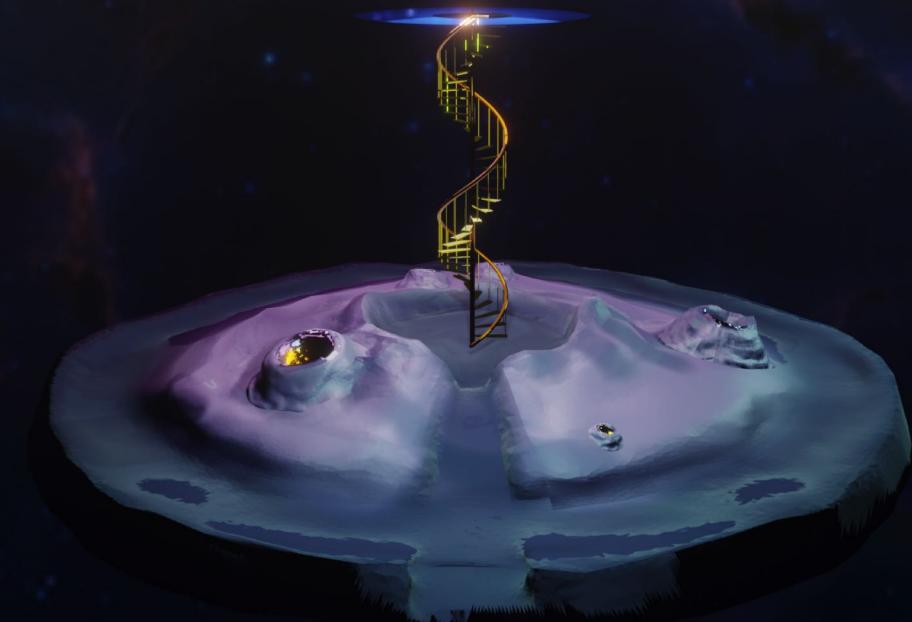
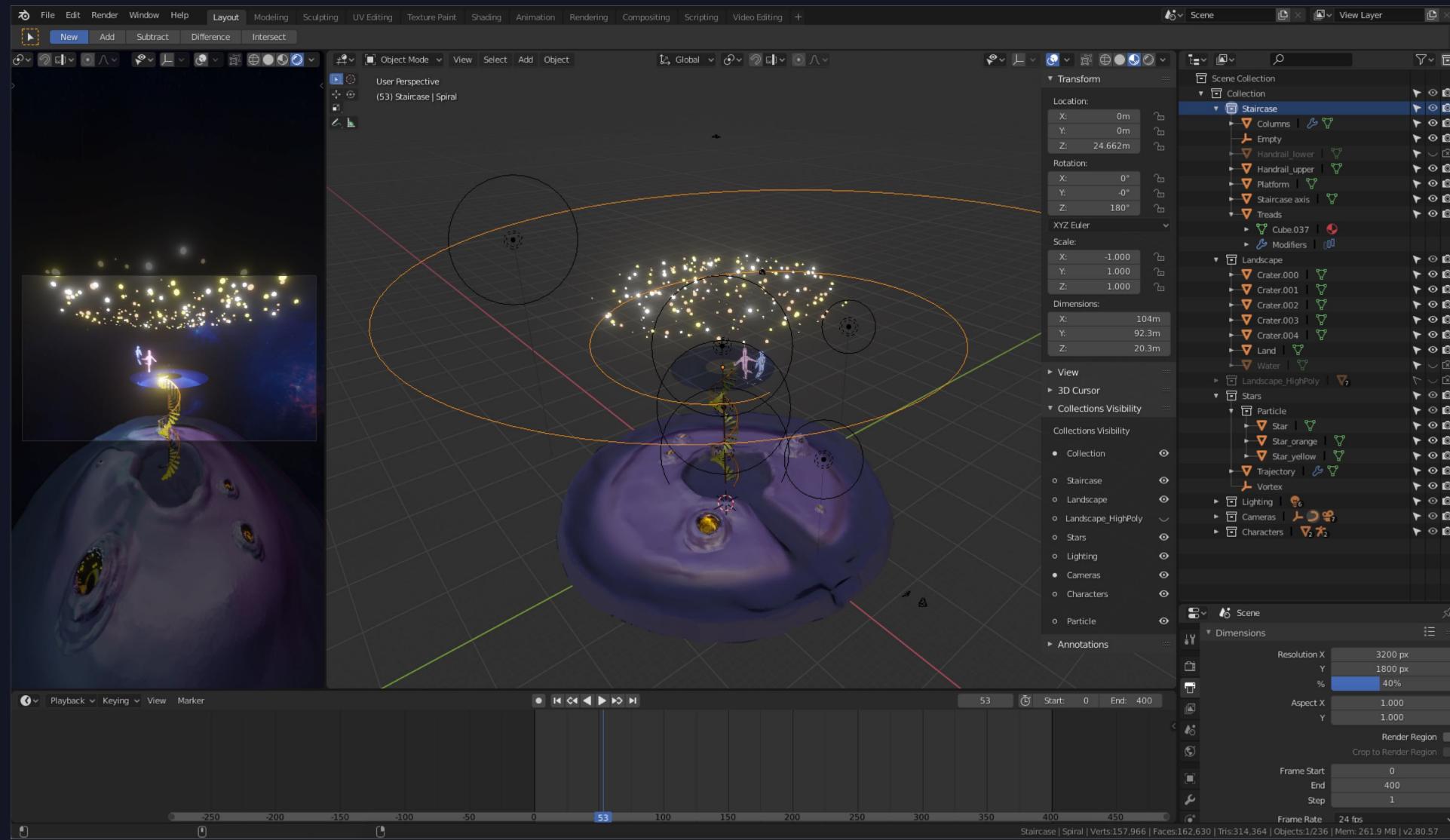


S T A R G A Z E R



BLENDER WORKSHOP | SUMMER 2019 | ZIQIAN CHEN





◀  N T E N T S ▶

- MODELLING
- SCULPTING / UV-UNWRAPPING
- TEXTURING / SHADING
- PARTICLES / PHYSICS
- CHARACTER / RIGGING
- LIGHTING / CAMERAS
- ANIMATION / RENDERING



# BACKGROUND

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*IN CASE ANYONE CARES AT ALL...*

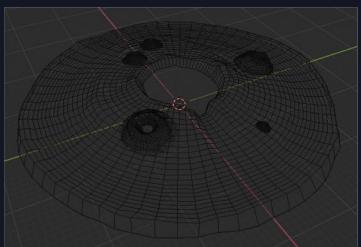
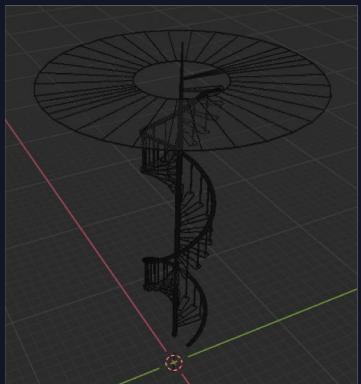
- The idea of the scene comes originally from one of my old weird dreams, in which a spiral staircase stretches to a platform under the starry night...
- The scene is created to give an extra-terrestrial vibe. A lumpy landscape with golden craters, a perfectly smooth metal staircase and a translucent platform, and vertex of bright stars revolving and gravitating away.
- Two characters are also created, which adds to amusement of the production. (Not showing here since it would ruin the tranquility of the scene lol)

# MODELLING

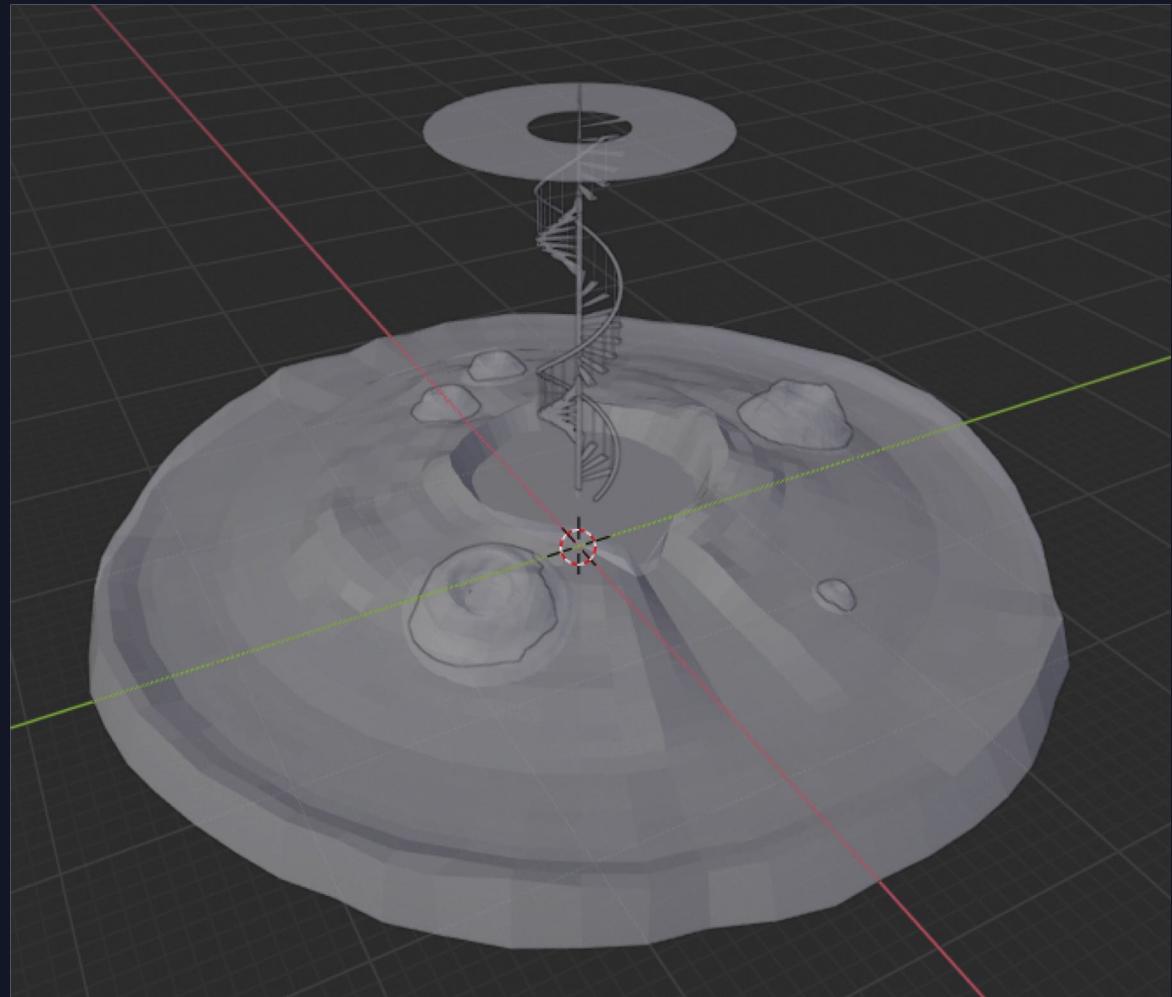
The basic scene comprises two sub-collections:

Staircase & Landscape.

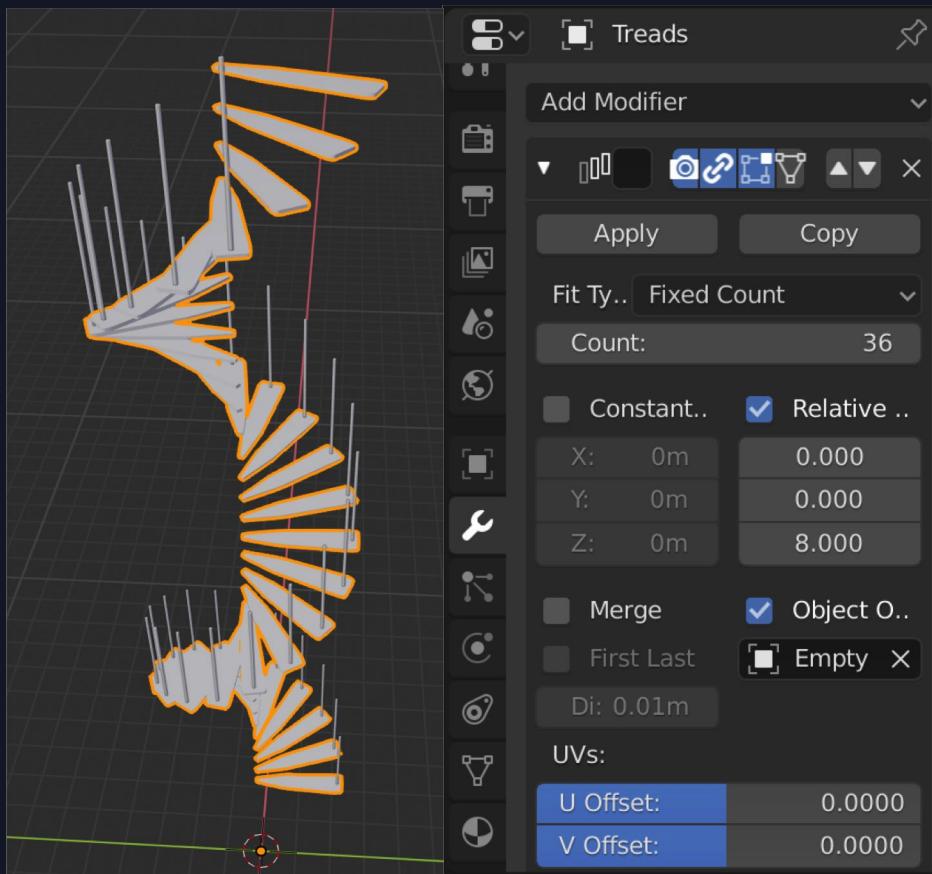
The hierarchy is as follows:



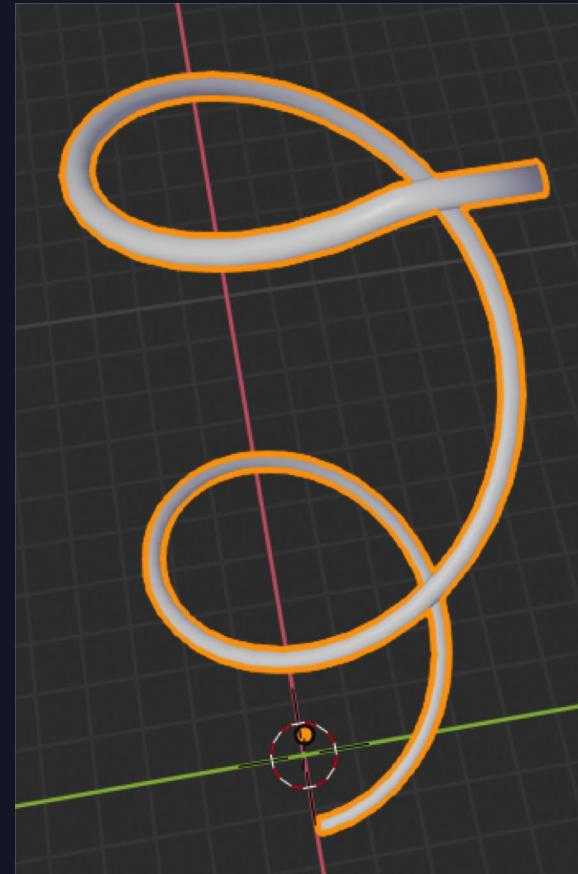
- Staircase
  - Platform
  - Central axis
  - Handrail + columns
  - Treads
- Landscape
  - Land
  - Craters x4



Two important modifiers were used when modelling the staircase: Array and Screw.



(Treads + Columns) x ARRAY

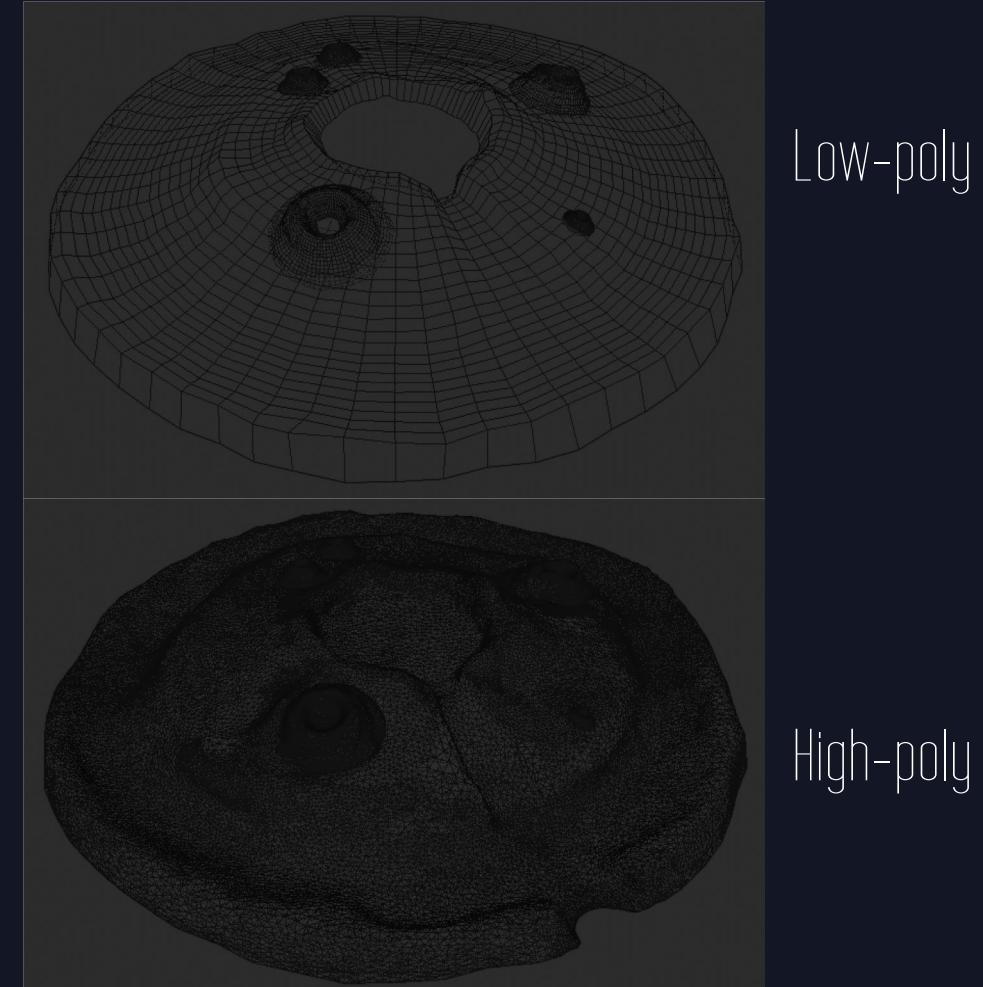
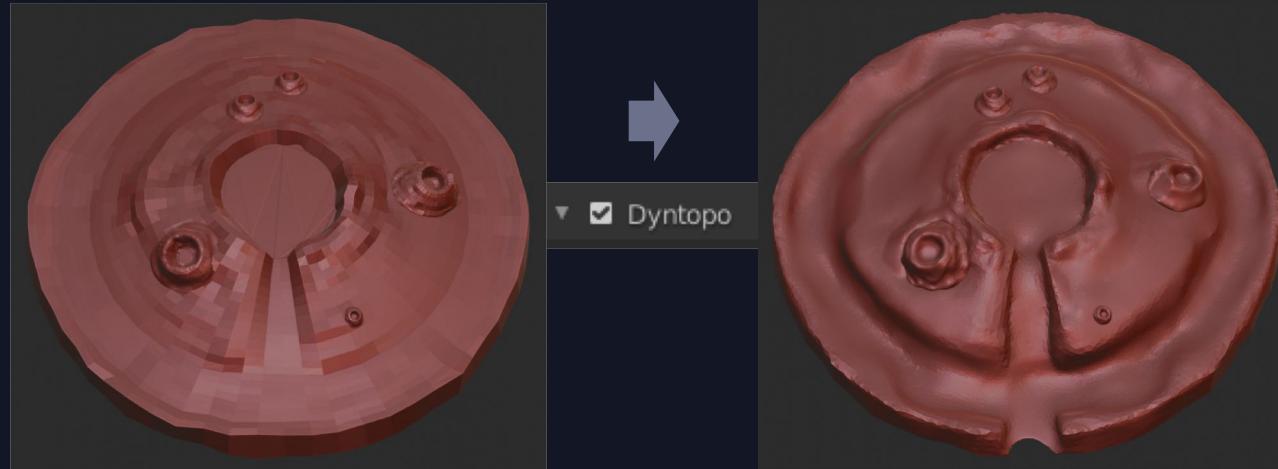


(Treads + Columns) x SCREW

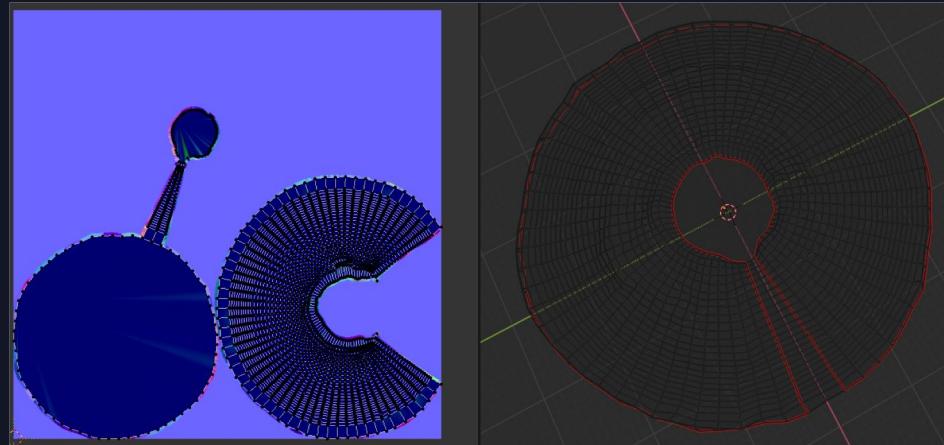
(\* Screwed  
from a circle for  
720 degrees.  
In the image it  
has already  
been applied.  
\*)

# SCULPTING / UV - UNWRAPPING

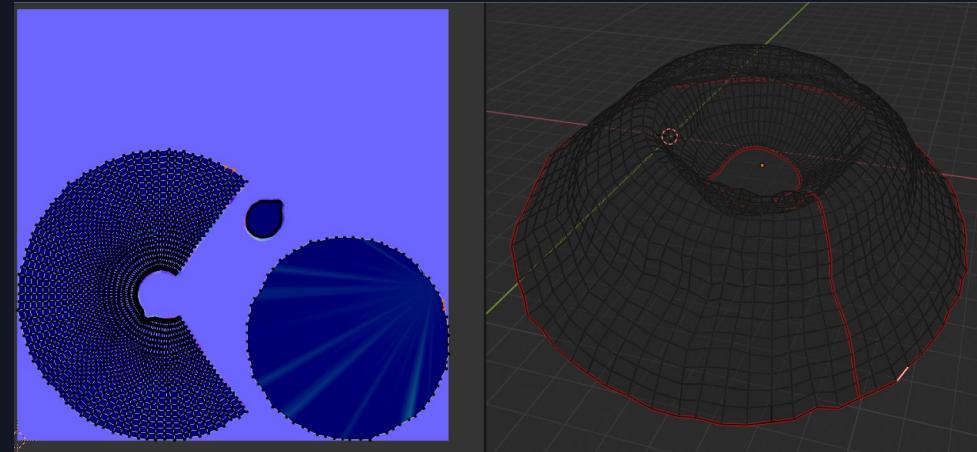
After modelling the low-poly meshes, a high-poly version of the Landscape was sculpted.  
(Staircase was left untouched since it was meant to be perfectly metal and smooth)



At the same time the low-poly meshes of Land and the Craters were unwrapped, so that later we could bake the high-poly features onto the UV map, to make the low-poly meshes “look like” high-poly ones. (See the normal maps next page)



Unwrapped Land



Unwrapped Crator

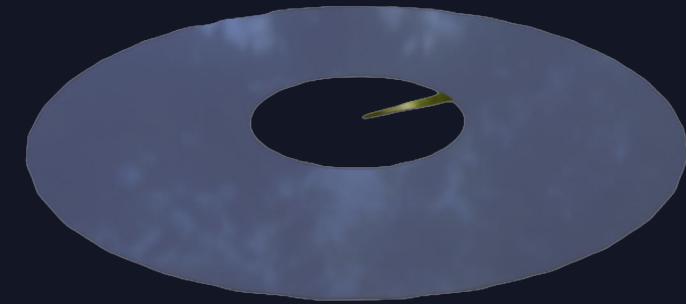
# TEXTURING / SHADING

Now it came to designing the material of the objects.



The stair

For Staircase the shading was neat, since it was supposed to be smooth and metallic (except for the platform which is transparent plastic)

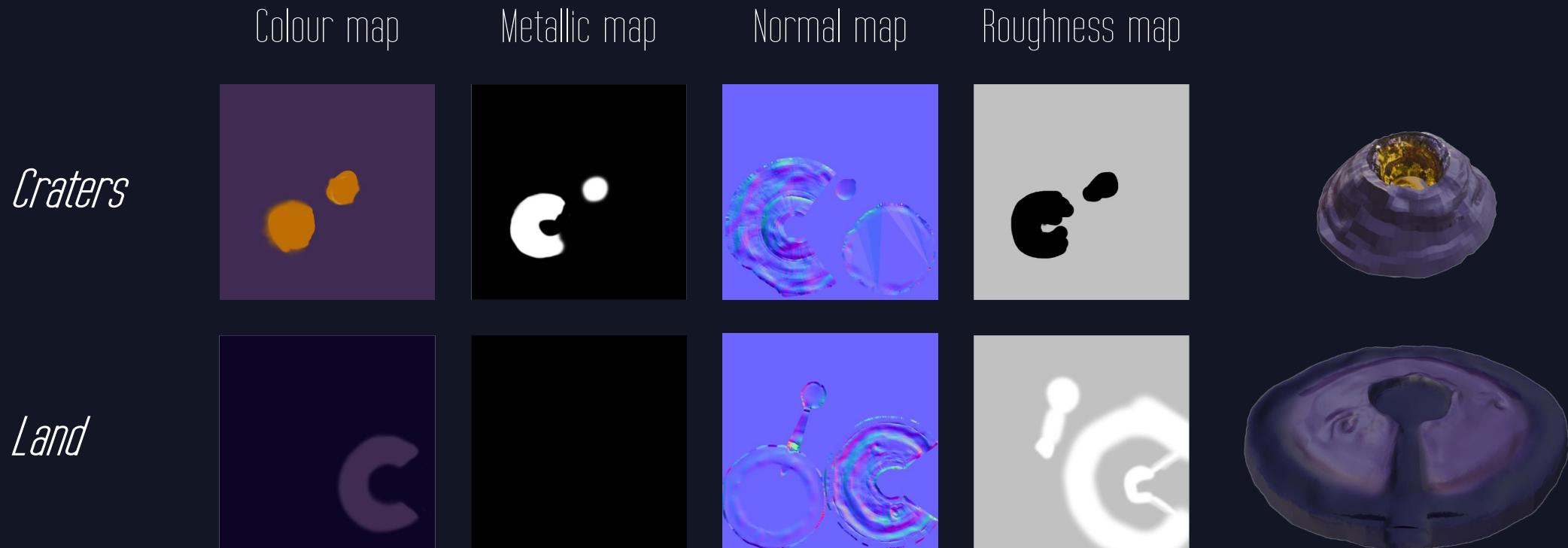


The platform

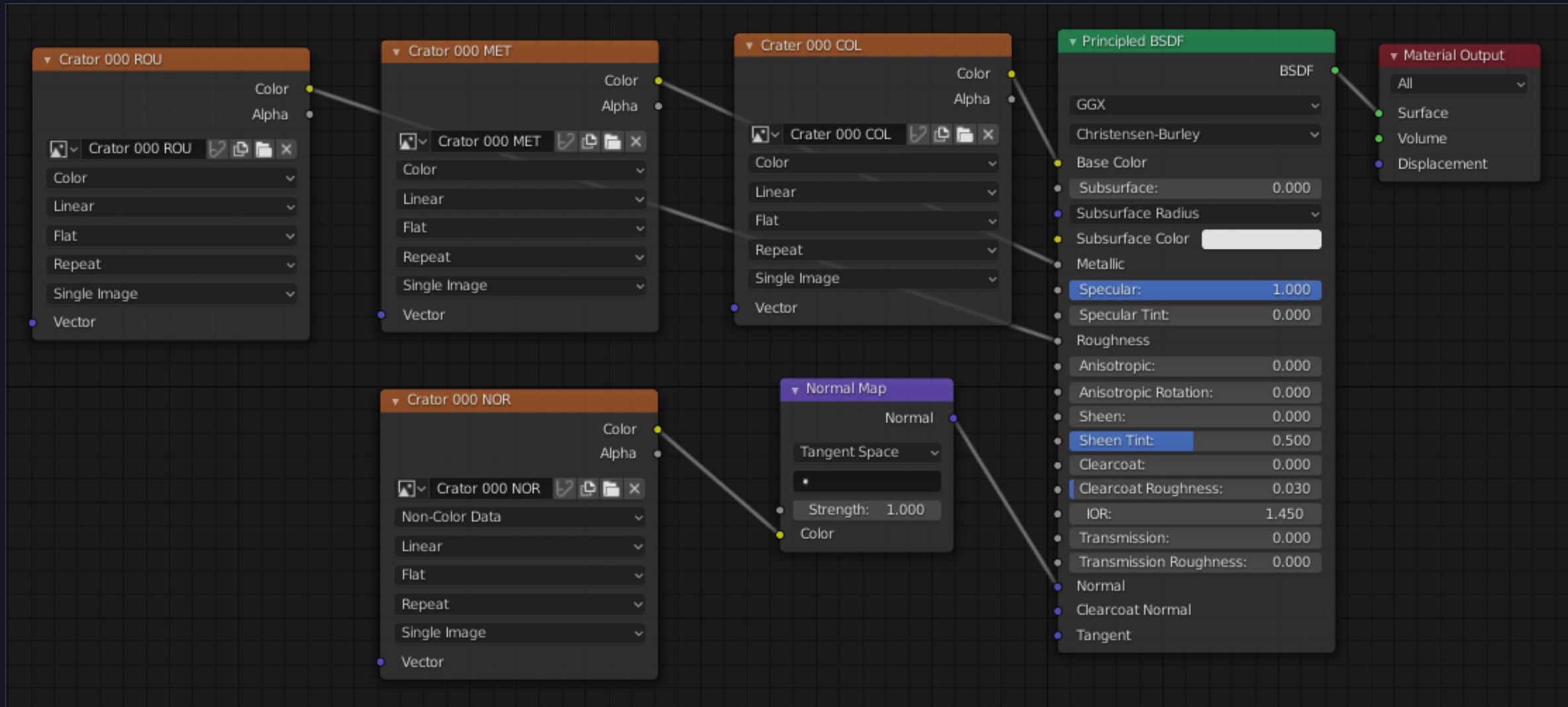
- The treads and columns are made to be golden.  
Metallic: 0.990, Roughness: 0.000, Base Colour: 
- The handrail and central axis are made to be copper-ish.  
Metallic: 0.990, Roughness: 0.100, Base Colour: 
- The disk-platform is made to be transparently blue.  
Metallic: 0.990, Roughness: 0.000, Base Colour: 

For Landscape (i.e. Land & Craters) it was a little more complex.

After baking the high-poly features to the normal map (see below), other three maps were painted for each object, to describe a distribution of different colours/metallicities/roughnesses.  
e.g. the inner side of a crater is metallic and smooth, making it look like as if there were gold mine inside.



The shading nodes were structured as below: Four input maps (colour, metallic, roughness, normal)



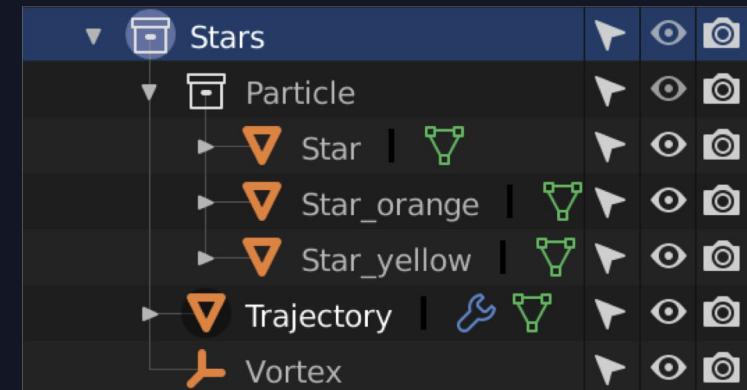
The shading nodes for one Crater

# PARTICLES / PHYSICS

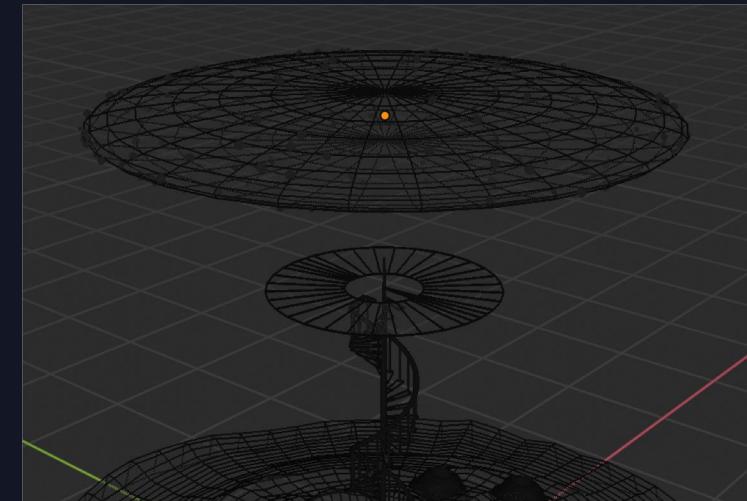
After modelling the two basic modules, a particle system (emitter type) of stars was created.

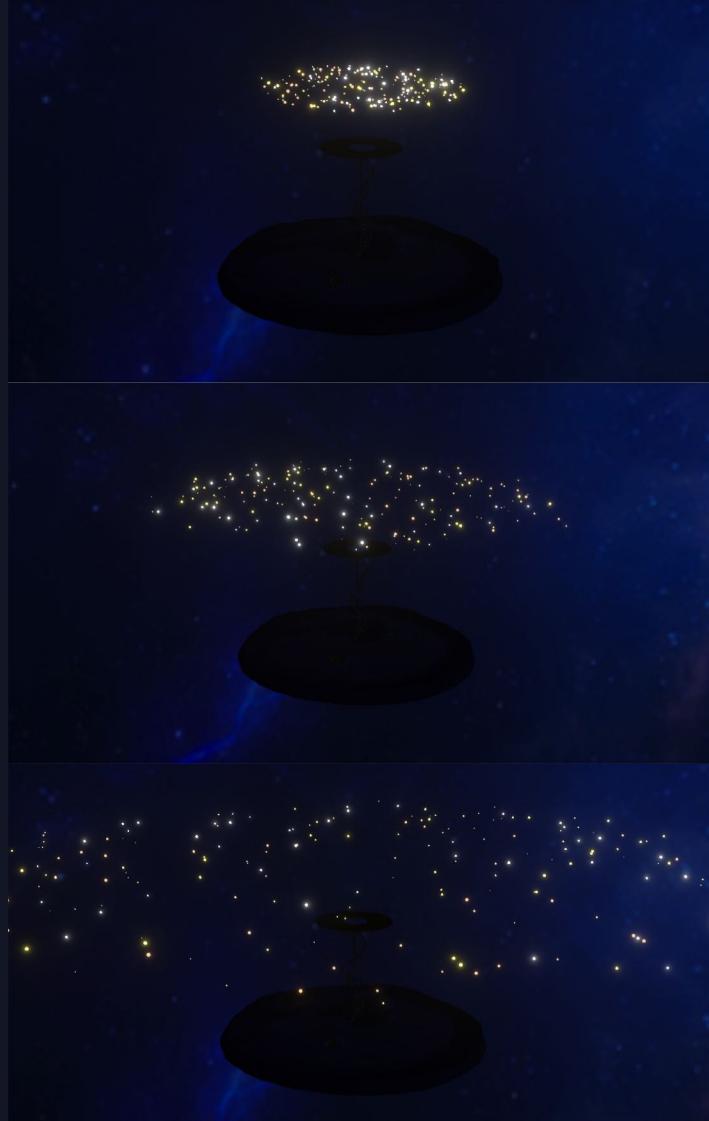


- Three star instances were created in different colours and brightnesses. They were rendered as a collection.
- The source geometry was a deformed ellipsoid (Trajectory), on the face of which the particles were scattered.
- There were 200 stars in total.



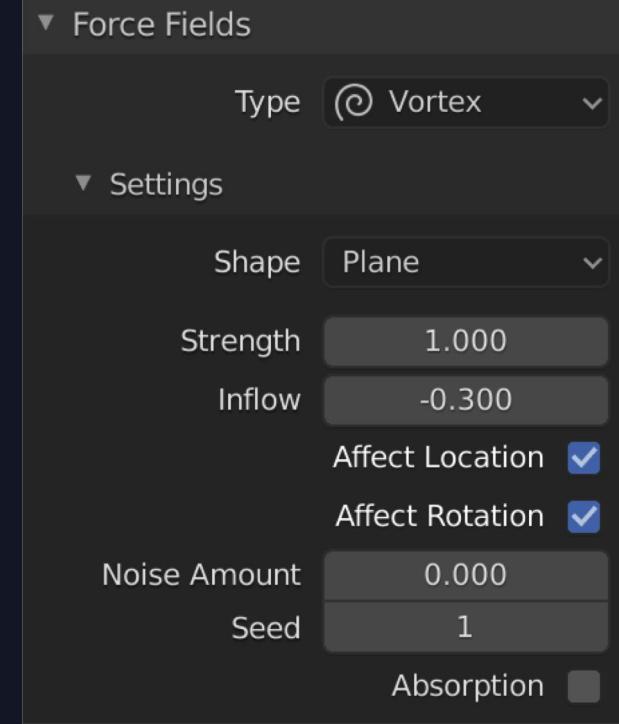
Hierarchy of the particle system





Since the emitter particle system came naturally as animated, I added a force field (vortex type) in Physics such that the stars revolve around the center like a mini-galaxy.

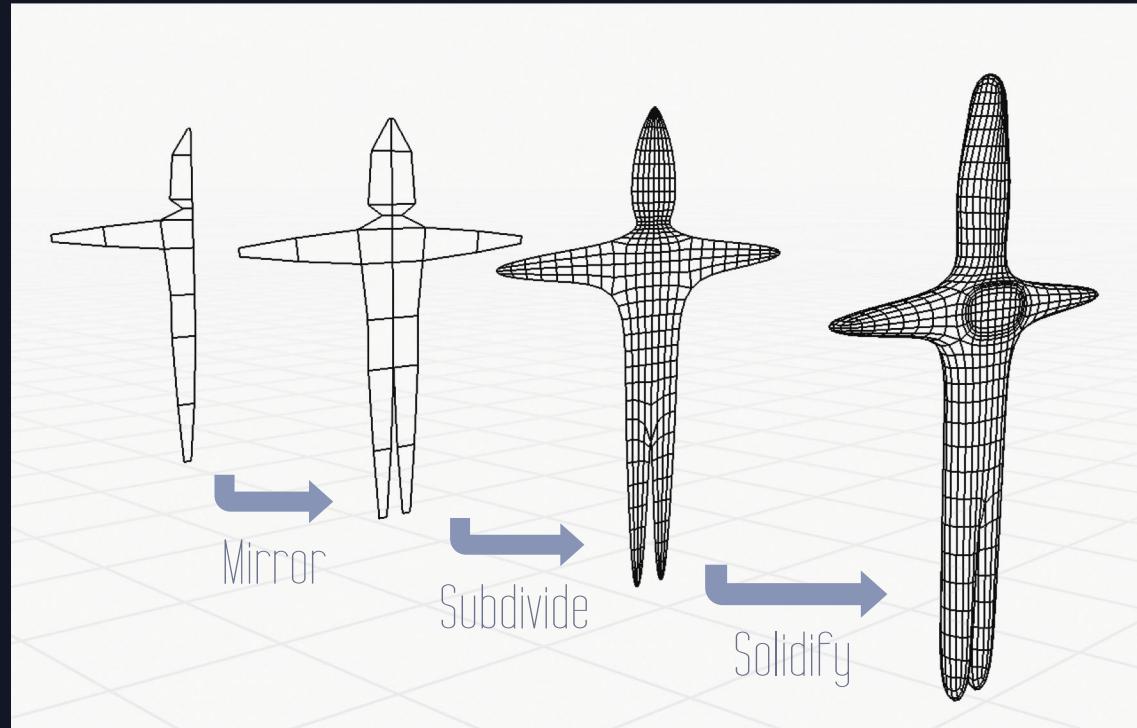
The parameter `Inflow` was chosen to be negative (-0.300) so that the stars scatter away from the center as they revolve.



# CHARACTER / RIGGING

Now comes the fun part. =)

To add to the liveliness of the "lonely land", two characters were designed and rigged.

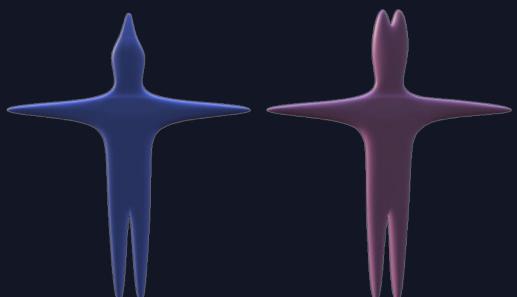


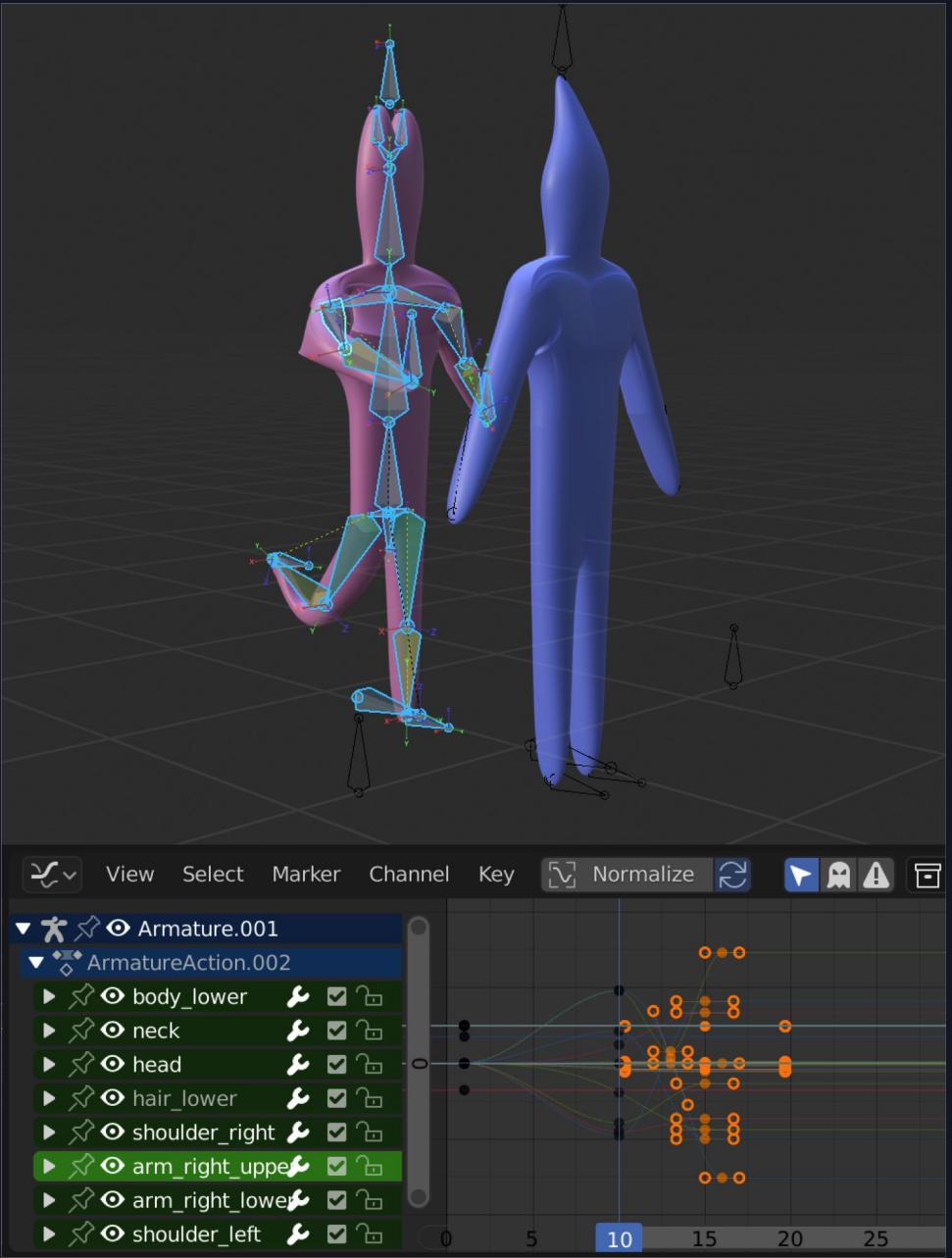
The characters take after a human shape but also has an alien sculp (just for fun...).

Three modifiers contribute to the design:

- Mirror
- Subdivision surface
- Solidify

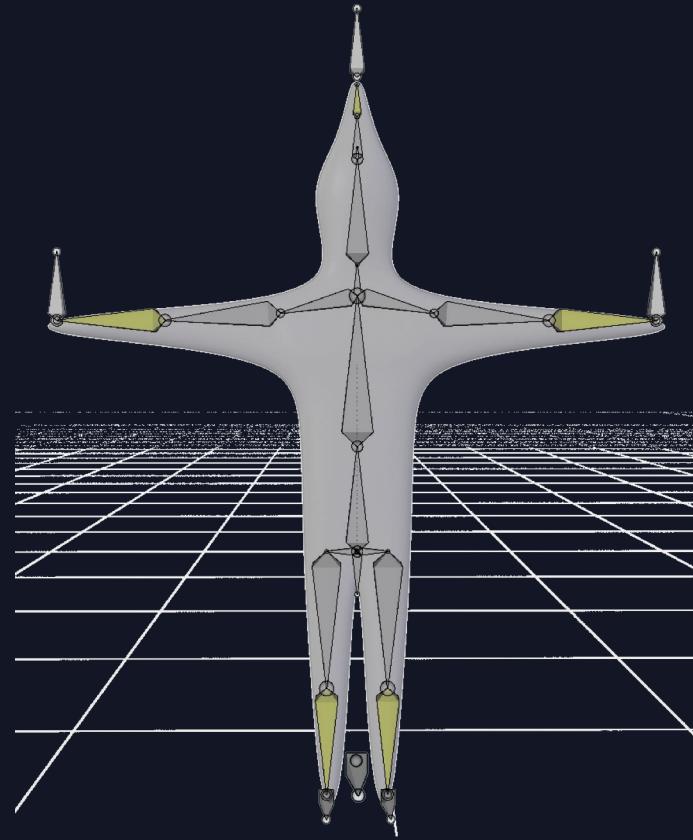
Two characters were created (somehow to represent male and female), with the only difference of the sculps.





The characters were then rigged as a typical humanoid. (See picture on the right)

- 5 IK bones (lower arms, lower legs, and hair)
- 6 control bones (controlling two arms, two legs, the head and the holistic movement/translation)
- Only the bones on the head differ between the two characters.



Rigging of one character

The bones were later animated in Pose Mode. The idea was that the pink gal kicks the blue dude far away to the sky...  
(Was actually planning to make a classic Titanic scene, but \ツ/)

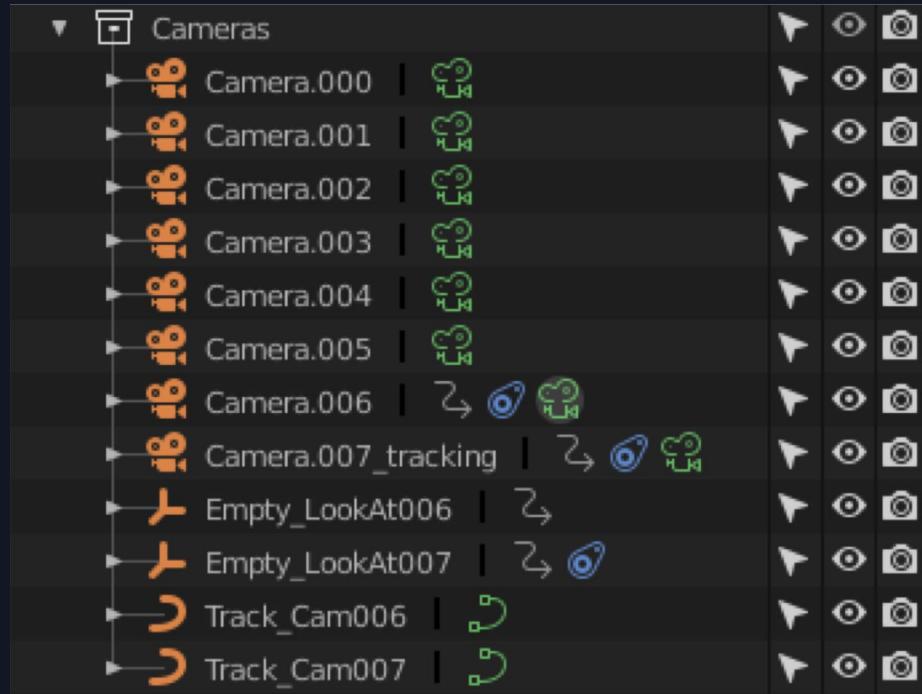
# LIGHTING / CAMERAS

To make the scene look more futuristic and exotic, several light sources were added as if there were celestial light from various directions.

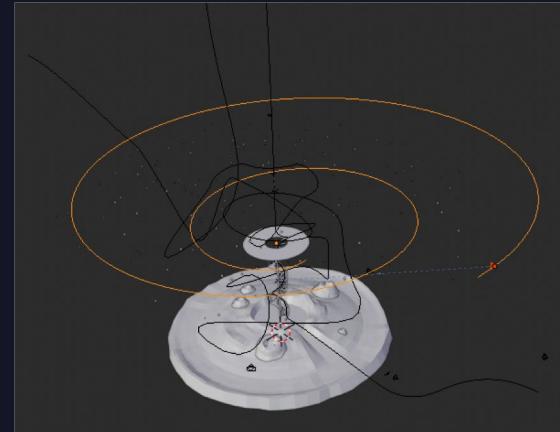


Ablation look of 6 light sources

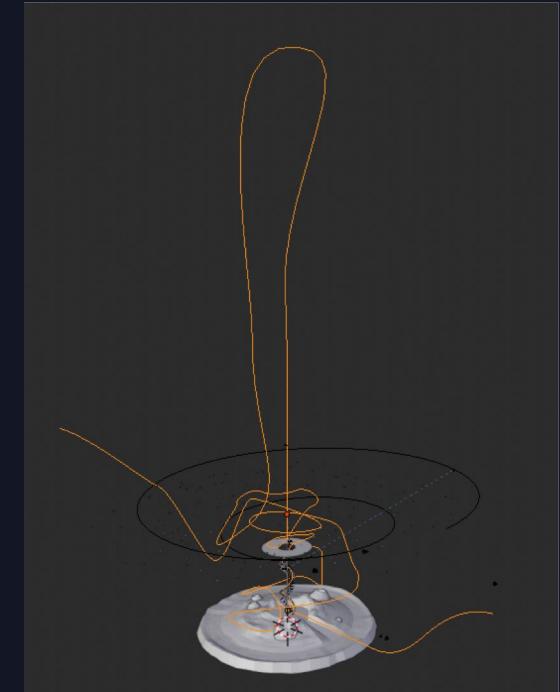
To explore different views from different angles, I created 8 cameras with different configurations.  
2 of them (Cam006 and Cam007) were animated along a certain path.



Hierarchy of Cameras and their tracks

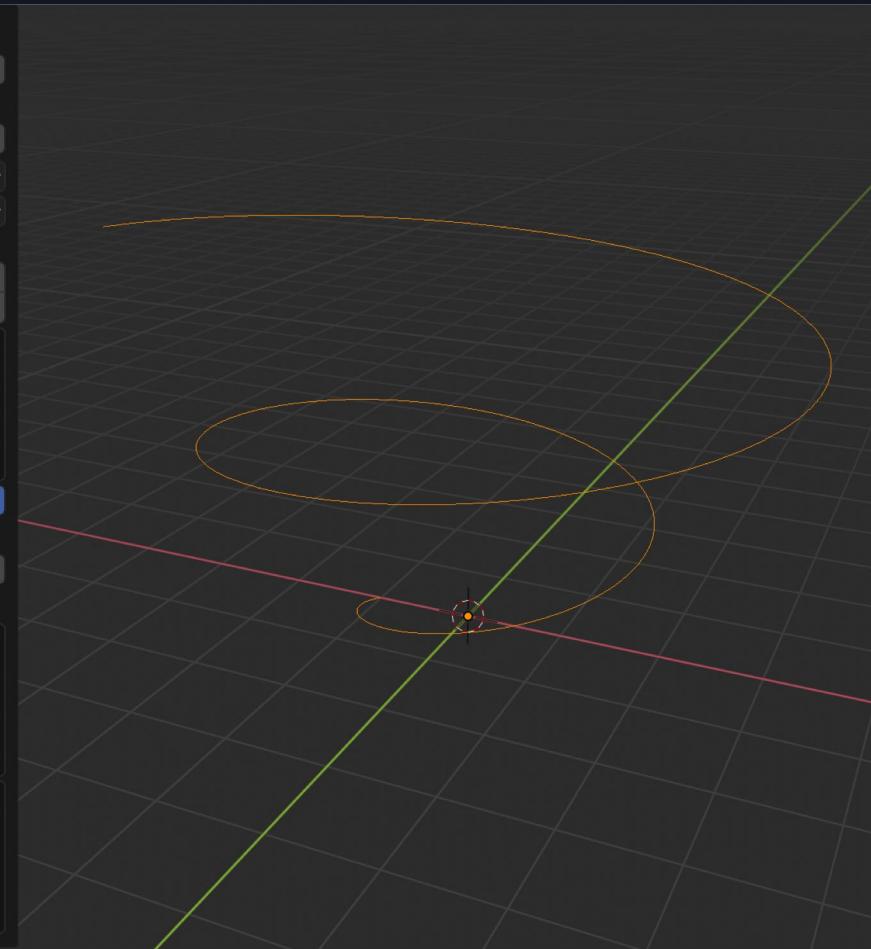
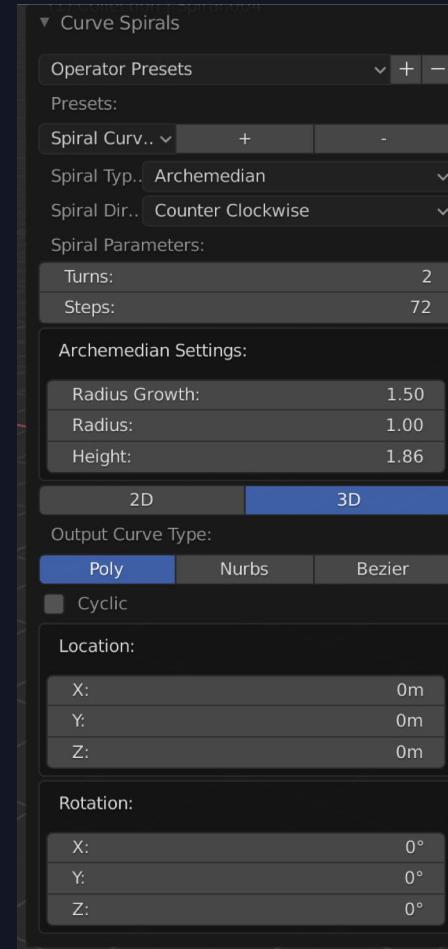
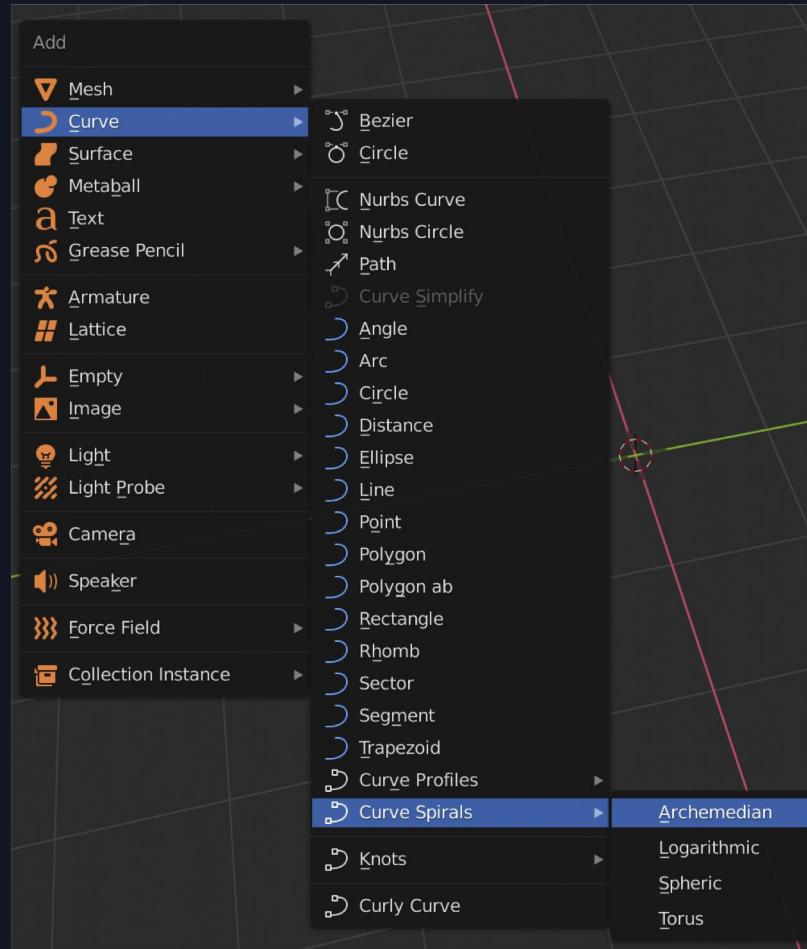


Cam006: Spiral track

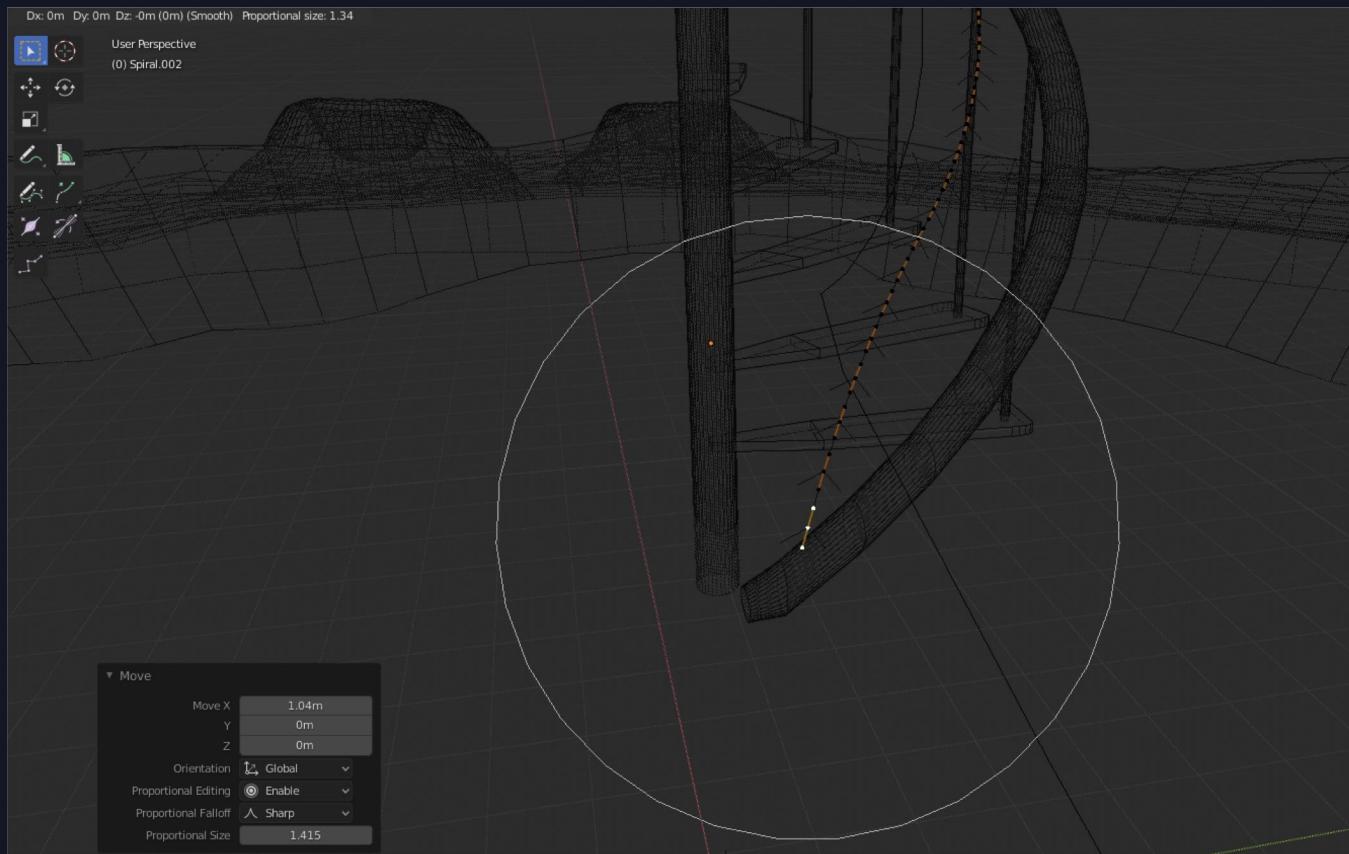


Cam007: Roller coaster

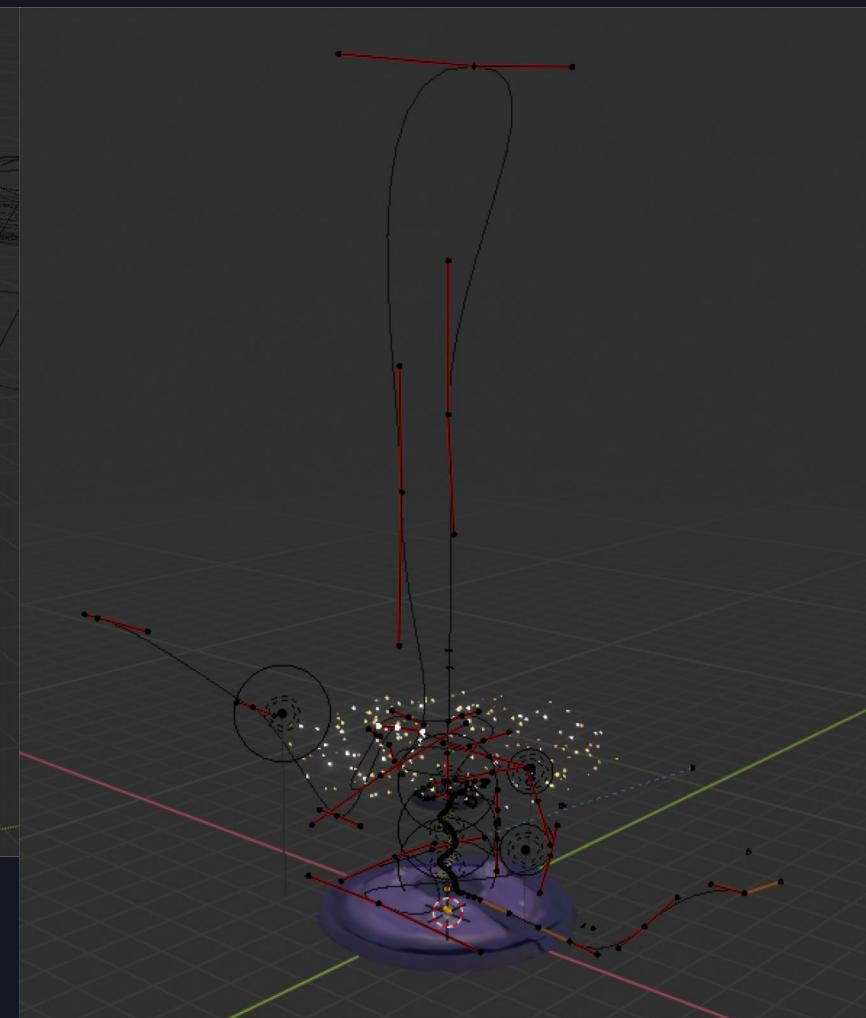
The spiral track of Cam006 was modelled with the help of an add-on: [Add Curve: Extra Objects]



The roller coaster track of Cam007 was modelled based on a Bezier curve.

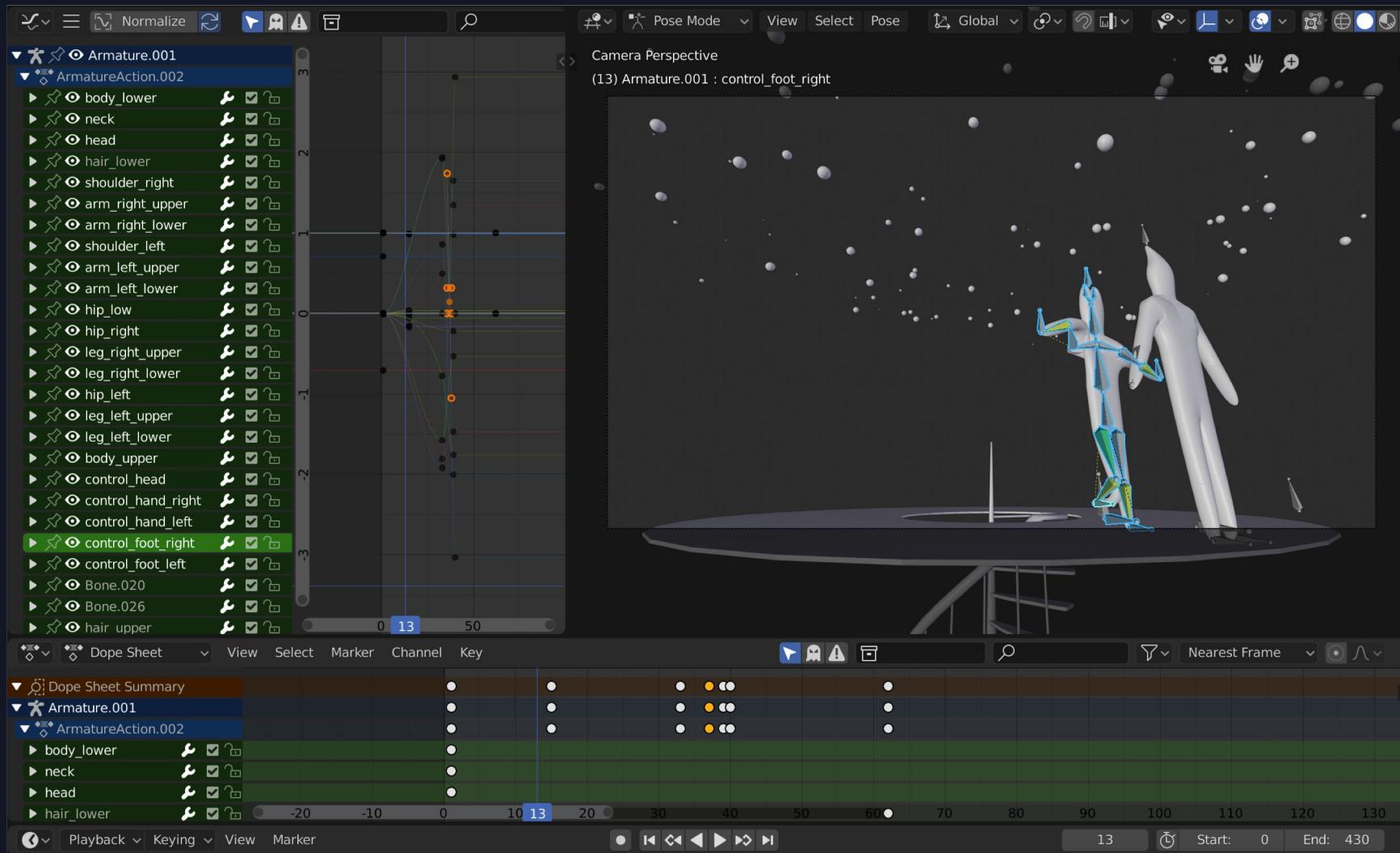


Proportional editing was used a lot here.



# ANIMATION / RENDERING

Many of the aforementioned modules were animated: the **particles**, the **characters** and the **cameras**.



In the end of the work, two animated productions were rendered.

- “My foot will go on” – From Cam006, a centrifugal view of the scene, where one character kicks the other to the sky. (Yes you may assume it’s an alternative version of the Tintanic scene...)

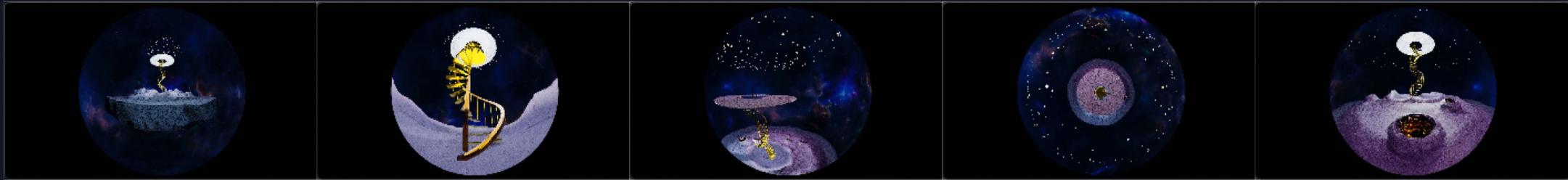


- “Roller Coaster” – From Cam007. To make the camera always “look forward” while moving, an empty object was placed on the same track with a constant minimal distance in front of the camera, so that a camera can Track To [Constraint] it.
  - Additional to transform of the camera, the focal length was also animated here.



\*Some by-products / alternative editions:

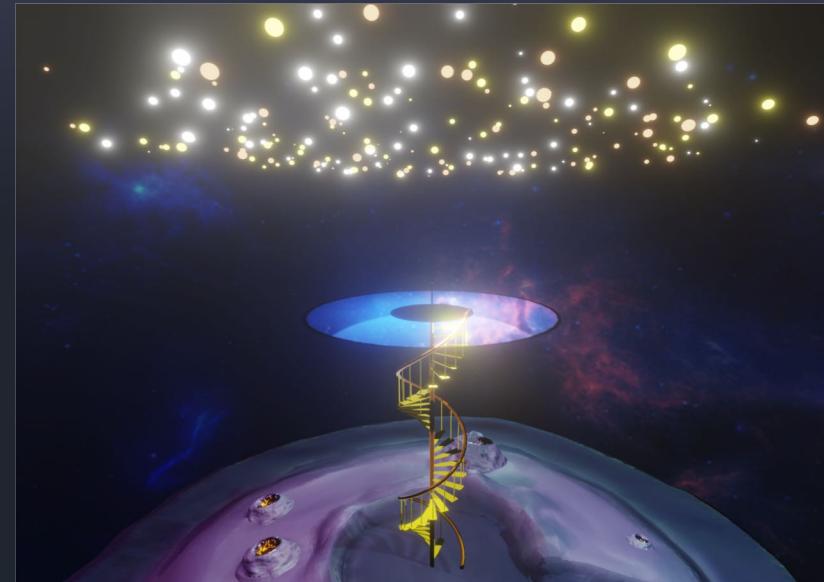
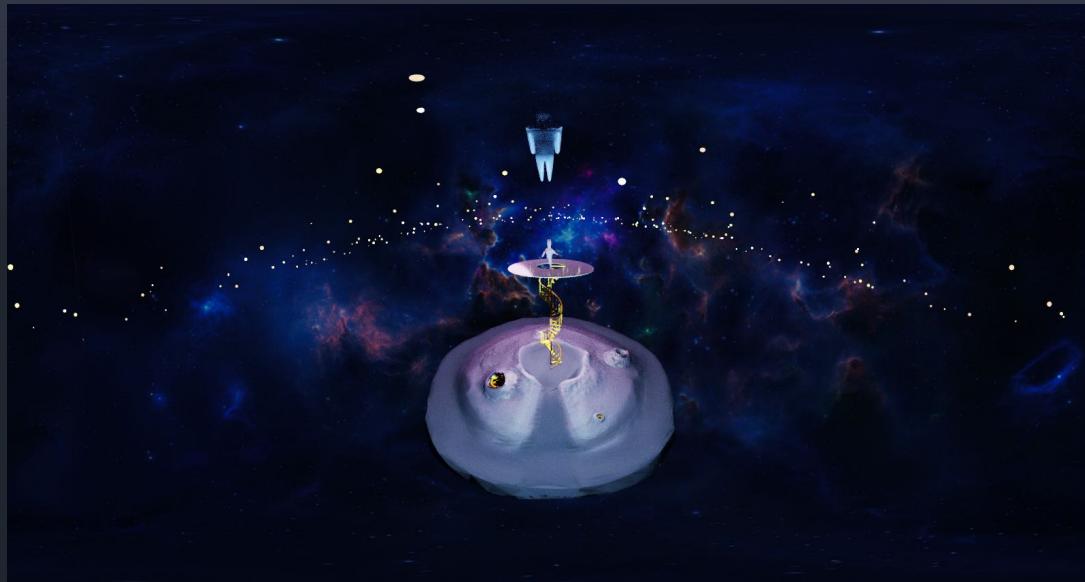
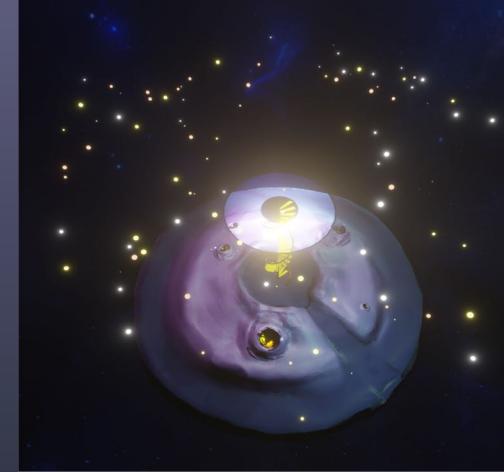
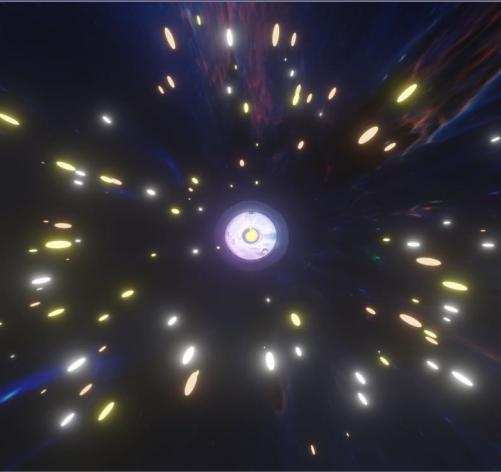
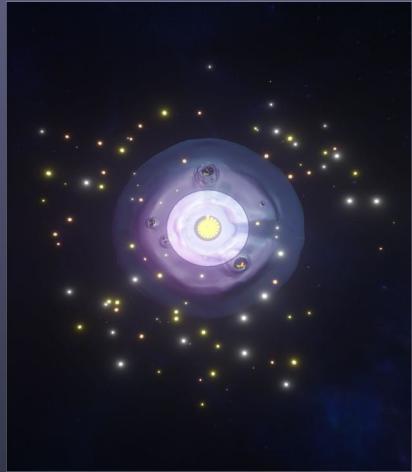
- "Roller Coaster (Panoramic Version)" – In Cycles rendering, changing Cam007 to a panoramic one gives another interesting view.



- "8k stars" – Characters removed. Just curious how messy it would look like when there were more stars lol. (Each single star was given 20 children, making 8000 in total =D)



# GALLERY: SOME MORE RESULTS



# A C K N O W L E D G E M E N T S

- Background skybox: <https://www.artstation.com/artwork/Ob0ee> (Colour adapted in Photoshop)
- Music for "My foot will go on": <https://www.youtube.com/watch?v=X2WH8mHJnhM>
- Music for "Roller Coaster", Nicki Minaj – Roman Holiday: [https://www.youtube.com/watch?v=\\_hUvjpF9vrw](https://www.youtube.com/watch?v=_hUvjpF9vrw)
- Special thanks to Björk's surreal music which I have been listening to non-stop and on repeat for inspirations so that my mind could be spiritually transported to an alien space... Love you, Mother Björk.



THANK YOU!