Planetarium info

General details

Required equipment

The app we're using for the planetarium is called "Spacecrafter", it should boot up automatically when we turn on the planetarium's computer. There is a tablet which can be paired with the computer, using the white device with two antennas which is plugged to the computer with an ethernet cable. This tablet will allow you to pick the different animations and effects that are on the computer by opening Chrome (it should send you to the page directly), you may need to reload the control panel by clicking on exit to go back on "Spacecrafter Pro".

In the planetarium's kit, there is also a mouse, a controller. The mouse is used to move the entire dome, while the controller allows you to move in the area the dome is "pointing at". For the animations I have been working on (and the ones that can be made using the repo I've provided here (INSERT LINK HERE)) you will only need the mouse because it uses something called "landscapes"

There is also a keyboard but we don't need to use it for these custom animations, but it provides shortcuts for the regular animations on the first tab of the tablet.

All the scripts used by Spacecrafter are .sts files, they can easily be opened on all machines and use a pretty simple (yet undocumented…) language.

Images vs Landscapes

When booting up Spacecrafter, you will see the sky with a fisheye view of grass and a telescope. This grass is what is referred to as a "landscape", which means that it will show up while you are looking at the sky, unless you disable it to visit different places. An image,however, stays in a specific spot that needs to be chosen in the script (using spherical coordinates) and will stay there until you disable the image specifically.

I personally chose to go with landscapes for the CMB animations since we don't actually need to see the sky for them, especially since they are far easier to set up and cover the entire screen, the only downside is that the image needs to be "adapted", which can easily be done in notebook I provided. The command to add a landscape is simply:
landscape action load type spherical maptext (location)/(image)
You can then turn off your landscapes using
flag landscape off

Images, however, are a lot harder to add, and are usually used to show logos, and such. I haven't used images in my animations but they use this command:

image action load name (name) filename (location/name.extension) coordinate_system dome alpha (alpha) scale (scale) altitude (alt) azimuth (az)
Something I have noticed while working on making scripts is that if you want to download a file online, you will have to unplug the connector and do USB tethering (or use an ethernet cable) with the computer so it can have access to the internet. I had to do this a lot in order to get my files from drives and repos.

Videos

There are two ways to make animated videos for the planetarium, either you can make a video that you will directly use (.mp4…) or you can make a script that will load an image, wait, load another image… This results in two very different scripts.

For a video, you simply need to use:
media action play videoname ../../ftp/Scipol_CMB/{video_name} keycolor off type VIEWPORT
For multiple images, you can use one of the two commands in the “Images vs Landscape” section and apply “wait (time)”:
landscape action load type spherical maptext (location)/(image)
wait (time)
landscape action load type spherical maptext (location)/(image2)
wait (time)...

The first option is a lot easier to use and can work with pretty much any video. The notebook has a function to change all images in a folder into a video of a given framerate, which makes the first option far better.

Making scripts

As mentioned earlier, making scripts is pretty simple and doesn’t take many lines. The ones I’ve been using are only 1-4 lines and could also just fit in one. The Notebook has a template that will automatically write a script for a static image or a video and can just be dropped in **scripts/fscripts**

There is one particularity when it comes to images and videos, for images you can drop them in **scripts/fscripts/Scipol_CMB**, but for videos you will have to drop them in **ftp/Scipol_CMB**

Current scripts (all in scripts/fscripts)

Sci01: Displays a frequency map with a jet cmap (143Hz)
Sci02: Displays a frequency map (same as Sci01) but with a RdBu_r cmap (143Hz)
Sci03: Displays a CMB map with a RdBu_r cmap (143Hz)
Sci04: Displays a foreground map with a RdBu_r cmap (143Hz)
Sci05: Displays a CMB map with a white noise
Sci06: Displays a CMB map with a basic brown noise

Sci07: Displays a CMB map with a brown noise mixed with a white one
Sci08: Displays a 180° picture of the Atacama Desert
Sci09: Displays a 6-minute-long video of a patch(30 arcmins of radius) analysis for an hour at 2fps
Sci10: Displays a 2-minute-long video of a patch(30 arcmins of radius) analysis for an hour at 5fps
Sci11: Displays a 6-minute-long video of a patch(30 arcmins of radius) analysis for 10h at 20fps
Sci12: Displays a 6-minute-long video of a patch(30 arcmins of radius) analysis for 100h at 20fps