PROJECT ROUND

INFORMATION

AstroChallenge General Committee 2024

Version dated 27th March 2024

General Instructions

Participants are presented with a selection of 20 questions in the field of astronomy, cosmology and astrophysics for the project round. Each team is required to select and complete **<u>ONE</u>** question only. It should be noted that the criteria for completing each question may vary. Due to the concise nature of this year's Project Round Infosheet, thorough examination of the document is advised.

On Day 1 of AstroChallenge 2024, teams are expected to present and explain their project in person. It is imperative for different teams from the same school to choose distinct questions.

Poster Exhibition (Mandatory)

The duration allocated for each team's presentation is strictly limited to five minutes. All team members must participate in the presentation as well as the making of the project presentation. Following the presentation, a question-and-answer session will be conducted by the judges, lasting no longer than three minutes.

Additionally, the AC Central Committee will also organize a voting process for participants to elect their favorite project exhibition. This vote will contribute to determining the recipient of the "Most Popular Project Award," which will be announced on Day 3 of AstroChallenge 2024

Short-form Video (Optional)

THIS SECTION IS OPTIONAL AND <u>SUPPLEMENTARY</u> TO THE EXHIBITION & POSTER

Each team attempting this <u>OPTIONAL</u> component is to film and answer the selected question prompt through a simple short-form video format (e.g., Youtube Shorts, Instagram Reels, Tik-Tok) of **no more than <u>1 minute in duration</u>**.

The target audience for this short-form video is towards a <u>typical member of the public</u>. Therefore, each team is reminded to keep the content of their video as simple, concise, accurate and engaging as possible, while fulfilling the question prompt.

The AC Central Committee will be posting and organizing the videos on social media platforms run by the AC Central Committee. The score awarded would comprise of

1. 70% from a weighted score of voting/engagement results

2. 30% from AC Central Committee grading

Submissions Details

Teams are to submit an electronic version of their poster (*and the optional short-form video*) and any other requisites/deliverables specified by their selected question **by 12:00 PM Noon (UTC+8) on May 17, 2024**, to astrochallenge@gmail.com.

General Submission Guidelines

A penalty of 20% per day will be applied to late submissions or any subsequent submissions of missing components. For those opting to submit via a cloud service, visibility of all materials to the AC Central Committee must be maintained through the conclusion of AstroChallenge 2024.

(Mandatory) Poster Submission Guidelines

It is crucial to ensure consistency between the poster submitted via email and the one presented. Non-adherence to these submission guidelines may lead to significant penalties, including the possibility of receiving a zero score for the project round segment.

Submissions of handwritten posters should be in the form of photographs. In cases where posters are composed of multiple segments (e.g., four A4 papers), photographs of each segment must be submitted. Please make sure that the words, infographics and information on the electronic copy is completely legible to us.

Supplementary materials not explicitly requested in the question do not require submission. However, a list of citations for any non-original work must be submitted alongside the poster **in a separate document by the designated deadline (as the poster)** to avoid penalties or further disciplinary measures.

(Optional) Video Submission Guidelines

In contrast to last year, we are reintroducing the video component in the form of an optional video submission. This offers teams an additional avenue to showcase their creativity and understanding of the topic, while ensuring the content remains as simplified and comprehensible as possible to engage a wide audience effectively.

Exceeding the time limit will immediately result in a penalty (by the percentage exceeded) on your video. For example, if you submit a 1-minute 30-second video, your video will be penalized by 50% (1.5/1)

We are aware of methods to cheat the system by speeding the video up. If it is blatantly noticeable, we will determine the rate of speed up and thereafter penalize the video by 1.1 times that amount. For example, if you submit a video of length 1 minutes but sped up by 1.25 times. Your video will be penalized by 1.375%.

You are once again reminded that 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.

In particular, the inclusion of excessive inside jokes that are not comprehensible to members of the public may lead to penalties.

Video files submitted must not be excessively large. The AC Central Committee will not watch any video with a size larger than 1.5 GB. Videos with a size larger that that will incur an immediate penalty of 100%.

It is mandatory for participants to submit a comprehensive list of all sources referenced in their project video. This list must be formatted as either a Word document or a PDF file. In the event of non-compliance with this requirement, it will be assumed that all content, research, and work presented in the project are the original creations of the participants. Consequently, the use of external resources without appropriate acknowledgment may lead to the disqualification of the team.

Upon the submission of your video, you hereby grant permission to the AC Central Committee, along with its agents, nominees, trustees, and any individuals appointed by the AC Central Committee, to utilize your video for non-commercial purposes. These purposes may include, but are not limited to, publicity, educational use, and critique. Your submission signifies your agreement to these terms.

Use of AI generation/assistance

1. **Prohibition of Plagiarism**. Utilizing AI to claim authorship of work that is not originally yours, including paraphrasing AI-generated content or altering original sources, constitutes as plagiarism and will be penalized.

2. **Acknowledgment of AI Assistance**. Clearly disclose any AI tool usage in your work, specifying how it was employed and its role in the creation process. Failing to do so is equivalent to undetected plagiarism and subject to similar penalties.

Other Instructions

Participants are reminded of the importance of adhering to all instructions contained within this document, any subsequent communications, or directives provided on the day of the presentation. Non-compliance may result in a discretionary penalty of 10% per infraction or other stipulated sanctions.

The content of posters, supplementary materials, and presentations must remain appropriate. For inquiries or guidance on proceeding with a question, participants are encouraged to contact astrochallenge@gmail.com. The AC Central Committee is available to provide assistance, and no penalties will be imposed for seeking clarification via email.

The Questions

For each of the questions listed below, participants are required to create presentation materials or posters (with a maximum combined size of A1) aimed at elucidating the selected topic for a general audience, including students from secondary schools, polytechnics, and junior colleges. The presentation should be crafted in a tone and manner that is accessible and engaging for the public.

In addition to the poster or presentation materials, teams opting to participate in the optional component must create a short-form video (e.g., YouTube Shorts, Instagram Reels, TikTok), not exceeding 1 minute in duration. This video should succinctly address the chosen question, aiming to inform and captivate a typical member of the public through concise, accurate, and engaging content, in alignment with the prompt of the question.

1. Explain the science behind solar eclipses. How and why do they occur? Include information on how to safely observe a solar eclipse.

2. Illustrate and describe the different stages in the life of a star, from its birth in a nebula to its final state.

3. Discuss the past, present, and future missions to Mars. What have we learned about the Red Planet, and what are the goals for future exploration?

4. Explain what black holes are and their significance in the universe. Discuss both their destructive and creative aspects.

5. Present a detailed overview of the Voyager missions. What have these spacecraft taught us about our solar system?

6. Describe the climate of Venus and compare it with Earth. What can studying Venus teach us about climate change on Earth?

7. Discuss the possibility of life beyond Earth. What makes a planet or moon potentially habitable?

8. Explain the science behind auroras. How do they form, and why are they more common near the poles?

9. Discuss the issue of space debris. What are the risks, and what can be done to mitigate them?

10. Introduce the Kuiper Belt and its significance in understanding the formation of our solar system.

11. Choose one of Saturn's moons and present its unique features and why it is of interest to scientists.

12. How does light pollution affect astronomical observations and our view of the night sky? Discuss ways to reduce light pollution.

13. Discuss the role of comets in our understanding of the solar system. What have we learned from studying them?

14. Highlight a mission to an asteroid. What was the mission's objective, and what did we learn?

15. Explain how galaxies form and evolve over time. Include information on the different types of galaxies.

16. Introduce the James Webb Space Telescope. What are its capabilities, and what do astronomers hope to learn from it?

17. Explain what are Lagrange points and how are they significant in an astronomical context.

18. Explain one of the most significant astronomical discovery in the last decade and how it contribute to our understanding of the universe.

19. Explain what is a Pulsar Timing Array and how it is useful in the discovery of Gravitational Wave Background.

20. Explain how elements heavier than Fe-56 are produced during a star's life time.

21. Give a sky tour of the Spring night sky as seen in Singapore.

Grading Rubrics (Poster):

Note that the AC Central Committee reserves the right to change any of the weightages or otherwise with or without prior notice should the AC Central Committee deem it prudent to do so at any time.

Criterion	Weightage	Below Expectations (BE) 0 - 3	Meeting Expectations (ME) 4 - 7	Exceeding Expectations (EE) 8 - 10
Accuracy and Depth of content (Includes Q&A)	40%	Content of the presentation is inaccurate with grave conceptual error; content fails to go beyond the superficial or is plagiarized from source materials. Narrow scope with limited variety of concepts and ideas. Unable to answer most, if not all, questions satisfactorily.	Content of the presentation 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. Unable to answer quite a number of questions satisfactorily.	Content of the presentation is largely accurate with negligible factual error; Analysis of content boasts originality with an excellent presentation portraying a large variety of concepts and ideas. All requirements of the question are, in addition, met. Able to answer most questions satisfactorily.
Communication	15%	Viewers of the presentation are unfortunately unable to comprehend or the presentation was substantially a re-reading of the poster.	Participants speak clearly and intelligibly most of the time; engages viewers to a certain degree.	Participants speak clearly and fluently throughout at a suitable pace; deeply engages viewers.
Poster Clarity	15%	Viewers of the poster are unable to understand what the intent or the topic is about.	The poster is generally clear to viewers of the poster. However, parts of the poster are confusing.	The poster is extremely clear to viewers of the poster.

Criterion	Weightage	Below Expectations (BE) **0 - 3**	Meeting Expectations (ME) **4 - 7**	Exceeding Expectations (EE) **8 - 10**
Creativity and Originality	20%	Method of presentation is overused or cliché or the presentation did not make reference to any poster and/or other materials or the presentation was substantially a re-reading of the poster.	Method of presentation is refreshing but uninspiring or the presentation did not make reference to all relevant materials and/or the poster.	Method of presentation is novel and innovative and all relevant materials along with the poster were included in the presentation.
Teamwork	10%	The judges wonder where all the other members of the team had gone...	Only some members are actively involved in the making of the project or there is disproportion in work allocation amongst members.	All members are actively and fairly involved in the project and the presentation.

Grading Rubrics (Video):

Note that the AC Central Committee reserves the right to change any of the weightages or otherwise with or without prior notice should the AC Central Committee deem it prudent to do so at any time.

Criterion	Weightage	Below Expectations (BE) 0 - 3	Meeting Expectations (ME) 4 - 7	Exceeding Expectations (EE) 8 - 10
Accuracy and Depth of content	40%	Content of video is inaccurate with grave conceptual error; content fails to go beyond the superficial or is plagiarized from source materials. Narrow scope with limited variety of concepts and ideas. Unable to answer most, if not all, questions satisfactorily.	Content of video 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 of video is largely accurate with negligible factual error; Analysis of content boasts originality with an excellent presentation portraying a large variety of concepts and ideas.
Communication	30%	Viewers of the video are unfortunately unable to comprehend.	Participants speak clearly and intelligibly most of the time; engages viewers to a certain degree.	Participants speak clearly and fluently throughout at a suitable pace; deeply engages viewers.
Creativity and Originality	20%	Method of video presentation is overused or cliché or the presentation did not make reference to any poster and/or other materials or the presentation was substantially a re-reading of the poster.	Method of video presentation is refreshing but uninspiring or the presentation did not make reference to all relevant materials and/or the poster.	Method of video presentation is novel and innovative and all relevant materials along with the poster were included in the presentation.

Criterion	Weightage	Below Expectations (BE) 0 - 3	Meeting Expectations (ME) 4 - 7	Exceeding Expectations (EE) 8 - 10
Teamwork	10%	The judges wonder where all the other members of the team had gone...	Only some members are actively involved in the video presentation. There is a certain degree of disproportion in work allocation amongst members.	All members are actively and fairly involved in the video presentation. There is fair allocation of work amongst all members.

Guidelines and Tips!

Here are some suggestions on how **you** can produce a good submission!

To start...

- **Envision your desired outcome**. Delve into a selection of captivating subjects and engage in comprehensive research to grasp the essential themes your project must communicate.

  Challenge yourself to present these themes in a manner that is not only distinctive but also universally comprehensible. This investigative phase is crucial in narrowing down your focus to one singular query that will anchor your project.

- **Remember who you are addressing**: your aim is to demystify complex concepts for the public and your peers. Clarity is paramount; simplify the terminology to ensure your explanations resonate with those not versed in the language of the stars.

- **Captivation is key!** Human attention is fleeting, so it's essential to construct a project that not only garners interest but also maintains it. Brevity and substance should be the pillars of your presentation—avoid unnecessary digressions.

- **Plan your time wisely!** Procrastination or rushed efforts often lead to subpar results.

- **Plan your content wisely!** Allocate time judiciously to refine your project's content, selecting the most pertinent information to feature.

The video...

- **Voiceover audibility is a basic requirement**. Clear sound and optional subtitles can significantly enhance viewer comprehension.

- **Visual simplicity aids concentration**. Avoid embellishments that could distract from the educational value of your video. When employing special effects, let them underscore rather than overshadow your core messages.

- For those navigating video editing for the first time, consider using the Photos App on Windows, a user-friendly tool that leaves no watermark. Alternatives like Windows Movie Maker or iMovie are also viable options. For enthusiasts ready to venture further, sophisticated software like DaVinci Resolve is available, though not a necessity for a successful project video.

- Test your video with acquaintances unfamiliar with astronomy to get unbiased opinions. Their insights can be invaluable, providing you with a fresh perspective that can enhance the final product.

The poster...

– Display both the question prompt number and the query text prominently on the poster.

– Ensure legibility from at least 1.5 meters away by selecting color schemes that enhance the clarity of your text against the poster background.

– Use vocabulary that is accessible and clear to a diverse audience.

– Opt for visuals and graphics that can convey complex information effectively, as they can often communicate more than extensive text.

– Avoid overcrowding your poster with information; it should serve as an overview rather than a comprehensive report. Consider supplementary verbal explanations or props for additional details.

– Dedicate sufficient time to the creation of your poster; rushed efforts often result in diminished quality.

– Craft your poster to capture and retain audience interest, using succinct messaging and minimal statistical data where possible.

The presentation...

– Dress yourself in a manner befitting the formality and significance of your presentation.

– Conduct rehearsals to refine your presentation skills and ensure fluid delivery.

– Make strategic use of props, data, and your poster to create a dynamic and informative presentation.

– Engage in thorough research that goes beyond the information on your poster, equipping yourself to handle potential questions with confidence.

– Achieve mastery over your subject matter before the day of your presentation to ensure confidence and credibility.

Use of assets/materials

– **Acknowledgement of sources is not optional but mandatory**. Attribute all utilized resources, including the contributions of your team members. Remember, credits should not encroach on your video's allocated timeframe.

– **Adherence to copyright laws cannot be overstated**. Avoid the outright reproduction of material found online, even if it falls under Copyleft or Creative Commons License. Strive for authenticity and respect intellectual property at all times.