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

# 4th International Olympiad on Astronomy and Astrophysics

**October, 18 – 25, 2025**

**Piatra Neamț - România**




# Telescope Round

Piatra Neamt
ROMANIA

# Instructions:

You will get 5 minutes before the start of the examination to read the instructions and questions.

You will be informed regarding the start of the round by the supervisors.

The total time that you will get with the telescope is 20 minutes.

Supervisors can only assist you in locking/unlocking the telescope axis - at request.

All telescopes are equipped with a 25 mm eyepiece.

The telescope scales are calibrated so that the hour angle axis represents right ascension.

Please be careful when using the telescope. Handle it with care, do not push it or stumble upon the tripod legs.

After that, you will be taken out of the observation hall.

## OT 1 (4 points)

On your telescope, the adjustment knobs are marked with 1 and 2. Mark with an X on your answer sheet, the answer to the following questions:

a. Which coordinate does knob No. 1 refer to?
b. Which coordinate does knob No. 2 refer to?

## OT 2 (9 points)

On the wall opposite to your position, you will find a sign numbered **1**. Point the telescope towards the specified sign and you will see a representation. For the star marked with the symbol *****, answer the following (mark with X on the answer sheet):

a. What is the name of the coordinate marked with letter **A**?
b. What is the name of the coordinate marked with letter **B**?
c. What is the name of the coordinate marked with letter **C**?

## OT 3 (20 points)

On the wall opposite to your position, you will find a sign named **O**. Point the telescope towards the specified sign, where you should see a constellation. Answer the following:

a. Draw the constellation seen through the eyepiece on your answer sheet;
b. Specify the IAU name or IAU abbreviation of the constellation;
c. Mark the Alpha star with a circle on your drawing;
d. Write the IAU name of the Alpha star;
e. Between stars Gamma (γ) and Beta (β) of this constellation, there is a Messier object. Specify its IAU name OR the Messier catalogue number;
f. Specify the type of the object (Mark with X on your answer sheet);
g. On your drawing, mark the position of this Messier object, with a triangle (Δ).

# OT 4 (27 points)

On the wall opposite to you, you will find signs named **R**, **N** and **Y**. Point the telescope towards each specific sign and, for each sign, answer the following:

a. Write the IAU Name or Messier Catalogue Number (if applicable) of the celestial Object found on the sign;
b. Right Ascension, read from the telescope for the sign;
c. Declination, read from the telescope for the sign.

# ANSWERS

## OT1 – 2 points for each correct answer

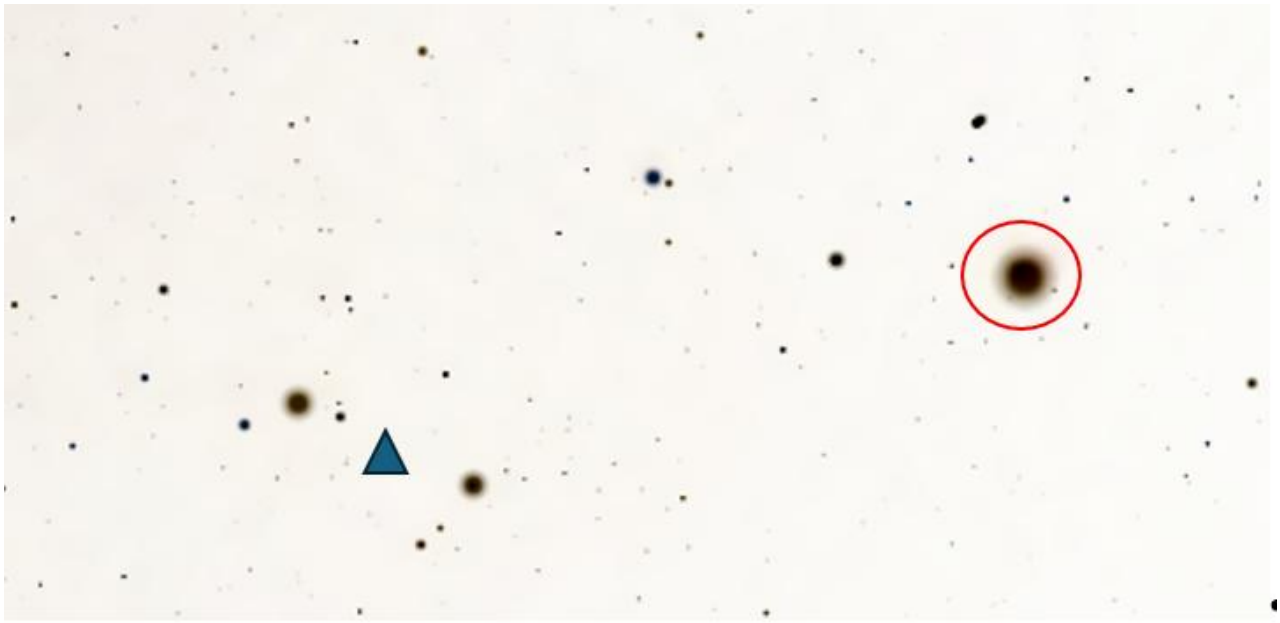
| 1. | Altitude | Right Ascension | Declination | Azimuth |
|---|---|---|---|---|
| a. | | X | | |
| b. | | | X | |

## OT2 – 3 points for each correct answer

| 2. | Azimuth | Local Hour Angle | Sideral Hour Angle | Zenith Angle | Altitude | Declination | Meridian Angle |
|---|---|---|---|---|---|---|---|
| A | | | | | X | | |
| B | | | | X | | | |
| C | X | | | | | | |

## OT3

a,c,g. **Drawing of the constellation – 5p; Marking the star – 2p; Marking of M57 – 2 p.**



| | | | | | | | |
|---|---|---|---|---|---|---|---|
| b. | **Lyra OR Lyr** | | | **2 points** | | | |
| d. | **Vega** | | | **3 points** | | | |
| e. | **Ring Nebula OR M57** | | | **3 points** | | | |
| f. | **3 points** | Galaxy | Supernova | Star Cluster | Planetary Nebula | Dwarf planet | Reflection nebula |
| | | | | | **X** | | |

## OT4 – 3 points for each correct answer

| Sign | a. Latin name or Messier number (if applicable) | b. Right Ascension | c. Declination ° |
|---|---|---|---|
| Telescop 1 | | | |
| R | **Orion Nebula OR M42** | 22 h 10 m | 32 |
| N | **Andromeda Galaxy OR M31** | 22 h 30 m | 26 |
| Y | **Double Star Albireo** | 23 h 00 m | 22 |
| Telescop 2 | | | |
| R | **Orion Nebula OR M42** | 21h 30 m | 40 |
| N | **Andromeda Galaxy OR M31** | 22 h 00 m | 32 |
| Y | **Double Star Albireo** | 22 h 30 m | 30 |
| Telescop 3 | | | |
| R | **Orion Nebula OR M42** | 20 h 00 m | 44 |
| N | **Andromeda Galaxy OR M31** | 20 h 50 m | 40 |
| Y | **Double Star Albireo** | 21 h 30 m | 38 |
| Telescop 4 | | | |
| R | **Orion Nebula OR M42** | 19 h 40 m | 48 |
| N | **Andromeda Galaxy OR M31** | 20 h 20 m | 44 |
| Y | **Double Star Albireo** | 21 h 00 m | 42 |

| | | | |
|---|---|---|---|
| Telescop 5 | | | |
| R | **Orion Nebula OR M42** | 19 h 40 m | 48 |
| N | **Andromeda Galaxy OR M31** | 20 h 20 m | 44 |
| Y | **Double Star Albireo** | 21 h 20 m | 42 |
| Telescop 6 | | | |
| R | **Orion Nebula OR M42** | 22 h 10 m | 42 |
| N | **Andromeda Galaxy OR M31** | 22 h 30 m | 35 |
| Y | **Double Star Albireo** | 23 h 10 m | 30 |
| Telescop 7 | | | |
| R | **Orion Nebula OR M42** | 20 h 40 m | 47 |
| N | **Andromeda Galaxy OR M31** | 21 h 20 m | 40 |
| Y | **Double Star Albireo** | 22 h 10 m | 36 |
| Telescop 8 | | | |
| R | **Orion Nebula OR M42** | 21 h 30 m | 34 |
| N | **Andromeda Galaxy OR M31** | 22 h 00 m | 28 |
| Y | **Double Star Albireo** | 22 h 40 m | 24 |
| Telescop 9 | | | |
| R | **Orion Nebula OR M42** | 22 h 10 m | 24 |
| N | **Andromeda Galaxy OR M31** | 22 h 40 m | 18 |
| Y | **Double Star Albireo** | 23 h 20 m | 16 |
| Telescop 10 | | | |
| R | **Orion Nebula OR M42** | 19 h 50 m | 46 |
| N | **Andromeda Galaxy OR M31** | 20 h 30 m | 48 |
| Y | **Double Star Albireo** | 19 h 00 m | 48 |
| | | | |
| | | | |
| | | | |

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|---|---|---|---|
| Telescop 11 | | | |
| R | **Orion Nebula OR M42** | 22 h 30 m | 30 |
| N | **Andromeda Galaxy OR M31** | 23 h 00 m | 28 |
| Y | **Double Star Albireo** | 21h 55 m | 36 |
| Telescop 12 | | | |
| R | **Orion Nebula OR M42** | 20 h 00 m | 42 |
| N | **Andromeda Galaxy OR M31** | 20h 30 m | 40 |
| Y | **Double Star Albireo** | 19 h 10 m | 44 |
| Telescop 13 | | | |
| R | **Orion Nebula OR M42** | 21 h 00 m | 32 |
| N | **Andromeda Galaxy OR M31** | 21 h 30 m | 32 |
| Y | **Double Star Albireo** | 20 h 20 m | 36 |
| Telescop 14 | | | |
| R | **Orion Nebula OR M42** | 21 h 30 m | 36 |
| N | **Andromeda Galaxy OR M31** | 22 h 00 m | 34 |
| Y | **Double Star Albireo** | 21 h 00 m | 42 |
| Telescop 15 | | | |
| R | **Orion Nebula OR M42** | 21 h 30 m | 40 |
| N | **Andromeda Galaxy OR M31** | 22 h 00 m | 38 |
| Y | **Double Star Albireo** | 20 h 50 m | 44 |
| Telescop 16 | | | |
| R | **Orion Nebula OR M42** | 21 h 20 m | 36 |
| N | **Andromeda Galaxy OR M31** | 21 h 50 m | 36 |
| Y | **Double Star Albireo** | 20 h 40 m | 40 |
| | | | |
| | | | |
| | | | |

| | | | |
|---|---|---|---|
| Telescop 17 | | | |
| R | **Orion Nebula OR M42** | 20 h 50 m | 32 |
| N | **Andromeda Galaxy OR M31** | 21 h 20 m | 32 |
| Y | **Double Star Albireo** | 20 h 10 m | 36 |
| Telescop 18 | | | |
| R | **Orion Nebula OR M42** | 21 h 00 m | 36 |
| N | **Andromeda Galaxy OR M31** | 21 h 30 m | 36 |
| Y | **Double Star Albireo** | 20 h 20 m | 40 |

Accepted error:

- ± 10 min for R.A
- ± 2° for Dec