



AstroChallenge 2023 Observation Round (Practical)

School/Team:

Team Members:

Assigned QM(s):

PLEASE READ THESE INSTRUCTIONS CAREFULLY

1. This paper consists of **8** printed pages, including this cover page.
2. You have **until 2200h** to attempt all the questions in this paper.
3. At the end of the paper, submit this booklet to your QM.
4. It's your team's responsibility to ensure all pages have been submitted.
5. It's your team's responsibility to ensure all instructions are read and understood before the start of the Practical Round.
6. This paper is open universe, but you cannot ask a friend to help you.

1. Setup and Scope Handling [20%]

In this section, you are required to set up a telescope as a group. This section is graded by negative marking. You are given **100 pts** at the start, and every error during setup and handling will result in a deduction. Assessment ends when the telescope is fully set up, the finder is aligned, and the telescope is pointed at an object. All members of the group must participate in this activity, else a penalty may apply. Note that the total score for this section will be normalized according to its weightage for mark tabulation purposes.

Note to Candidates:

1. All accepted defects (I.e. faulty parts of the setup which do not impact its usability) shall be explained clearly to your assessor immediately before setup.
2. If the assessor agrees with your claim, no points shall be deducted.
3. If the assessor deems your setup to be deficient, in consultation with the rubrics, he may deduct points or award zero points for this section.

For QMs: Please write any supplementary explanations for deductions made here.

Marking Rubrics	
OTA & Mount	
Model/Specs:	
Minor Mistakes (-3)	Tick
Eyepieces/Optical elements improperly packed/stored	
Mount not placed on a fairly level surface (For Dobsonians)	
Leaving eyepieces exposed without dust caps	
Screws/Bolts of mount/base not secured tightly	
Lids of boxes/containers are not closed	
Errors (-5)	Tick
Bearing disks are not properly placed onto elevation bearings (For Dobsonians)	
Placing telescope on mount before counterweights are loaded (For Equatorials)	
Tripod is not leveled (For Equatorials/Alt-Az)	
Mount not aligned to the North (For Equatorials)	
Finder is improperly secured to OTA	
Finder is improperly aligned	
Major Errors (-10)	Tick
Did not bring any eyepieces	
Touching optical elements in eyepieces with bare hands	
Dropping/Stepping on eyepieces/mount head	
Kicking/Tripping over setup/telescope/boxes	
Not holding on to telescope when locking knobs are unsecured	
Telescope is severely imbalanced	
OTA is improperly secured to the dovetail clamp	
Major safety breaches	
Immediate Zero	Tick
OTA is dropped	
Unable to set up telescope at all	
Setup unsafe/unable to be used	
Multiple Deductions (-3)	Occurrence
Assistance required from QM in scope set-up	

For QM Use only:

Name	Sign	Total Score
		/100

2. Cosmic Bingo [40%]

Instructions

There are 5 rows and 4 columns in the following chart. Each team member will pick a different row and write their initials beside it.

This section is a solo effort. All observation targets in a row can only be found by the member who selected it. Other team members may provide verbal assistance. However, other members are not allowed to touch the optical tube – doing so will disqualify that target and remove it from the grid. When switching between team members, the telescope should be reset to a neutral position.

The first 2 columns are boresight-only targets. Here, boresighting is defined as the aiming of a telescope by aligning the OTA body with a target without looking through the eyepiece. Physical landmarks on the OTA body may be used to aid alignment (e.g. screws, brackets, ridges), however the use of aiming devices such finderscopes and laser viewfinders (e.g. TELRADs) are strictly forbidden. Participants are not allowed to look through the eyepiece or finderscopes to ‘check’ their answers. Upon finding the stipulated object, inform the examiner, who will verify by checking the eyepiece. If verified, the QM will mark it off the bingo grid.

The last two columns are non-boresight targets. For non-boresight targets, the participant is free to use the eyepiece, finderscopes, aiming devices, as well as star charts (physical or digital), internet resources or personal notes and references to aid in the finding.

Scoring

Upon finding the stipulated object, inform the examiner, who will verify by checking the eyepiece. If verified, the QM will mark it off the bingo grid. Else the QM inform you to try again. Participants may re-attempt each cell multiple times if needed or skip a cell if they wish.

Each cell in the grid is worth **10 pts**. For each completed row or column, **5 pts** will be awarded. Note that the total score for this section will be normalized according to its weightage for mark tabulation purposes.

Partial credit (**5 pts**) may be given to boresight objects found outside of eyepiece, but inside finderscope, if participants are unable to get the object inside the eyepiece after multiple tries.

Mark Breakdown	
Object	10 x 20 = 200
Row/Column Bonus	5 x (4 columns + 5 rows) = 45
Total	200 + 45 = 245

Name of Team			
Examiner(s)			
Start Time		End Time	

Your Initials	Bright Boresight	Other Boresight	Double Stars and Lunar Features	DSO
No. of Objects Found				
	Venus	Menkent (Theta Centauri)	Acrux (Alpha Crucis)	Jewel Box Cluster (C94)
	Arcturus (Alpha Boötis)	Alphard (Alpha Hydrae)	Algieba (Gamma Leonis)	Beehive Cluster (M44)
	Mars	Antares (Alpha Scorpii)	Theophilus/Cyrrillus/Catharina Complex (Lunar Feature)	Omicron Velorum Cluster (C85)
	Spica (Alpha Virginis)	Denebola (Beta Leonis)	Mizar/Alcor (Zeta Ursae Majoris)	Eta Carinae Cluster (Trumpler 16)
	Rigil Kentaurus (Alpha Centauri)	Regulus (Alpha Leonis)	Cor Caroli (Alpha Canun Venaticorum)	Coma Star Cluster

For QM Use only:

Object Score	Row Bonus	Column Bonus

Name	Sign	Total Score:
		/245

3. Stellar Marathon [40%]

In the following section, you are required to find as many visible objects as possible. The marks will be allocated as follows:

- a. Visual doubles and visually split multiple star systems (5 pts)
- b. Open clusters (12 pts)
- c. Globular clusters (15 pts)
- d. Galaxies (18 pts)
- e. Nebulae (18 pts)
- f. Galaxy clusters (22 pts)
- g. Comets (25 pts)

For credit to be awarded, the object must be visually detectable in the eyepiece. For instance, nebulosity in extended objects should be at least detectable under averted vision. Visual doubles and multiple star systems should at least be partially split in the eyepiece. No credit is awarded for correct location of objects which are too dim to be visible under local sky conditions. Participants must also be able to name and explain the classification of the object shown (as per above guidelines) for credit to be awarded.

There will be no 'double-marking' of objects, i.e. at any time in one field-of-view, if two objects are visible within the same field-of-view, only one selected object will be credited as a find, and any other visible objects will not receive any credit, even if 'found' subsequently on a separate occasion. Participants are advised to select the appropriate field-of-view before showing the object to the examiner for checking.

Note that objects listed in the table for Section 2. Cosmic Bingo will not be credited if found again for this section.

You can consult any references such as physical/digital star atlases, internet resources or any personal notes or references to assist with finding objects. However you are not allowed to communicate with other teams or any third parties for assistance.

There is no maximum score for this section. All scores would be scaled against the highest score amongst all participating teams for tabulation of marks.

S/N	Object	Time Observed	Classification	Score Awarded	Countersign
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42					

For QM Use only:

Name	Sign	Total Score: