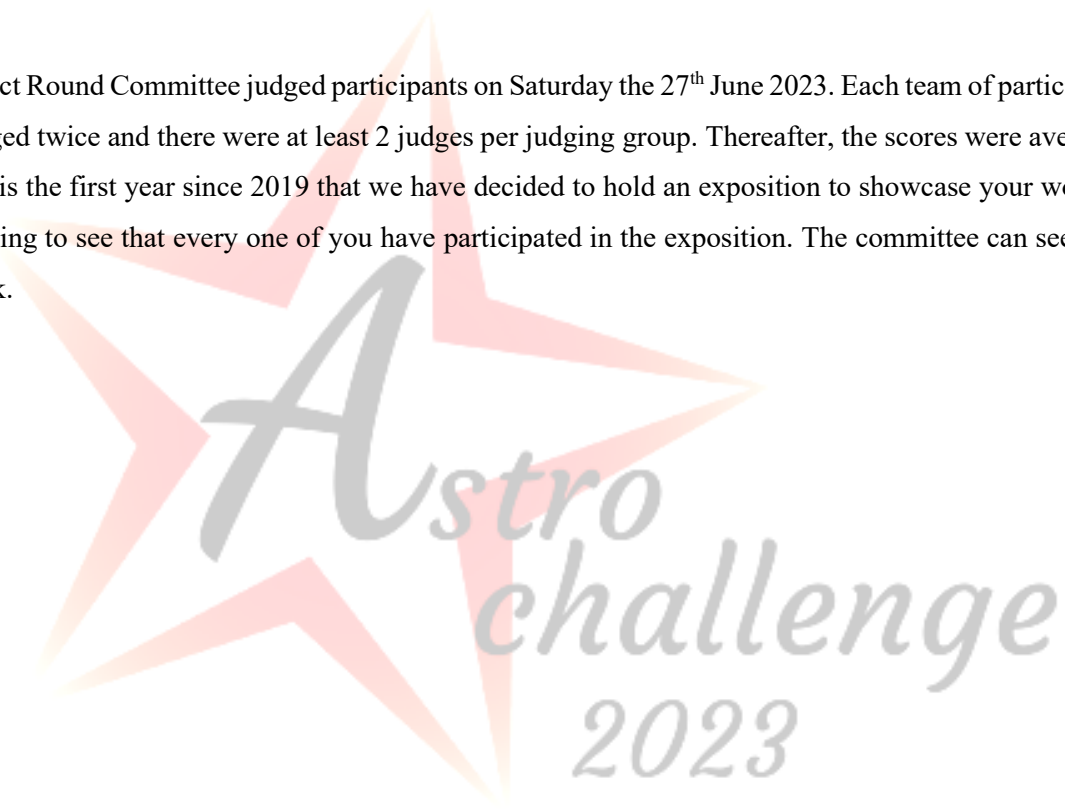


Report
Of the AC2023 Project Round Committee
On
Participant Performance
In the Project Round

The Project Round Committee judged participants on Saturday the 27th June 2023. Each team of participants were judged twice and there were at least 2 judges per judging group. Thereafter, the scores were averaged out. This is the first year since 2019 that we have decided to hold an exposition to showcase your work. It is heartening to see that every one of you have participated in the exposition. The committee can see your hard work.



General Comments:

It would be good if all teams can indicate the question number they attempted somewhere. For most teams, identifying the question answered is not a problem. However, for some confusing ones, it would be.

1. On-Time Rate

There was a significant list of teams who failed to submit their work on time or failed to send the list of references as required.

2. Deduction Rate

Naturally, the list of teams were awarded various penalties. Overall, the number of teams penalized is more than that in 2022.

3. Non-submission rate

3 teams in total failed to submit their posters by the stipulated deadline. However, all teams did participate in the exposition and this we are extremely heartened to see.

4. Presentation Quality

The presentation quality varied between teams. Some teams suffered a disadvantage because of this. Some teams actually benefitted from presentation. We are heartened to see skits being acted out.

5. Exemplary Projects

The committee would like to commend the Best Project winners as declared.

In addition to the above, the projects by RI/1 (for the interesting skit acting), ACSI/1 (for painstakingly handwriting their poster) and RVHS/1 (for effort put in complying with the instructions) from the Senior Category were commendable. From the Junior Category, NYGH/1 stood out for trying a topic which no one else had tried and for putting in a lot of effort. The committee would like to encourage these teams to keep up the good work and others to seek inspiration from them. A copy of their posters will be published in due time.

Question-by-Question

Q1: Introduce an existing or past space station. Explain what it has achieved, or it is planned to achieve in its life time.

Expectations: Name the space station, explain the space station sufficiently clearly such that anyone who doesn't know about it would at least be appraised of who sent it up, what it looks like, from when to when it is operational and if it has achieved anything or not or is planned to.

What really happened: Only one junior team attempted this. It was quite good a job.

Q2: Explain what are pulsars. What scientific significance do they have?

Expectations: Define a pulsar as a neutron star which rotates quickly. Tells us what is pulsed out. Scientific significance: explain what we can learn from pulsars and how that information learnt is useful.

What really happened: many teams tried this question. Good teams summarized the answer and addressed the question. Others did not do so.

Q3: How do we know the size of the Universe?

Expectations: Tells us the actual estimated size of the Universe and the methods in which we can use estimate the size PLUS historical methods and estimates. Good answers will be comparing the actual size and the visible size of the universe.

What really happened: a few teams tried this question. Not all of the requirements were answered however.

Q4: How did the Solar System come about?

Expectations: Correct chronology of events, general planetary migration models. (Can talk about nice model, formation of the moon etc.). How do we date the solar system (eg. Age of the sun as an upper estimate).

What really happened: a few teams tried this. The good ones legitimately did address all of the points above and did quite well.

Q5: What are the different types of galaxies out there? How are they different in the early universe?

Expectations: List all the key different types of galaxies according to the Hubble tuning fork at least (At least spirals, ellipticals, irregulars, lenticulars).

Talk about the formation and about how galaxies used to be more irregular. Explain not just how but also why galaxies were how they used to be and why they are different now.

What really happened: quite a number of teams tried this. However, none of the teams stood particularly out.

Q6: What are some of the most interesting exoplanets found? Why are they interesting?

Expectations: Give at least 2 interesting exoplanets of different types along with their unique or special properties. The exoplanets must be interesting enough for the judges. Minimally, talk about how they were discovered and how their properties were measured. Note that being the “First discovered” does not generally count as a unique property. Unique properties must be explained to be interesting.

What really happened: quite a number of teams tried this. What was notable was that this did appear to be a good entry level question and teams generally did a good job for the poster. Unfortunately, upon being questioned, some teams started smoking liberally.

Q7: Explain the sources of the different colors observed in photographs of nebulae.

Expectations: Differentiate by type of nebulae (scientific approach is the main focus) From an astrophotography focus, false and real colors should be explained. For instance, how Astrophotography can enhance different wavelengths of light.

What really happened: a handful of teams tried this question. Most did not too badly.

Q8: In preparation for our (hopefully permanent) return to the Moon, your space agency has tasked you to propose landing sites for future scientific missions far and beyond. What are your key priorities in selecting a site? Hence, explain the key benefits of your proposed site(s) to the public.

Expectations: Identify specific landing sites, why would it be suitable and why were the sites chosen.

Safety: free of geological hazards.

Scientific aims and goals.

Commercial resources.

Participants need to identify at least one site. Participants should also have considered why this location and not any others.

What really happened: only one team tried this question. It was a good attempt.

Q9: Introduce and explain to the public an existing Hubble Space Telescope image. Explain its scientific significance. Include a link to the photo you have chosen.

Expectations: Choose a good photo from the HST which can be shown to the public (ie presentable) and which has a good scientific significance. Participants should explain what the image is about with reference to image features and what the image hoped to achieve.

The answer would depend on the image.

What really happened: one team tried this. The committee agreed that it was a very good effort.

Q10: What is planetary protection? Discuss its significance and some of the protocols involved.

Expectations: Definition + reasonable discussion of the Committee on Space Research (COSPAR) and Outer Space Treaty, Categories of missions (that require planetary protection), Brief explanation of Coleman-Sagan equation, Significance (why there is a need to prevent forward and backward contamination; explain each in detail), E.g. in the context of Astrobiology, public health, controversies, etc.

Brief description of decontamination procedures and protocols (at least 2):

1. Heat sterilisation
2. Chemical sterilisation

3. Radiation sterilisation
4. Plasma sterilisation
5. Others (whether in practice or in developmental stage)

What really happened: One team tried this question. We feel that this question is a little on the hard side for the junior team which did. Nonetheless, we commend the team for their good effort.

Q11: Explain what the Fermi Paradox is.

Expectations: Define the Fermi Paradox and explain why possibly that we are unable to find intelligent life in the universe despite there theoretically being a lot of candidates.

Explain what the paradox currently is as observed (too little detection). Possible resolutions to the paradox are the focus of the question.

Kardashev scale is off topic.

What really happened: quite a lot of teams tried this. Unfortunately, a lot of teams also tried to add Kardashev scale into the answer which is irrelevant. Otherwise, teams did manage to get the main points across to the committee.

Q12: What are some of the surface features of the Moon? How are they formed? Can they be captured using your phone camera?

Expectations: With a photo of the moon, try to label a few features (craters and mares). A separate image of the moon may be shown to identify the features. Separately, participants should be able to explain what these features are.

What really happened: No one tried this question. We thought that this question would be simple enough and encourages teams to go out to see the world instead of staying indoors.

Q13: Introduce your school's astronomy club or equivalent to students of other schools.

Expectations: No fixed answer scheme.

What really happened: No one tried this question. We thought that astronomy societies or clubs would be interested in promoting themselves. Unfortunately, it does not seem to be the case.

Q14: How can we tell our geographical position by using just the Sun or the stars? If possible, demonstrate using field data collected and determine the coordinates of a position of your choice.

Expectations: The Celestial Sphere should be explained along with how the coordinates system work AND how that is relevant to your location on earth.

Furthermore, a demonstration using data collection in a specific location is required to do well along with evidence of conducting of measurements.

What really happened: Only one team tried this question. The basics were there.

Q15: Give a night sky tour. What are some of the constellations visible in Singapore? Can they be taken by a typical camera?

Expectations: Presentation must give a night sky tour using images taken and shown. At least 5 images must be shown. The key is a tour.

What really happened: Only one team tried this question. The effort was exemplary. However, some content was wanting, especially during questioning.

--AC2023 Project Round Committee

Post Scripts:

For a complete Namelist of committee members, please refer to the website under Past Committees.

