AstroChallenge 2017

To: Teachers-in-charge and Participants

On behalf of the organizing committee, I would like to thank you for your keen interest in **AstroChallenge 2017**. The following contents of this letter include important issues and rules to take note of:

1.) Location and time to report

Day 0 (26 May) 14:00 – **NTU Block NS4, Tutorial Rooms TR+8/TR+9**

Day 1 (29 May) 09:00 – **NTU, Tan Chin Tuan Lecture Theatre**

Day 2 (3 June) 09:00 – **NUS, LT27**

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

2.) Payment

The registration fee for each Junior or Senior team is **$60, or $15 per person** for groups with **less than 3 members** at the point of registration. Payment is by cash only. Collection of payment will be done on Day 0 (26 May) 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 may 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) so that they can be identified by their school.

4.) Schedule of Events

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

5.) Observation Round Location

The observation round will be held at the **foyer outside Tan Chin Tuan Lecture Theatre**. The equipment for observation round can be deposited within the grounds of the Lecture Theatre for the day itself before the activity.

6.) Rules and Regulations

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

7.) Project Round

The video for the Project Round must be **submitted by Day 0 (26 May)**. The video file may be submitted via **email**, or loaded into a **thumb drive** which will then be copied over to our computers on Day 0.

Project Round materials and presentation meant for the **exhibition** segment are to be COMPLETED beforehand and **submitted on Day 2 (3 June)** during registration. Please refer to the general Rules and Regulations in Appendix B & C for more information. Further updates and information will be posted on our website and Facebook Page.

8.) Things to bring for the competition

1. Writing materials and **scientific** calculator (graphic calculators are NOT allowed)

2. Telescope for participants in the Senior category on **29 May (Day 1)**

3. Completed Project (video file) on **26 May**, materials for exhibition on **3 June**

4. 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 2017. Thank you.

Yours sincerely,

Lam Ka Ying (Ms.)
Chairperson
AstroChallenge 2017

Appendix A – Schedule of Events

Day 0: 26 May 2017 – NTU Block NS4 Tutorial Rooms TR+8 & TR+9

1600 – 1900	Registration, Payment and Project Round Part 1 submission*
1600 – 1700	Schedule Briefing & Update of Changes
1700 – 1800	Conceptual Q&A with QMs
1800 – 1900	Dinner**
1900 – 2100	Observation Round Briefing (Senior Category)

*At least one representative from each school must be present for this day. Attendance is highly recommended, especially for participants with queries.
**Students taking part in Junior Category may be dismissed at 1800H

Day 1: 29 May 2017 – NTU Tan Chin Tuan Lecture Theatre

0900 – 1000	Registration (Equipment may be deposited in the LT)
1000 – 1030	Opening Address
1030 – 1230	Multiple Choice Questions Round
1230 – 1400	Lunch
1400 – 1615	Data Response Question Round
1615 – 1630	Observation Round Reminders (Senior Category)*
1630 – 2000	Dinner Time & Telescope Setup (Senior Category)
2000 – 2200	Observation Round (Senior Category)

* Students taking part in Junior Category may be dismissed at 1615H

Day 2: 3 June 2017 – NUS LT27

0900 – 0915	Registration and Briefing
0915 – 1230	Project Round
1230 – 1400	Lunch time and Post-Mortem
1330 – 1400	MCQ/DRQ Debrief (Optional)
1400 – 1615	Finals 1 (Junior Category)
1615 – 1645	Break & Refreshments
1645 – 1900	Finals 2 (Senior Category)
1900 – 1930	Prize Presentation
1930 – 2000	Interaction Time (Optional)

Appendix B – 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.

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: NTU LT1A Foyer

- 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 2017 cannot be held liable for the weather.

- 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 (e.g. Google sky maps) are NOT permitted during the theoretical observation round unless specified. 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 C for AstroChallenge 2017 Project Round Entry Rules and Regulations.

Final Round

Duration: 2.5 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. 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.

Score Weighting for Preliminary Round

	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%

Score Weighting for Finals Round (for both Juniors and Seniors)

40% Final Round 1: Jeopardy Round (Individual and Team Segment)
30% Final Round 2: Game Round
30% Final Round 3: Buzzer Round

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

20% Preliminary Round
80% Finals Round

The weighting for AstroChallenge 2017 is provided to serve as a strategic guide for participants. The organizers reserve the right to amend the weighting pursuant to its discretion.

Appendix C – 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: The video submission and live booth
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 AC2017. The deadline of submission is on **26 May 2017, 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 **3 June**, 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 Ivan at +65 90029906 or email bokivan@hotmail.com, or write in to astrochallenge@gmail.com

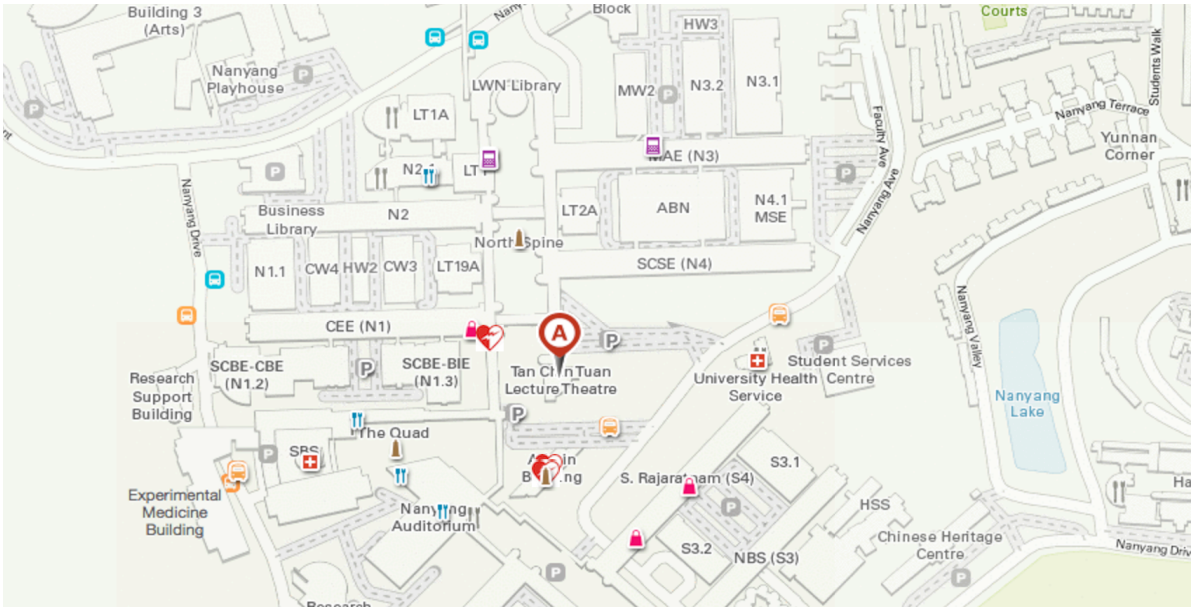
S/N	Question
1.	What are orbital resonances and why do they happen?
2.	Does the North Star ever move?
3.	Why do we only see one side of the moon?
4.	Why doesn't the moon fall towards the Earth?
5.	Should I buy a Refractor or Reflector telescope (or something else)?
6.	How can I make my very own Telescope?
7.	How can I take a good photograph of a planet?
8.	How may astronomers, including you and I, take an image of the sun?
9.	What is a meteor shower and how can I best see one?
10.	How can I find out where I am, using only the night sky?
11.	How do we find planets beyond the solar system?
12.	How do we detect black holes?
13.	What is Radio Astronomy about?
14.	What are gravitational waves and what's so special about their discovery?
15.	How do we know what the stars are made of?
16.	How can we travel to Mars and what challenges will we face?
17.	Can we make any terrestrial planet habitable?
18.	How are stars in an Open Cluster different from stars in a Globular Cluster?
19.	Red Dwarfs, Brown Dwarfs, White Dwarfs and Black Dwarfs – why are these stars so small, yet so different?
20.	How did all the planets in the Solar System form?
21.	Is Planet X for real?
22.	What are comets and why do they have tails?
23.	I heard that the northern lights are disappearing. Is this true?
24.	Do we truly know what gravity is?
25.	How do we know that the Universe is expanding?
26.	How can we tell how old the Universe is?
27.	It is said that the dinosaurs went extinct in the K-T extinction event because of a collision between Earth and a huge asteroid. Will an asteroid impact cause human extinction?
28.	Could a nearby supernova pose a threat to us?
29.	What will happen if we have two moons?
30.	Where else am I likely to find life, besides Planet Earth?

Appendix D – Maps of Competition Venues

Map of NTU – Tutorial Rooms TR+8 and TR+9 (For Day 0)
Location of Rooms: Block NS4 NS4-05-86 and NS4-05-87

If you need directions to go to TR+8/+9 from Pioneer MRT by bus 179, please refer to this link: http://goo.gl/maps/8L7dP Drop of at Lee Wee Nam Library and walk to Block NS4.

Map of NTU – Tan Chin Tuan Lecture Theatre (For Day 1)



For directions to TCT LT from Pioneer MRT by SBS Bus 179, kindly refer to this link: http://goo.gl/S2i3p4

Map of NUS - NUS LT27 (For Day 2)

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