



AstroChallenge 2016

To: Teachers-in-charge and Participants

On behalf of the organizing committee, I would like to thank you for your keen interest in **AstroChallenge 2016**. The following contents of this letter include important issues and rules to take note of:

1.) Location and time to report

Day 0 (1st June) 10:30 – NUS, **Yusof Ishak House Student Lounge**

Day 1 (8th June) 09:00 – NUS, **LT27 (Please note the change in location)**.

Day 2 (11th June) 09:00 – NTU, **LT1A**

The respective maps for NTU and NUS (see Appendix IV) are included in this letter.

2.) Payment

The registration fee for **each Junior or Senior team** is **\$60.00**. Payment is by cash only. Collection of payment will be done on Day 0 (1st June) during registration. This registration fee serves to defray the costs of the competition and **does not** include the participants' meals. Participants will be ushered to the canteen for their meals. **Please also note that an additional administrative fee of \$10.00 will be charged** if there is any change in team composition after the registration deadline.

3.) Attire

Participants are encouraged to wear school uniforms (secondary schools and junior colleges) or society T-shirts (polytechnics).

4.) Itinerary

Please refer to Appendix I. Please note that the schedule may be subject to changes.

Please note that senior category participants are to deposit their equipment with us at the Faculty of Engineering Seminar Room, **E5 03-23**. Following which, they will then be guided back to **LT27** where the theory papers will be held. Participants in the junior category will gather at **LT27** upon arrival instead.

5.) Observation Round Location

Observation round will be held outside **LT3 and LT4**.



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6.) Rules and Regulations

Please note that the Observation Round has been modified since 2015. For more information, please refer to Appendix II, as well as our website. Further information about the Rules and Regulations will be posted on our [website](#) and [Facebook Page](#).

7.) Project Round

Project Round materials and presentation (*meant for the exhibition segment*) are to be COMPLETED beforehand and submitted on **Day 2** (11th June) during registration. Please refer to the general Rules and Regulations in Appendix II & III for more information. Further updates and information will be posted on our [website](#) and [Facebook Page](#).

8.) Consent and Indemnity Forms

We require all students to submit a Consent and Indemnity Form. A copy of the Consent and Indemnity Form is included in Appendix V. You may also download the form online at our website, http://www.astrochallenge.org/?page_id=19. All students should sign and submit the Consent and Indemnity Forms on **1st June** during registration at NUS.

9.) Things to bring for the competition

1. Writing materials and **scientific** calculator
2. Consent and Indemnity Forms for participants on **1st June**
3. Telescope for participants in the Senior category on **8th June**
4. Completed Project on **11th June**
5. Money for meals (You will be guided to the canteen during mealtimes.)

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 2016**. Thank You.

Best regards,
James Lim
President
AstroChallenge 2016 Committee



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Appendix I – Schedule

***Day 0 of AstroChallenge 2016: 1st June 2016 – NUS YIH Student Lounge**

| Time | Event |
|---------------|---|
| 10:00 – 17:00 | Registration, Payment and Project Round Part 1 submission |
| 10:30 – 12:00 | Icebreakers |
| 12:00 – 13:00 | Lunch |
| 13:00 – 14:00 | Project Round Part 2 Briefing |
| 14:00 – 15:00 | Conceptual Q&A with QMs |
| 15:00 – 17:00 | Obs Round Briefing (includes movement to LT3/4) |

*At least one representative from each school must be present for this day. Attendance is highly recommended, especially for students with queries about AstroChallenge 2016.

****Day 1 of AstroChallenge 2016: 8th June 2016 – NUS LT 27**

| Time | Event |
|---------------|---|
| 09:00 – 10:00 | Attendance taking (Seniors)/ Equipment deposit @ E5 03-23 |
| 09:30 – 10:00 | Attendance taking (Juniors) @ LT27 |
| 10:00 – 10:30 | Opening Address |
| 10:30 – 12:30 | Multiple Choice Questions Round |
| 12:30 – 14:00 | Lunch |
| 14:00 – 16:15 | Data Response Questions Round |
| 16:15 – 16:30 | Observation Round Reminders (Senior Category) |
| 16:30 – 18:00 | Telescope Setup Retrieval @ E5 03-23 |
| 16:30 – 20:00 | Dinner Time & Telescope Setup |
| 20:00 – 22:00 | Observation Round (Senior Category) |

** All events are compulsory except for the **Observation Rounds (Senior Category only)**.

*****Day 2 of AstroChallenge 2016: 11th June 2016 – NTU LT 1A**

| Time | Event |
|---------------|---|
| 09:00 – 09:15 | Registration and Briefing |
| 09:15 – 12:30 | Project Round |
| 12:30 – 14:00 | Lunch + Arrival of Guest of Honour and Judges |
| 13:30 – 14:00 | MCQ/DRQ Debrief (Optional) |
| 14:00 – 16:00 | Finals 1 (Junior Category) |
| 16:00 – 16:30 | Break + Refreshment |
| 16:30 – 18:45 | Finals 2 (Senior Category) |
| 18:45 – 19:15 | Prize Presentation |
| 19:15 – 20:00 | Interaction Time (Optional) |

*** Subjected to changes.



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Appendix II – Rules and Regulations

Note: The following list comprises the rules for all the rounds in AstroChallenge. The organizing committee reserves the right to amend any of the rules contained herein this list. 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.
- Graphic and financial calculators are not allowed.
- Any team caught cheating will be subjected to disciplinary/remedial action, including immediate disqualification. The teacher-in-charge and their respective schools will be notified in the event of cheating.
- The tabulation of total points is final. No further correspondence will be entertained.
- Top 50% of MCQ individual scores, DRQ, Observation, and Project team 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:

Multiple Choice Questions (MCQ) Round

Duration: 2 hours

- This is an individual round.
- Most of the questions in this round will be qualitative.
- A maximum of 5 team members 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 MCQ round will be the total marks from the best 4 individuals in the team.
- There will be a total of 50 questions. Participants start off with 50 points.
- Two (2) marks will be given for a correct answer, -1 mark for a wrong answer and 0 marks for blanks. A maximum of 7 blank answers are allowed from each individual, after which all other blank answers are considered wrong.
- 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 MCQ paper will not be the same as the Senior Category paper.



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Data Response Questions Round

Duration: 2 hours

- This is a group round.
- Most of the questions in this round will be quantitative, with respect to applications in astronomy.
- The team reserve cannot take part, unless one member of the team is absent and/or unwell. Only 4 participants of the team can take part in Data Response.
- The points awarded to the team for this round consist of the total marks tabulated from all the questions.
- There will be a total of 5 Data Response Questions. Each question is independent of one another.

Observation Round (Senior Category only)

Duration: 2-3 hours (depending on the weather)

Venue: NUS Engineering bridge (area outside LT3, LT4)

- This is an inter-school round.
- Each school can only have **ONE team (5 people)** in the observation round. If the school has more than 1 participating team, all teams will get the same points as the participating team. The school can choose 5 people out of all its participating teams to participate in this round.
- Participants may bring along any reference materials, subjected to approval. These materials must be submitted to the quizmasters beforehand for review.
- 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 2016 cannot be held liable for the weather.



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- In case of bad weather, this round will be substituted with a theoretical observation round, which may comprise a written test and/or the use of stargazing software and/or indoor practical tests.
- Personal stargazing software and applications are NOT permitted during the theoretical observation round unless specified (e.g. Google sky maps). However, printed/written material such as observation plans and finder charts **may** be permitted for specific components.
- 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 not be paused.
 - What will be shown: stars, planets and deep sky objects (subject to sky condition settings), cardinal points, 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.
 - Sky and viewing options settings: 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.
 - For further information, please see our website for a briefing about the Observation Round.

Project Round

Please refer to Appendix III for AstroChallenge 2016 Project Round Entry Rules and Regulations.

Final Round

Duration: 2.25 hours (projected)

The **top five teams** (based on all the rounds from the Senior and Junior Categories will take part in this round. In addition, there will be a **sixth team** composed of **4 individuals** with the highest MCQ scores from different schools that are not already represented in the finals.



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Should there be less schools than available slots, the next highest scoring individuals will be selected.

- Only 4 participants are allowed for each main team. The fifth member is not allowed to sit together with the team.
- Only 1 team from each school per category can qualify for the Final Round.
- 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.
- Should a qualifying participant from the 6th team is absent, the next highest scorer will be selected to participate.

Round 1: Individual Round

- Each member of the team is to answer questions without help from the other members.
- Questions in this round are categorical and largely contain questions pertaining to practical astronomy.

Round 2: Mystery Round

- The rules regarding this round will be revealed on the day itself.

Round 3: Buzzer Round

- The Quizmaster will indicate who has first hit the buzzer before the team is allowed to answer the question. There will be a visual or other sensory cue to determine which team hits the buzzer first.
- Teams are expected to answer immediately after buzzing in. Judges reserve the right to penalize teams that do not answer within a reasonable amount of time.
- The team will be given a time limit to answer the question. If the answer is incomplete or not given after the time limit, the team is deemed to have given an incorrect answer. The question may then be opened to the rest of the teams.
- In the event of a dispute, the judges and organizers reserve the right to have the final say in the accuracy of the answer, and the award of points. The judges' decision is final.



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Score Weighting (AstroChallenge 2016)

| | Junior | Senior |
|-------------------------|--------|--------|
| Round 1 – MCQ | 35% | 25% |
| Round 2 – Data Response | 35% | 25% |
| Round 3 – Observation | - | 30% |
| Round 4 – Project | 30% | 20% |
| Total | 100% | 100% |

Grand total = $0.2 \times$ Total from Final Round 1 in % + $0.3 \times$ Total from Final Round 2 in % + $0.3 \times$ Total from Final Round 3 + $0.2 \times$ Total for Preliminary Rounds in %.

The sixth team's Preliminary Round score will be a weighted average of their respective schools.

The weighting for AstroChallenge 2016 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 III – Explain Like I’m 5 (ELI5)

Your team is to **choose and answer one challenging question in the field of astronomy, cosmology and astrophysics**. However, you are to convey the answer using a simple video format, aimed at educating a typical 5-year-old child. As such, please ensure that your explanation is as concise and accurate as possible, while being extremely easy to understand.

You will find the list of questions below, of which your team is to select **1 out of the 30** questions.

Summary of Instructions

1. Your task is to explain an astronomy/astrophysics concept simply. (*Imagining yourself as a school teacher or a parent talking to a 5-year-old child will help*).
2. There are two segments to this challenge:
3. You will first choose **1 out of the 30** questions to **explain in a video of no more than 5 minutes in duration**.
4. Following which, you will then submit this video for assessment to be review by the organisers of AC2016. The deadline of submission is on **1st June 2016, 1800h** (Day 0).
5. Your video could be shown to students from a Primary school for educational purposes, and thus should be in an appropriate tone and mode of presentation.
6. **On AC2016 Day 2**, you will **set-up a booth and present a discussion of the question** to judges. In this segment, you are to set-up an exhibition to **elaborate more** about your topic **in greater depth**, which your team might not have conveyed in the video.
7. The presentation should be **no longer than 8 minutes** and should be a **supplementary component**, not a re-screening of your original video.
8. In both segments, you may wish to use **any form of visual and audio aids** that you deem appropriate for the discussion.
9. For the full instructions for the project round, please refer to our website <http://astrochallenge.org>.

Should you wish to seek any clarifications you may contact Clarence @ clarenceliuhh@hotmail.sg or write in to astrochallenge@gmail.com



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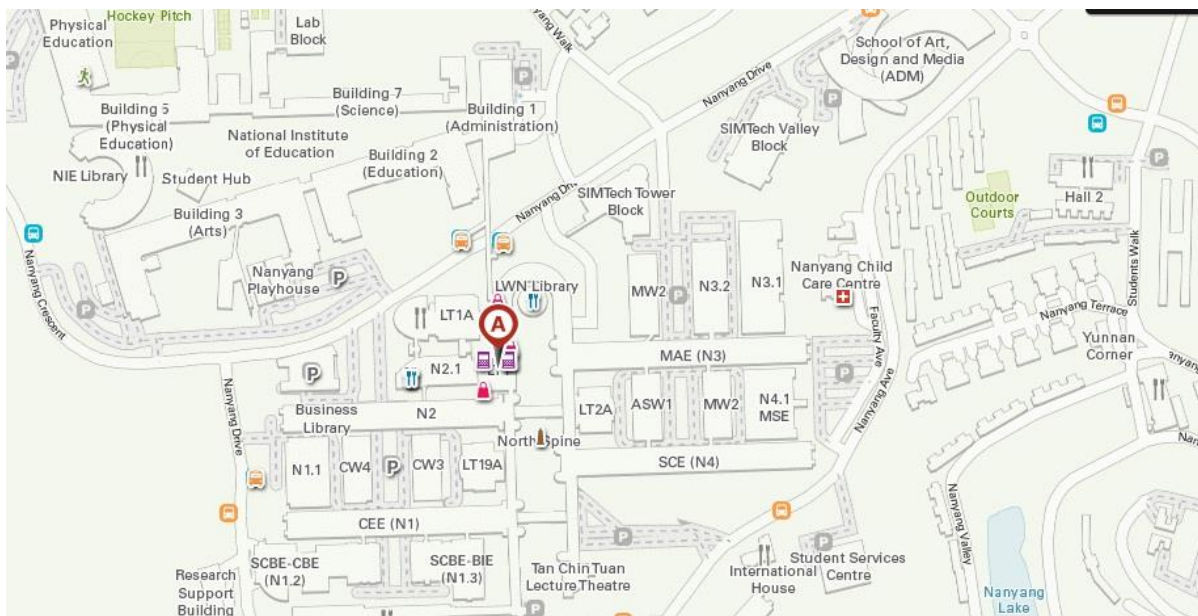
| <i>No.</i> | <i>Question</i> |
|------------|--|
| 1. | Why is Carbon important to life? |
| 2. | Is Earth unique? |
| 3. | What are the problems of living in space? |
| 4. | How do you detect exoplanets? |
| 5. | What is the cause of seasons? |
| 6. | What is the celestial sphere? |
| 7. | What is an eclipse? |
| 8. | Why do lunar eclipses not occur every month? |
| 9. | How were the first elements formed? |
| 10. | What is the fate of the Universe? |
| 11. | What is the Big Bang? |
| 12. | How do we know there is dark energy and dark matter? |
| 13. | Is there a limit to how far you can see? |
| 14. | Is Earth at the centre of the universe? |
| 15. | What are some tests for General Relativity in space? |
| 16. | Can you see a black hole? |
| 17. | How do you know if a group of stars are from a cluster? |
| 18. | Why do astronomers observe in different wavelengths of light? |
| 19. | How do you measure distances to a galaxy? |
| 20. | Are colours in Astrophotography real? |
| 21. | How can I use the constellations to determine my location and/or date? |
| 22. | Why are there so many types of telescopes? |
| 23. | Should Pluto be a planet? |
| 24. | What are Trojans and Centaurs in space? |
| 25. | How was the solar system formed? |
| 26. | What are comets? |
| 27. | Explain the life and death of stars. |
| 28. | What are nebulae? |
| 29. | Why do stars have different colours? |
| 30. | Why do stars spin? |



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Appendix IV – Maps of Competition Venues

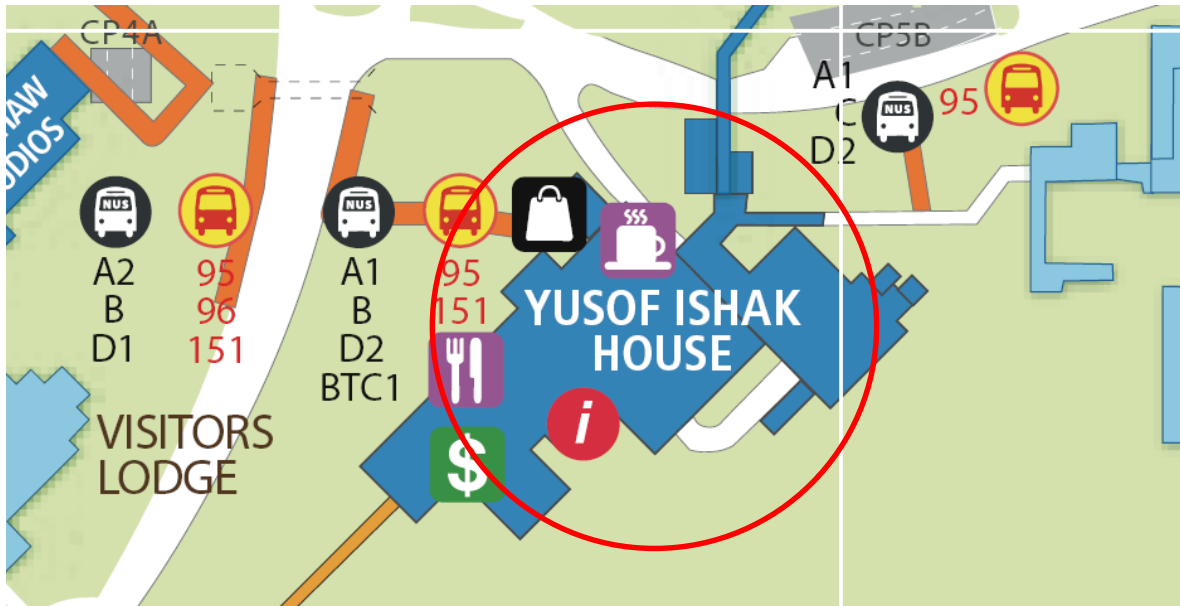
Map of NTU – LT1A



If you need direction to go to LT1A from Pioneer MRT by bus 179, please refer to this link:
<http://goo.gl/maps/8L7dP>

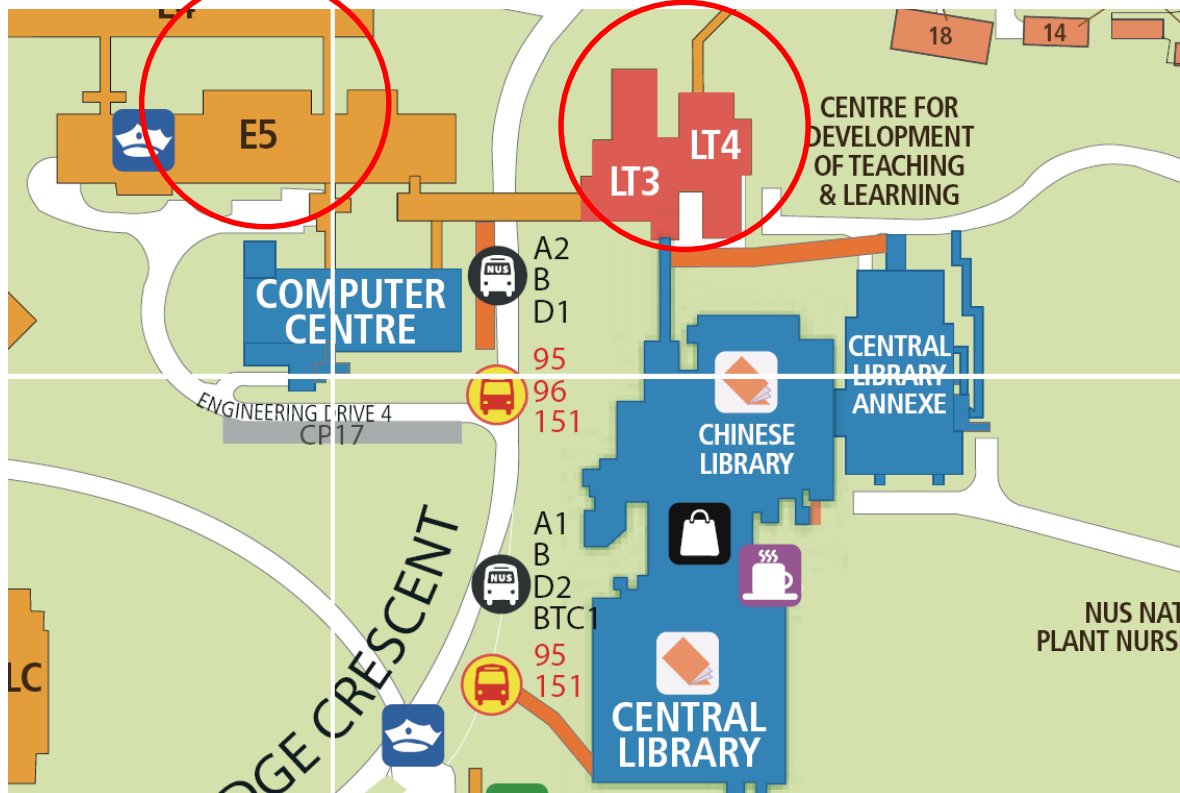
Map of NUS

Yusof Ishak House (Day 0)



You may take shuttle bus A1, D2 or public bus 95 from Kent Ridge MRT Station to get to the Yusof Ishak House.

LT3/4 and E5



Similarly, you may take shuttle bus A1, D2 or public bus 95 from Kent Ridge MRT Station and alight at the Central Library. We will be taking a short tour at the end of Day 0.

NUS LT27



If you need direction to go to LT27 NUS from Kent Ridge MRT by bus 95 or NUS Internal Shuttle Bus A1 or D2, please refer to this link: <http://goo.gl/maps/I21VO>