



AstroChallenge 2020

To: Teachers-in-charge and Participants

On behalf of the Organizing Committee, I would like to thank you for your keen interest in **AstroChallenge 2020**. The contents of this letter include important issues and rules to take note of:

1.) *Competition Dates*

In view of feedback from several teachers and students, we will be pushing back Day 1 to the first week of the June holidays, fitting into the timeslot left by the IPS trip. Accordingly, the dates and start time of the competition are:

Day 0 – 23 May, 09:00 (online only)

Day 1 – 6 June, 09:00

Day 2 – 13 June, 09:00

Should the situation improve by Day 0 23 May, we will be implementing a physical version of AstroChallenge with appropriate safe distancing measures. Otherwise, AstroChallenge will be held online this year. Confirmation will be released closer to the date.

2.) *Payment*

The registration fee for each Junior or Senior team will be decreased to **\$60**. **For groups with 3 or fewer members** at the point of registration, **\$20 per person** will be levied. We will be accepting PayNow transactions for payments with regards to the registration fee. Detailed payment instructions will be given to the registered teams after the registration deadline.

This registration fee serves to defray the costs of the competition (e.g. prizes, certificates and the cost of online examination platforms). Please also note that an **additional administrative fee of \$10 may be charged** if there is any change in team composition *after* the registration deadline.

3.) *Schedule of Events*

Please refer to Appendix A. Please note that in view of current events, the schedule is highly fluid and subject to changes.

4.) *Observation Round Location*

Should there be a physical version of AstroChallenge, the Practical Observation Round will be held in the NUS Field. More information on depositing equipment will be given during the briefing on Day 0.

5.) *Rules and Regulations*



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In view of the recent format changes, **the weightage of certain rounds in AstroChallenge has been modified**. Further information about the Rules and Regulations will be posted on our [website](#) and [Facebook Page](#).

6.) *Project Round*

The video and infographic for the Project Round must be **submitted by Day 0 (23 May)**. The files may be submitted via **email** or uploaded **online** and shared with us. Please note that the files **should NOT exceed 1 GB in size**. Please refer to the [Project Round Infosheet](#) as well as the Project Round Infosheet Update (Appendix D) for more information. Further updates and information will be posted on our [website](#) and [Facebook Page](#).

7.) *Things to possess for the competition*

- a. 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 (<https://www.seab.gov.sg/docs/default-source/documents/guidelinescalculators.pdf>).

- b. Telescope for participants in the Senior category on **6 June (Day 1)**.
- c. Completed Project on **23 May**.
- d. **Thermometer** for temperature taking

More details and updates on the aforementioned events will be provided on AstroChallenge website at <http://www.astrochallenge.org>.

Please contact us at astrochallenge@gmail.com if you have further enquiries. We look forward to seeing you at AstroChallenge 2020. Thank you.

Yours sincerely,

Grace Huang Wei (Ms.)
Chairperson
AstroChallenge 2020 Committee



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Appendix A – Schedule of Events for AstroChallenge

Under AC Online

Day 1: 6 June 2020

0900 – 0930	Registration/Attendance Checks
0945 – 1145	Individual Round
1145 – 1300	Lunch
1300 – 1430	Team Round

Day 2: 13 June 2020

0900 – 0915	Registration
0915 – 1200	Finals 1 (Junior Category)
1200 – 1215	Juniors Prize Presentation
1215 – 1330	Lunch
1330 – 1630	Finals 2 (Senior Category)
1630 – 1645	Seniors Prize Presentation

NB: Day 2 is by invite only. The Organizers will attempt to setup a livestream of the Finals

Under AstroChallenge (Physical Version)

Day 1: 6 June 2020

0900 – 0930	Registration (Equipment may be deposited at the designated area)
0930 – 1130	Individual Round
1130 – 1230	Lunch
1230 – 1430	Team Round
1430 – 1445	Observation Round Reminders (Senior Category)*
1500 – 1700	Observation Round – Theory Component (Senior Category)
1700 – 1930	Dinner Time & Telescope Setup (Senior Category)
1930 – 2200	Observation Round – Practical Component (Senior Category)

* Students taking part in Junior Category may be dismissed at 1430H

Day 2: 13 June 2020

0900 – 0915	Registration
0915 – 1200	Finals 1 (Junior Category)
1200 – 1215	Juniors Prize Presentation
1215 – 1330	Lunch
1330 – 1630	Finals 2 (Senior Category)
1630 – 1645	Seniors Prize Presentation

NB: Day 2 is by invite only. The Organizers will attempt to setup a livestream of the Finals



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Appendix B – Rules and Regulations for AC Online

Note: This set of rules (the default) are for the current format of an online only AstroChallenge. Should we receive the go-ahead to organize a physical AstroChallenge, we will follow the rules detailed in Appendix C. The main difference between the two sets of rules are weightage differences, and format of the Observation Round.

The organizing committee reserves the right to amend any of the rules contained herein. Participants will be notified of the relevant changes.

General rules

- Handheld communication devices or devices with storage and display capabilities (other than calculators) are not to be used during all the quiz rounds.
- Only scientific calculators found in SEAB's approved list of calculators are permitted. No other calculators will be allowed in this competition.
- Any team caught cheating will be subjected to disciplinary/remedial action, including immediate disqualification. The teacher-in-charge and their respective school will be notified in the event of cheating.
- The tabulation of total points is final. No further correspondence will be entertained.
- Top 50% of Individual Round, Team Round, Observation, and Project scores will be released. Full release of results will only be made upon the teacher-in-charge's request, and each school may only view its own students' scores.

Rules and Regulations for Specific Rounds:

Individual Round

Duration: 2 hours

- A maximum of 5 members per team can take part.
- The overall points for the Individual Round will be the average of the marks from the best 4 individuals in the team.
- The Individual Round Paper will be conducted on an online platform. For invigilation purposes, Zoom will be used concurrently. Participants are reminded not to use their phones during this period
- During the paper, you are NOT allowed to alt-tab/minimize the platform window. The platform will log instances of such activity.
- Participants are reminded to ensure that they have a stable internet connection for the duration of the Round. In the scenario where participants are unable to solve their internet connection problems, they should contact the organizers before the start of the Individual Round. Any requests during/after the Round ends will not be entertained.



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- 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 are considered wrong.

- The first 5/10 questions in the Senior/Junior Individual Round will exclusively focus on testing 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.

Team Round

Duration: 1.5 hours

- Most of the questions are on applications in astronomy.
- This will be an open book paper. However, the time provided for the Team Round will be **reduced by 30 minutes** compared to the usual physical format.
- The team reserve may take part for the AC Online version of the Team Round
- The points awarded to the team for this round is the total sum of marks awarded across all questions, up to a maximum of 80 marks.
- There will be a total of 5 structured questions. Each structured question will contain around 20 marks, up to a total of 100 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 Senior Category, 1 structured question (the Data Analysis Question) will be released on Day 0, and will be due for submission by 12 noon on Day 1 (6 June)
- Thus, the Junior Team Round Paper will contain 5 structured questions. The Senior Team Round Paper will contain 4 structured questions – the Data Analysis Question will have already been released on Day 0.



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Observation Round (Senior Category only)

Duration: 2 hours (Theoretical only)

- This is an inter-school round.
- Each school may only send only 3 people to participate in this round. The school can choose these 3 people out of all its participating teams. The score obtained by these 3 people will be the score awarded to all teams for that school.
- There will only be one component, namely the Theory component.

Theory Component

- The Theory Component will be held after the Team Round. This comprises a written test and the use of stargazing software and/or indoor practical tests.
- The Theory Component comprises a test administered through Zoom or similar software. AC Committee members will be paired with each school to administer the test online at the same time.
- Questions will be displayed by the AC personnel. Other parts of the paper may be sent to all schools beforehand if deemed necessary.
- Personal stargazing software and applications (e.g. Google Sky maps) are NOT permitted during the Theory Component unless specified.
- The questions will be displayed section by section. The AC personnel will only proceed to the next section if all 3 observation team members from the school agree.
- The Sky Tour component will be conducted live through Zoom or similar software.
- Some sections may require participants to scan (by printer or by smartphone) their answers and submit. Further instructions will be given during the competition.
- The stargazing software that may be used in the theoretical observation round is Stellarium (<http://www.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 familiarize themselves with the program prior to the competition, and take note of the following additional settings:
 - Unless otherwise stated, time zone and location are set to those of Singapore.
 - Time will 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.



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- Only keyboard navigation – directional arrow keys, PgUp & PgDown to zoom – is allowed.
- Unless otherwise stated, viewing options will be standardized as follows:
 - Atmosphere: On.
 - Light pollution: 6.
 - 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.

Project Round

Please refer to Appendix D for AstroChallenge 2020 Project Round Entry Rules and Regulations.

Final Round

Duration: 2.5 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.

Round 1: Practical Jeopardy Round

- Each member of the team is to select a category, and then answer questions without help from the other members.
- Questions in this round largely revolve around practical astronomy.
- Each question is worth 20 points. The full score in this round will be 80 points.

Round 2: Game Round

- The Game Round will comprise of 20 questions done via the Kahoot format. All members will individually take part in this round. Their scores will then be summed up at the end of the round to form the team score.
- The full score in this round will be the top scoring final team's score.



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Round 3: Theory Jeopardy Round

- Each member of the team is to select a category, and then answer questions without help from the other members.
- Questions in this round largely revolve around theoretical astronomy.
- Each question is worth 20 points. The full score in this round will be 80 points.

Score Weighting for Preliminary Rounds

	Junior	Senior
Round 1 – Individual	35%	30%
Round 2 – Team	30%	25%
Round 3 – Observation	-	15%
Round 4 – Project	35%	30%
Total	100%	100%

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

- 35% Preliminary Rounds
- 20% Practical Jeopardy Round
- 25% Game Round (Kahoot)
- 20% Theoretical Jeopardy Round

The weighting for AstroChallenge 2020 is provided to serve as a strategic guide for participants. The organizers reserve the right to amend the weighting pursuant to its discretion.



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Appendix C – Rules and Regulations for AstroChallenge (Physical version)

Note: This set of rules will be implemented should we receive the go-ahead to organize a physical AstroChallenge. Otherwise, we will follow the rules detailed in Appendix B. The main difference between the two sets of rules are weightage differences, and format of the Observation Round.

The organizing committee reserves the right to amend any of the rules contained herein. Participants will be notified of the relevant changes.

General rules

- Handheld communication devices or devices with storage and display capabilities (other than calculators) are not to be used during all the quiz rounds.
- Only scientific calculators found in SEAB's approved list of calculators are permitted. No other calculators will be allowed in this competition.
- Any team caught cheating will be subjected to disciplinary/remedial action, including immediate disqualification. The teacher-in-charge and their respective school will be notified in the event of cheating.
- The tabulation of total points is final. No further correspondence will be entertained.
- Top 50% of Individual Round, Team Round, Observation, and Project scores will be released. Full release of results will only be made upon the teacher-in-charge's request, and each school may only view its own students' scores.

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 are considered wrong.



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- The first 5/10 questions in the Senior/Junior Individual Round will exclusively focus on testing 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.

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 4 participants per team may take part in the Team Round.
- The points awarded to the team for this round is the total sum of marks awarded across all questions, up to a maximum of 80 marks.
- There will be a total of 5 structured questions. Each structured question will contain around 20 marks, up to a total of 100 marks.
- The first structured question will contain short open-ended questions that focus on testing factual understanding and recall of astronomical basics.
- In addition, 1 structured question (the Data Analysis Question) will be released on Day 0, and will be due for submission by 12 noon on Day 1 (6 June)
- Thus, the Junior Team Round Paper will contain 5 structured questions. The Senior Team Round Paper will contain 4 structured questions – the Data Analysis Question will have already been released on Day 0.

Observation Round (Senior Category only)

Duration: 2 + 2 hours (Theoretical + Practical)

Venues:

Theory – NUS Classrooms

Practical – NUS Field

- This is an inter-school round.
- Each school may send **only 3 people** to participate in this round. The school can choose these 5 people out of all its participating teams. The score obtained by these 5 people will be the score awarded to all teams for that school.
- There are two components for Observation Round, namely the Theory and Practical component.



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Theory Component

- The Theory Component will be held after the Team Round. This comprises a written test and the use of stargazing software and/or indoor practical tests.
- Personal stargazing software and applications (e.g. Google Sky maps) are NOT permitted during the Theory Component unless specified.
- The stargazing software that may be used in the theoretical observation round is Stellarium (<http://www.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 familiarize themselves with the program prior to the competition, and take note of the following additional settings:
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 - 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.

Practical Component

- The Practical Component of the observation round is held after dinner.
- Participants may bring along **any reference materials, subjected to approval.** These materials must be submitted to the quizmasters beforehand for review.
- Only **1 person** from each school's Observation Team is allowed to proceed with setting up the telescope. This person will be **randomly selected** from each school's Observation Team.
- Only telescope set-ups previously approved by the AC Organising Committee are allowed to be used for the Practical Component.



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- At any one time, only **1 person** from each school's Observation Team is allowed to handle the scope. The other members are allowed to use any reference materials but must remain **at least 1m away** from the telescope set-up. Teams can rotate between the participant handling the scope while maintaining the 1m rule.
- 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.
- GOTO-enabled mounts/scopes and any form of computerized 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 organizers, judges, NTU and 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 organizing committee reserves the right to call off or replace the round.
- The organizing committee of AstroChallenge 2020 cannot be held liable for the weather.

Project Round

Please refer to Appendix D for AstroChallenge 2020 Project Round Entry Rules and Regulations.

Final Round

Duration: 2.5 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.



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Round 1: Practical Jeopardy Round

- Each member of the team is to select a category, and then answer questions without help from the other members.
- Questions in this round largely revolve around practical astronomy.
- Each question is worth 20 points. The full score in this round will be 80 points.

Round 2: Game Round

- The Game Round will comprise of 20 questions done via the Kahoot format. All members will individually take part in this round. Their scores will then be summed up at the end of the round to form the team score.
- The full score in this round will be the top scoring final team's score.

Round 3: Theory Jeopardy Round

- Each member of the team is to select a category, and then answer questions without help from the other members.
- Questions in this round largely revolve around theoretical astronomy.
- Each question is worth 20 points. The full score in this round will be 80 points.

Score Weighting for Preliminary Rounds

	Junior	Senior
Round 1 – Individual	35%	25%
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Score Weighting for Grand Total (for both Juniors and Seniors)

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25% Game Round (Kahoot)
20% Theoretical Jeopardy Round

The weighting for AstroChallenge 2020 is provided to serve as a strategic guide for participants. The organizers reserve the right to amend the weighting pursuant to its discretion.



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Appendix D – Project Round Infosheet Update

This Appendix serves to update the [Infosheet](#) released previously on our website.

Updated Instructions

1. Your task is to explain an astronomy/astrophysics concept simply. (*Imagining yourself as a school teacher will help*).
2. There are two segments to this challenge: The video submission and infographic.
3. You will first choose **1 out of the 20** questions to **explain in a video of no more than 5 minutes in duration**. If your school is fielding multiple teams for the respective age category, you should not pick the same question as other teams from the same school
4. Following which, you will then submit this video for assessment to be reviewed by the organisers of AC2020. The deadline of submission is on **23 May 2020, 1800h** (Day 0).
5. The expected target audience for the video are members of the public, including students from secondary schools, polytechnics and junior colleges. Videos should thus be in an appropriate tone and mode of presentation.
6. In particular, the inclusion of excessive inside jokes that are not comprehensible to members of the public may lead to penalties.
7. Videos should not be excessively large – we recommend a 1 GB maximum. Videos larger than this limit often encounter playback issues.
8. Videos/infographics that are targeted to younger age-groups are more than welcome.
9. Concurrently, you should prepare an infographic/poster that allows you to **elaborate more** about your topic **in greater depth**, which your team might not have conveyed in the video.
10. The infographic/poster should be a **supplementary component**, not a rehash of your original video. Thus, teams are **strongly encouraged to split their content wisely**.
11. All infographic/poster submissions should **not exceed A3 in dimensions**.
12. In both segments, you may wish to use **any form of visual and audio aids** that you deem appropriate for the discussion.
13. Should you wish to seek any clarifications, you may write in to astrochallenge@gmail.com.



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Revised Weightages

Video Segment (60%)

Communication (Language and Ease of Understanding)	30%
Content	40%
Visual Aid/Presentation	20%
Teamwork	10%

Infographic Segment (40%)

Content	35%
Delivery (Organisation of content and Ease of Understanding)	45%
Aesthetic appeal	20%



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Project Round Infographic Rubrics

Criterion	Weightage	Approaching Expectations 0 – 3	Meeting Expectations 4 – 7	Exceeding Expectations 8 – 10
Accuracy and Depth of content	35%	Content captured in infographic is inaccurate with grave conceptual errors; content fails to go beyond the superficial or is plagiarised from source materials. Narrow scope with limited variety of concepts and ideas.	Content captured in infographic is somewhat accurate with few factual errors; Analysis of topic is limited or paraphrased from source materials, with a fair variety of concepts and ideas.	Content captured in infographic is largely accurate with negligible factual errors; Analysis of content boasts originality with an excellent presentation portraying a large variety of concepts and ideas.
Organisation and Delivery	45%	Filled with jargon that makes it difficult to understand in first glance. Organisation of information is haphazard and is a detriment to, rather than helping, the engagement factor.	Information had been broken down from complex concepts although some parts still employ unnecessary amount of jargon. Information is mostly organised to follow a logical path but may not engage the reader.	Easy to read, information has been simplified without affecting the content's logic and meaning. Organisation of information enhances the delivery and engagement potential of the infographic and guides the reader through a logical thinking path.
Creativity and Aesthetic appeal	20 %	The use of images distracts from the content rather than enhancing its delivery. Choice of images is jarring and may put off the reader.	Images used may be bland but are appropriate to the topic. While they may not enhance the appeal of the infographic, they nevertheless do not distract from it.	Images help to illustrate the points of the infographic, and help visualise the concepts being delivered more easily. They attract the reader to the infographic.