



AstroChallenge 2024

To: Teachers-in-charge and Participants

Dear Sir/Mdm,

On behalf of the AC Core Committee, I would like to thank you for your keen interest in **AstroChallenge 2024**. The contents of this letter include important issues and rules to take note of:

1.) Competition Dates and Format

Day 1 – **1st June**, 09:00, NTU

Day 2 – **3rd June**, 09:00, NUS

Day 3 – **8th June**, 09:00 (Juniors)/14:00 (Seniors), NUS

Please refer to **Appendix A** for the schedule of events and **Appendix B** for more information on the rounds. **Appendix C** has a memorandum from the Head Question Master. Please note that the schedule may be subject to changes.

As of now, registration for AstroChallenge 2024 has been opened. The registration link can be found on our website or [here](#). The early bird period of the registration period will last till **21st April 2259 SGT** From then till **17th May 2259 SGT**, the regular period will begin. After this period, all further registrations will be considered late and therefore incur further fees. More details will be provided under point 3.



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2.) Mode of Communication

Telegram will be used as the main mode of communication between participants and the AstroChallenge committee. The AstroChallenge Main Channel has been set up in order to convey key information before and during the competition. Scan the QR code on the left below to join:

Make sure that your telegram handle is as indicated in our online registration form.

Every now and then, we will be posting stories and updates on Instagram as well as Facebook. This will include behind-the-scenes moments and previews to the Post Mortem. Feel free to follow us by the scanning the QR code on the right (@astrochallenge_sg):





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3.) Payment

For teams registered before **21st April 2024 2259 SGT (GMT +8)**, there will be an Early Bird Discount. The registration fee will be reduced by **\$10** from the rates above.

AC2024 Signup Pricings

Date of registration	2 members	3 members	≥ 4 members
Before 21st April 2259h	\$30	\$50	\$60
21st Mar 2259h – 17th May 2259h	\$40	\$60	\$70
From 17th May 2300h	\$55	\$75	\$85

When you have successfully registered your teams, a confirmation email with the confirmed team details will be sent to you. Once you received this confirmation email, you will have 2 weeks to make the required payment. Afterwards, we will send you a final email stating that we have received the payment.

We will be accepting a few methods of payment. For the preferred method via **PayNow** transaction, please select UEN number and input S98SS0058J (instead of the usual NRIC/mobile). Alternatively, you can scan the QR code included in the confirmation email.

After the transaction is done, do inform us via email at astrochallenge@gmail.com that you have sent the payment. We will then process the payment and send a confirmation.

Alternatively, we accept **PayLah** directly to Mr Poh Yu Heng or Mr Au Yong Kuang Herbert, using the following QR code:





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We also accept **Giro Deduction** or **direction bank fund transfer** via the following details:

Malayan Banking Berhad Singapore, Holland Village Branch
Bank Code: 7302
Branch Code: 018
Bank Account Number: 04181062002
Holder Name: National University of Singapore Astronomical Society (NUSAS)

Lastly, schools may choose to settle payments directly through **vendors@gov**. If the school is registered and wishes to do so, please notify us **by 1st May 2024** and we will send an e-invoice via vendors@gov with a default payment term of 30 calendar days.

This registration fee serves to defray the costs of the competition (e.g., prizes, certificates, organisation and manpower). Please note that an **additional administrative fee of up to \$15** may be charged **per change in registration or new registration** if there are any changes made to team composition or any new registrations made *after* the registration deadline of **17th May 2024 2259 SGT (GMT +8)**. Registration fees are **non-refundable**.

4.) *Competition*

Please refer to **Appendix B** for the rules and regulations.

Please refer to **Appendix D** of the [Invitation Letter](#) uploaded on AstroChallenge website for the complete syllabus.

5.) *Project Round*

The QM Committee **strongly urges** you to read the [Project Round Information sheet](#) thoroughly again prior to submission. Any instructions therein must be followed. Further instructions are as follows:

The poster for the Project Round must be submitted by **1200 SGT (GMT+8) on 17th May 2024** by email to astrochallenge@gmail.com. You will incur penalties should we receive your submission late.

The submission for the optional short-form video category must be submitted by **1200 SGT (GMT+8) on 17th May 2024** by email to astrochallenge@gmail.com. As this is an optional component that would be posted onto AstroChallenge social media channels, we will not be accepting ANY late submissions to ensure fairness between participating teams.



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6.) DAQ Round (For Senior Category only)

The submission deadline for the DAQ round is on **28th May 2359 SGT (GMT+8)**. The deadline is strict. Late submissions may be rejected or penalised accordingly.

Each team is expected to work on this question on their own and you are reminded of the need to credit all non-original sources.

You are required to zip all your deliverables into one zip folder for submission.

You should name your submission in the following format:

[Full School Name]_[Team Number]_DAQ_Submission.zip.

For example: Lower Kent School_1_DAQ_Submission.zip

Failure to conform to the above instructions may result in your submission being rejected and being awarded 0 for this portion.

For a list of deliverables, refer to the question paper. (update the link to DAQ release)

Please note that for this year's DAQ round, there are no additional files to be downloaded apart from the question paper. All materials required are publicly accessible, and the instructions for accessing them are provided in the question paper.

Do email us at astrochallenge@gmail.com if you encounter any technical difficulties with the DAQ round.

7.) Things to bring along for the competition

- a. **Student Card/NRIC** for identification.
- b. **Writing materials** and **scientific calculator** (graphic calculators are **NOT** allowed). We will be following the list of approved (**scientific**) calculators for national examinations which is available on the [SEAB website](#).
- c. **Telescope** for participants in the Observation Round (Senior category only) on **1st June (Day 1)**. You should have already indicated on the registration form if you wish to loan a telescope.
- d. **Completed Project** (Seniors and Juniors) **1st June 1900**.

Yours sincerely,
Lu Xixun (Ms)
Chairperson
AstroChallenge 2024 Core Committee



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Appendix A – Schedule of Events for AstroChallenge

Day 1: 1st June 2024 – NTU (LT1A, foyer outside LT1A and North Spine Rooftop)

	Junior	Senior
0900 – 0930	*Registration/Attendance Checks	
0930 – 1000	Briefing for Project Round	
1000 – 1200	Project Round (Junior)	
1200 – 1300	Lunch Time	
1300 – 1330		*Registration/Attendance Checks
1330 – 1430	Opening Address	
1430 – 1500	Team Round Briefing	Project Round Briefing
1500 – 1700	Team Round	Project Round (Senior)
1700 – 1900		Dinner Time
1900 – 2000		Setting up scopes (Senior Category only)
2000 – 2230		Observation Round – Practical Component (Senior Category only)



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Day 2: 3rd June 2024 – NUS (LT7A, and Engineering Auditorium)

	Junior	Senior
0900 – 0930		Registration/Attendance Checks
0930 – 1000		Briefing for Observation Round
1000 – 1130		Observation Round – Theory Component (Senior Category only)
1130 – 1230		Lunch Time
1230 – 1300		Attendance Checks and Briefing for Team Round
1300 – 1500		Team Round (Data Response Questions)
1500 – 1530	Registration/Attendance Checks	Break
1530 – 1600	Briefing for Individual Round (MCQs)	
1600 – 1800	Individual Round (MCQs)	Individual Round (MCQs)
1800 – 1930	Dinner	
1930 onwards	Stargazing (Optional)	

Day 3: 8th June 2024 – NUS (LT6)

0900 – 0930	Registration/Attendance Checks
0930 – 1200	Finals 1 (Junior Category)
1200 – 1215	Prize Presentation (Junior Category)
1215 – 1345	Lunch
1345 – 1400	Registration/Attendance Checks
1400 – 1630	Finals 2 (Senior Category)
1630 – 1645	Prize Presentation (Senior Category)
1645 – 1830	Post-Mortem



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Appendix B – Rules and Regulations for AstroChallenge

The AC Core Committee and the QM Committee reserves the right to amend any of the rules contained herein. Participants will be notified of the relevant changes.

General rules

1. Unless otherwise explicitly specified, any communication devices or devices with storage and/or display capabilities are not to be used during all the rounds.
2. Unless otherwise explicitly stated, only text written/typed/spoken in English shall be marked and scored.
3. You are not restricted from using any other language for purposes other than to be marked or scored.
4. Only scientific calculators found in SEAB's approved list of calculators are permitted. No other calculators will be allowed in this competition.
5. Any team caught cheating will be subjected to disciplinary/remedial action, including but not limited to being reprimanded, having score deductions or being immediately disqualified. The teacher-in-charge and their respective school will be notified in the event of cheating. After investigation, the Core Committee may, at its discretion, denounce the actions of the said team publicly as a deterrence as well as make known of any punishments awarded.
6. The tabulation of the points at any stage in the competition, including the total score, is final. No correspondence or representation will be entertained.
7. At the discretion of the QM Committee, the Top 50% of Individual Round, Team Round, Observation, and Project scores may be released. Unreleased results will only be made upon the Teacher-in-Charge's or an authorised agent's (who has to be a participant) request. Each school may only view its own students' scores.



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Rules and Regulations for Specific Rounds:

Individual Round

Duration: 2 hours

- A maximum of 5 members per team can take part. Participants may leave before the time limit, but may not leave within the last 15 minutes of the paper.
- The overall points for the Individual Round will be the average of the marks from the best 4 individuals in the team.
- There will be a total of 50 MCQs in this round. Each MCQ contains 5 options.
- Participants start off with 50 points.
 - 2 marks will be given for a correct answer.
 - 1 mark will be deducted for a wrong answer.
 - 0 marks will be given for blanks.

A maximum of 7 blank answers are allowed from each individual, after which all other blank answers will be considered as wrong.

- There will be 5 to 10 questions in the Senior/Junior Individual Round exclusively focusing on astronomical basics and recall of fundamental Astronomy facts.
- A “*Best Astronomer*” from each category will be selected based on the individual scores for this round. In the event of a tie, several tiebreakers (e.g., most correct answers) will be used to break the tie.
- The Junior Category Individual Round paper will not be the same as the Senior Category Individual Round paper.
- Scripts with illegible names or schools will be similarly not marked.



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Team Round

Duration: 2 hours

- Most of the questions are on applications in Astronomy.
- The team reserve cannot take part, unless one member of the team is absent and/or unwell. Only a maximum of 4 participants per team may take part in the Team Round.
- There will be up to 5 structured questions. Each structured question will contain around 20 marks, up to a total of 100 marks.
- In the interests of fairness, the points awarded to the team for this round is the total sum of marks awarded across all questions, capped at a maximum of 80 marks.
- The first structured question will contain short open-ended questions that focus on testing factual understanding and recall of astronomical basics.
- In addition, for the Seniors, 1 structured question (DAQ) will be released on 6th April 2024 through the website and will be due for submission by **18th May 2359 SGT** (GMT+8), BEFORE Day 1. The deadline is strict. For further instructions such as how to format the submission, refer to point number 6 above.
- The use of a cheat sheet is permitted for this round. Each participant is allowed to prepare a single piece of A4-sized paper (double sided) with **handwritten** materials. Participants are also allowed to share their cheat sheets within the team during the round.



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Observation Round (Senior Category only)

Relative Weightages:

Round Name	Weightage
Theoretical Observation	50%
Practical Observation	50%

Duration:

Theory: 1.5 hours

Practical: as long as it takes but no later than 2230

Venues:

Theory – NUS LT7A, on Day 2

Practical – NTU North Spine Rooftop, on Day 1 (There will be ushers to guide participants to the exact venue on the day itself.)

- This is an inter-school round.
- Each school may send **up to 5 participants** to participate in this round. The school can choose these number of participants out of all its participating teams to form the observation team. The score obtained by this observation team will be the observation score for all teams for that school.
- The Two components will be explained further in detail below:

Theory Component

- This round mainly tests Participant's knowledge of how to stargaze in theory. As such, other than the fact that no scope handling is tested, anything else under the universe can be tested.
- Teams might be split into two for some or all components of the paper.
- The Theory Component shall be **closed book**. You may not bring in any material for the test to refer to. Doing so will result in your disqualification and related investigative procedures.
- The stargazing software that may be used in the theoretical observation round is Stellarium (<https://stellarium.org/>). The question may involve finding deep sky objects or pointing out particular stars and constellations (analogous to practical observation round).
- Participants are highly recommended to familiarise themselves with the program prior to the competition, and take note of the following additional settings:



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- Unless otherwise stated, time zone and location are set to those of Singapore.
- Time may or may not be paused.
- What will be shown: stars, planets and deep sky objects (subject to sky condition settings), the ground.
- What will NOT be shown: labels for celestial objects, constellation lines, celestial coordinates grid.
- Only keyboard navigation – directional arrow keys, PgUp & PgDown to zoom – is allowed.
- Unless otherwise stated, viewing options will be standardised as follows:
 - Atmosphere: On.
 - Light pollution: 3.
 - Labels and Markers: All off.
 - Projection: Stereographic.
- If tested, the telescope and miscellaneous settings in the Oculars plugin will be revealed on the day itself. If the Oculars plugin is not used, participants may switch between Equatorial and Azimuthal Mount mode as they deem fit.
- For further information, please see our website for a briefing about the Observation Round closer to the date.
- Participants are encouraged to practice finder chart drawings and finding using Oculars mode.

Practical Component

- The Practical Component of the observation round is held on Day 1.
- Members from other teams and visitors from schools are allowed to be silent observers for the practical component.
- Participants may bring along any reference materials, subjected to checks. These materials must be submitted for checking to the quizmasters beforehand for review.
- Only **2 people** from each school's Observation Team is allowed to proceed with setting up the telescope. They will be **randomly selected** from each school's Observation Team.
- Only telescope set-ups not deemed to be a danger to anyone around by the AC Core Committee are allowed to be used for the Practical Component.
- At any one time, only **1 person** from each school's Observation Team is allowed to handle the scope.
- Teams are to keep to their allocated areas.
- Participants are expected to complete their observation log sheets (provided). They will also be tested on their telescope handling and alignment skills. Judges will verify each object found by the team.



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- GOTO-enabled mounts/scopes and any form of computerised mounts/scopes are **NOT allowed** to be used during this round, **unless the motor and computer are switched off and the scope operated manually.**
- Participants are expected to pack their equipment in shock-absorbing material to ensure it will not be damaged during transportation.
- The organisers, the AC Core Committee, the judges, NTU and/or NUS will **not** be liable for any loss or damage of equipment at any point of time during the competition.
- This round is dependent on the weather and in case of bad weather, the AC Core Committee reserves the right to call off or replace the round.
- For the avoidance of doubt, the AC Core Committee cannot be held liable for the weather or other such frustrating events beyond their control



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Project Round

Please refer to the [Astrochallenge 2024 Project Round Information Sheet](#) for the specific rules and requirements for the round.

Exhibition round

- Do note that the AC Core Committee may choose to amend any of the below instructions as necessary. Notice will be given to you if the instructions are changed.
- Teams will be given a strict window of 30 minutes to set up. If teams are still setting up beyond this strict window, the AC Core Committee may impose a 20% overall penalty on your total project round score without notice.
- The time limit for each presentation is set to 5 minutes. All team members must participate in the presentation as well as the making of the project presentation. Thereafter, Judges may ask questions for up to 3 minutes. The time will be kept centrally by bells so as to be fair to everyone.
- Ensure that someone is at your project booth at all times. If a particular project booth is deserted for more than 60 seconds at any point within the exhibition segment, the AC Core Committee may impose a 50% overall penalty on your total project round score without notice. If your team does not appear at all, the marks allocated for the project round will be 0.
- Do note that the instructions for the Exhibition segment may be amended with notice due to unexpected circumstances or other conditions imposed by, inter alia, the government, NUS, NTU, our venue sponsors and/or the AC Core Committee.

(Optional) Video submission round

- Do note that the AC Core Committee may choose to amend any of the below instructions as necessary. Notice will be given to you if the instructions are changed.
- Video submissions from the team will be uploaded on AstroChallenge social media accounts.
- The time limit for each video submission is set to 1 minute. Every member in the group must participate and contribute clearly to the video. Otherwise, handicaps/penalties may be imposed to the judge's discretion.

You are reminded of the seriousness of passing off any other person's work as your own.



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Final Round

Duration: 2.5-3 hours (projected)

The **top five teams per category** (based on all preceding rounds) will take part in this round. Only 1 team from each school per category can qualify for the Final Round.

- Only 4 participants are allowed for each team. The reserve member is not allowed to take part.
- In the event that 2 or more teams from a school qualify for the Final Round, only the top team will participate in the Final Round. The next team will be bumped up.

Illustration: The rankings for AC are as follows

1. Lower Kent School Team 1
2. Lower Kent School Team 2
3. Upper Kent School Team 1
4. South Holland School Team 3
5. Upper Serangoon Institute Team 4
6. South Holland School Team 2
7. Upper Kent School Team 3
8. Lower Thomson School Team 1
9. Lim Chu Kang Institute Team 3

The Qualifications for the final round will be as follows:

1. Lower Kent School Team 1
2. Upper Kent School Team 1
3. South Holland School Team 3
4. Upper Serangoon Institute Team 4
5. Lower Thomson School Team 1

Lower Kent School Team 2 is not in the finals because Lower Kent School Team 1 is already in the finals and was ranked higher. South Holland School Team 2 is bumped up but since South Holland School Team 3 had already qualified, it is similarly not in the finals. So on and so forth.

- The Final Round components will be changed this year and the details will not be released as of now.



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Score Weighting for Preliminary Rounds

Round Name	Junior	Senior
Individual	30%	20%
Team	30%	20%
Observation	N/A	30%
Project	40%	30%
Total	100%	100%

Score Weighting for Grand Total (for both Juniors and Seniors)

Round Name	If Online	If Physical
Preliminaries	40%	30%
Finals	60%	70%
Total	100%	100%

The round weightages for AstroChallenge 2024 are provided to serve as a strategic guide for participants. The Core Committee and/or the QM Committee reserve the right to amend the weighting should it be decided necessary or expedient at any point in the competition, with or without prior notice.



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Appendix C: Memorandum from the Head Question Master

Dear Participants,

Welcome to AstroChallenge 2024 and welcome back to students who have participated in previous iterations of AstroChallenge! Greetings, my name is Ting Jun Rui, and I am serving as AstroChallenge Head Question Master for AstroChallenge 2024. I am a 1st Year NUS Physics and Computer Science student, and this is my first time on the other side, serving in the organising committee in AstroChallenge after years of participating.

Similar to previous iterations of AstroChallenge, we are keeping to the same structure and broad aims. My goal, as Head Questionmaster, would be to craft and organise a fun and engaging paper, programme and learning experience for all our participants.

The syllabus may seem daunting especially to the first-timers. However, do keep in mind that no one is expected to know the syllabus completely! You can prepare beforehand to learn the concepts and ideas (which you should!), but please do not treat this as an Olympiad! You can see this competition as a low stakes, yet rigorous and fun competition to flex your knowledge in Astronomy and Astrophysics and potentially (hopefully!) learn something new from!

On behalf of my very talented and meticulous team of Question Masters, we are humbled by and appreciative of your interest in AstroChallenge, we hope that you will find enjoyment and a meaningful experience from AstroChallenge!

Best of luck,
Ting Jun Rui (Mr.)
Head Question Master of AstroChallenge 2024