

# AstroChallenge 2020

## *Project Round Infosheet*

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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, 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 20** questions.

## Instructions

1. Your task is to explain an astronomy/astrophysics concept simply. There are two segments to this challenge: The video submission and live booth.
2. You will first choose **1 out of the 20** questions to **explain in a video of no more than 5 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.
3. Following which, you will then submit this video for assessment to be reviewed by the organisers of AC2020. The deadline of submission is on **23 May 2020, 1800h** (Day 0).
4. 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.
5. In particular, the inclusion of excessive inside jokes that are not comprehensible to members of the public may lead to penalties.
6. Videos should not be excessively large – we recommend a 1 GB maximum. Videos larger than this limit often encounter playback issues.
7. Videos/presentations that are targeted to younger age-groups are more than welcome.
8. On **13 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.
9. The presentation should be no longer than 6 minutes and should be a **supplementary component**, not a re-screening of your original video. Thus, teams are **strongly encouraged to split their content wisely**.
10. In both segments, you may wish to use **any form of visual and audio aids** that you deem appropriate for the discussion.
11. Should you wish to seek any clarifications, you may 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 and exhibit 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 into your video! Treat your video as a primer to the topic, while the exhibit is an opportunity to cover specific areas in more detail. One should walk away from your video feeling that they roughly know the answer to the question, and wish to find out more by going to your exhibit.

### 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.

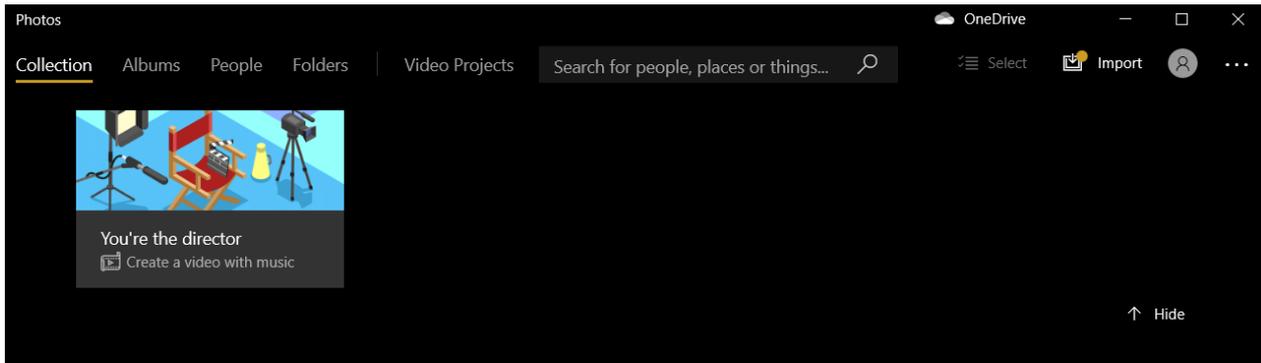


Figure 1: The Photo App in Windows 10.

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.

## Project Exhibit Guidelines

- **Do not simply replay your video!** You should recap the key points from your video, but ultimately the exhibit is meant for you to go deeper into the topic. Thus, little credit will be given for merely rehashing what you said in the video.
- **Rehearse!** Practice makes perfect. Note the time taken during your rehearsals too - this will also help you avoid running over the time limit.
- **Ensure that all of your team members are involved in the exhibit.** Group work is a graded component of the project round, and judges will ask all members questions!
- **Show interest in your question chosen and presentation.** If you are interested, likely the judges will feel your interest and reward you accordingly

## 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	Show and tell: 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	Choose a planet in the Solar System. Tell us more about this planet and its moons (if any), and what do we still not know about it?
4	How do planets form? How has observing exoplanets helped us understand planet formation?
5	How can amateur astronomers help professional astronomical research? What equipment is needed?
6	Identify an astronomy misconception propagated by popular media and explain why it is wrong.
7	In 2019, the first image of a black hole was taken. How was this image taken?
8	Introduce some classical instruments relating to astronomy.
9	Promote a place to stargaze that is accessible to most Singaporeans.
10	What are lunar seas and how do they form?
11	What are meteor showers and how should I observe them?
12	What are planetary rings? How would Earth be affected if it had rings?
13	What are some leading theories of how black holes are formed?
14	What are some of the different calendars still in use around the world today and what are they based on?
15	What are some of the health risks associated with living in space?
16	What are the challenges of establishing a moon base?
17	What is a supernova and how is it essential for life?
18	What kind of scope should I buy if I want to do astrophotography?
19	Why do we bother to send telescopes up into space when we have so many observatories on Earth?
20	Why do we need to observe objects across the whole electromagnetic spectrum?

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 and/or exhibit 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

### Video Segment (40%)

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

### Live Presentation Segment (60%)

Communication (Language and Ease of Understanding)	30%
Content (25% of the points here are allocated for Q&A)	40%
Visual Aid/Presentation	20%
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.
Clarity and Engagement	30%	Participants speak haltingly or mumble and are difficult to understand; does not engage viewers.	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%	Few members are actively involved in the video presentation. There is a huge disproportion in the allocation of work amongst all members.	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.