

The  
AC2021  
Organizing Committee

Presents:

AstroChallenge 2021

*Project Round Infosheet*

For Participants

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## 1. Project Round Rules and Regulations

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 member of the public. As such, ensure that your explanation is as concise and accurate as possible, while also being extremely easy to understand.

In line with the general aims of the project round to promote scientific communication, we have incorporated a new section to replace the live presentation: AstroMythBusters! We hope that it will not only encourage you to identify misconceptions and internalize why they are wrong, but also expand your scope of learning.

Your team is to select 1 out of the 20 questions in the list below and your video should consist of two sections:

1. Answer to the question of your choice
2. AstroMythBusters! Identification and explanation of selected misconceptions related to your topic

Participants should note that your choice of question will not significantly impact your score in AstroMythBusters! We understand some questions have limited misconceptions so we will take that into consideration during grading, but more importantly: the focus will be on how your selected myth is accurately debunked. If the misconceptions related to your topic are few, you are encouraged to showcase your creativity by coming up with your own fabricated but reasonable misconceptions to debunk.

### General Mandatory Instructions

1. Your task is to explain an astronomy/astrophysics concept simply in the form of a video submission.
2. You will first choose 1 out of the 20 questions to explain in a video of no more than 8 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. Exceeding the time limit will result in your video being penalized by the percentage exceeded. For example, if you submit a 10-minute video, your video will be penalized by 25% (2/8).
3. We are aware of methods to cheat the system by speeding the video up. If it is 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 8 minutes but speeded up by 1,25 times. Your video will be penalized by 27,5%.

4. For the avoidance of doubt, credits (if within the video) are not considered part of your 8 minutes. However, introductions are.
5. It is recommended that the time spent on answering the question be no longer than 6 minutes. The remainder of the time (2 minutes) is allotted to you to introduce some common misconceptions about the question you have chosen and to address them sufficiently.
6. You may not separate your submission into two. You are only allowed one video submission.
7. Following which, you will then submit this video for assessment to be reviewed by the organisers of AC2021. The deadline of submission is on 29<sup>th</sup> May 2021, 1900h (Day 0). Late submissions will be penalized at a rate of 20% for each day late or part thereof. For example, if you were to submit your video at 1901h on 29<sup>th</sup> May 2021 (Day 0), you will be penalized 20% of your video score. If you submit it on 30<sup>th</sup> May 2021 1901h, you will be penalized 40%.
8. 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.
9. In particular, the inclusion of excessive inside jokes that are not comprehensible to members of the public may lead to penalties.
10. Videos should not be excessively large - we recommend a 1 GB maximum. Videos larger than this limit often encounter playback issues. Then you will be at a disadvantage because we are unable to grade it as well.
11. Videos/presentations that are targeted to younger age-groups are more than welcome. Correspondingly, any features of inappropriate content will be heavily frowned upon and may be severely marked down.
12. It is **compulsory** for you to send in a transcript of your video if it is not subtitled. Failure to do so may incur a 30% penalty of your communication scores.
13. It is **compulsory** for you to send in a list of all references referred to in a word document or pdf file. Failure to do so will result in the presumption that all work and research within the project is originally yours and as such

any use of external resources may result in your team being disqualified.

14. More information will be provided in the following sections below.

15. Should you wish to seek any clarifications, you are more than welcome to write in to [astrochallenge@gmail.com](mailto:astrochallenge@gmail.com).

## 2. Guidelines for Attempting the Project Round

Here are some suggestions on how you can produce a submission of good quality.

### How to start

- **Begin with the end in mind.** Choose a few interesting topics, and research widely to get an understanding of the key messages that you should include in your project. Ask yourself if you feel confident explaining these messages to others in a unique and easily accessible manner.

This process of research should help you pick a single question to focus on.

- **Know your target audience:** you are expected to explain concepts to a member of a public/your schoolmates. They may not be aware of astronomical terms, so do explain yourselves!
- **Be interesting!** Like it or not, humans are easily distracted. Ensure that your project video is capable of holding the attention of your audience. This also means that you should be concise - do not beat around the bush.
- **Plan your time wisely.** Hastily submitted projects tend to lead to poor quality.
- **Plan your content wisely.** You should not squeeze everything about your topic into your video! Plan well and pick the most relevant to talk about.

### Video Submission Guidelines

- **Please ensure that your audio is clear.** Accurate subtitles are always a plus.
- **Ensure that your video does not contain distracting visuals.** This includes watermarks or excessive special effects. As a rule of thumb, any special effects that you use should help the audience focus on your key messages.
- **Free video editing software:** The Photos App in Windows contains a free and simple video maker that does not leave watermarks. You may also try Windows Movie Maker / iMovie.

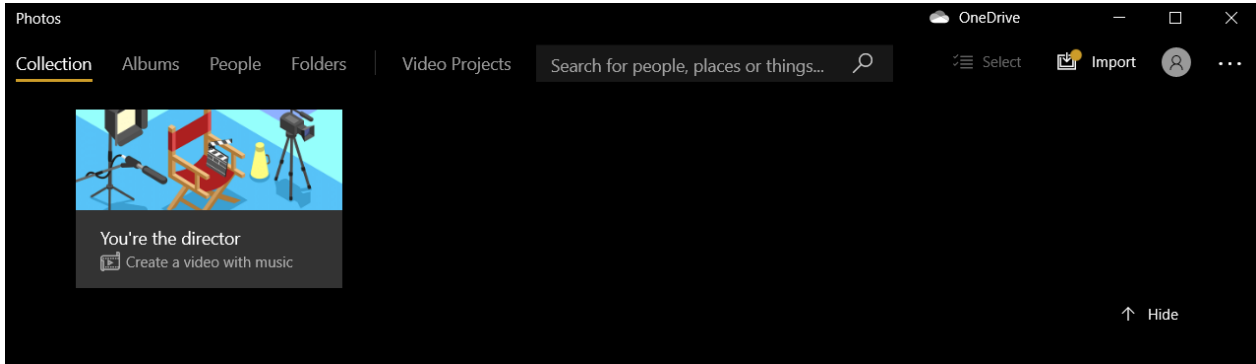


Figure 1: The Photo App in Windows 10.

Despite its name, did you know you can use it to make videos too?

- You can try other professional video editors if you so desire (e.g. DaVinci Resolve), but this is not required in order to create a good video for the Project Round.
- Show your video to a few friends who know nothing about astronomy. Gather feedback from them - did they like it? What did they hate? Use this feedback to improve upon your work.

## Use of assets/materials

- Provide credits for all resources used, including credits for your own team members! Note that the time limit imposed on your video submission excludes time spent on credits.
- Ensure fair use of copyrighted resources. To put simply, avoid lifting substantial chunks wholesale from whatever materials you find online even if it's Copylefted or has a Creative Commons License.

### 3. Questions

No.	Question Title
1	Advertise your astronomy/science club to your schoolmates*
2	Choose a deep sky object. With the aid of public data from professional observatories and other sources, tell me more about its background, and specific interesting features of the object**
3	Describe what a black hole is. Cover as many details as possible, accurately and in simple terms.
4	Explain why dark matter has been proposed to exist
5	How are planets formed?
6	How can we generate energy while travelling in outer space?
7	How can we observe solar eclipses and what is the scientific value in doing so.
8	How did civilizations in the past (ie before telescopes) appreciate the night sky?
9	How did people in the past keep track of time?
10	How does Astronomy affect our daily lives?
11	How likely are we to experience an extinction level asteroid collision? How do we know?
12	In 2020, the radio dish at the Arecibo Observatory collapsed. Create a video explaining some of the major achievements it was involved in
13	Meteor showers are some of the most regular and still impressive astronomical phenomenon to occur each year. Briefly educate the public on when, where and how to catch best to catch meteor showers, and some background knowledge on meteor showers.
14	Pick a fictional portrayal of space flight or living in space. Critique on how realistic it is.
15	Pick a Space mission and elaborate on it
16	Promote places that are good for taking astrophotography and justify your claim.
17	Select an astronomical event happening in this year (2021) and explain the significance of it.
18	What are exoplanets and how can we find them?
19	What are some leading theories on how the universe will end?
20	Which telescope should I buy?

If your question has asterisk(s) on it, please refer to Section 4 for further instructions or guidance.



## 4. Footnotes for Questions

\*: If your school does not have an Astronomy Club, you may promote your Science Club (or similar) on what the club does relating to Astronomy. Feel free to email us should you have any queries especially on cases where your school does not have an Astronomy Club but you would still wish to attempt this question.

\*\* : Your video MUST at least explicitly refer to raw data from the [ESA/Gaia Archive \(https://gea.esac.esa.int/archive/\)](https://gea.esac.esa.int/archive/), to obtain parallaxes and associated distance to the object, if the object is within the GAIA catalogue.

You may also consider sourcing for raw image data from the [NASA/IPAC Infrared Science Archive \(https://irsa.ipac.caltech.edu/frontpage/\)](https://irsa.ipac.caltech.edu/frontpage/) and the [Hubble Legacy Archive \(https://hla.stsci.edu/\)](https://hla.stsci.edu/).

- While image processing will be a plus, you are not required to process the raw FITS images - both websites provide a quick image viewer. You may also look for final processed works based on this raw image data, but accord proper credit where it is due.

As always, you should credit the sources of your data by providing appropriate links. Feel free to email us should you have any queries regarding these data sources. To reiterate, you can try to process raw FITS images and incorporate it into your video/presentation, but this is strictly optional.

## 5. Project Round Weightage

### Main Topic (80%)

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

### AstroMythBusters!(20%)

Communication and clarity of explanation of myths	60%
Visual Aid/Presentation	20%
Choice of common myths	10%
Teamwork	10%

## 6. Project Round Grading Rubrics

Criterion	Weightage	Approaching Expectations 0 - 3	Meeting Expectations 4 - 7	Exceeding Expectations 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.	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.	Method of video presentation is refreshing but uninspiring.	Method of video presentation is novel and innovative.
Teamwork	10%	Viewers of the video wonders 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 involved in the video presentation. There is fair allocation of work amongst all members.

Criterion	Weightage	Approaching Expectations 0 - 3	Meeting Expectations 4 - 7	Exceeding Expectations 8 - 10
Communication and clarity of explaining misconceptions	60%	Viewers of the video are left scratching their heads on what exactly was addressed. More misconceptions arise.	The addressing of the misconceptions is somewhat accurate with few factual errors; not all question marks about the misconception are resolved	The addressing of the misconceptions is very accurate with few factual errors; most question marks about the misconception are resolved
Creativity and Originality	20%	Method of video presentation is overused or cliché.	Method of video presentation is refreshing but uninspiring.	Method of video presentation is novel and innovative.
Choice of common misconceptions	10%	Viewers of the video are confused as to why this misconception was chosen...	Choice of the common misconceptions is more or less as expected	Choice of the common misconceptions is unique and interesting; better than what viewers expected
Teamwork	10%	Viewers of the video wonders 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 involved in the video presentation. There is fair allocation of work amongst all members.