

Attn: Contestants and Teachers-in-Charge

Observation Round Changes Outchit

There have been some changes to the Observation Round for AstroChallenge 2024. This outchit serves to explain the format and administrative changes in the Theoretical and Practical Observation Rounds.

Theoretical Observation Round

The duration of the paper has been shortened from 2 hours to 1 hour 30 minutes. This change aims to encourage students and their school's Astronomy club to focus more on Practical Observation rather than Theoretical Observation. In the Theory Observation Round, each school's observation team will be split into two, namely, *Team A* and *Team B*, with no communication allowed between the two teams (as well as between contestants across different schools).

The Theoretical Observation paper will be a closed-book test. The paper will consist of the following sections:

Section A: Finderchart drawing and finding

Each team will be given instructions on drawing a finder chart. Teams will have 20 minutes to draw a finder chart, after which the finder chart drawn by each team will be collected by the facilitator. Each team will then receive the finder chart the other team drew and will be expected to find the target object on Stellarium in ocular view. Contestants will be afforded no other help/information other than the finder chart.

Every team may take as long as they wish to plan and interpret the finder chart before approaching their facilitator to begin their attempt to find the object on Stellarium. However, contestants are reminded that any preparation time is part of the 1 hour 30 minutes of their theory paper. Once the paper is concluded, contestants will not be allowed to find the object. Consequently, teams are encouraged to approach the facilitator as soon as they are ready to start finding on Stellarium.

For sections B and C, both teams A and B will attempt the same question independently, submitting two separate scripts, without any communication between both teams.

Section B: Half sky question

In this section, there will be a star chart of the size of half of the celestial sphere, in stereographic projection. This section is similar to past year's Observation Round's half-sky questions (i.e., AC2023 Observation Round Part D). However, in addition to labelling questions and short-answered questions, there may be a few fill-in-the-blank questions in this section this year.

The aim of this section is slightly different from past years. This section aims to test the knowledge that the contestants would need when they give a typical night sky talk to the members of the general public.

This is to encourage contestants to equip themselves with such knowledge to be better able to deliver such talks during potential astronomy outreach events.

Section C: Equipment question

This section tests the knowledge and understanding of the contestants about astronomical equipment. The equipment may be but is not limited to a typical visual set-up. This question aims to encourage participants to familiarize themselves with some of the observation techniques that are currently in use.

Practical Observation Round

The Practical Observation Round consists of two sections: Setup and scope handling, bearing 20% of the grade, as well as Observation, bearing 80% of the grade. The observation team will attempt this round together without splitting into smaller groups.

Section A: Setup and Scope Handling

This section aims to test the fundamentals of the teams on the setup and handling of usual Astronomy observation equipment. There have been no changes from the assessment of telescope setup and handling from past year formats. As always, safety is paramount.

Section B: Observation

This section has been revamped from what used to be the cosmic bingo and stellar marathon in the past year. There are two important changes to the rules in this section, as will be elaborated in detail below, and a technical change primarily in scoring. The scoring change aims to improve the experience of participants, better reflecting the participants' ability to find different celestial objects.

Please refer to the complete instructions for this section (including the new scoring system) attached to this document (Appendix A). Participants are highly encouraged to study the new scoring system carefully before Day 1.

IMPORTANT CHANGES:

1. Banning of Astro Hopper

While this round is designed to be open-book and open internet, for fairness, a temporary ban over the online application Astro Hopper (<https://artyom-beilis.github.io/astrohopper.html>) has been imposed in this competition. Under the current structure of this round, this application permits a significant advantage to people aware of and proficient in this application. The use of this application will not be allowed this year.

Any celestial objects found in violation of any of the above rules will be rejected and the telescope returned to the neutral position.

2. Regarding the use of Mobile Devices & Cameras

- (a) Mobile devices (e.g. phones, tablets, cameras) **will not be allowed** to be put against **ANY** part of the telescope setup (e.g. OTA, mount, tripod, etc.)
- (b) Mobile devices (e.g. phones, tablets, cameras) **will not be allowed** to be attached onto **ANY** part of the telescope setup through mechanical connections (e.g. brackets, etc.)

- (c) Mobile devices (e.g. phones, tablets, cameras) **will not be allowed** for assistance for telescope alignment

Any celestial objects found in violation of any of the above rules will be rejected and the telescope returned to the neutral position.

3. Laser Guidance

Laser guidance will be allowed for all objects throughout the entire round. However, we will not allow laser pointers to be held up by hand against any part of the telescope setup, or be pointed through the eyepiece at any time. You may, however, attach the laser pointer to the optical tube via a mechanical fixed connection (e.g., bracket) as an “aiming device”.

Please note that, for objects marked for boresighting, contestants may not turn on the laser pointers that are attached to the optical tube via a mechanical connection. Contestants are only permitted to use it **independently** of the telescope.

As always, contestants are reminded to practice safety and ensure the safe operation of any lasers.

I would like to wish all contestants a fruitful Observation Round and an exciting AstroChallenge experience.

Yours sincerely,

Ting Jun Rui (Mr.) AstroChallenge Head Questionmaster,

Ng Kang Zhe (Mr.) Deputy AstroChallenge Head Questionmaster,

Wu Xiao (Mr.) OIC Observation

Appendix

Contestants will receive the same instructions as below during the day of the competition.

Section B Observation (80%)

Instructions

This section contains two items: a Bingo chart, and an observation record sheet that can be as long as necessary.

Throughout the round, you may consult any references such as physical or 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.

Safety

You are reminded of the paramount importance of safety.

You must not put your laser pointer against the optical tube assembly (OTA) body or point it through the eyepiece at any time.

This is not an exhaustive list of safety hazards and participants should take every precaution to ensure the safety and well-being of themselves and others around.

Committing any act that compromises anyone's safety in any way would result in immediate disqualification and participants shall be held liable for any responsibility according to law.

Banning of Astro Hopper

While this round is open-book and open internet, for fairness reasons, a temporary ban over the online application Astro Hopper (<https://artyom-beilis.github.io/astrohopper.html>) is imposed for this year. Under the current structure of this round, this application gives a significant advantage to people who are aware of and are proficient in this application. There was not enough time for the QMs to have a thorough discussion on whether to allow this application for this round, as it would have profound implications on the intended learning outcome that is being examined. The QMs are also not aware of how well the application is currently being adopted across different schools. This application is thus not allowed to be used for this year.

Other Regulations Enforced

In addition to the banning of Astro Hopper, the following regulations will be put in place:

1. It is not allowed to put any mobile device (such as a phone or tablet) against any parts of the telescope set-up (including OTA, mount, tripod etc).
2. It is not allowed to attach any mobile device to the telescope set-up, through any mechanical connection (such as a bracket etc).
3. It is not allowed to use mobile devices for telescope alignment.

Any celestial object found with this application, or with violation of any of the above rules, will be rejected with the telescope returned to the neutral position afterwards.

Bingo Chart

The Bingo chart contains 5 rows and 4 columns. Each team member would pick a different row and write their initials beside it.

For observation targets in the Bingo chart, solo effort is required. All observation targets in a row can only be found by the member who selected it. Other team members may provide any form of assistance, including laser guiding, but they are not allowed to touch the optical tube – doing so will disqualify that

target and any further attempts to find the target would be nullified. When switching between team members, the telescope should be reset to a neutral position, as deemed appropriate by the QM.

The first two 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 (eg. screws, brackets, ridges), however, the use of aiming devices such as finderscopes and laser viewfinders (eg. TELRADs) are not allowed. 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 as well as aiming devices to aid in the finding.

Observation Record Sheet

The observation record sheet will contain all other observational targets that are credit-bearing but are not inside the Bingo chart. The record sheet is as long as necessary, and participants are not required to achieve a minimum and are not confined to a maximum number of items that there must be on the sheet.

You may find any object that gives you credit and ask the QM to verify its identity after you have made sure that object is in the field-of-view (FOV). You must be able to identify/name this object. The QM will then verify whether the observed object is the one you intended to find.

There will be no “double marking” of objects. That is, at any time in one FOV, if two objects are visible within the same FOV, only one selected object will be credited as found, 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 FOV before showing the object to the examiner for checking.

Scoring

A combined scoring system would be adopted for this section. Marks will be awarded for finding an object according to the following table. There is a bonus for completing one row or column of the Bingo sheet.

Type of Object	Marks Awarded	Remark
Any boresighting objects listed in the bingo sheet	+10	Regardless of the type of object, exactly 10 marks will be given upon successful finding. Must follow the rules regarding boresighting.
Visual doubles / visually split multiple star systems	+5	
Open Clusters	+15	Note the “no double counting” rule, especially for clusters that may also exhibit nebulosity.
Nebulae	+15	
Globular Clusters	+20	
Galaxies	+25	
Comets	+30	
Completion of one bingo row/column	+20	Extra credit on top of accounting for the objects found in that row/column.

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