telescope till the end of allotted time. The telescope assistant will check the object only at the end of the allotted time.
- For task 2, we recommend using 10 mm eyepiece and Barlow 2x.
- For task 5, you are not allowed to use the telescope.

TASK 1: FINDERSCOPE ALIGNMENT

available time: 5 minutes 5 points

- The finderscope is NOT aligned at the beginning. **Point the telescope to Saturn and align the finderscope parallel to the main tube.**

If the alignment of Saturn is not within the crosshair of the finderscope, the telescope assistant will correct it – and you receive only partial or no points.

TASK 2: OBSERVATION OF SATURN

available time: 10 minutes 15 points

- In the upper box, the circle represents the disk of Saturn and the horizontal line is the E-W direction on the sky. Pay attention to direction of North (see top right corner).
  Mark position of Titan by a cross.

- The smaller box on the bottom right corner of first box is for drawing the rings of Saturn. Again the circle represents the disk of Saturn.
  Draw the rings of Saturn in this box with the correct size and orientation.
  Both the outer and inner edges of the ring are necessary, no faint ring details or gaps are needed.
  Keep orientation of the image the same as the orientation in the upper box.

- **Estimate the angular distance (in arcsec) and position angle (in degrees) of Titan relative to the center of Saturn.** You may do your calculations besides the answer.

  Apparent major axis of the ring: 43"

TASK 3: M57 – FIELD OF VIEW

available time: 10 minutes total: 10 points

- **Find the planetary nebula M57 (in constellation Lyra), and put it in the centre of the field of view in the main scope.**
- The star chart in the answer sheet shows a part of constellation Lyra. In this chart, **draw the FOV circle around M57 as accurately as possible.**

If you cannot find M57, the assistant will help you, but only after 5 minutes. In this case you will lose the marks for pointing to the object.

TASK 4: VARIABLE STAR – AF CYGNI

available time: 15 minutes total: 15 points

- **Use the given charts of the constellation Cygnus to find the variable star AF Cyg.**
  The large scale finder chart has normal orientation (N is up E is to the left)
  The smaller scale chart has 'telescope' orientation (S is up W is to the left)
  Brightness of reference stars are given without decimal points. e.g. '97' means 9.7 magnitude
  If you do not find AF Cyg, the telescope assistant cannot help you to point to it in this task.

- **Estimate the magnitude of AF Cyg by comparing it with the reference stars** and write it down, with decimal point, at one decimal accuracy (i.e. 9.7).
  Write the time of your observation in UTC. You may ask telescope assistant for the time in the local time zone (CEST).

TASK 5: NAKED EYE BRIGHTNESS ESTIMATION

available time: 5 minutes 5 points

- **Estimate the visual magnitude of the two naked-eye stars marked on the stellar chart of constellation Ursa Minor:**
  a) ζ UMi (zeta UMi = Alifa) – STAR 2
  b) γ UMi (gamma UMi = Pherkad) – STAR 1
  c) Write your estimate with one decimal accuracy (e.g. 8.6).
- **Estimate the angular distance between γ UMi (STAR 1) and Polaris in degrees.**

TASK 1/ ALTERNATIVE: FINDERSCOPE ALIGNMENT

available time: 5 minutes 5 points

- The finderscope is NOT aligned at the beginning. **Point the telescope to Altair (α Aql) and align the finderscope parallel to the main tube.**

If the alignment is not satisfactory, the telescope assistant will correct it – and you receive only partial or no points.

TASK 2 / ALTERNATIVE: EPSILON LYRAE

available time: 10 minutes 15 points

- **Find ε Lyr, and make a drawing of the field of view (with the object and other stars) with 10mm eyepiece.**
  Label the directions North and East by two arrows and mark them as 'N' and 'E'.
- **Estimate the angular distance between the wide pair (ε1-ε2), and estimate the position angle of the same pair.**
- **Increase the magnification with 2x Barlow lens to be able to resolve and separate the two close pairs. Estimate the angle** (in degrees to the nearest integer) **subtended by the two close pairs relative to each other.** (The enclosed angle of the two lines going through the two narrow pairs).
  Do not give any PA, only the relative angle of the two close pairs. No drawing is needed.

If you cannot find ε Lyr, the assistant can point to it for you, but only after 5 minutes. In this case you will lose the marks for pointing the telescope to the object.
The telescope assistant will check the object at the end of the 10 min limit. If you are ready sooner, keep the star in the FOV, and wait for the check.