Apophysis Xaos Simplified

Small Theory, Big Application

A tutorial on the Xaos function within Apophysis

Written by: Stan Ragets
aka: f—l—A--r--k.deviantart.com

Table of Contents

Introduction

The xaos feature of Apophysis was released with version 2.08. Since then there has been much confusion about how it works and functions. My goal with this tutorial is to provide a clear explanation, along with practical suggestions and examples to get you off and running with this powerful feature. Stick with this tutorial, and you'll be a chaos master in no time!

It is important to note, that this tutorial primarily focuses on the idea of linking transforms. This is only one aspect of the xaos function. Although being extremely powerful and versatile, it is by no means the only way to use xaos. As always, I encourage you to explore all the possibilities available.

This tutorial assumes that you have some experience with Apophysis.
The current version (as of 02.23.09) is Apophysis 2.09 or Xyrus02's Apo7x.12.
The tutorial also assumes you are using one of the above two versions.

Theory

Simply put, xaos allows you to choose where pixels are plotted, making them less random than the weighted system alone previously employed by Apophysis. The majority of the information on xaos currently focuses on a “function” based approach to using it. It's high time we take a look at it from a results-oriented approach.

You can read much on the theory and illustrations of how xaos works in the references below. The approach presented here, while perhaps not being technically correct or accurate, will no doubt help you to envision in your mind better what xaos is capable of.

Picture in your mind two separate parts to a fractal: One a structure or texture, and the second, a map. The structure gets painted onto the map very much like a texture. Wherever the map leads, the structure/texture goes. Without a map, the structure cannot be present. The following section will illustrate this concept more clearly.

For further reading on theory and function:

http://zueuk.deviantart.com/journal/19827222/

> Here you can read firsthand Peter Sdobnov's explanation of the xaos function.

http://ideviant.deviantart.com/art/Xaos-a-new-dimension-95768014

> This is an excellent explanation by Ian Anderson of more of the theory and use of xaos in Apophysis.

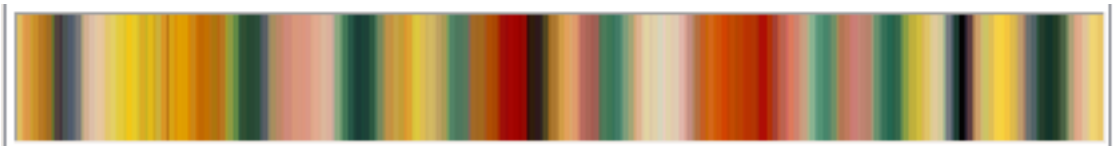
How to Apply Xaos to a Transform (Example 1)

In this section, we're going to look at how to apply Xaos to a transform, and in doing so, learn how linked transforms function.

Goal: To link a “structure” to a “map” using chaos.

Step 1

Open the flame editor and create a **blank frame**. Choose a gradient you will be able to see clearly.
Hint: Avoid black in your gradients for the duration of this example.



Step 1: This is the gradient I chose to work with.

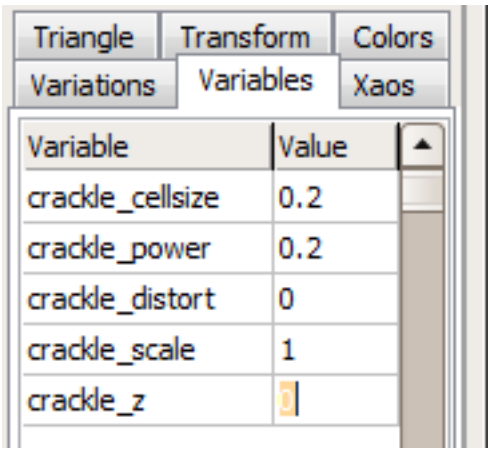
Step 2

For Transform 1, set the following **Variations**:

Linear = 0
Crackle = 1

Change the variables for Crackle to match the following:

Cellsize = 0.2
Power = 0.2
Distort = 0
Scale = 1
Z = 0

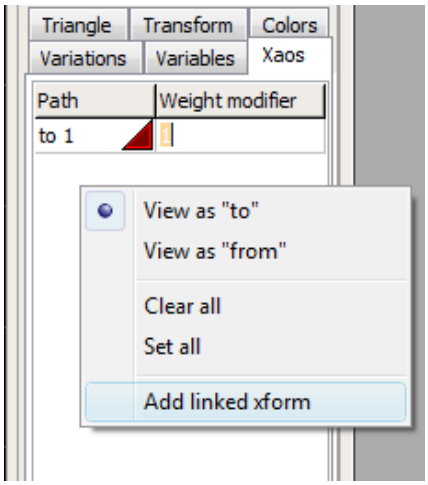


Adjusting the Crackle Variables

Here we have just set up our “texture” for the fractal.

Step 3

Goto the **Xaos tab**, **right click**, and choose “**Add Linked Transform**”.
A detailed explanation of what this does follows the steps of this example.



Step 4

The last step added a new transform, **Transform #2**.
Change the variations to the following:

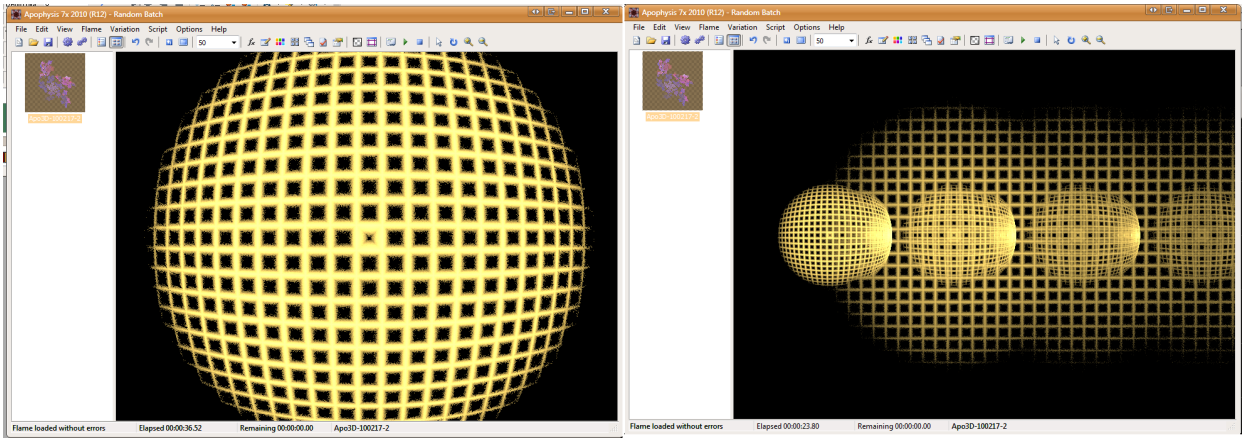
Linear = 0
Bubble = 0.5

This transform becomes our "map" for where the "texture" will be painted.

Step 5

So right now, it doesn't look like much, does it?
Add a new transform (#3).
Keep this one set to **Linear = 1**.

Move the Linear Transform to the **right** by **1 unit**.

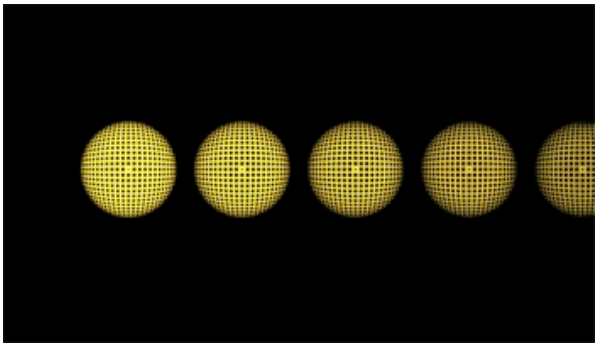


Before and After Step 5

Step 6

Set your **Xaos** Settings as follows:

	Xfrm 1 Texture (Crackle)	**Xfrm 2** Map (Bubble)	**Xfrm 3** Linear
To 1:	0	1	1
To 2:	1	0	0
To 3:	0	1	1



Now you should have something (slightly) impressive. Take a moment to congratulate yourself, you've just conquered the first step in mastering xaos! What did we do? Let's take a moment first off, to see what linked transforms do, and then we'll explain the xaos map to our fractal.

Linked Transforms

During this discussion of linked transforms, we're going to forget about transform #3 in our example, and only focus on transforms 1 and 2.

What happens when you add a linked transform? Note the following table.

Xfrm 1 (“Structure”)	**Xfrm 2 (“Map”)**
Variation: Crackle	Variation: Bubble
Xaos	**Xaos**
To 1: 0	To 1: 1
To 2: 1	To 2: 0
Colors	**Colors**
Speed: 0	Speed: 1
Opacity: 0	Opacity: 1

First, note how the two transforms are linked to each other via xaos numbers. Our “structure” is funneled into the “map” and has no focus on itself. The “map” on the other hand *only* goes towards the “structure”. This is how you will set up any xaos settings when you want to “paint” a texture on a particular part of a fractal. However, there is a bit more.

Secondly, we must look at the *colors* tab of the editor window. This is very important to ensure the “structure” or “texture” appears properly on the “map” and not all over the fractal. Notice how the *opacity* is turned off (or set to 0) for this transform. This means that this transform is transparent to the eye. We will only see this transform (our texture) on the “map” that we have linked it to.

You can use this method with practically any combination of variations to breathe new life into fractals or to provide texture to once “flat” images.

Explanation of The First Example

Here is the table again for quick reference. Study it along with the explanation.

	Xfrm 1 Texture (Crackle)	**Xfrm 2** Map (Bubble)	**Xfrm 3** Linear
To 1:	0	1	1
To 2:	1	0	0
To 3:	0	1	1

In our example, we have used the Bubble variation. (This variation lends itself quite nicely to 3D work, by the way.) That means that our "map" is going to look rounded just as if you had placed a Bubble transform in the editor all by itself.

Our "structure" consists of the Crackle plugin (**available here**). The Crackle will only be applied where wherever the Bubble structure goes.

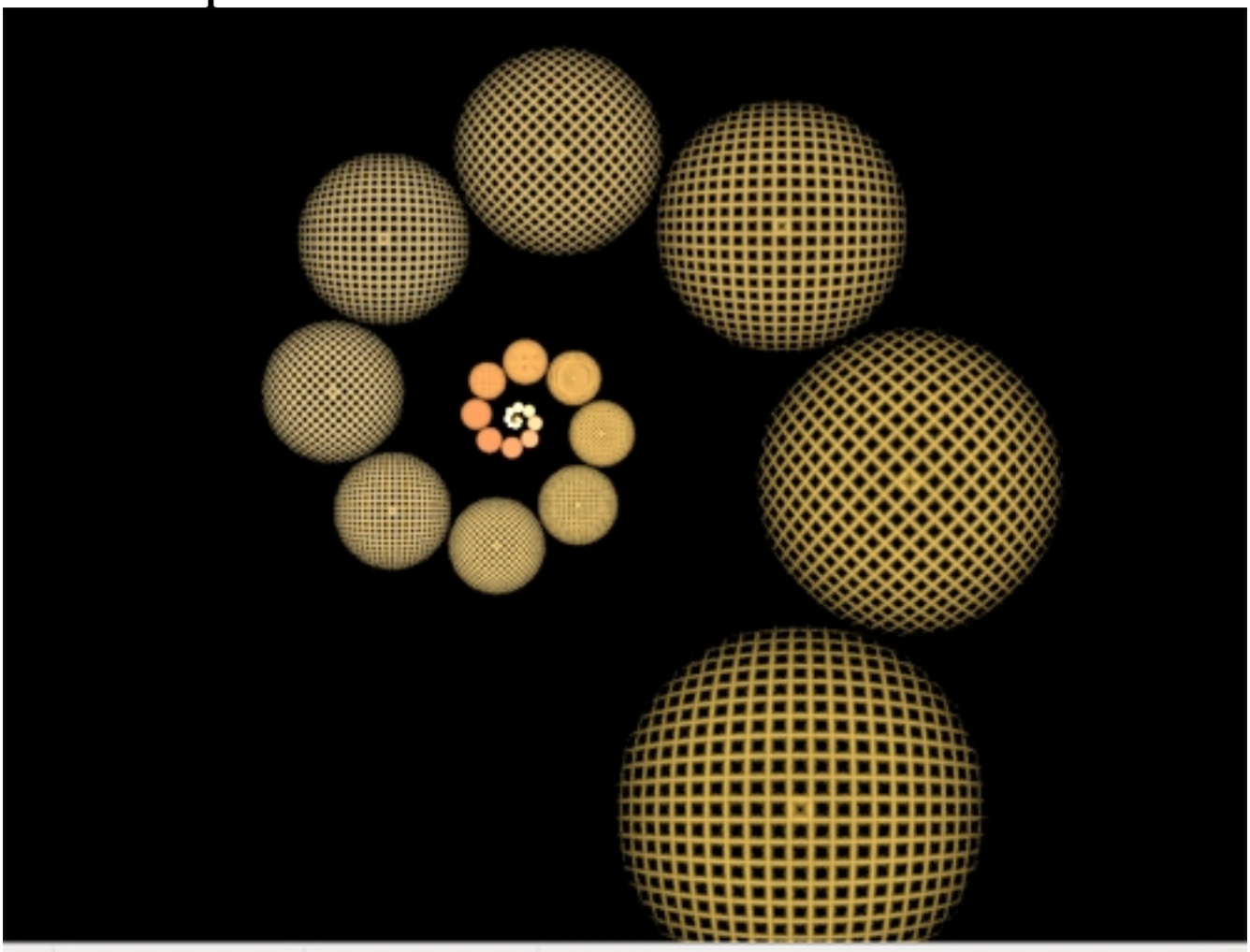
Transform #3, our linear transform, now gives us something to work it. Notice how it does not link to transform 2, our "structure".

For the "textured" transform: all xaos will point to the "map" or link.
For the "map" transform: xaos = 0 for itself.
For all other transforms: no xaos is directed to the "map".

Take a moment now to explore with the linear transform. Move it around, resize it, rotate it. When your finished, put it back where it started. Next, add another linear transform so that you now have 2. Try configuring the xaos so that it follows the rules in bold above.

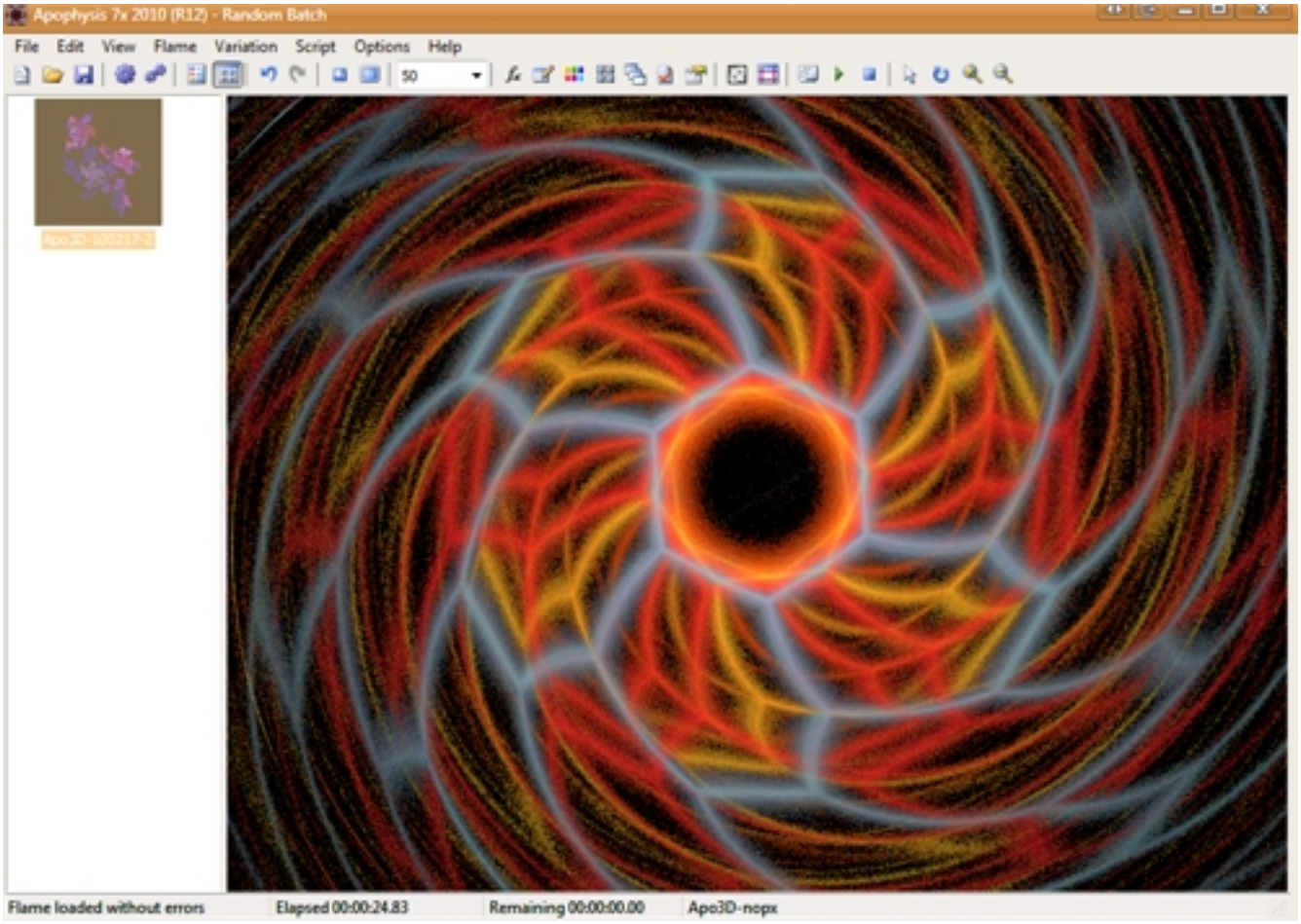
It is incredibly important to note that by adding new transforms, the links from "add linked transform" are effectively destroyed. This method of setting up links requires that you go in and manually adjust the Xaos settings each time a new transform is added. It has been suggested that you could set up your fractal as you normally would, and then add your linked transforms at the end. This would alleviate this problem.

More Examples



This example is of a simple spiral using the same parameters from our first example. You can copy and paste the parameters below into Apophysis and explore the spiral.

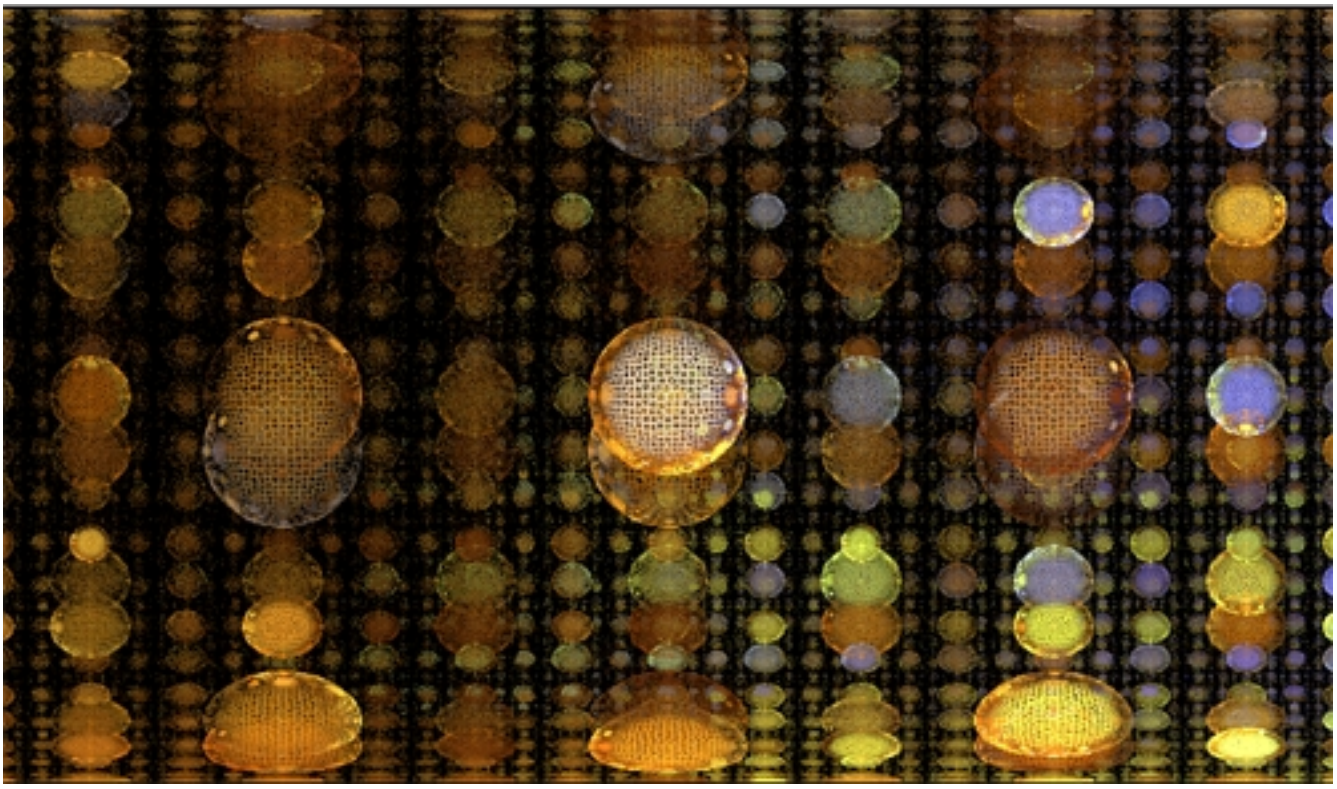
```
<flame name="Apo3D-100219-1" version="Apophysis 7x 2010 (R12)" size="800 600" center="-0.398729749619141 -0.765956555156069" scale="280.524412079417" oversample="1" filter="0.2" quality="50" background="0 0 0" brightness="4"
gamma="4" gamma_threshold="0.04" estimator_radius="9" estimator_minimum="0" estimator_curve="0.4" >
  <xform weight="0.5" color="0" crackle="1" coefs="1 0 0 1 0 0" crackle_cellsize="0.2" crackle_power="0.2" crackle_distort="0" crackle_scale="1" crackle_z="0" chaos="0 1 0 " plotmode="off" opacity="0" />
  <xform weight="0.5" color="0" symmetry="1" bubble="0.5" coefs="1 0 0 1 0 0" chaos="1 0 " opacity="1" />
  <xform weight="5" color="0.935" symmetry="0.93" linear="1" coefs="0.584386 -0.584386 0.584386 0.584386 0.25 -0.75" chaos="1 0 " opacity="1" />
  <palette count="256" format="RGB">
    DFBD5FE3A14DDC9747CD9E30CA8E29B87925B17419A06B24
    64742C51423E42343C4B54534F5A6C5E68707A787AAFA37D
    D4B091DDBEA7E1C9A6E8C79EE6C693E4C76BE4D065E2CE44
    E6CB3BDFC52EF3C717E8CB28D9BF2EDAAD23C9B223E2BA19
    D2A81DCCB03BD99624BC7715D8A313DC9109E19F01DF9D01
    DB8700CC8615CC7102C16802C37000BA7312AD750DB76813
    B77620A49B2B8E9B42618A452F583D304F33234A31274834
    2A4D3943565A5A5F658E8568A88E5EBB8868C9876ACF8A7B
    D18C79D9977AD9977FDE967EDB9886DEA788E3AA90DCAE92
    DCB79CDBB09DC0A99B8AA88068956C4177562657471D463A
    193B361945381D42382B5840497558768 75D998E4EC19248
    C6913DC7A246C49D35DB962FDEA330D9C13BDEC93EDEBD52
    CFB45DD3B962CDB364BEA161A99A55759E5E5283664B795D
    4E775E58795A836657A26926A06521A3681CA6581EB04E03
    A94703A62B019F0F089A0808A50603A0030095010094 0903
    320B0A301D0C2E181B3027215246209B671EAC772EB88236
    D29C45E3A15BDCA96EE09B6BD28368B86A5EAA6556A65B51
    9C6055586F524C7B5A3E775636745B427B66568E747E9E7B
    A3A576D1A877DEB290E1C8A3E2D4A2DDC9A7E1D1AAD7D5BC
    EACEBEE0D2ABE3C9AEDFCBB2E1B5AADAA393C48E82B58461
    B46F3FC65D23C86503D5671AD05E04D15408D24301C34201
    C24A02B54600BC4101BD3504B83201B33503AA2904AE0D06
    B00D03B23005A64034C55A38BC6350D16860DE7A5CCE8370
    CE9778C7A183ADB48A88B391629C8253937546866B55846A
    6E9067A28C58B27654C07A5DCC7A71CB7E77C48976BF8371
    B6826BA1997868916D4E8067357057236650286047346 74B
    61894F8A9F43BBAD40C0B13BD2BE3DDBB75BE0C468DDCD8B
    E1CA9BD1C9989CB0907378804557601B3A30030303271F2E
    5B3B3FA97D51CE9F69D0BA73CCC465DFBE55F5CF4CF7D242
    F8D23CF5C53EDEBA4ACFB055BF9B6CA17E66696F6F506266
    2B523C243D2D17362812332A203C26354A3349624376875D
    AFA178DBA584E2AB8CE2C39AE4CE8BF1D573EFD070EAC767
  </palette>
</flame>
```



Here is another example to explore. This flame takes advantage of the Hexes variation “mapped” to a swirl transform. A linear transform adds some extra detail.

Pay careful attention that the numbers used in the Xaos tab are not strictly 1 and 0. Change them around and see how they affect the overall fractal. Some suggestions to try: **0.01, 0.1, 5, 10.**

<flame name="Apo3D-nopx" version="Apophysis 7x 2010 (R12)" size="800 600" center="-0.00523847375832437 0.0246658985620826" scale="330.925382384279" cam_perspective="0.195" oversample="1" filter="0.2" quality="50" background="0 0 0" brightness="4" gamma="4" gamma_threshold="0.04" estimator_radius="9" estimator_minimum="0" estimator_curve="0.4" >
<xform weight="0.5" color="0" pre_blur="0.5" hexes="1" coefs="1 0 0 1 0 0" hexes_cellsize="0.3" hexes_power="0.1" hexes_rotate="0" hexes_scale="1" hexes_distort="0" hexes_z="0" chaos="0 1 0 " plotmode="off" opacity="0" />
<xform weight="0.5" color="0.013" symmetry="0.97" swirl="1" coefs="0.909091 0 0 0.909091 0 0" chaos="2 0 " opacity="1" />
<xform weight="0.3" color="0.039" symmetry="0.01" linear3D="1" coefs="0.866025 -0.5 0.5 0.866025 0 0" chaos="0 1 0.9 1 0 " opacity="1" />
<palette count="256" format="RGB">
498A8D437C8B42498E6319648B1139C20024AC0009DCFD2E
FE8E22FD6111FC3500FD2508FF1511FD0A22FC0034F00036
F3002CF60022D10015AC0009711217372426422922C4D2E33
1F4F4F2B593637641E345D0F31560033580136 5A034E4026
6D3E1B8C3D11B43108DD2600EE1607FF060EFF000BF00016
AC00097D15044F2B004F3E024F51054F4E09504C0D4E1F33
4F0F2A5100225119115233014 13B0431430728460 5005813
44A01034A51F25AB2F339F6741949F41959441978A465246
3F593038611B3B58143F500D48420B51340A500D0F4B0010
AC0009C3152EDA2A53DD355AE14161ED4C68FF114FEF0039
D30045B70052940F49721F405F26394D2E33464C3745513D
4E40264F42175145095F430B6E420DAB4200AB4200AC0009
AC0009AC0009AF000CB2000FAC000992360B4E40264E4325
38611B28810D18A1001B97001F8E002F6E0B385E164E4026
4E40264E40264E40264E40264E4026414F2B38601D385E16
3F4F00484505513B0A522600AB0005AB000551001A510022
731D11953A00A73200BA2B00CF0022E4002FE01A00DC1C00
AB42008A3E0F6A3B1E4B483C2D385100374E024D4F023D6C
322C67621C635E2C735A3C84B493BB8CB9C2CEFF62E0F35F
E4FF3ADDFA3AD6F63AD2F72ECBF12BB9E42A95C824449F13
3D821A37652237631F37631F44684C57965F5BA0486FA756
D2D897DDDDA1E9E2ACD2EBC3F3E4B9F5E0CCF0D0DAB1B0C6
A7A9C39DA3C07A8DB3408DA84087A11D7976107570035E6E
044C5A2652673C394E444F37534E298C3D12AB4200E74800
F34B08FF4F10FF6A7AC38C8DD0D695CAC1C7A8AEB6687981
494B494B4A424B453B45503B65A25BA4C165B7E229ACDA28
94AA23BA5A02B23C04A6182967006142458E4086A3408FA7
4087A34373864951545336525B295B5631565265754387 84
43898A447D744856556A3F35A43D00D54000F62100FF1511
FF160FF12F00E23400D14000AB4200703B1958322E373D42
2B4036025130007800 16A80B17A90E348E00505100933C00
AB4200B850009BA3198FC72384B06185B0644F8D8A548A90
</palette>
</flame>



This example might appear to be more complicated, but fear not. It's actually built off our first example, utilizing a few more linear transforms. Again, take note of how changing the Xaos values makes a difference in the fractal.

```
<flame name="Tiling Example" version="Apophysis 7x 2010 (R12)" size="800 469" center="0 0" scale="232" angle="-1.57079632679949" rotate="90.0000000000002" oversample="1" filter="0.5" quality="50" background="0 0 0" brightness="4"
gamma="4" gamma_threshold="0.04" estimator_radius="9" estimator_minimum="0" estimator_curve="0.4" >
   <xform weight="0.5" color="0" symmetry="1" bubble="0.9" coefs="1 0 0 1 0 0" post="0.227273 0 0 0.227273 0 0" chaos="0 1 1 1 1 1 1 1 1 1 1 0 " opacity="1" />
   <xform weight="1" color="0.455" linear3D="1" coefs="1 0 0 1 0 -1" opacity="1" />
   <xform weight="1.5" color="0.169" linear3D="1" coefs="0 1 -1 0 1 -1" opacity="1" />
   <xform weight="0.7" color="0" linear3D="1" coefs="0.5 0 0 0.5 -0.5 -1" opacity="1" />
   <xform weight="0.5" color="0" crackle="1" coefs="1 0 0 1 0 0" crackle_cellsize="0.2" crackle_power="0.1" crackle_distort="0.4" crackle_scale="1" crackle_z="0.1" chaos="1 0 0 0 0 " plotmode="off" opacity="0" />
   <finalxform color="0" symmetry="1" cylinder="1" coefs="1 0 0 1 0 0" />
   <palette count="256" format="RGB">
      9C4404762C00772F017933026F4A346661675A55754F4A84
      474DA1474CB4484CC75665DB647FF06871F46D63F85651E5
      4040D26658A56E6AAD767CB68089BB8A96C08FA0C195ABC2
      B3CF84C0E575CEFC66D2FC60D7FD5ADFFE51E7FF49F2FF50
      FFFA4FFAD441EDB535E09629D07B18C06107B75805AF4F03
      AD5A00AF7D17B2A12FD7B135FDC13CFDBF3BFEBE3AF9A626
      EA952AB26209A84E0B9F3A0E9339078738008838068A390C
      96440CA24E0CAE580DBA650BC67309CB840ED19513FEAF30
      F7B932BF9646AF8761A0797C967E858D838E7B879D6F6C4B
      703C007032007129016A26006423006222006122016726 00
      692800712E016C2A00682700642500612300 5A1D00601600
      602100602100612201612400612600632500 6B2A006B2B00
      6425001409110C082505073A09083C0D0A3F13084D1E073D
      2A193D281D4D26225D2321682021742B308C20247B35285D
      4B2A4572310B7B310E8431117E35027D360279310064 2506
      2C15432B18512A1B602F1D6C3420792B1E7A201F7C322591
      4531A22B27962A289F2A29A83139B52432D03A34E05D61CF
      9595D393A2B891B09E8CA3A28797A68DA7A6A0AFAA9A9FB3
      8C95BC6F78C76662C25E4DBD4E4FA1606B89936E7FA87445
      CE8E37DF8E38F18E39FEB334FFC238FFC13CFFC145F2B354
      C0A26EB08B70BA7F56C4733CC37520CA6C0CCF6E0DD2720E
      E38511E68815EA8C1AE17F14D57416D27E1EB98740C0B671
      C5C85DC3E978C0FE6FC1F85FDEE348CBBC3FAB92369B833B
      B1A96B9BA07D86978F8BA395A49AA5AF998BC4BA7DCFFA64
      F4FA66F1FA4FFCF157FFD449FFD33FFFBC39FF9F22FFA81B
      F8D53DF6E130F4E033DAE85FADCD7A889AB26562CB5049A6
      3431A439398F402C73705564A16739C46815C36412CB6912
      CC5E21C8673C906C606A578E6A598F7374668B6729A74A1E
      A94B05A14200AA4D00B54F05BC5C08C6670BCE720DD57E0B
      EC8E1AEF911FF3991FFA9A21F8981FF2951CEA8C18D47410
      BD5607AE4F00A348019B46069D4807A65915A6620DA2540A
      994E00913D01903E0477460080350091370096 3C00A44902
   </palette>
</flame>
```

How to Work Xaos Into Other Fractals (Advanced Example)

In this section, we're going to take the julian/disc method, and incorporate some xaos into it.

Step 1

Create a **new fractal and blank flame**. Change the **variations** to the following:

Linear = 0
Julian = 1

Julian Variables (Change these at your discretion.)

Power = 88 Distance = 1

Step 2

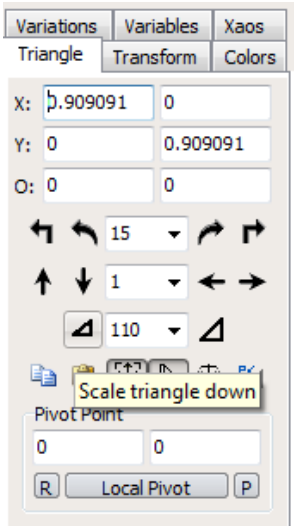
Add a new transform. Set the **variations** to the following.

Linear = 0
Disc = 1

Increase the Weight to 5.

Step 3

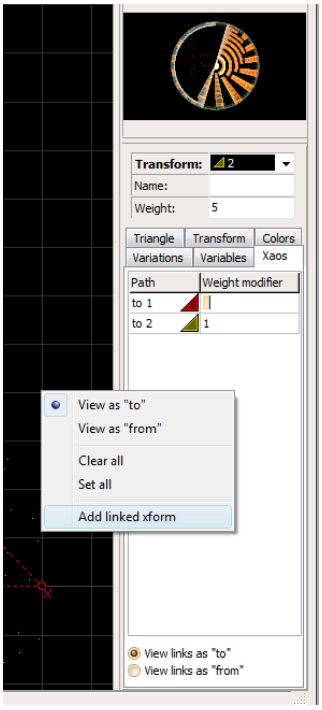
Shrink transform 2 (disc) once by 110.
In the **colors tab,** change **transform color** to **1.0**
Rotate Counter-clockwise by 15 degrees twice (30 degrees total).



Step 3: Scaling Down Transform 2

Step 4

With **transform 2** active, **right click in the xaos tab** and choose "**Add Linked Transform**".



Step 5

On **transform 3**, set the following **variations**.

Linear = 0
Swirl = 1

Step 6

Enable the Final Transform, and set the following **variations**.

Linear = 0
Polar = 1

Your final result should be similar to the following image.

Bear in mind that this is only one option for the Xaos settings for this type of fractal. Play with different settings, variations, variables and find what suits you best.

Hint: You may find it easiest to delete the Final Transform while you experiment and then add it in again once you've found a suitable design.

Examples: Provided by Tim

<flame name="Apo3D-ngon" version="Apophysis 7x 2010 (R12)" size="266 266" center="0 0" scale="66.5" cam_perspective="0.195" oversample="1" filter="0.5" quality="50" background="0 0 0" brightness="4" gamma="4" gamma_threshold="0.04" estimator_radius="9" estimator_minimum="0" estimator_curve="0.4" >
<xform weight="0.5" color="0" bubble="1" coefs="1 0 0 1 0 0" chaos="0 " plotmode="off" opacity="0" />
<xform weight="0.5" color="0" symmetry="1" ngon="1" coefs="-0.022823 1.259679 -1.259677 -0.02282 -0.010897 -1.977952" ngon_sides="4" ngon_power="2" ngon_circle="1" ngon_corners="1" chaos="1 0 " opacity="1" />
<xform weight="0.5" color="0" linear3D="1" coefs="-1 0 0 -1 0 0" opacity="1" />
<xform weight="0.5" color="0" linear3D="1" coefs="1 0 0 1 0 0" chaos="0 1 0 " opacity="1" />
<xform weight="0.5" color="0" linear3D="1" coefs="0 -1 1 0 0 0" chaos="0 1 0 0 " opacity="1" />
<xform weight="0.5" color="0" linear3D="1" coefs="0 1 -1 0 0 0" chaos="0 1 0 0 0 " opacity="1" />
<palette count="256" format="RGB">
498A8D437C8B42498E6319648B1139C20024AC0009DCFD2E
FE8E22FD6111FC3500FD2508FF1511FD0A22FC0034F00036
F3002CF60022D10015AC0009711217372426422 92C4D2E33
1F4F4F2B593637641E345D0F315600335801365A034E4026
6D3E1B8C3D11B43108DD2600EE1607FF060EFF000BF00016
AC00097D15044F2B004F3E024F51054F4E09504C0D4E1F33
4F0F2A5100225119115233014130431430728460500 5813
44A01034A51F25AB2F339F6741949F41959441978A465246
3F593038611B3B58143F500D48420B51340A500D0F4B0010
AC0009C3152EDA2A53DD355AE14161ED4C68FF114FEF0039
D30045B70052940F49721F405F26394D2E33464C3745513D
4E40264F42175145095F430B6E420DAB4200AB4200AC0009
AC0009AC0009AF000CB2000FAC000992360B4E40264E4325
38611B28810D18A1001B97001F8E002F6E0B385E164E4026
4E40264E40264E40264E40264E4026414F2B38601D385E16
3F4F00484505513B0A522600AB0005AB000551001A510022
731D11953A00A73200BA2B00CF0022E4002FE01A00DC1C00
AB42008A3E0F6A3B1E4B483C2D385100374E024D4F023D6C
322C67621C635E2C735A3C848493B8BCB9C2CEFF62E0F35F
E4FF3ADDFA3AD6F63AD2F72ECBF12BB9E42A95C824449F13
3D821A37652237631F37631F44684C57965F5BA0486FA756
D2D897DDDDA1E9E2ACD2EBC3F3E4B9F5E0CCF0D0DAB1B0C6
A7A9C39DA3C07A8DB3408DA84087A11D7976107570035E6E
044C5A2652673C394E444F37534E298C3D12AB4200E74800
F34B08FF4F10FF6A7AC38C8DD0D695CAC1C7A8AEB6687981
494B494B4A424B453B45503B65A25BA4C165B7E229ACDA28
94AA23BA5A02B23C04A6182967006142458E4086A3408FA7
4087A34373864951545336525B295B5631565265754387 84
43898A447D744856556A3F35A43D00D54000F62100FF1511
FF160FF12F00E23400D14000AB4200703B1958322E373D42
2B4036025130007800 16A80B17A90E348E00505100933C00
AB4200B850009BA3198FC72384B06185B0644F8D8A548A90
</palette>
</flame>

<flame name="Apo3D-loonie" version="Apophysis 7x 2010 (R12)" size="266 266" center="0 0" scale="66.5" cam_perspective="0.195" oversample="1" filter="0.5" quality="50" background="0 0 0" brightness="4" gamma="4" gamma_threshold="0.04" estimator_radius="9" estimator_minimum="0" estimator_curve="0.4" >
<xform weight="0.5" color="0" bubble="1" coefs="1 0 0 1 0 0" chaos="0 " plotmode="off" opacity="0" />
<xform weight="0.5" color="0" symmetry="1" loonie="1" coefs="0.489297 -0.008636 0.008638 0.489296 0.043842 -2.963253" chaos="1 0 " opacity="1" />
<xform weight="0.5" color="0" linear3D="1" coefs="-1 0 0 -1 0 0" opacity="1" />
<xform weight="0.5" color="0" linear3D="1" coefs="1 0 0 1 0 0" chaos="0 1 0 " opacity="1" />
<xform weight="0.5" color="0" linear3D="1" coefs="0 -1 1 0 0 0" chaos="0 1 0 0 " opacity="1" />
<xform weight="0.5" color="0" linear3D="1" coefs="0 1 -1 0 0 0" chaos="0 1 0 0 0 " opacity="1" />
<palette count="256" format="RGB">
498A8D437C8B42498E6319648B1139C20024AC0009DCFD2E
FE8E22FD6111FC3500FD2508FF1511FD0A22FC0034F00036
F3002CF60022D10015AC0009711217372426422 92C4D2E33
1F4F4F2B593637641E345D0F315600335801365A034E4026
6D3E1B8C3D11B43108DD2600EE1607FF060EFF000BF00016
AC00097D15044F2B004F3E024F51054F4E09504C0D4E1F33
4F0F2A5100225119115233014130431430728460500 5813
44A01034A51F25AB2F339F6741949F41959441978A465246
3F593038611B3B58143F500D48420B51340A500D0F4B0010
AC0009C3152EDA2A53DD355AE14161ED4C68FF114FEF0039
D30045B70052940F49721F405F26394D2E33464C3745513D
4E40264F42175145095F430B6E420DAB4200AB4200AC0009
AC0009AC0009AF000CB2000FAC000992360B4E40264E4325
38611B28810D18A1001B97001F8E002F6E0B385E164E4026
4E40264E40264E40264E40264E4026414F2B38601D385E16
3F4F00484505513B0A522600AB0005AB000551001A510022
731D11953A00A73200BA2B00CF0022E4002FE01A00DC1C00
AB42008A3E0F6A3B1E4B483C2D385100374E024D4F023D6C
322C67621C635E2C735A3C848493B8BCB9C2CEFF62E0F35F
E4FF3ADDFA3AD6F63AD2F72ECBF12BB9E42A95C824449F13
3D821A37652237631F37631F44684C57965F5BA0486FA756
D2D897DDDDA1E9E2ACD2EBC3F3E4B9F5E0CCF0D0DAB1B0C6
A7A9C39DA3C07A8DB3408DA84087A11D7976107570035E6E
044C5A2652673C394E444F37534E298C3D12AB4200E74800
F34B08FF4F10FF6A7AC38C8DD0D695CAC1C7A8AEB6687981
494B494B4A424B453B45503B65A25BA4C165B7E229ACDA28
94AA23BA5A02B23C04A6182967006142458E4086A3408FA7
4087A34373864951545336525B295B5631565265754387 84
43898A447D744856556A3F35A43D00D54000F62100FF1511
FF160FF12F00E23400D14000AB4200703B1958322E373D42
2B4036025130007800 16A80B17A90E348E00505100933C00
AB4200B850009BA3198FC72384B06185B0644F8D8A548A90
</palette>
</flame>

<flame name="Apo3D-lazysus" version="Apophysis 7x 2010 (R12)" size="266 266" center="0 0" scale="66.5" cam_perspective="0.195" oversample="1" filter="0.5" quality="50" background="0 0 0" brightness="4" gamma="4" gamma_threshold="0.04" estimator_radius="9" estimator_minimum="0" estimator_curve="0.4" >
<xform weight="0.5" color="0" bubble="1" coefs="1 0 0 1 0 0" chaos="0 " plotmode="off" opacity="0" />
<xform weight="0.5" color="0" symmetry="1" lazysusan="0.4" coefs="1.342589 -0.00163 -0.010343 1.376739 -2.896684 2.952368" lazysusan_spin="3.14159" lazysusan_space="0" lazysusan_twist="0" lazysusan_x="0" lazysusan_y="0" chaos="1 0 " opacity="1" />
<xform weight="0.5" color="0" linear3D="1" coefs="-1 0 0 -1 0 0" opacity="1" />
<xform weight="0.5" color="0" linear3D="1" coefs="1 0 0 1 0 0" chaos="0 1 0 " opacity="1" />
<xform weight="0.5" color="0" linear3D="1" coefs="0 -1 1 0 0 0" chaos="0 1 0 0 " opacity="1" />
<xform weight="0.5" color="0" linear3D="1" coefs="0 1 -1 0 0 0" chaos="0 1 0 0 0 " opacity="1" />
<palette count="256" format="RGB">
498A8D437C8B42498E6319648B1139C20024AC0009DCFD2E
FE8E22FD6111FC3500FD2508FF1511FD0A22FC0034F00036
F3002CF60022D10015AC0009711217372426422 92C4D2E33
1F4F4F2B593637641E345D0F315600335801365A034E4026
6D3E1B8C3D11B43108DD2600EE1607FF060EFF000BF00016
AC00097D15044F2B004F3E024F51054F4E09504C0D4E1F33
4F0F2A5100225119115233014130431430728460500 5813
44A01034A51F25AB2F339F6741949F41959441978A465246
3F593038611B3B58143F500D48420B51340A500D0F4B0010
AC0009C3152EDA2A53DD355AE14161ED4C68FF114FEF0039
D30045B70052940F49721F405F26394D2E33464C3745513D
4E40264F42175145095F430B6E420DAB4200AB4200AC0009
AC0009AC0009AF000CB2000FAC000992360B4E40264E4325
38611B28810D18A1001B97001F8E002F6E0B385E164E4026
4E40264E40264E40264E40264E4026414F2B38601D385E16
3F4F00484505513B0A522600AB0005AB000551001A510022
731D11953A00A73200BA2B00CF0022E4002FE01A00DC1C00
AB42008A3E0F6A3B1E4B483C2D385100374E024D4F023D6C
322C67621C635E2C735A3C848493B8BCB9C2CEFF62E0F35F
E4FF3ADDFA3AD6F63AD2F72ECBF12BB9E42A95C824449F13
3D821A37652237631F37631F44684C57965F5BA0486FA756
D2D897DDDDA1E9E2ACD2EBC3F3E4B9F5E0CCF0D0DAB1B0C6
A7A9C39DA3C07A8DB3408DA84087A11D7976107570035E6E
044C5A2652673C394E444F37534E298C3D12AB4200E74800
F34B08FF4F10FF6A7AC38C8DD0D695CAC1C7A8AEB6687981
494B494B4A424B453B45503B65A25BA4C165B7E229ACDA28
94AA23BA5A02B23C04A6182967006142458E4086A3408FA7
4087A34373864951545336525B295B5631565265754387 84
43898A447D744856556A3F35A43D00D54000F62100FF1511
FF160FF12F00E23400D14000AB4200703B1958322E373D42
2B4036025130007800 16A80B17A90E348E00505100933C00
AB4200B850009BA3198FC72384B06185B0644F8D8A548A90
</palette>
</flame>

Other Notes and Thoughts

The “texture” / “map” idea works well in most cases, but will not work when your “map” includes blur variations. The blurs cover over any of the “textured” aspects.

The “texture” / “map” idea is simply an analogy used to explain in different terms how xaos works. Its power goes far beyond this approach, and I encourage you to continue to explore the different facets of how it works.

There are times where you will find it advantageous to link your “texture” to more than one transform. Also in the reverse, there may be times where you'll find a better result by linking more than one transform to your “texture”.

Variations to start exploring with: crackle, hexes, truchet, loonie, synth, pie, swirl.

Don't limit yourself to the variations above, they are just some suggestions to get you going. Xaos, just like fractals in general, is unlimited. Let your creativity take you places you never thought you could achieve before!

This tutorial was not meant to be an all-encompassing instruction on xaos. There is still much to be explored with this function.