

# Cell Noise to Volume Displacement Animation



Polymesh objects can be rendered as volumes. This gives many creative opportunities for rendering solid objects in varied and interesting ways. This short 'making of' tutorial shows how to combine a [polymesh](#) with a [volume](#) by combining their shading using the *displacement* attribute of a [standard\\_volume](#) shader. We will also cover how to reproduce the above-animated effect using the [cell\\_noise](#), [color\\_correct](#), [ramp\\_rgb](#) and [range](#) shaders connected to *volume\_displacement* of the [standard\\_volume](#) shader. An example of a free to use head scan model can be found [here](#).



The polymesh should be closed and not have anything self-intersecting, otherwise, the volume may not render correctly.

## Step Size

- First of all, we need to convert the head mesh to a volume. Select the mesh and under its Arnold attributes, increase the *Step Size* to 0.1. When the *Step Size* is positive, it turns a polymesh into a volume and its value is used as the base step for raymarching the volume.



More information about volume *step\_size* can be found [here](#).

A basic scene file can be found [here](#).

## Standard Volume

- Assign a [standard\\_volume](#) shader to the polymesh and increase the *density* to a very high value of around 4000. This will ensure that the *displacement* texturing looks more defined later.



Head mesh rendered as volume

## Range

- Connect a *range* shader to the *volume\_displacement* of the *standard\_volume* shader.
- Increase its *output\_max* value to around 30. This will increase the effect of the *volume\_displacement* once we connect the *cell\_noise* shader to it.

## Camera Projection

To animate the effect from top to bottom we will project a ramp through the V direction.

- Create a *camera\_projection* shader and connect it to the *input* of the *range* shader.
- Remember to select the render camera that you want to use for the *camera\_projection*.

## Ramp RGB

- Create a *ramp\_rgb* shader and connect it to the *projection\_color* of the *camera\_projection* shader.



## Color Correct

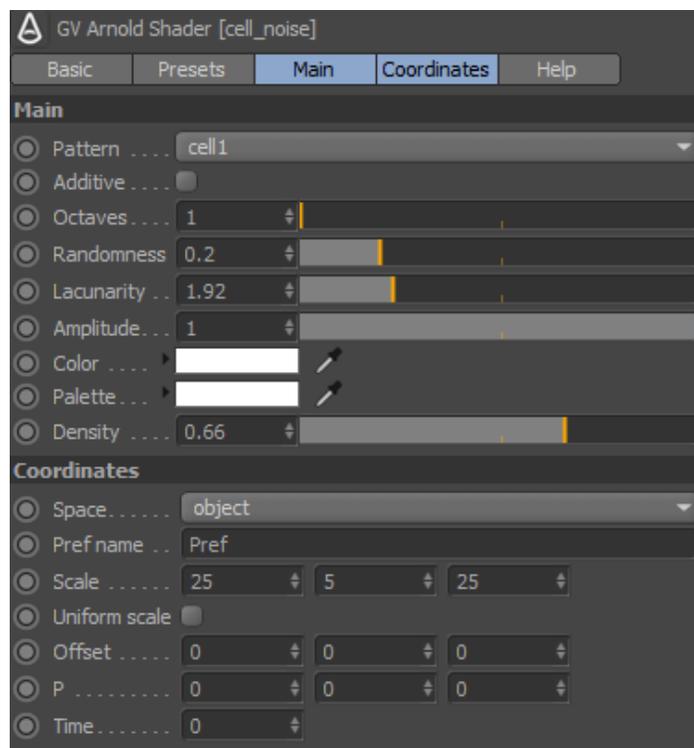
- Connect a *color\_correct* shader and connect it to the *input* of the *ramp\_rgb* shader. You can use this to fine-tune the *cell\_noise* shading effect.

## Cell Noise

- Create a *cell\_noise* shader.
- Change the *pattern* to *cell1*.
- Disable *additive*.
- Ensure that the *coord\_space* is set to *object*.
- You will need to adjust the *scale* according to your scene size. In this case, the *cell\_noise* is thinner because Y and Z are less than X.
- Increase the *density* to 1 and set *randomness* to around 0.2 to add some irregular shapes.



Final *cell\_noise* settings



## Animation

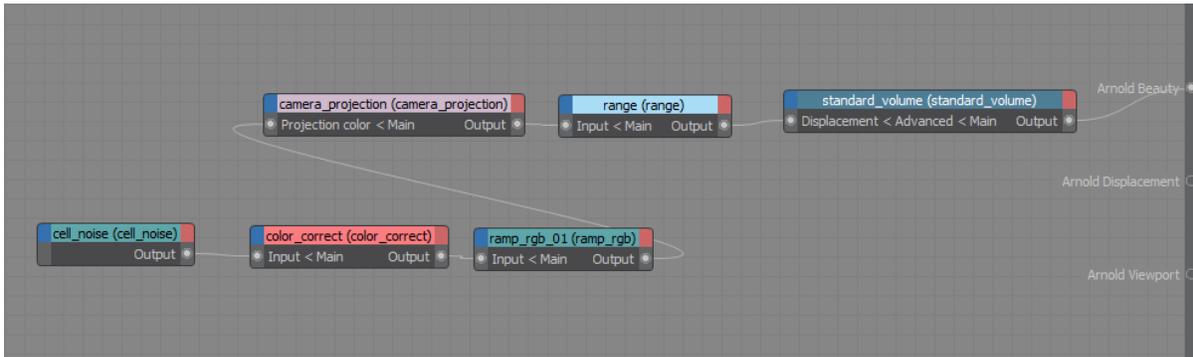
- Keyframe the black color of the *ramp\_rgb* from left to right over time to see the effect move bottom to top across the head volume.
- Keyframe the *time* attribute of the *cell\_noise* shader to animate the *cell\_noise* effect.

## Conclusion

That's it. Remember to increase the *volume\_samples* for any lights in the scene when rendering the final animation.



Further example with *cell\_noise* scaled in Y



Final shading network