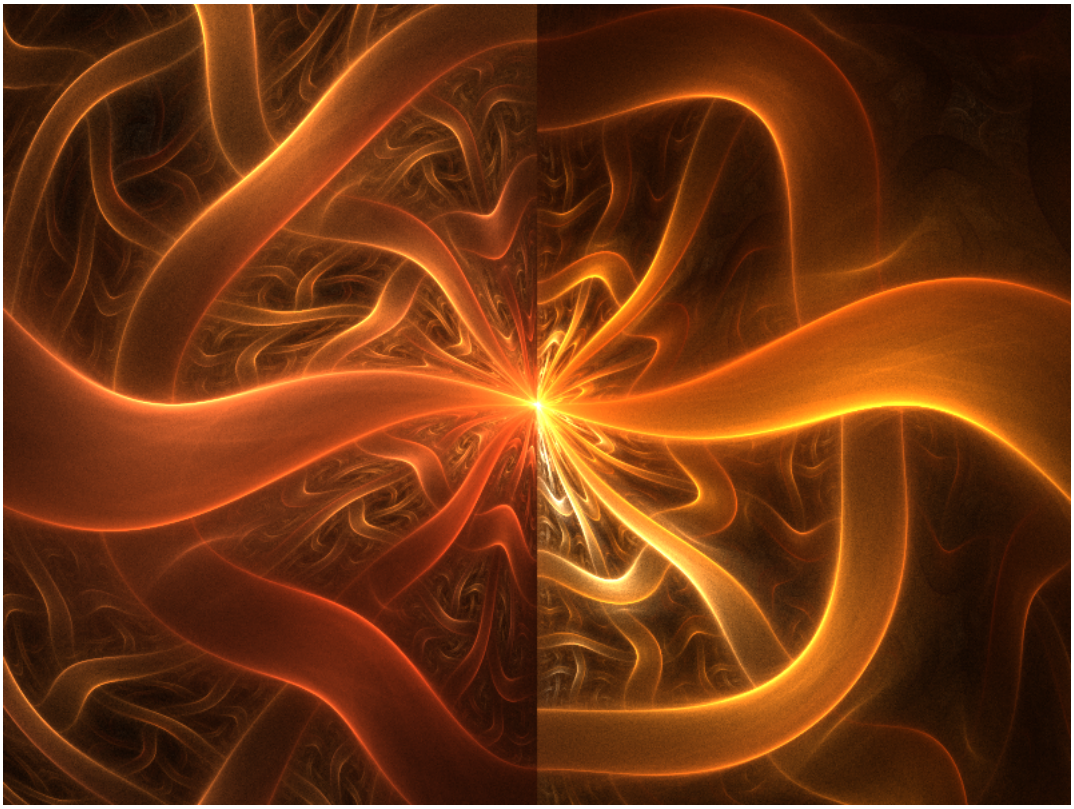
# Post-Transforms

"Flipped Disc" Flames using Post-Transforms



# Introduction

## About the Author

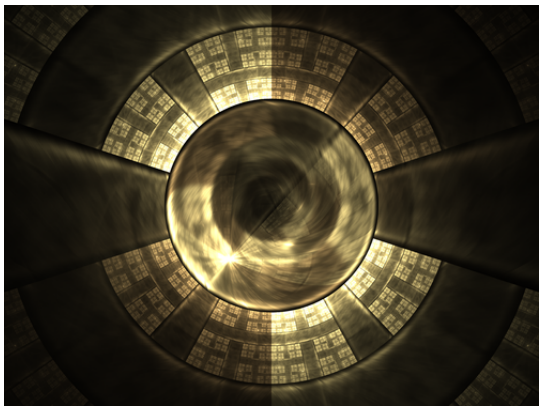
My name is Joel Faber and I am a fractal artist. I work primarily with Apophysis. You can see some of my creations at my deviantART gallery.

## About this Tutorial

This tutorial is a novice/advanced tutorial about a new feature called "post-transforms" in Apophysis. If you've never used Apophysis before then you can download the latest version from SourceForge. If you are not already familiar with Apophysis then you can find many beginner tutorials at

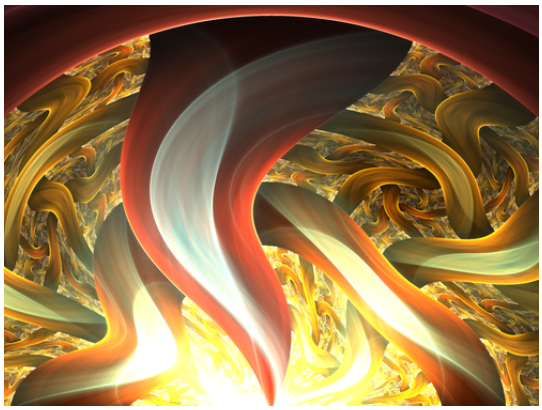
- FracFan Forum: `http://woosie.net/fracfan/`
- Apophysis Wikispaces: `http://apophysis.wikispaces.com/Tutorials`
- The Apophysis group at deviantART: `http://apophysis.deviantart.com/journal/2038750/`

In this tutorial we will use post-transforms to make fractals using a "flipped disc" transform. Some examples of such fractals are below.



*Brushed Metal*

`http://www.deviantart.com/deviation/38631954`



*Twister*

`http://www.deviantart.com/deviation/41369740`

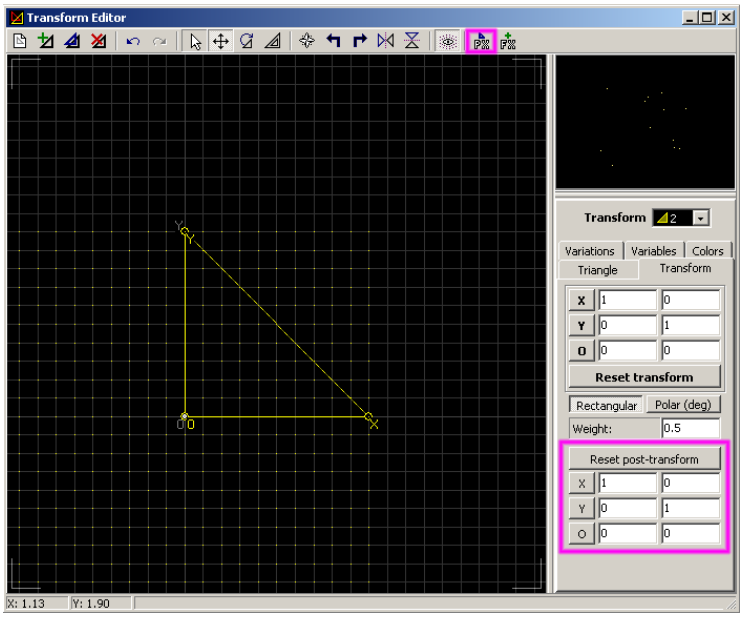
# Introduction to Post-Transforms

A post-transformation is an additional "affine transformation" performed after the normal transformation and variations are computed. If you have no idea what that means, don't worry about it! If you want to know more you can get started by taking a look at the Wikipedia page for affine transformations or Scott Draves's paper.

First we will take a look at some new buttons and knobs in Apophysis. Later we'll push those buttons and turn the knobs to see how they work. Finally we'll build a fractal using a simple post-transformation.

## New Editor Features

Open up Apophysis and the transform editor and let's get started! You'll notice that there are a few more buttons and boxes in the editor. The big box highlighted in the picture below displays the post-transform coefficients. You can manually edit the post-transform here if you're up to it.

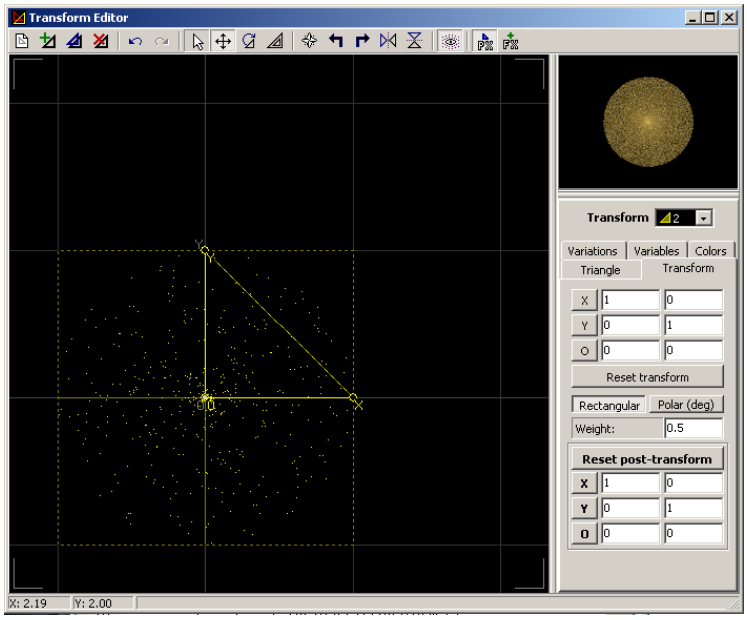


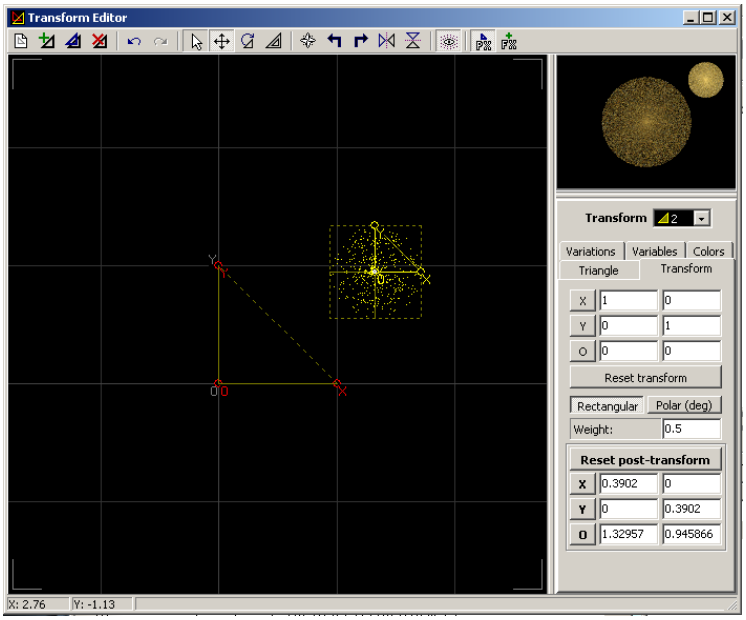

The small button highlighted in the toolbar is the "enable post-transform editing" button. If you click this button then you can modify the post-transform triangle. This is an additional triangle that you can use to manipulate the size, position, rotation and skew of the shape the transform produces. Push the button again if you want to edit the transform's regular triangle.

## Playing with Post-Transforms

First, make sure that "Auto reset location" is disabled. (You can uncheck this by right clicking on the little preview window in the editor). Then click the "New blank flame" button.

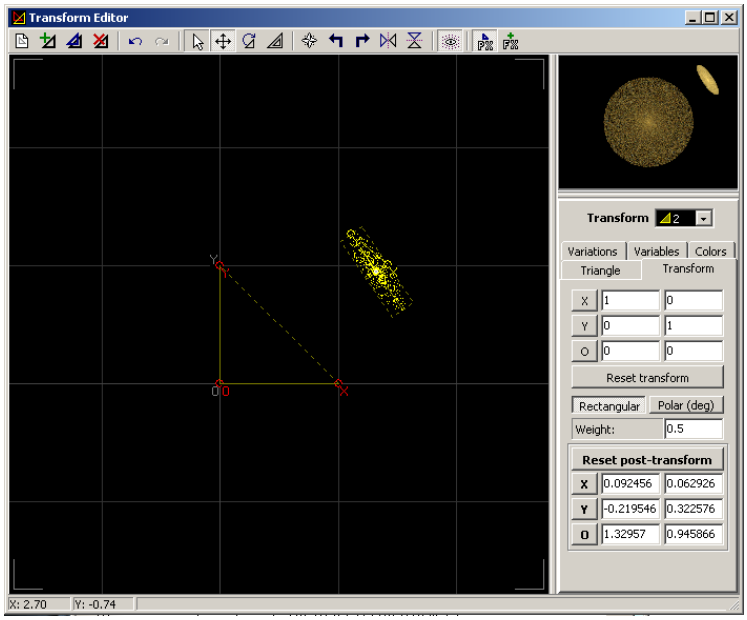
On both transforms set *linear* = 0 and *blur* = 1. (You don't have to use blur, but it works well here because each blur transform has no effect on the other.) You should see just a coloured ball in the preview. Enable post-transform editing by toggling the post-transform edit button.





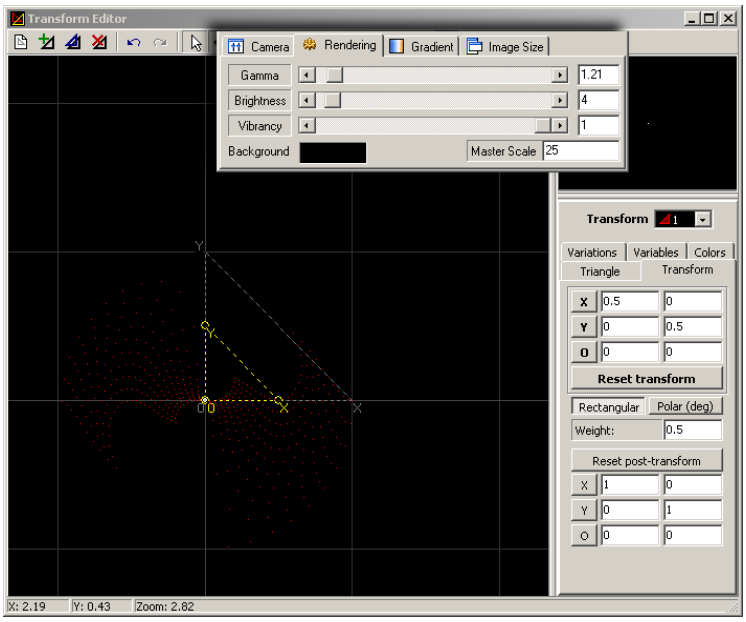

Now that the transform is in post-transform edit mode, move the transform around and scale it. You should see two balls in the preview window. Each one corresponds to one of the blur transforms. As you move the post-transform around you should see the ball move too. (I wrote a variation called *move* a while ago that did something similar. You may have seen this in very old versions of "Apophysis JF" or "Apophysis Z+" by Gygrazok.)

You can also make the ball oblong and rotate it. Play around some more if you wish, then let's move on!



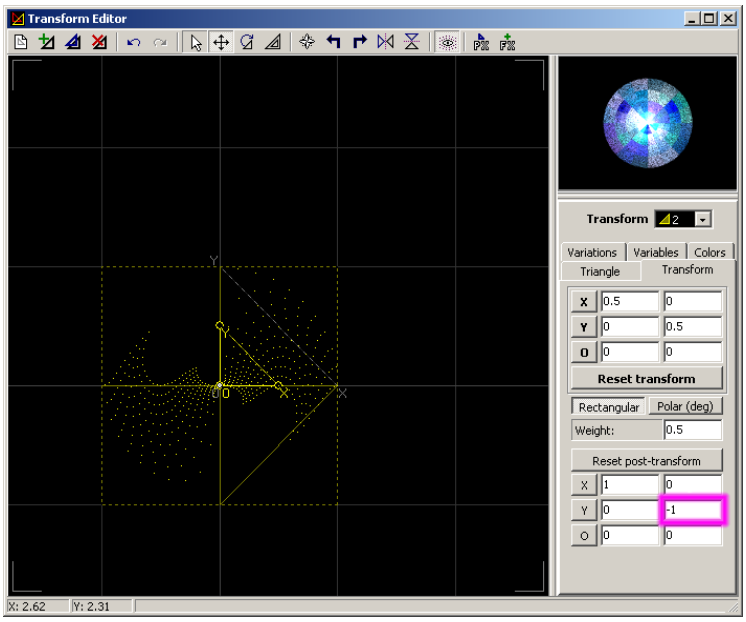
## The "Flipped Disc" Style

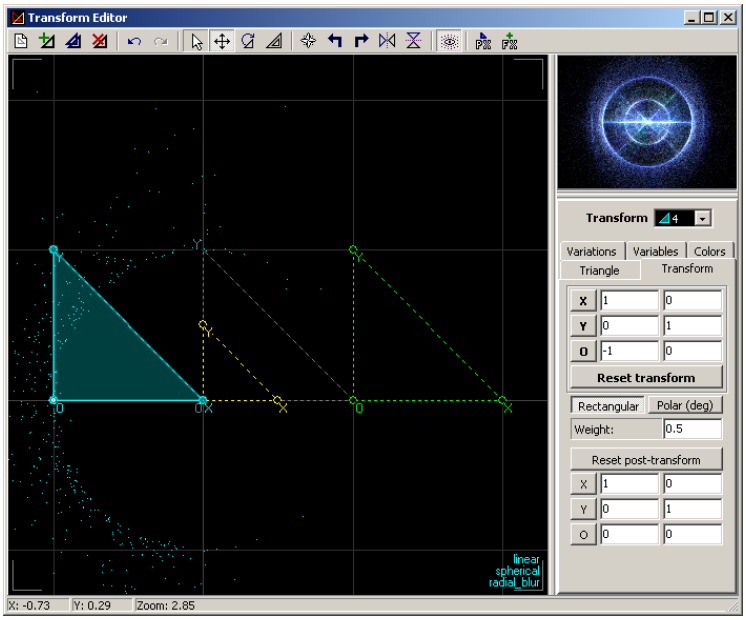
If you haven't already, click the "New blank flame" button again and let's get started putting post-transforms to good use.




Set *linear* = 0 and *disc* = 1 on both transforms and scale both triangles down somewhere between 0.3 and 0.5. We'll play with this value later, so it doesn't matter much now, but make sure it is no greater than 0.5. Also lower the gamma in the "Adjust" dialog box. Don't worry if nothing shows up in the preview windows yet.

Now here is the "flipped disc" trick. Select any of the two transforms and click the "enable post-transform editing" button. Flip the post-transform along either the $x$ or $y$-axis. Pictured on the right, I've flipped transform 2's post-transform along the $y$-axis. Notice the yellow image preview dots on the right are a mirror image of the red image preview dots in the image above. Now that something is displayed in the preview, play around with the scale of each of the disc transforms. See what happens when they are both smaller, both bigger, and different sizes. Pick a size you like, and let's move on!

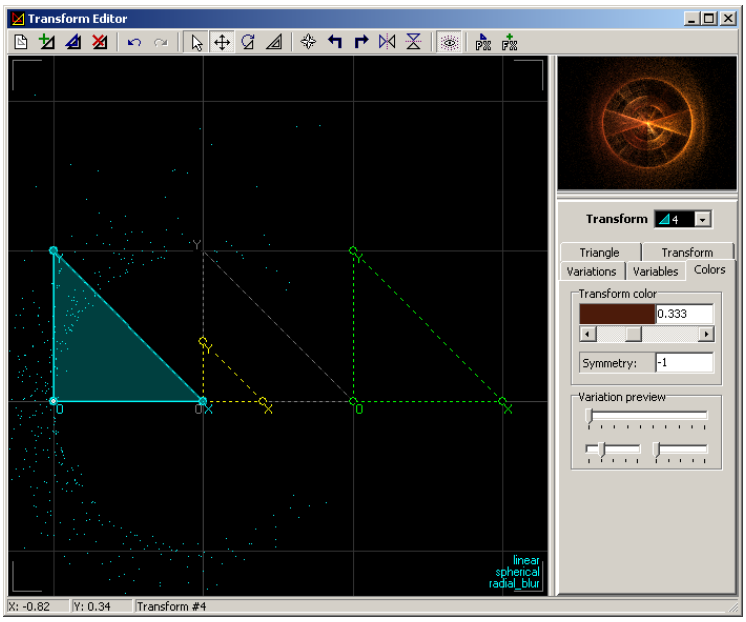


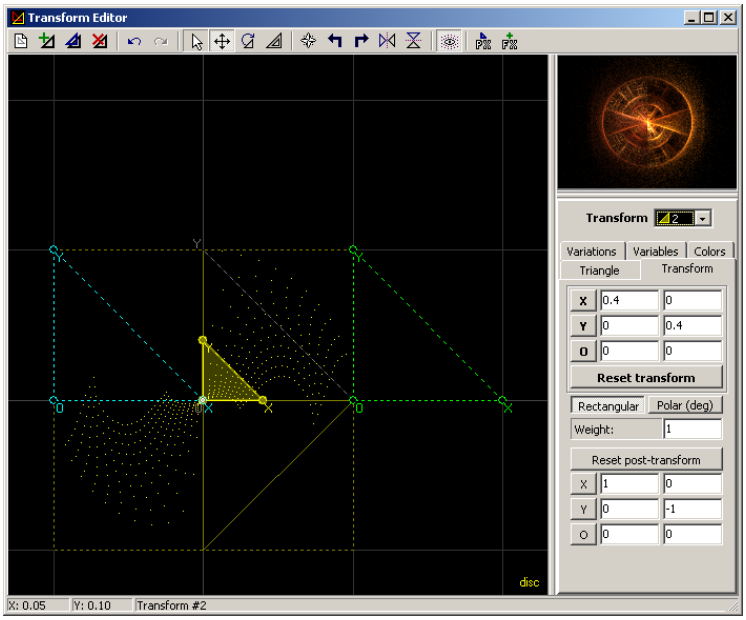



Add two more transforms. Both of these transforms contain *linear*, *spherical* and *radial_blur*. Translate both of them in opposite directions. Shown here I've got $linear = 0.5$, $spherical = 0.5$ and $radial\_blur = 1$. I also set $radial\_blur\_angle = 1$ in the variables tab. I used these values so that the new transforms don't overlap the circular shape created by the disc transforms. Different values and variations will give you different effects in the final image. Play with different values or try adding new variations to these transforms, but if you want a nice clean result try not to overlap them with the disc shape.

Now that we've got a basic pattern we need to work on the colours a bit. We want bright, bold colours. For this we need to play with weights, colour values and colour symmetry.

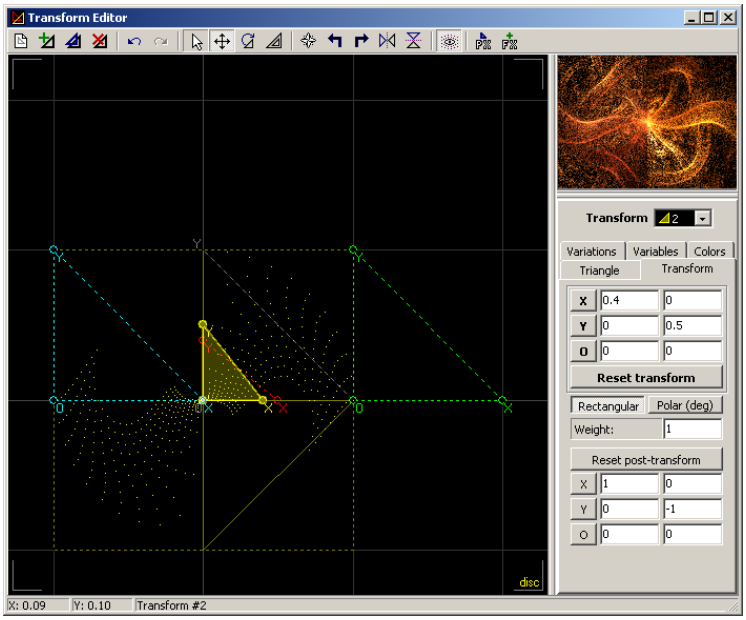
Let's start with colour symmetry. We want the two radial_blur transforms to dictate the overall colours in the fractal. The colours should flow smoothly over the smaller details. To do this we want to set $symmetry = -1$ in the two radial_blur transforms and set colour symmetry high in the disc transforms. Shown on the right, I've set $symmetry = 0.95$ in the two disc transforms. (For a short introduction to colour symmetry, see this short tutorial.) Play with the colour values and gradient and see what results you can get.






We want to show more of the details in the circle in the centre. We can do this by increasing the weight of the disc transforms. If you increase the weight too much you will start to loose some detail. Find a weight that you like.

We've got some interesting shapes, set our colours and weights. We can tweak the shape some more by playing with the disc transforms some more. Try translating these transforms small amounts or skewing them. Shown on the right I've made one transform taller and the other wider. I've also used "master scale" to move the camera in closer to the image.




## Conclusion

Two `.flame` files should have been included with this tutorial. They contain the parameters for each of the sequences of screenshots in this tutorial. If you obtained this tutorial without the parameters you can download them from my deviantART gallery.

So what else can you do with this "flipped disc" trick? Try Michael Faber's Disc Spiral Tutorial, but instead of using one disc transform use two disc transforms just like we did in this tutorial.