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Modeling Planet Rings In 3ds Max

If you're into modeling space scenes in 3ds Max, planet rings can be a bit of a hassle in the mapping department, since the best methods I've discovered for creating them are not necessarily intuitive.

The straightforward method, which really requires no tutorial, is to create a radial pattern and matching alpha map in Photoshop with noise and radial blurs, and map it onto a square plane in 3ds Max.

The downside is that you're guessing at the size of the rings relative to the size of the planet. Maybe you need thinner rings spaced farther away from the planet, or thicker rings in closer orbit. It can be hard to judge when you're creating a map blindly in Photoshop and jamming it into 3ds Max to make it work with your scene.

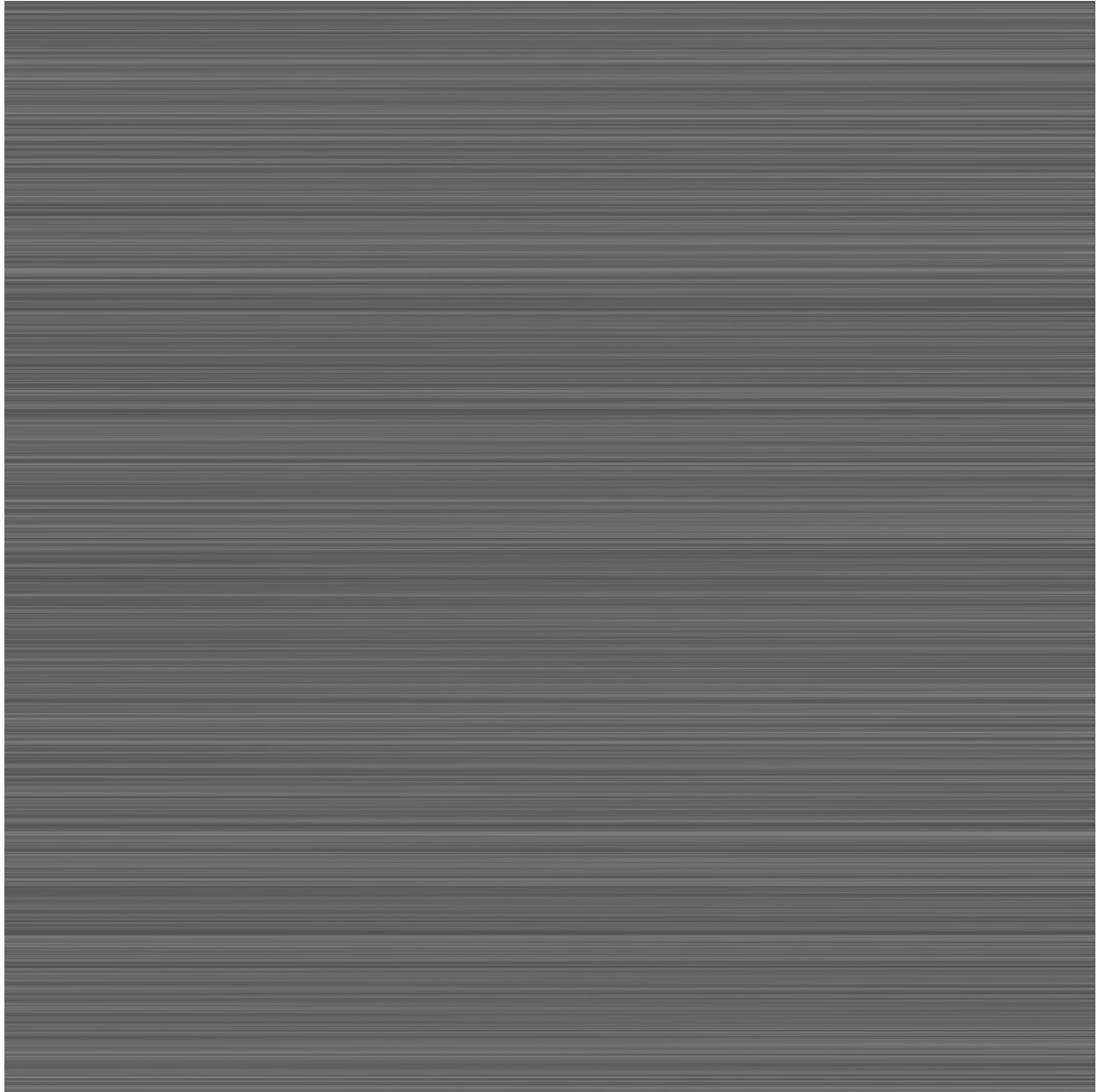
The method I'll cover here, while not completely intuitive, I'm hoping you'll find to be a better solution to the one mentioned above. It's definitely more flexible.

1) Open 3ds Max or reset your current scene, and create a sphere or geosphere primitive as a stand-in for your planet (or as your actual planet, if you haven't created that yet). Center it in the scene by selecting the move tool and entering 0, 0, 0 in the absolute position boxes at the bottom, or by right clicking the move tool and entering 0, 0, 0 in the popup box.

2) Open Photoshop and create a new document with a square canvas. It can be 500x500, 1000x1000, or 10,000x10,000 if you're crazy enough. Since most of my early texture work in Max was based on game engines that required maps in power of two sizes, for high res textures I usually begin with a 2048x2048 canvas, or 1024x1024 if medium resolution is sufficient.

Set your modes to RGB color, 8-bit depth, and PPI resolution to 150 or 200. Resolutions around 200ppi are best for noise-based maps, which is what we'll be using here.

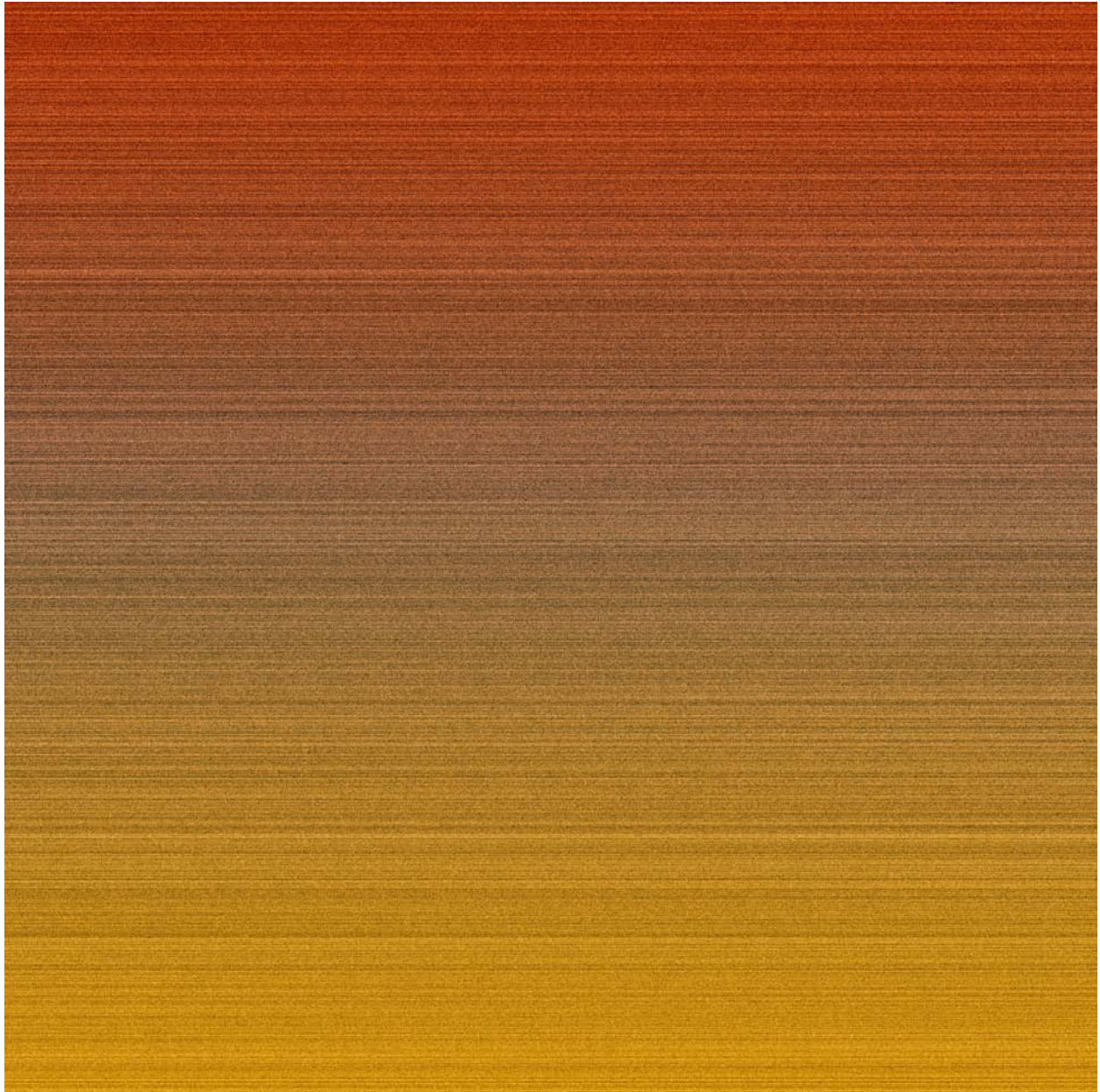
3) Fill the background white or black, and add gaussian monochromatic noise. 200% should be sufficient. Apply a motion blur, 0 degree angle, 999 distance. Reapply the filter several times by using the shortcut Control-F, until your bands of horizontal lines sharpen up sufficiently. You should end up with something like this:



4) Duplicate this layer, then turn it off and lock it. We'll be coming back to this later for the basis of our alpha map.

On the new layer, you can adjust colors by using the colorize option with the Hue and Saturation adjustment (Control-U). You can also color your map with a Gradient Map adjustment (Image --> Adjustments --> Gradient Map), or by using the gradient overlay layer effect. Or you could use combinations of all three.

For this example, I rendered 10% gaussian monochromatic noise on top of the map, used Hue and Saturation to colorize it a golden hue, and then added a gradient overlay layer effect with dark red at the first stop, gray blue at the center stop, and orange-red at the third stop, at about 90% opacity with a soft light blending mode. This was my result:



5) Save your Photoshop file in PSD format, then again as a jpg or png and name it planet_rings_color. Turn off the color layer, and unlock and turn back on the gray layer

beneath. We'll turn this into our alpha map, then jump back into 3ds Max and get these rings up and running.

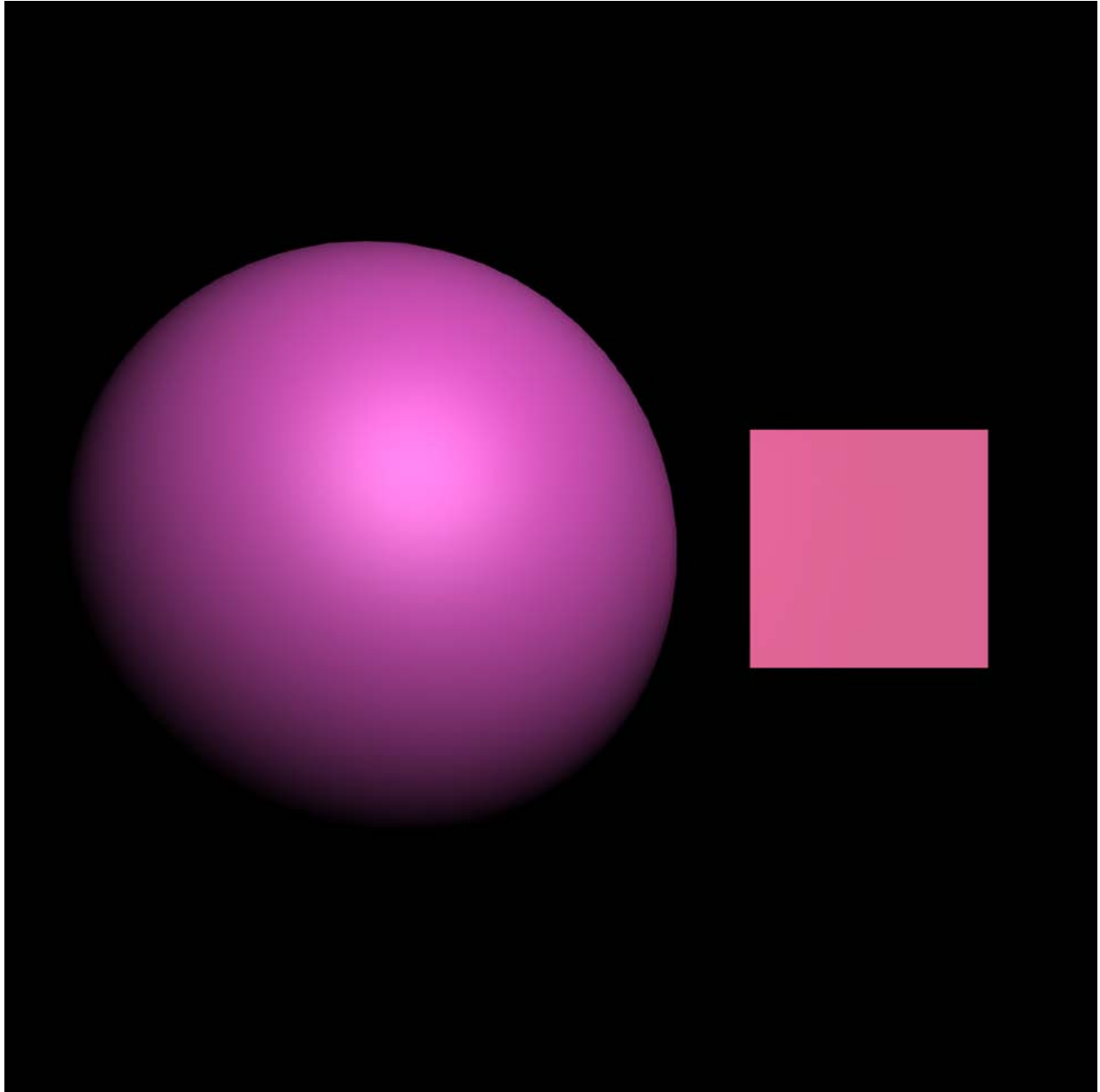
Working on your grayscale map from step 3, apply a series of gaussian blurs (5 to 10 pixel radius) followed by levels adjustments until you begin to see soft, wide bands of alternating white, gray, and black. Or, if you want finer detail in your rings, blur less, and use sharper contrast with your levels adjustments. This is where you'll define not just the color of your rings, but their opacity values (and, hence, the "shape" or "type" of rings).

This is the map I finished with:



6) Save that map as planet_rings_alpha as a jpg or png, then switch back over to 3ds Max, where our sphere (or geosphere) has been waiting patiently for us.

In the top viewport, create a plane primitive with the "square" radial checked and your segments set to 1 length and 1 width:



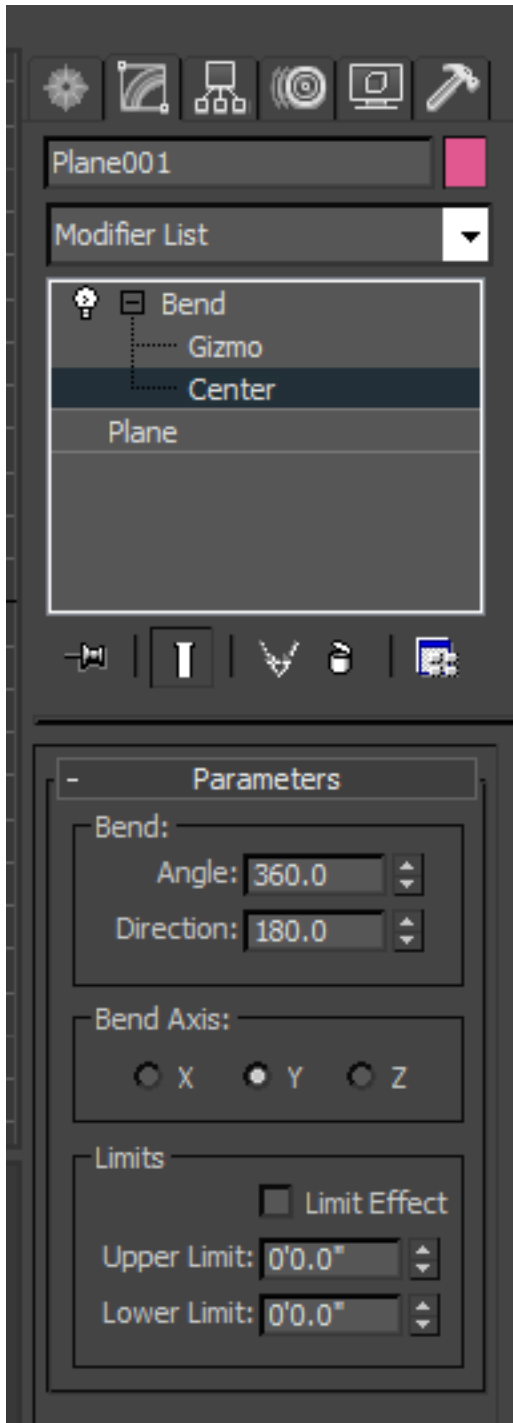
Scale your plane so that it is the width you want your rings to be, but keep it square -- same number for length and width still.

Now we'll change our number of length segments to be consistent with how smooth we want the edge of our rings to be -- smoother necessarily requiring more polygons. If poly limits are

not a major concern, change the length segments to 100. The 100 segments should be perpendicular to the planet in the top viewport -- ie, running towards the planet rather than along side of it.

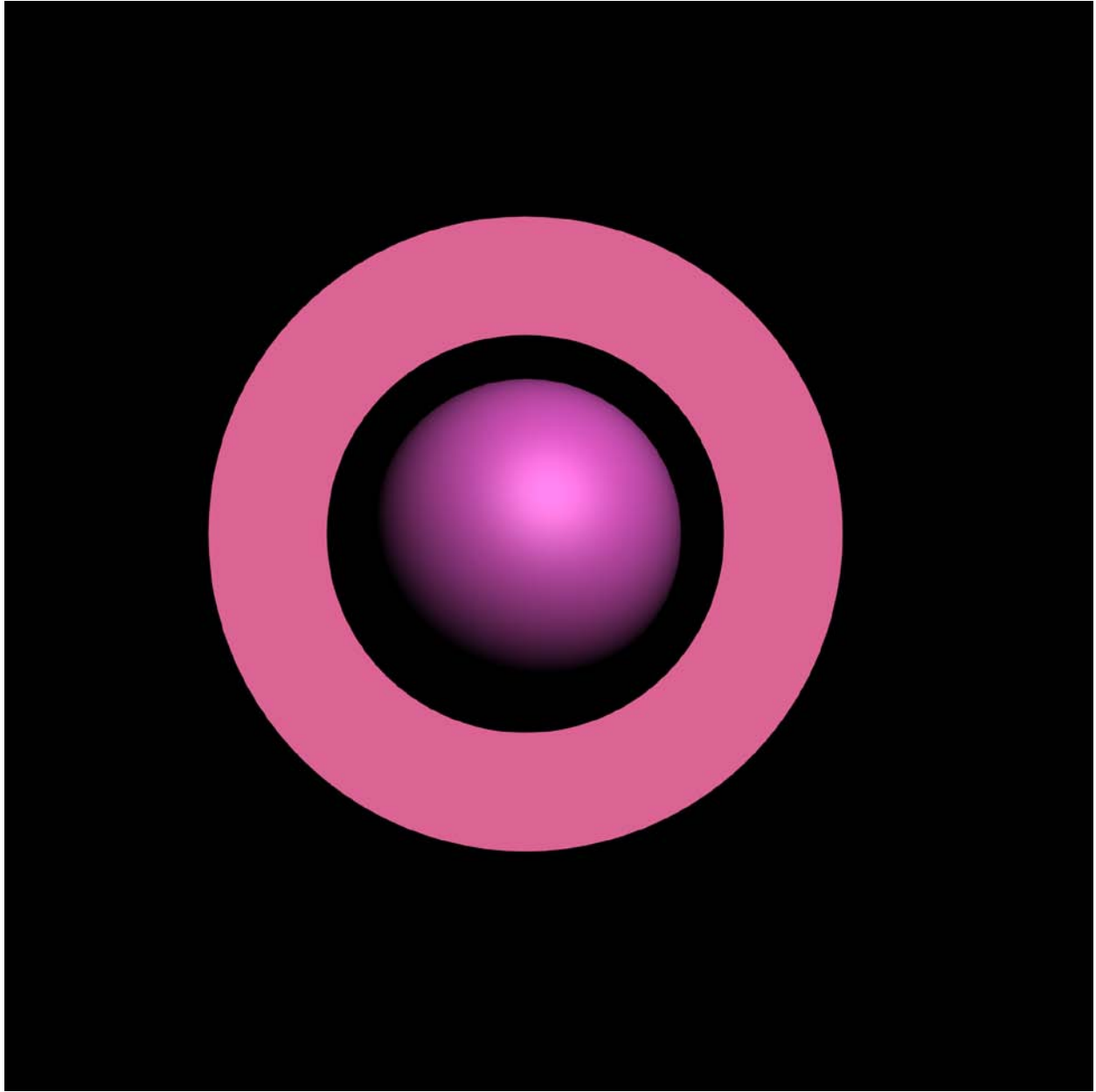
7) In the modifier pane, add the Bend modifier to your plane. Choose the Y axis, set the direction to 180, and finally, the angle to 360. Your plane should now curve in on itself and form into a disk divided into 100 pie wedges.

Go up to the modifier stack and roll out the options for the Bend modifier by clicking the + next to it. Select "center" and turn on your move tool.

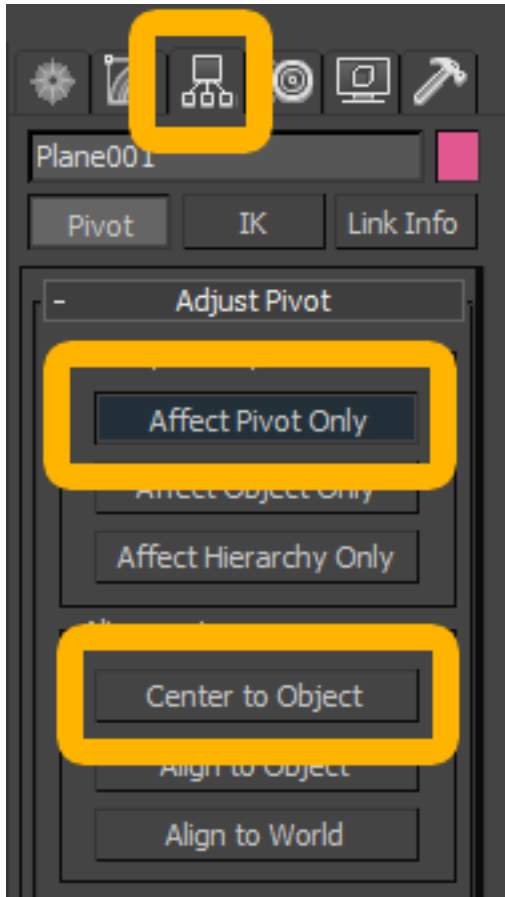


In the top viewport, move the center gizmo to the left or right to scale the center radius of our newly made disc, until it is large enough to fit around your planet with the proper distance you require.

By clicking back to the Bend modifier, you can move the ring to center it on your planet as you continue to position the Center to get the radius right.



Finally, collapse your modifier stack, click into the hierarchy tab for your ring, select "affect pivot only" and then "center to object." Turn "affect pivot only" off, then use the align tool to align your rings perfectly to the planet.

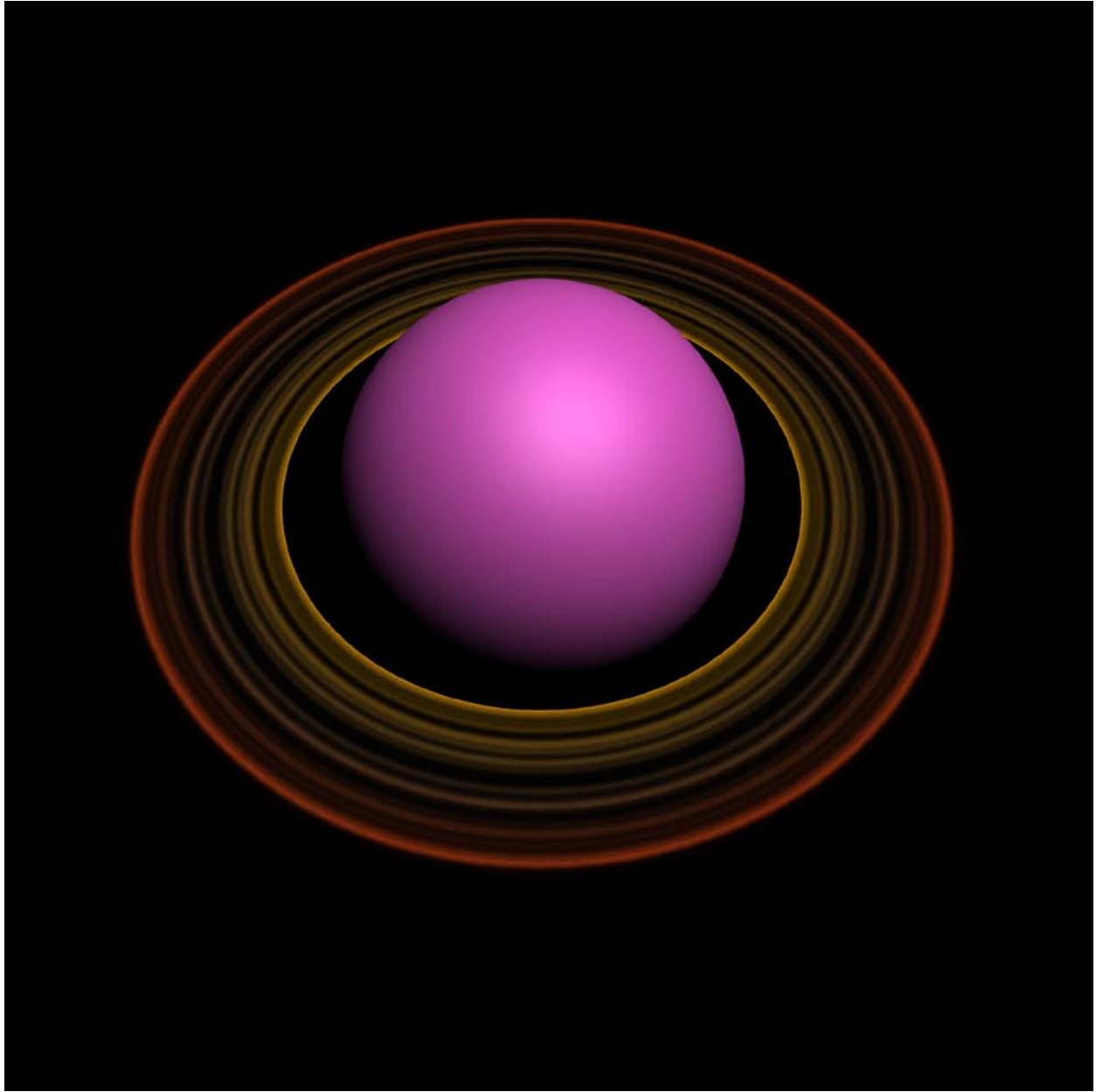


8) One step remains, adding our Photoshop maps to the ring.

Open your material editor and select an empty material slot. Click the small box next to the Diffuse color swatch, and select "bitmap." Browse to where you saved "planet_ring_color" and add the map to that slot.

Click Go to Parent, then click on the small box next to the Opacity slot. Add your bitmap "planet_ring_alpha" to that slot, then apply the material to your ring object.

Render, and your rings should look something like this (or better!):



Additionally, you may opt to copy your alpha map to the self illumination channel to give your rings a varying amount of self illumination.

As always, experiment with the steps, have fun, make cool stuff, and if you have any questions regarding this tutorial or any of the others, I can be reached by email pretty much around the clock.