

# Foreword

Hello! This is my first "tutorial", but it's going to be a bit different than most tutorials. Many tutorials give you a step-by-step process which tends to result in a lot of similar results for different users. Others are too open-ended and theoretical to be of use to most beginners. In contrast, this aims to truly be a tutorial for all skill levels--it can be as complicated or as simple, as rigid or as flexible as you want it to be. I'm aware that as a result, it's rather disorganized. **Almost everything in this tutorial is little more than a guideline--you may want to follow these steps closely the first time, but later, stray from the prescribed path and experiment a little.** Striking the right balance is obviously a difficult undertaking, so I welcome feedback on the user-friendliness of this tutorial. After all, this is my first one ever.

If you use this tutorial, I would appreciate it (though it's obviously not required) if you post a link/thumbnail of your works, as many as you like, in the comments. I intend to supplement this tutorial with examples from my own gallery--and parameters are available for **all** of them via note--but I would also like to build a little collection of all the results at the bottom of the tutorial. Plus, I'm really quite eager to see all of your incredible works!

Also, as a disclaimer: It's possible that other people have used what I'm about to show here before. I don't claim to be the original "discoverer" of any of this.

## Requirements:

This tutorial does assume that you know the basics of Apophysis, Chaotica, or JWildfire, such as post-transform editing. My screenshots are from Apophysis 7x, but the basic premises of this tutorial should work in any of the above programs.

You'll need **polar**, **pre\_blur**, and **elliptic** at the bare minimum. Depending upon your preferences, you'll probably want some variations such as **noise**, **blur**, **radial\_blur**, **etc.** as well.

Other than that, variations (especially in step 4A) are really just a matter of preference.

## Forward Part II (Step 0)

This actually isn't part of the tutorial, but just a separate mini-tutorial for inquisitive minds.

Back over the summer of 2014, I realized I was thoroughly perplexed by the polar variation. I simply never seemed to have use for it. I concluded that I was obviously missing something, so I sat down and experimented with polar for ages.

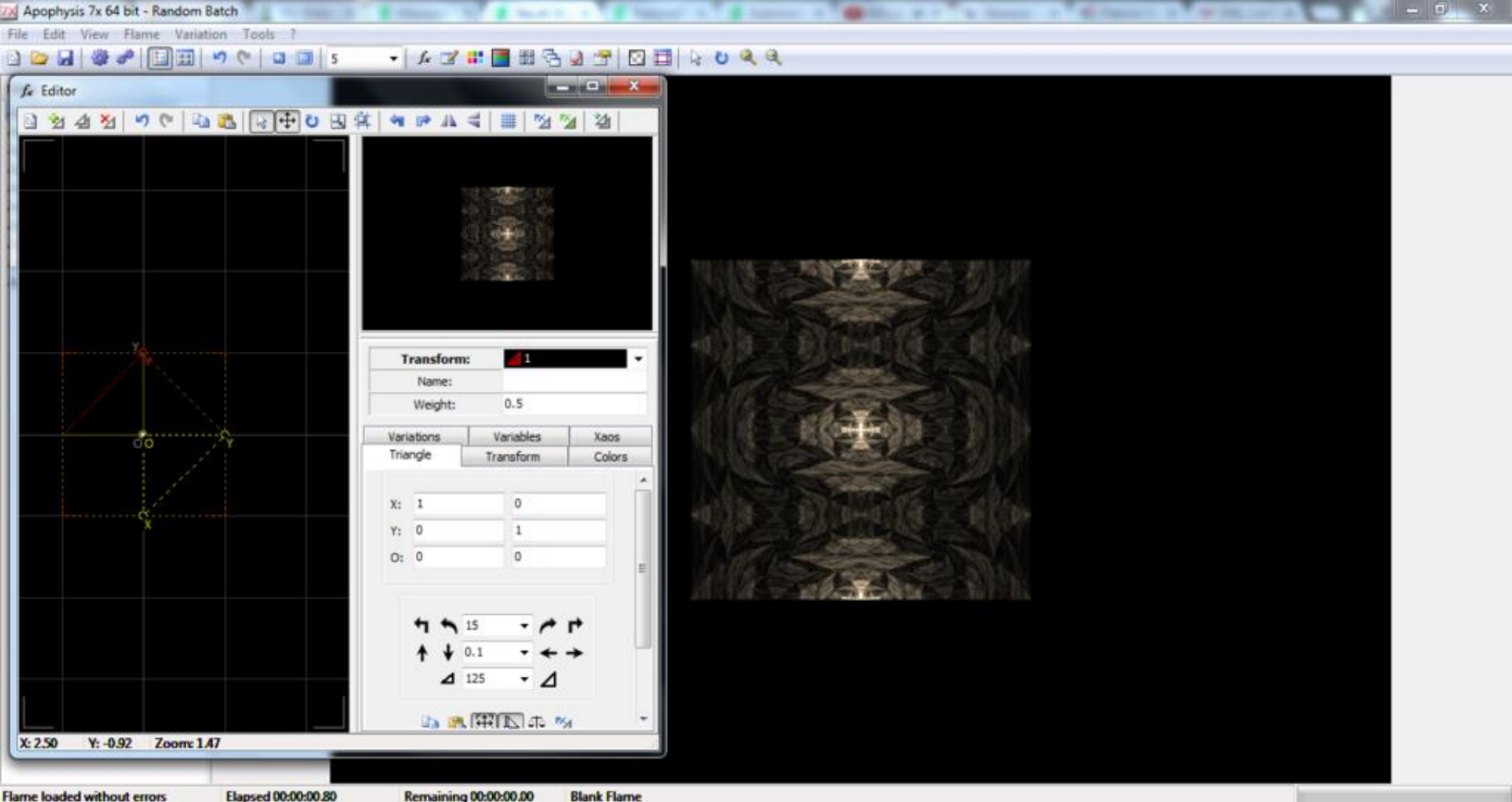
Eventually I discovered a relatively simple base flame:

Step 0a: Transform 1: linear = 0, polar = 1.

Step 0b: Activate post-transform, rotate 90 degrees counter-clockwise.

Step 0c: Duplicate transform, rotate 180 degrees.

With scale = 32, you should have something like this.



I found that this technique could lead to very unique fractals, but I eventually found it quite inflexible. I unceremoniously dumped it and didn't think about it again for about half a year.

However, in January of 2015, I was suffering from a serious lack of inspiration when I thought about returning to my now-quietly-neglected polar variation experiments. After some more experimentation, I found something I thought was interesting and proceeded to repeatedly use it, over and over and over again *ad nauseum*. (My watchers can confirm this, I'm sure.) The results of these experiments constitute this tutorial.

## Step 1: Set up your polar base transforms.

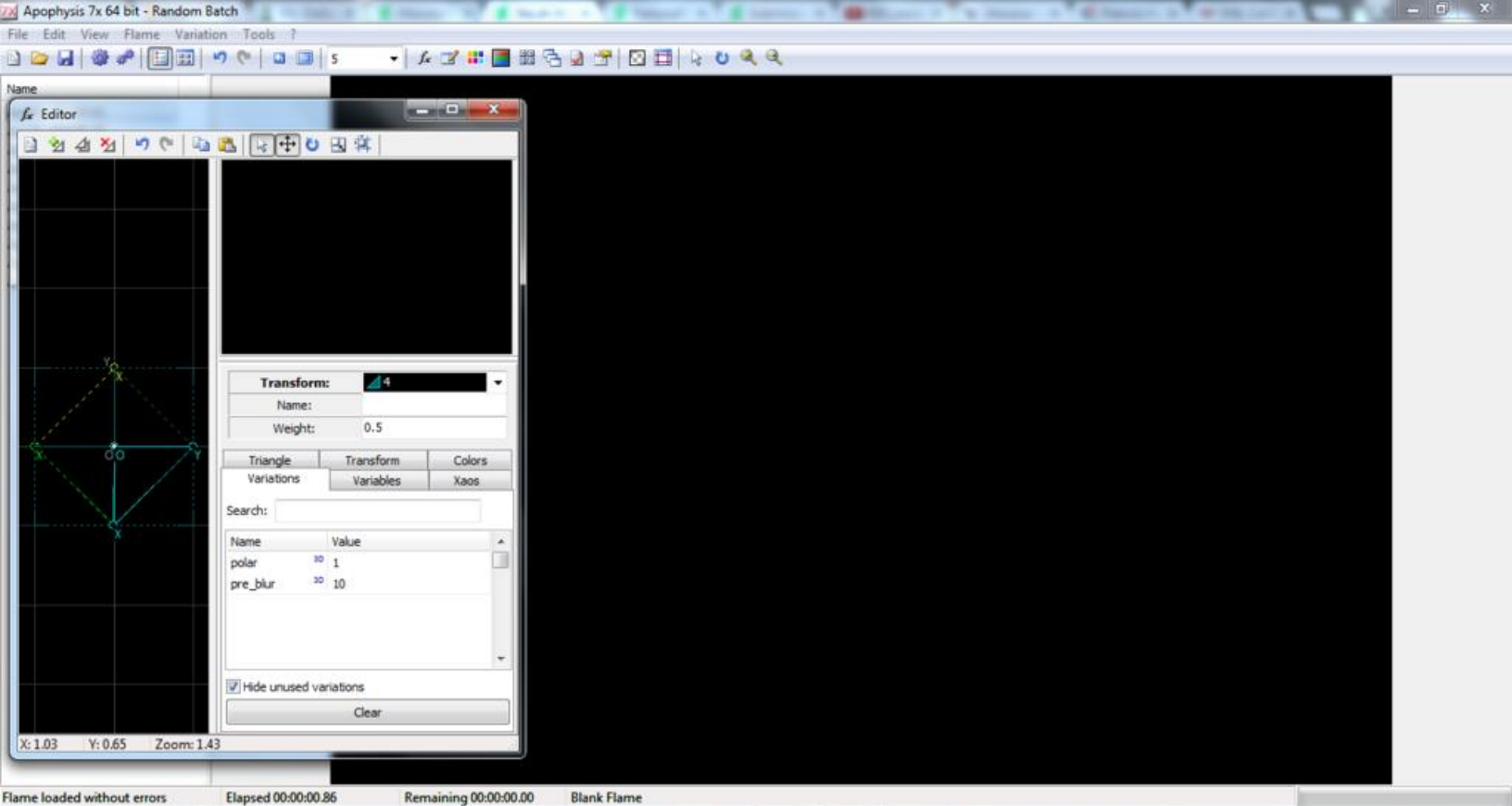
*Note: more experienced users may want to create only one of these transforms and then use linked linear transforms instead of duplication. If this is your first time using this tutorial, or you have no idea at all what this all means, that's fine. Just ignore this.*

Open up a new flame. Set scale to about 16 for now (non-Apophysis users, you may have to experiment on your own a bit, sorry!) You'll probably want to start with a lighter gradient for now, so we can see everything clearly—we can color our fractal later.

For the first transform, set linear = 0, polar = 1, and pre\_blur = 10. Go to the color tab and set opacity to 0.

...And in your preview screen, you should see a spectacular...nothing! But that's OK at this point.

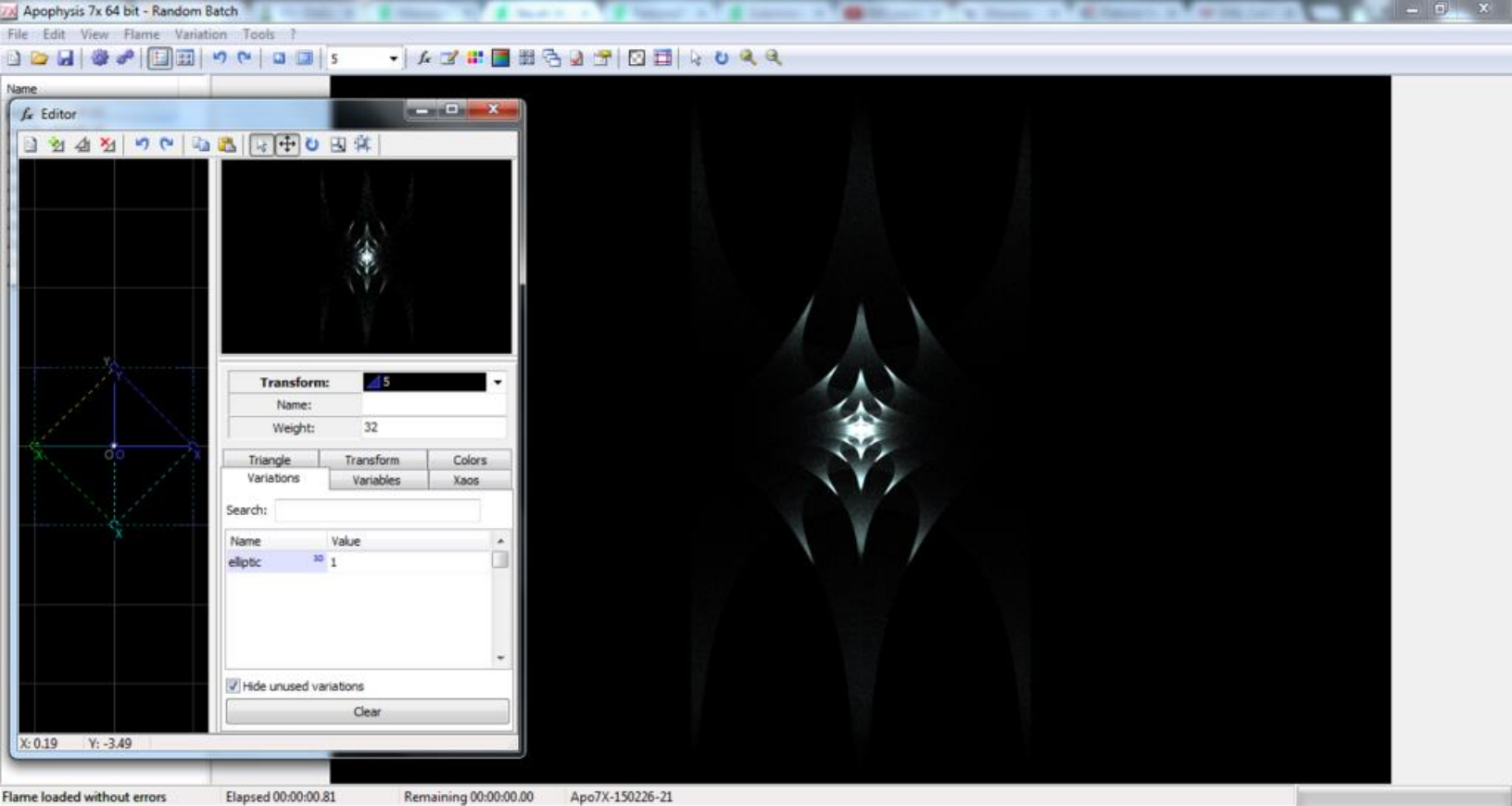
Enable post-transform editing. Duplicate the transform and rotate the new transform's post-transform 90 degrees counter-clockwise. Duplicate it and rotate it again. Repeat yet again. Now, you should have four transforms, identical save for their location in different quadrants, and still nothing to show for it. But that's step 2.



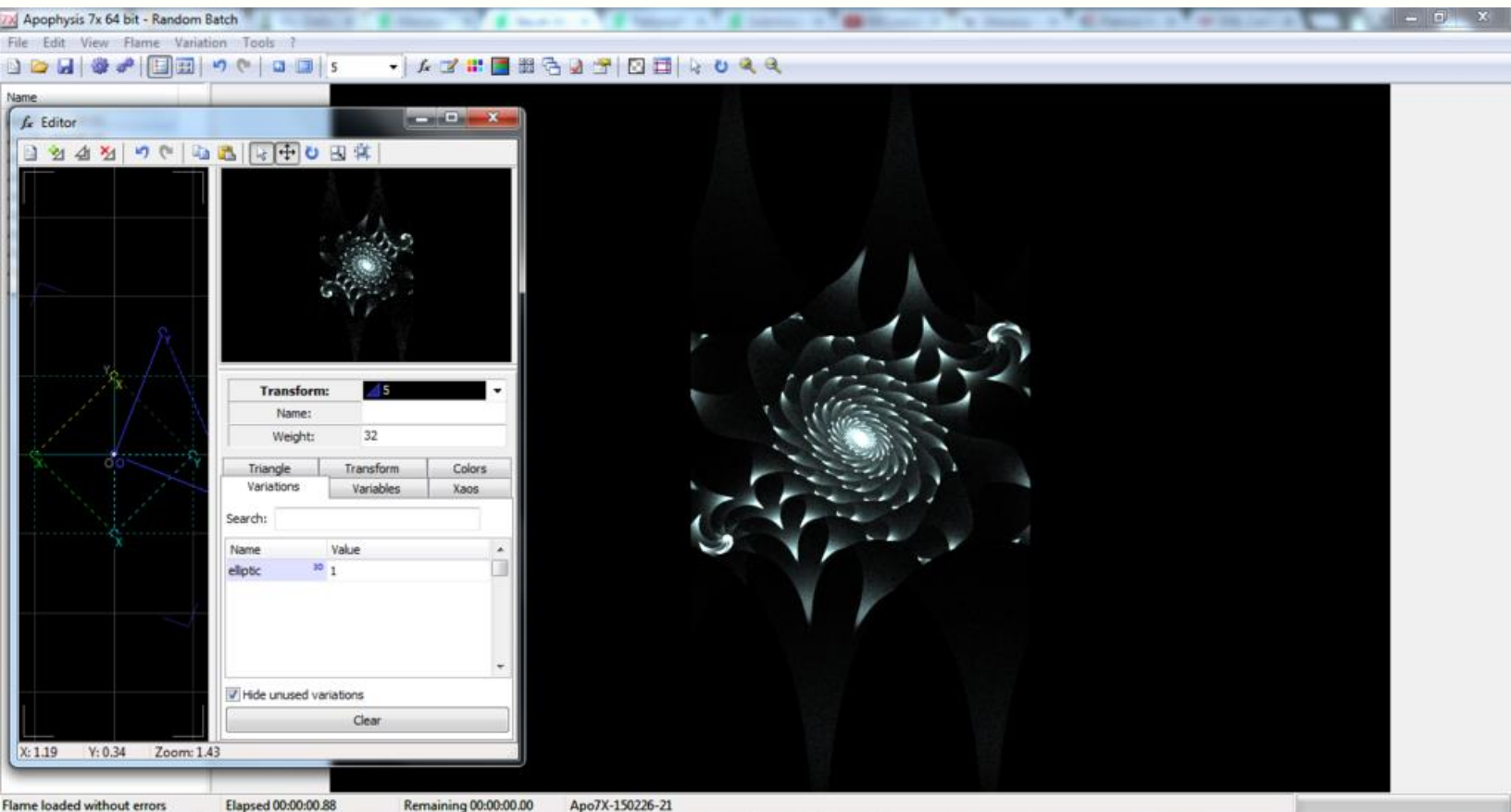
## Step 2: The spiral itself.

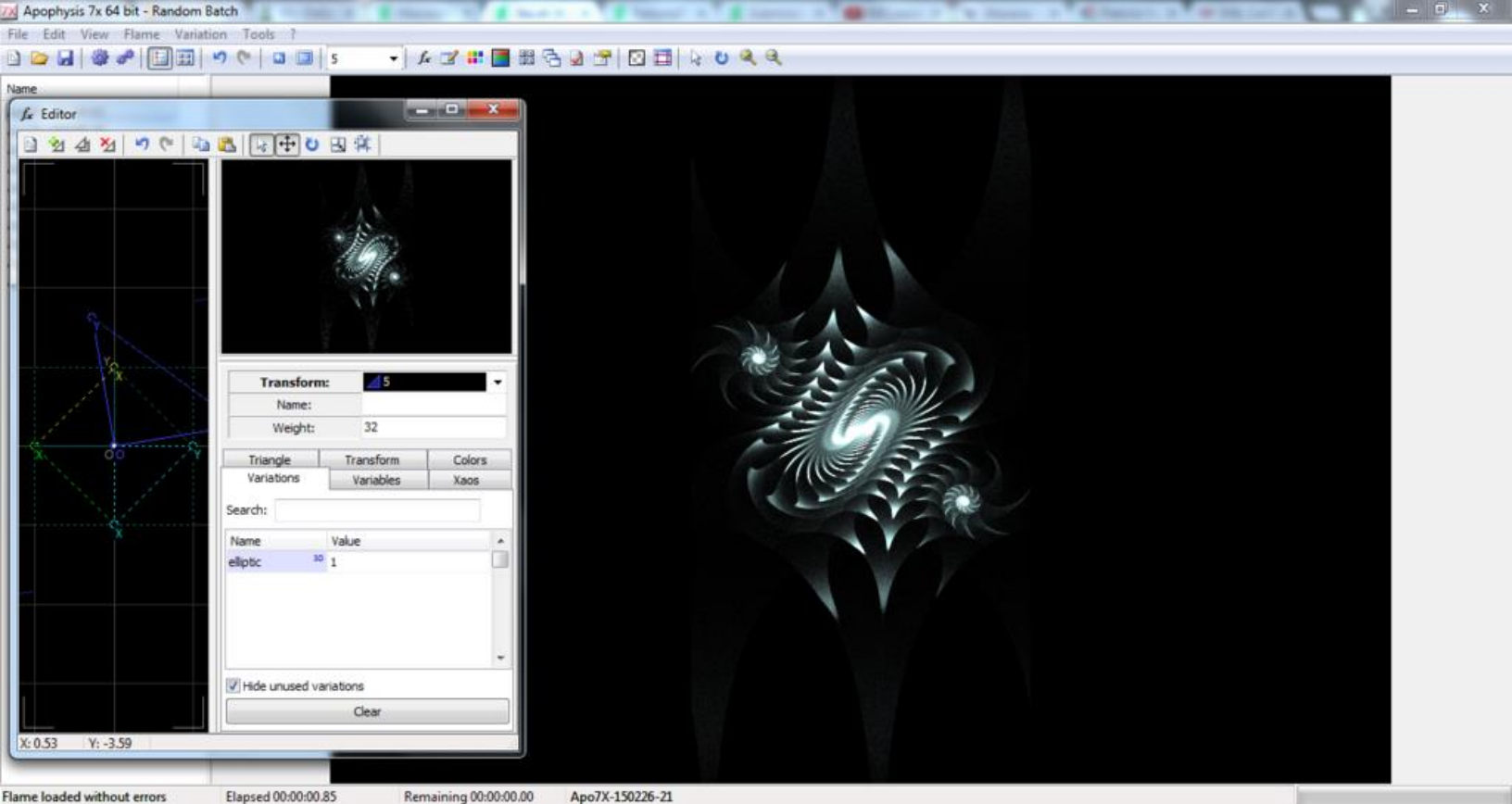
Here's where you begin to have a dizzying array of options. I can't possibly cover them all here...which is why I'll just cover polar-elliptic spirals for now and mention the rest later, in the Appendix.

Make a new transform (transform 5), and increase the weight dramatically. (32 is a good start.) Set linear = 0 and elliptic = 1.



Now scale up the transform and rotate it to your liking--I don't advise moving it though. This will determine the shape of your spiral and drastically affect your results. A couple of examples:





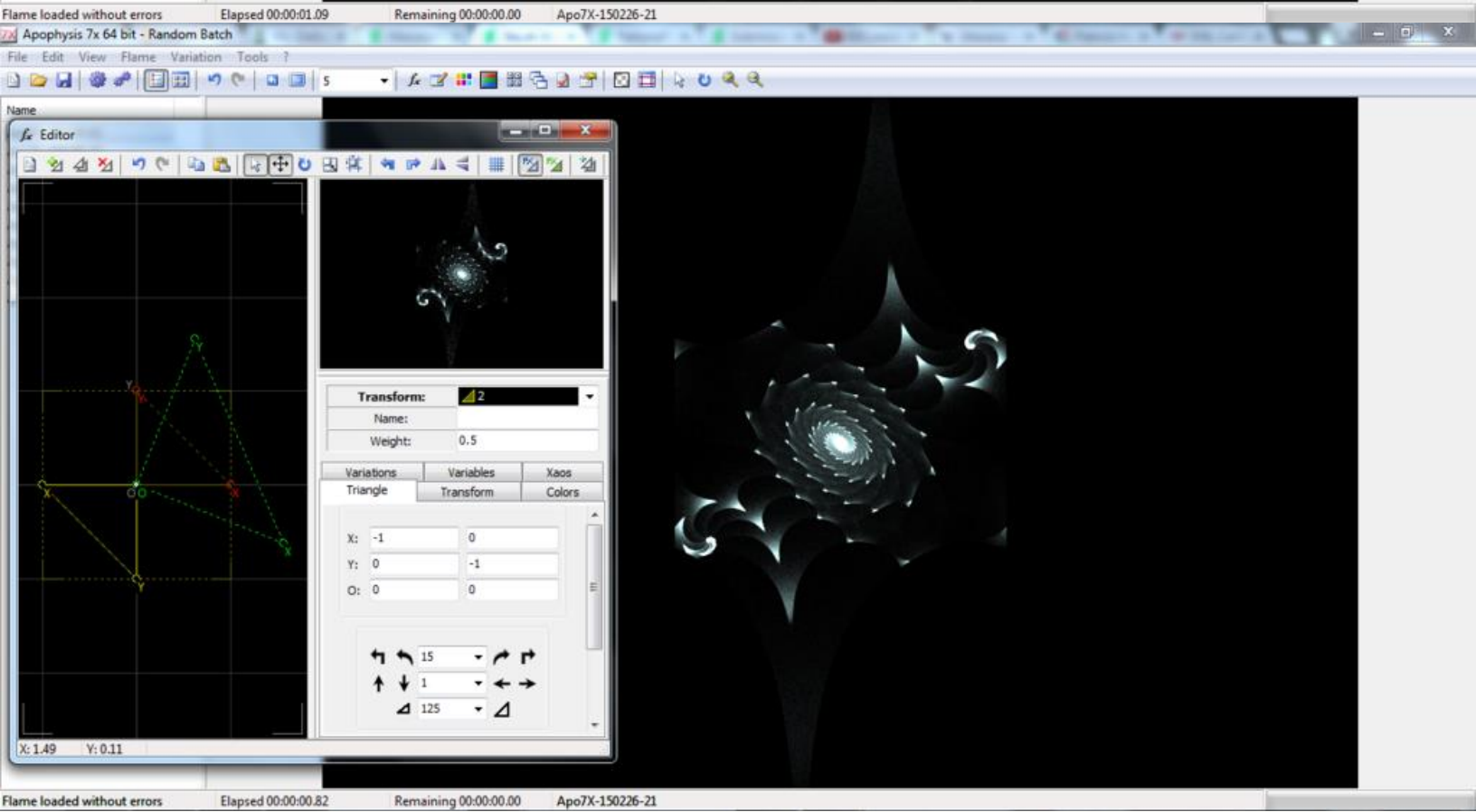
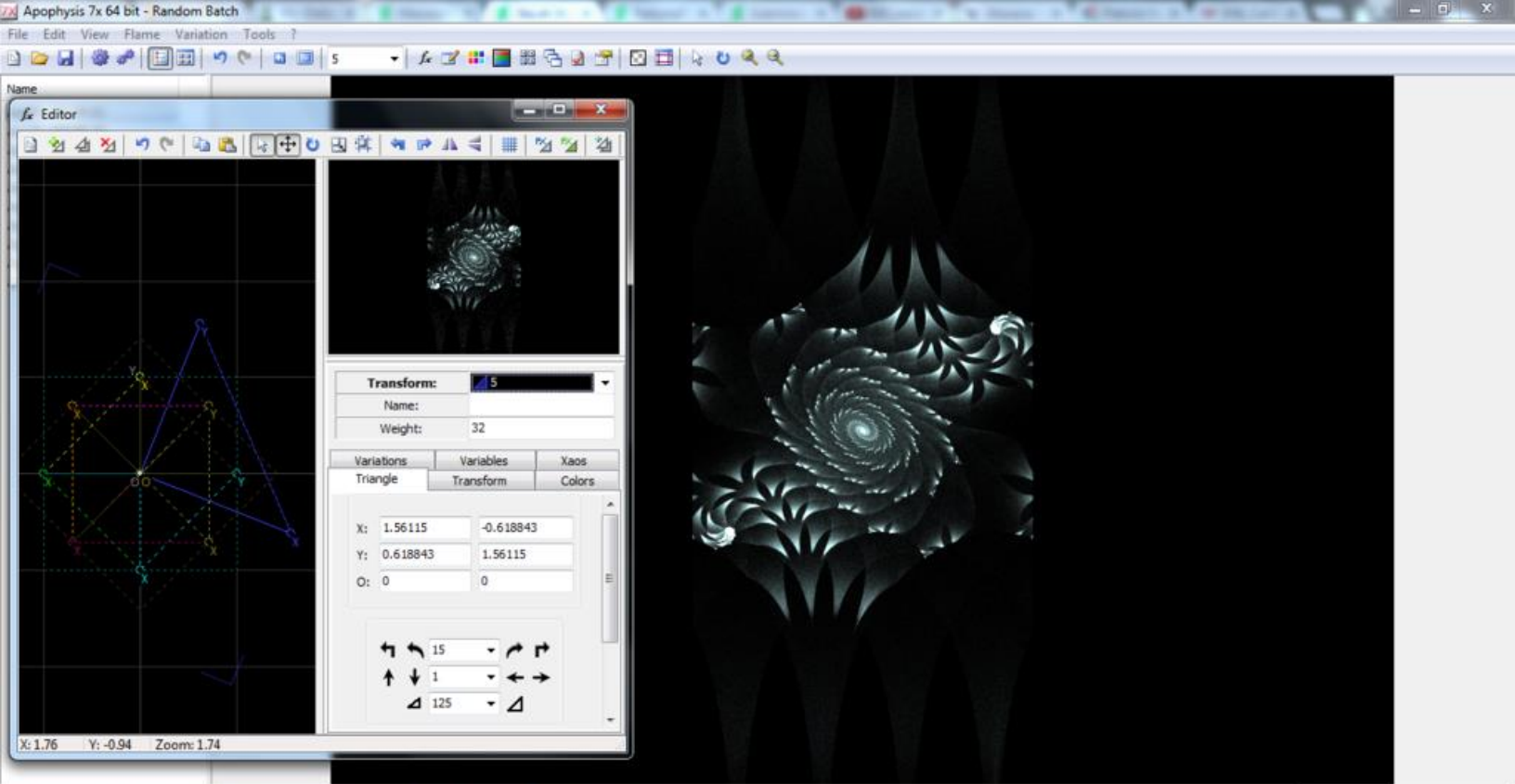
I'll continue with the first of the above pair of examples.

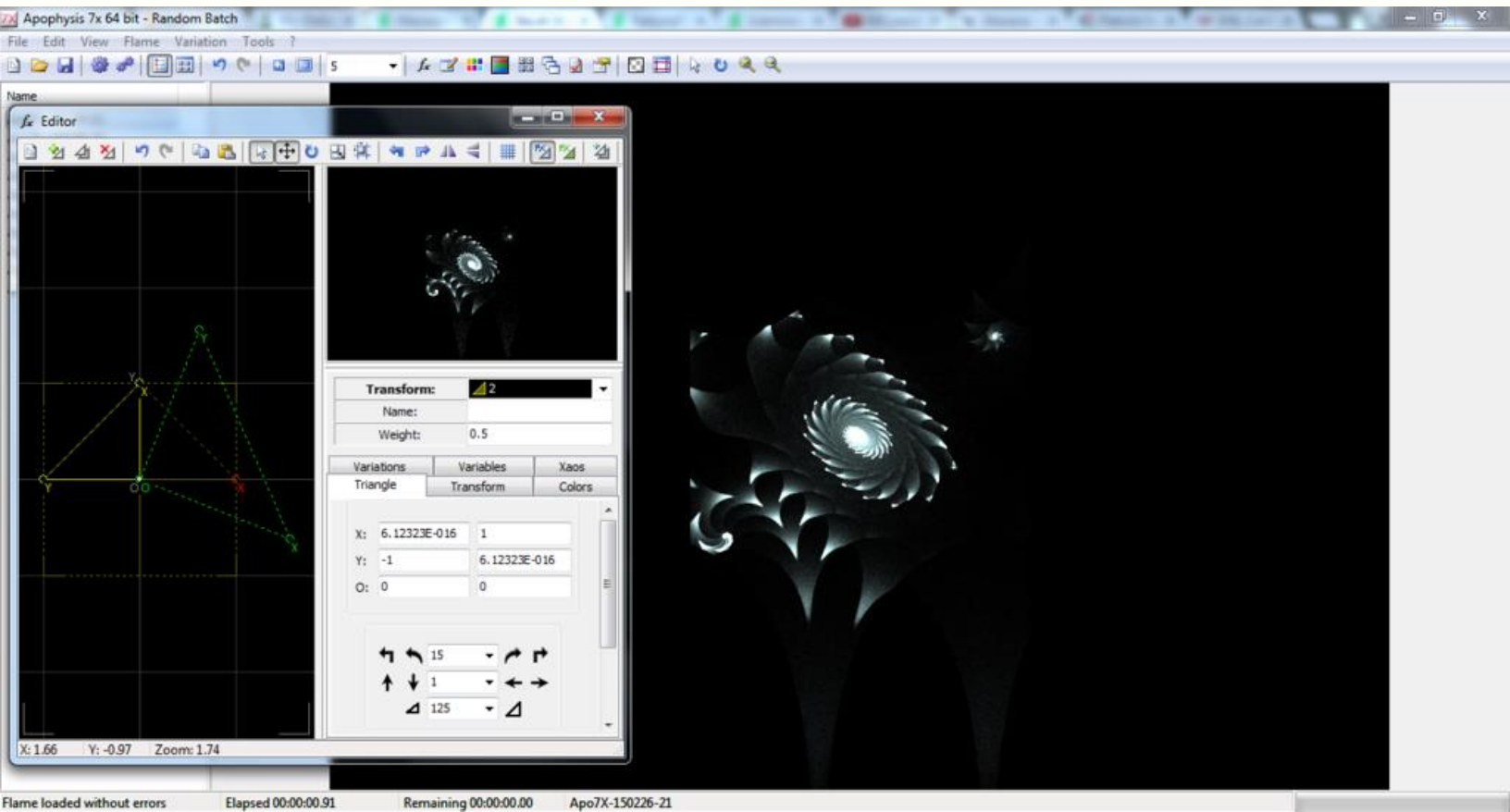
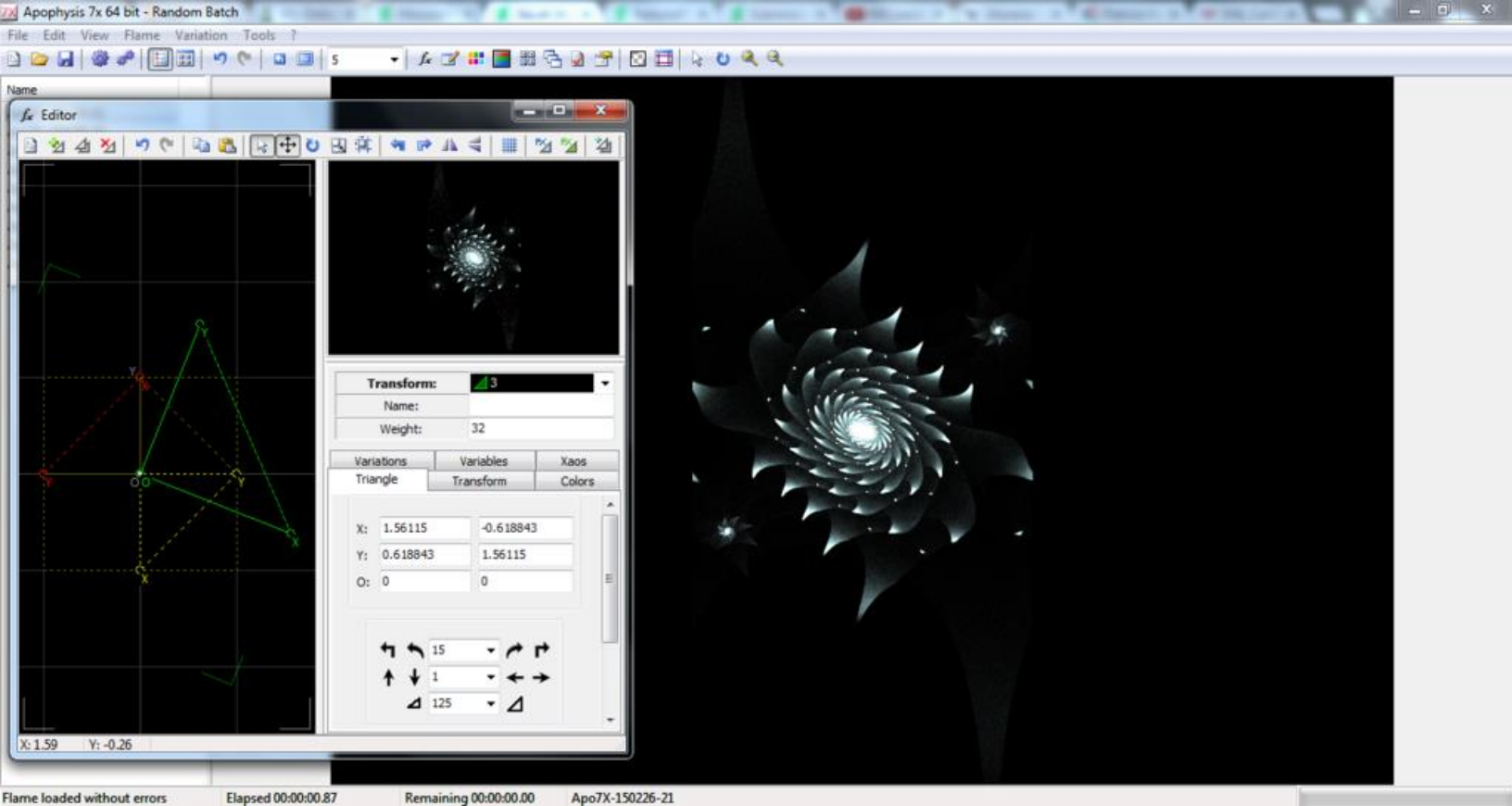
### Step 3: Re-evaluate your polar transforms.

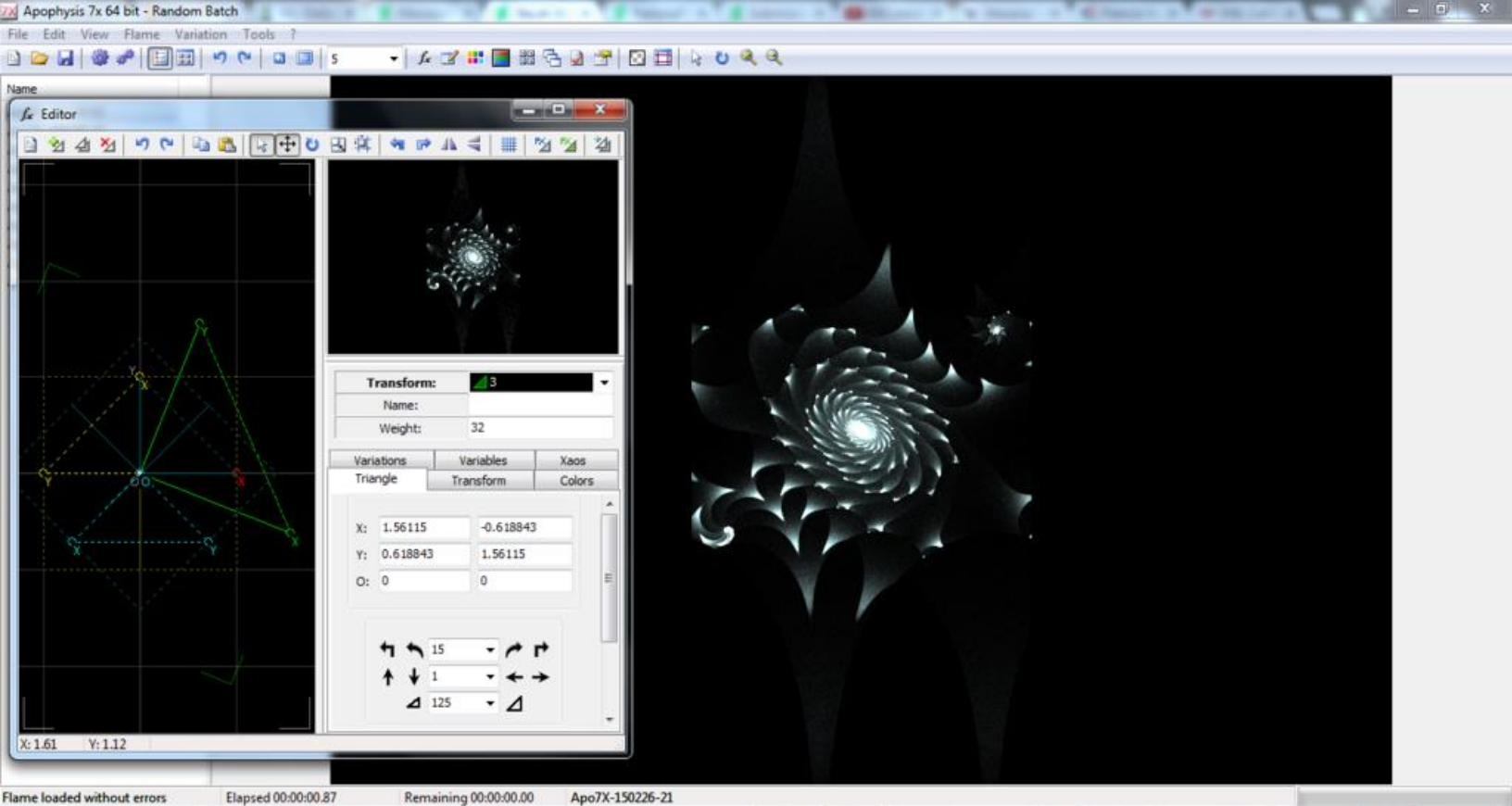
Now that you've decided on your elliptic transform using a basic combination of 4 polar transforms, you may want to experiment with deleting some of them. You may even want to add some more at different rotations! Generally, the more polar transforms you have, the greater weight you'll want on your elliptic transform. The reverse is also true. A higher elliptic weight brightens the center; a lower one can make the fractal appear "washed out".

You have a great deal of artistic freedom in doing this, and it can dramatically shape your results. For example, these are all the exact same spiral with different combinations of polar transforms:









However, if at this point you don't want to make any changes to the polar transforms (especially if this is your first time attempting this tutorial) you don't have to do this step. You can still produce a wide variety of results with just the four basic polar transforms.

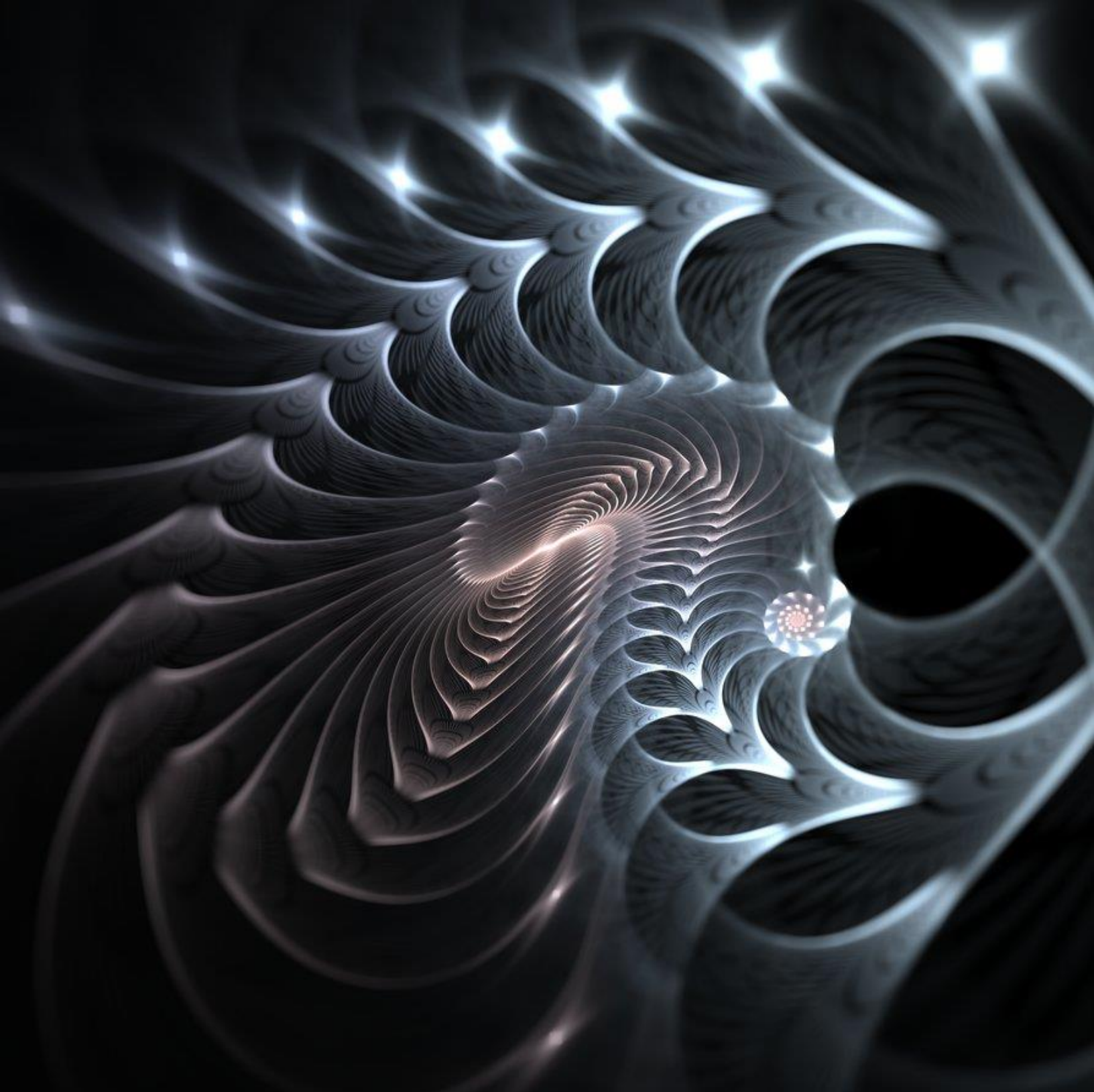
#### Step 4: Make it unique.

Now you get to become even more creative. You can do Part A, Part B, both, or neither.

##### Part A: Modifying existing transforms

You can try modifying your polar transforms: for example, adding a bit of rectangles for texture. (This is personally my favorite option, but you have plenty more.) You can modify some of them, or all of them.



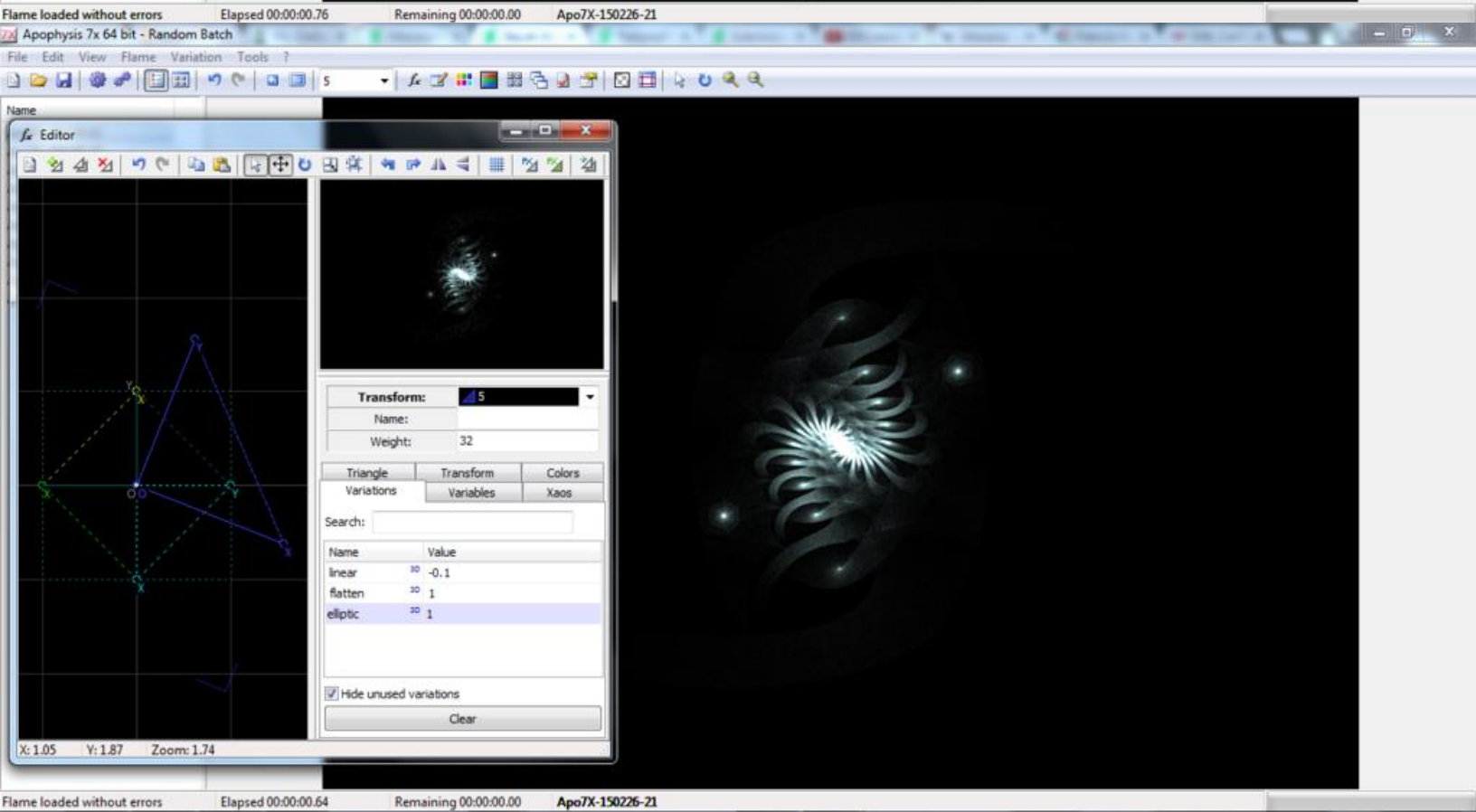
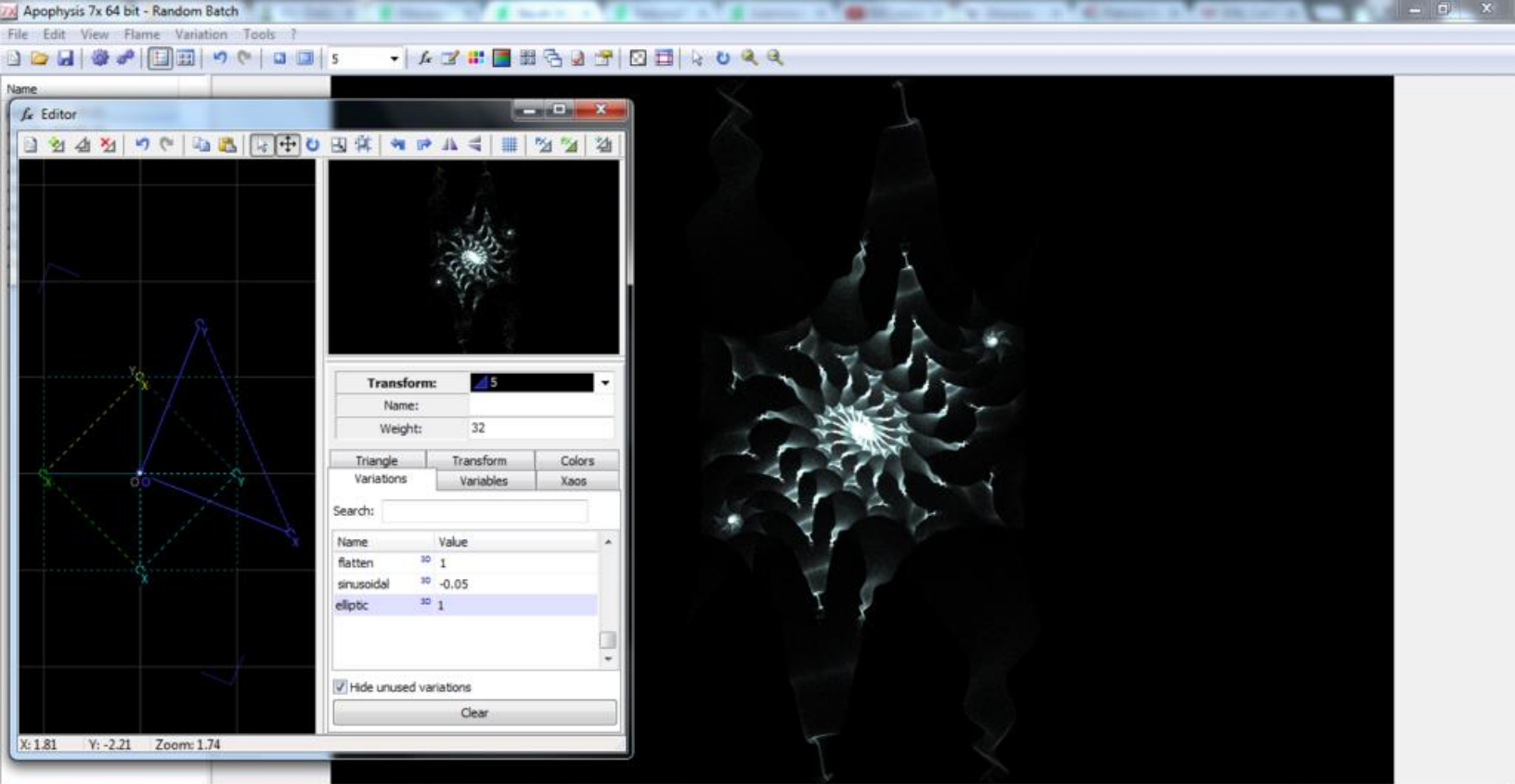


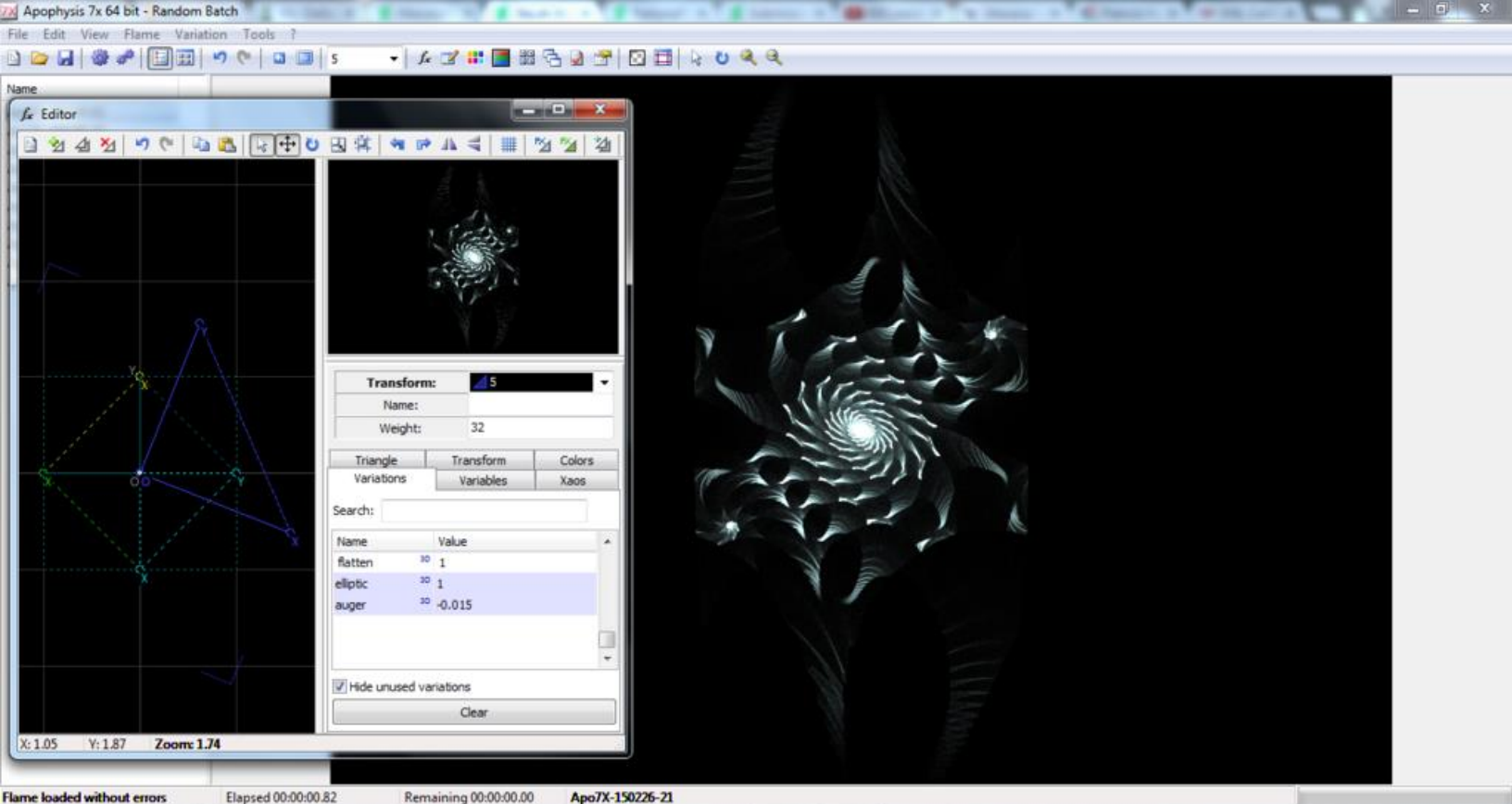
*Silver and Bronze*, an example of rectangles texture in a polar spiral.

You can try modifying your elliptic transform to create distorting effects: with small amounts of anything, really!

*Note: In both cases, depending upon your software, you may need to set  $\text{flatten} = 1$  to avoid breaking the fractal.*

The possibilities are endless. Here are some examples of modified elliptic transforms you can use, or create your own. I've deliberately shown the variations tab with unused variations hidden so you can use these in your own works if you so choose.





## Part B: Highlights

Here, you can add separate transforms for highlights. Set the weights very low and experiment with moving (especially dragging, but rotation and re-sizing can work too) the post-transforms of your new transforms. I would be more specific about the positioning of the highlights, but there's no one-size-fits-all; it depends upon what else you've done up to this point, and what you want to create as the artist.

"But what variations should I use?" you may ask. Here are some examples from my gallery, with different transforms separated by semicolons.

*Note that some of these have been modified with the techniques listed in the Appendix and therefore use variation(s) other than elliptic.*

radial\_blur **Rainbow Spiral**  
 log; noise **Splash**  
 eyefish/pre\_blur; radial\_blur **Moonlit Spring**  
 noise **Silver and Bronze** and **Ocean Breeze**  
 sinusoidal/pre\_blur; noise **Peering Within**  
 linear **Spiraling into Control**

## Step 5: Coloring

Pick a gradient that you like. It doesn't have to be a light one--you can always increase the brightness in the "Rendering" tab if necessary. Also, a general recommendation: keep the gamma low. I don't think I've ever had a need for a gamma value higher than 1.25 or so with this technique, and usually gamma = 1 is just fine.

You can change the coloring on all your transforms if you like, but in reality the majority of your focus should be on your elliptic transform. Set the color speed greater than 0—I think 0.9 is usually a good starting point, but change it according to your tastes—and experiment. Again, there's no one-size-fits-all.



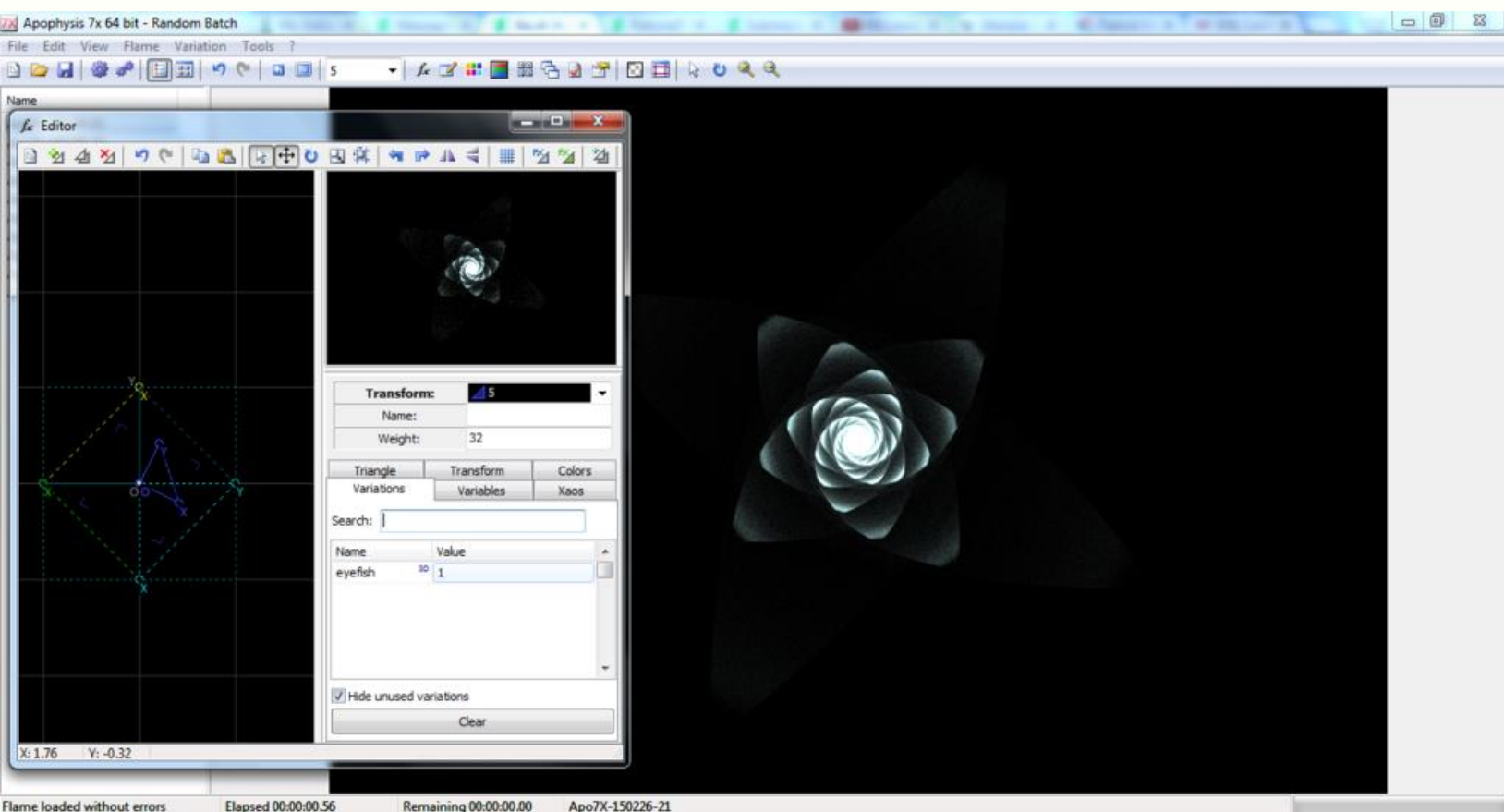
You've finished your polar spiral! Save it, render it, and upload your work to dA. Then, leave a comment so you can be featured in this journal for future tutorial users!

## Appendix: Extending the Tutorial

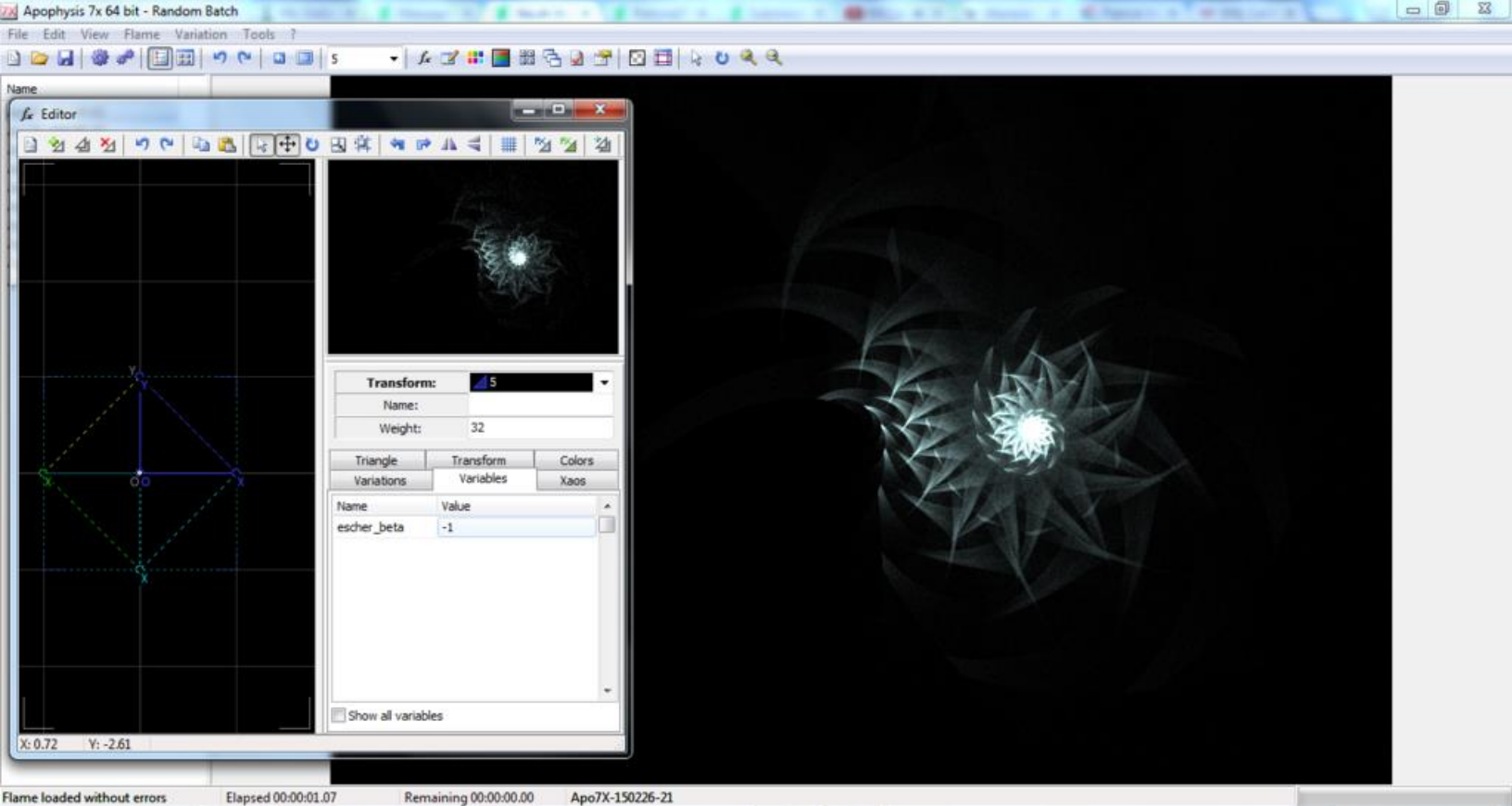
But there's a lot more you can do with this technique! The key lies in your variation choice in step 2, and herein lies your chance to shine as a fractal artist. Here is a list of elliptic-replacements some I have tried so far. (I've tried a lot more, but these so far have been the simplest and most flexible.) Of course, for all of these you can still add distorting variations as described in Step 4A to broaden the scope of possibilities even further!

***Have an new idea that you think others might find useful? Send me your example, with params, and I'll add it here--with credit of course!--for others to use as inspiration.***

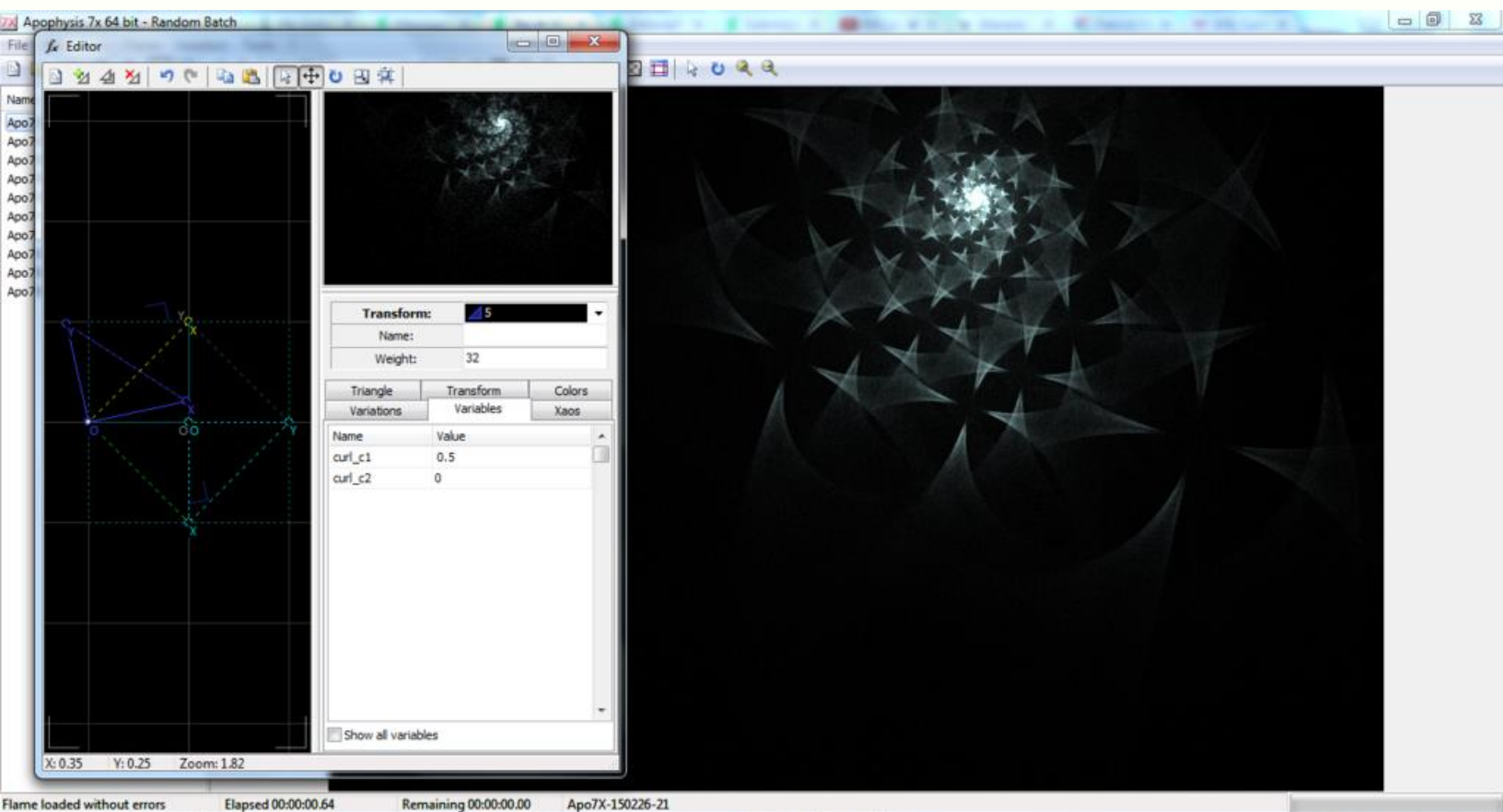
**Polar-eyefish:** Eyefish = 1. Shrink the transform by a little over half and rotate it however you like.



**Polar-escher:** Escher = 1. Try negative escher\_beta values; -1 works well. The transform and post-transform themselves actually doesn't need to be modified at all, although you certainly can.



**Polar-curl:** Curl = 1. Lots of options here! For example, set curl\_c1 between 0 and 0.5 and set curl\_c2 to 0. Move the transform over to the left a bit and rotate counter-clockwise. You may want to delete some polar transforms to make your spiral less cluttered, but I've included all of the default four below.



**Swirling!** This is one of my favorite techniques! It really deserves its own tutorial because it is considerably more complicated, but I believe it has the most versatility, *especially* when combined with multiple linked transforms. A



simple example, starting from a blank fractal:

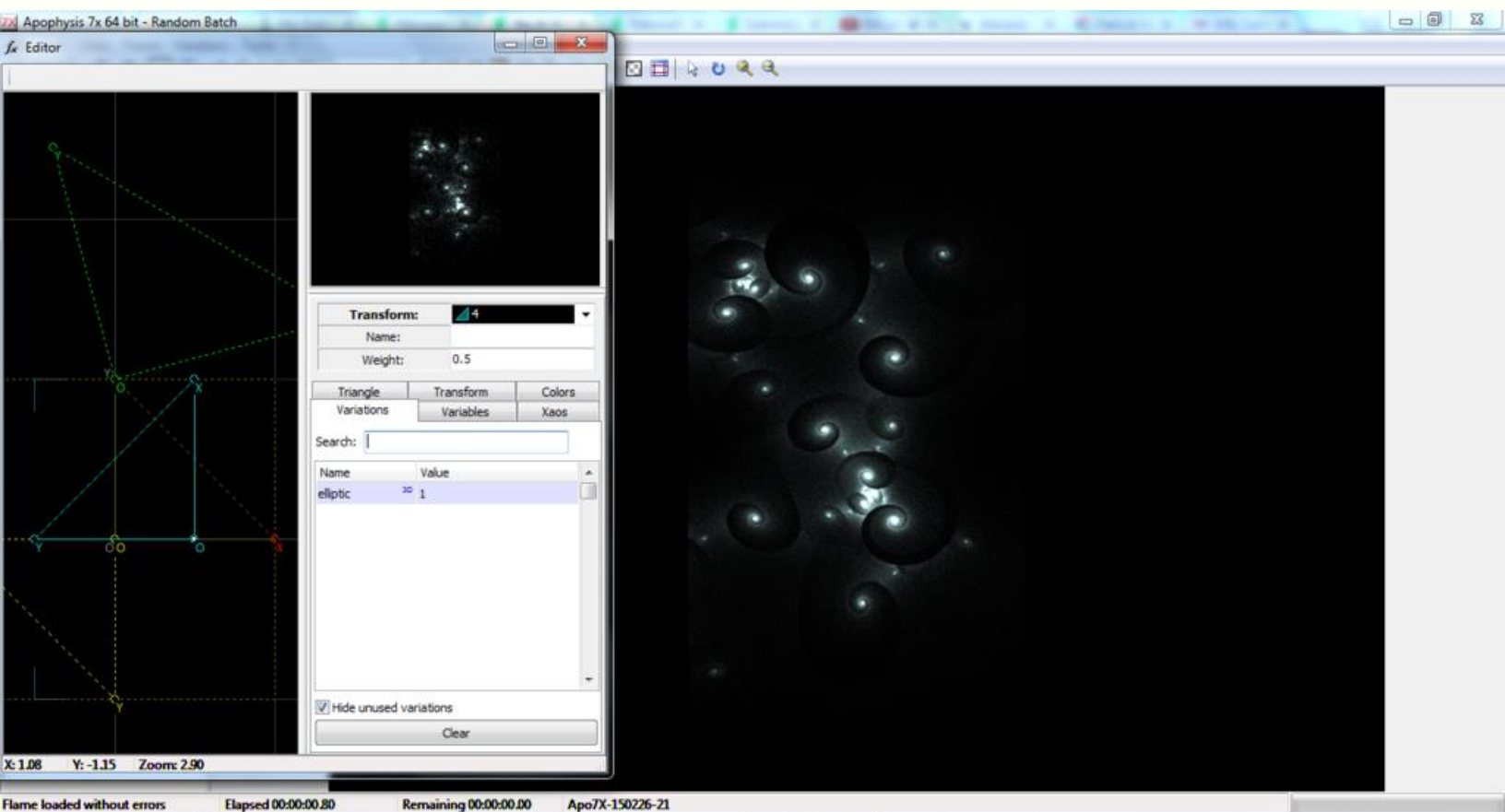
**Transform 1:** Linear = 0, polar = 1, pre\_blur = 10. Weight should be 0.5 by default.

**Transform 2:** Duplicate Transform 1, activate post-transform editing, rotate 180 degrees.

**Transform 3:** New transform, linear = 0, foci = 1. Set weight to 4. Move up 1 unit, scale up by 150, rotate. (Experiment! Try 15 degrees, either way you like, first. Later, you can change it.)

**Transform 4:** Go to Xaos and add a linked transform to Transform 3. Linear = 0, elliptic = 1. You can experiment with moving, scaling, and rotation this transform in a variety of ways--or just leave it as is. For this example, I moved it 0.5 units to the right and rotated it 90 clockwise.

You can also try different variations with this technique; what is most important is the high-weighted **foci** transform with at least one linked transform. (Yes, you can use multiple linked transforms for some very interesting effects.) You can try **cylinder** or **hyperbolic** rather than polar, or try **spherical** or **bipolar** instead of elliptic. If you're feeling very adventurous, try throwing **cross** or **rectangles** in the mix.





A basic swirl, *Witchcraft*.

But these are only examples. Experiment with different variations and linked transforms to truly customize your fractal.



*Ataraxia*, an example of a polar spiral with multiple linked transforms.

**That's all! I hope you enjoyed my tutorial, and once more, I would love to see your results and hear your feedback!**