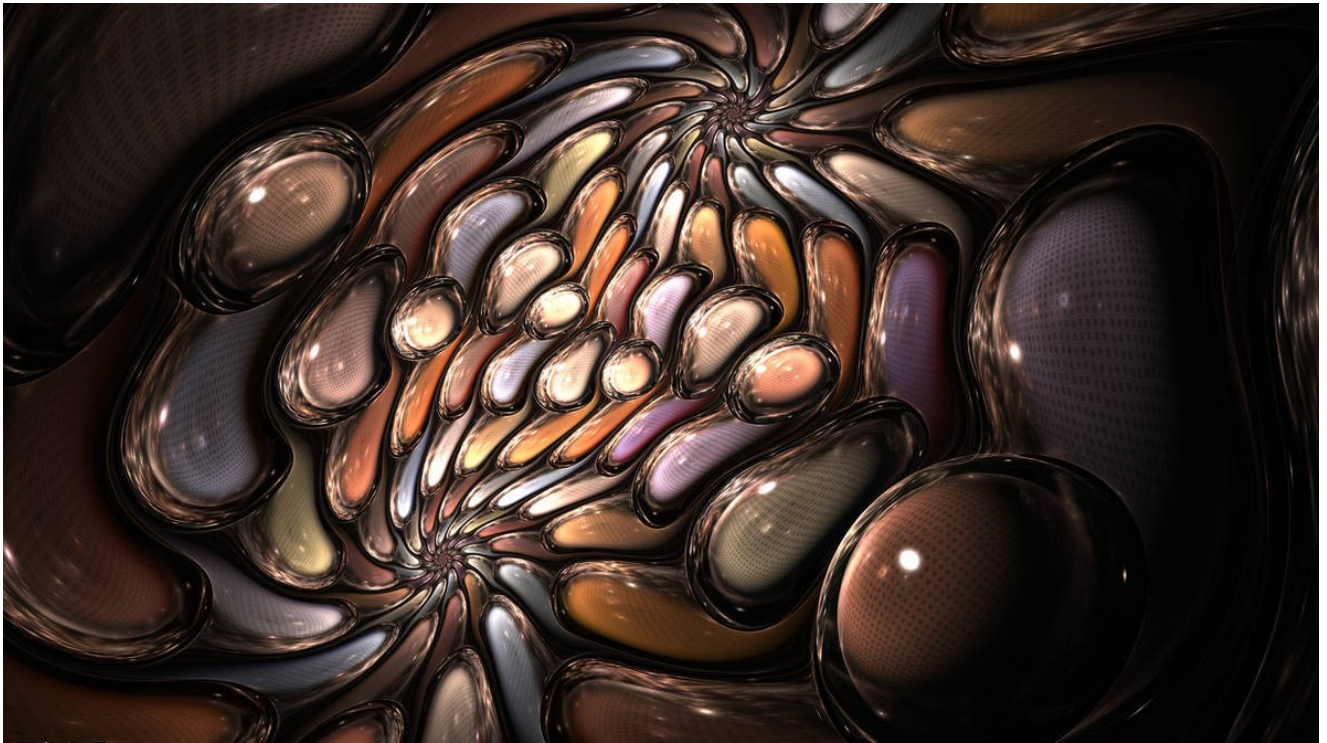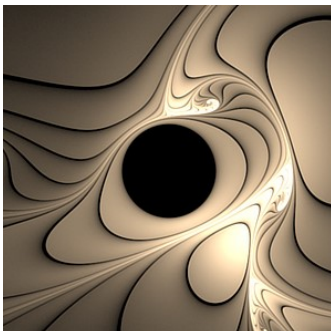# Filling in with bubbles

by tatasz

Lets take a look at frameworks where you have a circular hole that needs to be filled to create a pattern.


The basic idea

Here, you have a variation or a combination of variations that has a round hole, which you need to fill with something to create a round pattern:

We have basically two elements here - the framework itself and the filler. Lets take a look at some frameworks and fillers.
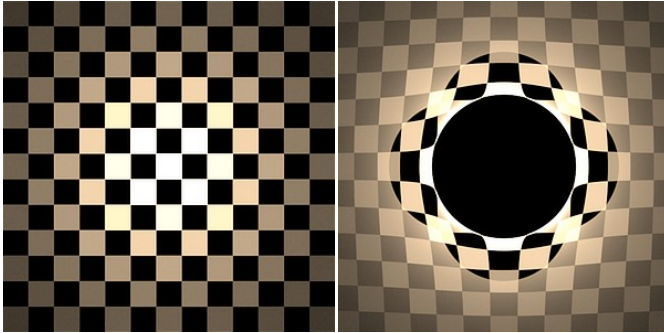
Plastics and Blooms

There are many tutorials on those structures (both frameworks and fillers):
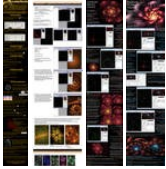
And yeah, blooms are also plastics (just look at the transfor 2 of the 2D tutorial - linear + spherical) 🟤
Lets take a quick look on how it works.
Below, I made a checkboard pattern, and then applied a final transform with a mix of spherical and linear:
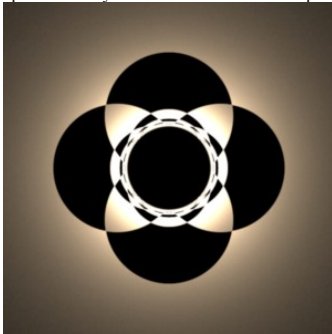

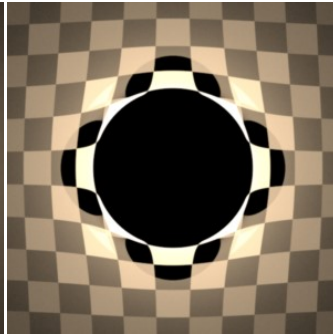Yay, a hole that we can now fill in with something cool 🐵
As a sidenote, this framework overlaps a little bit, as you can see. That is usually not an issue but may create some artifacts.

You may replace linear with some other variations, like eyefish (rather common) or lazysusan, loonie, etc:
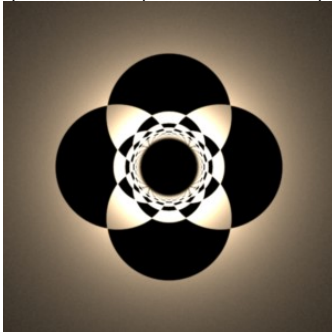
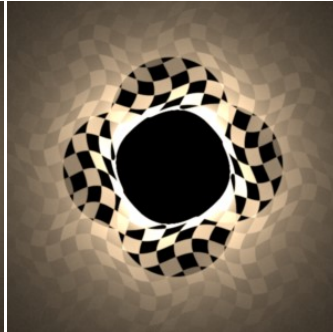spherical + eyefish   spherical + loonie
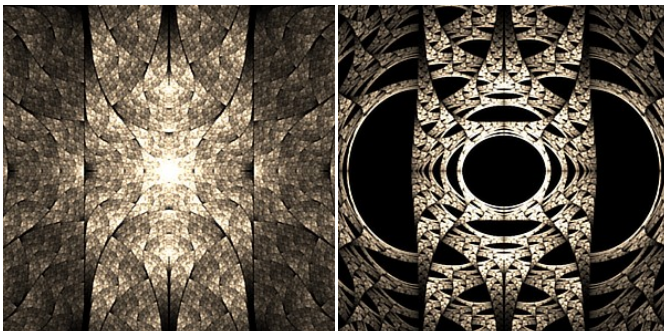

spherical + hemisphere   spherical + waves2

Those are not all the possibilities, experiment.

You may also use this technique to make holes in other frameworks, by adding either spherical or linear.
For example, below, i took a simple elliptic splits and added a small amount of spherical to elliptic transform (left - no spherical, right - with spherical):

If you fail to replicate the result above, take a look at the parameters: [Elliptic Splits with holes](#)
Try filling those with a bubble or a hemisphere.
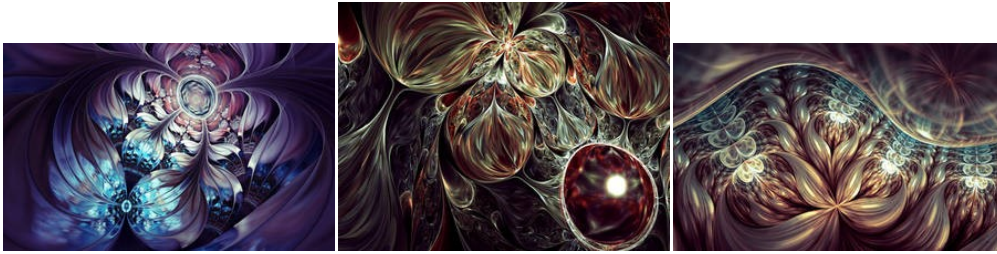
This may fail for some frameworks, but you can always use a pre linked transform with spherical and eyefish to create holes.
For example, back tothe elliptic example, first, we add a pre linked transform with spherical (left). Then, we add a bit of eyefish to it, creating a hole (middle).
Finally, we fill it in with hemisphere (right), by adding another pre linked transform to elliptic, this time with a pre blurred hemisphere.
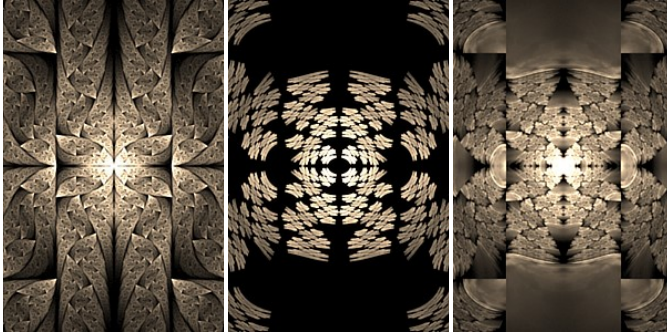
Once more, here go the parameters: Elliptic Splits with holes - v2
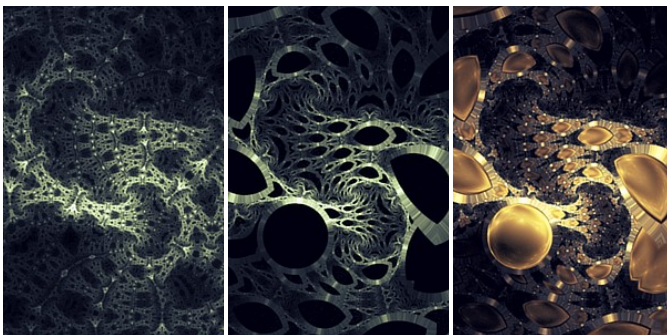
Crops

You can also use crops, such as circlecrop or smartcrop to create holes:
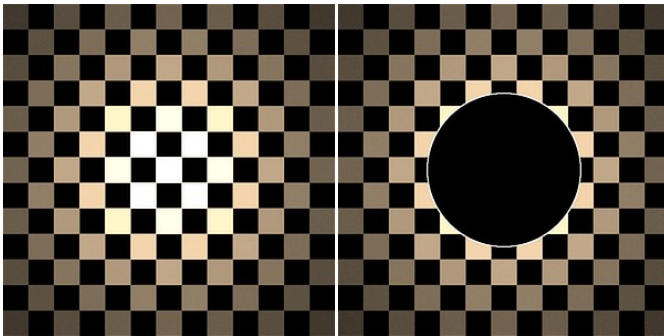
Above, I applied crop to a checkboard patterns.
The big advantage of crop is that there are no distortions / overlaps. And there is a disadvantage too - the croplines 😐

Below, an example of smartcrop usage: a jscope spherical pattern (left), smartcropped (middle) and filled with bubble (right).


plangkye shared many parameters that feature smartcrop. Make sure you check it out 😄
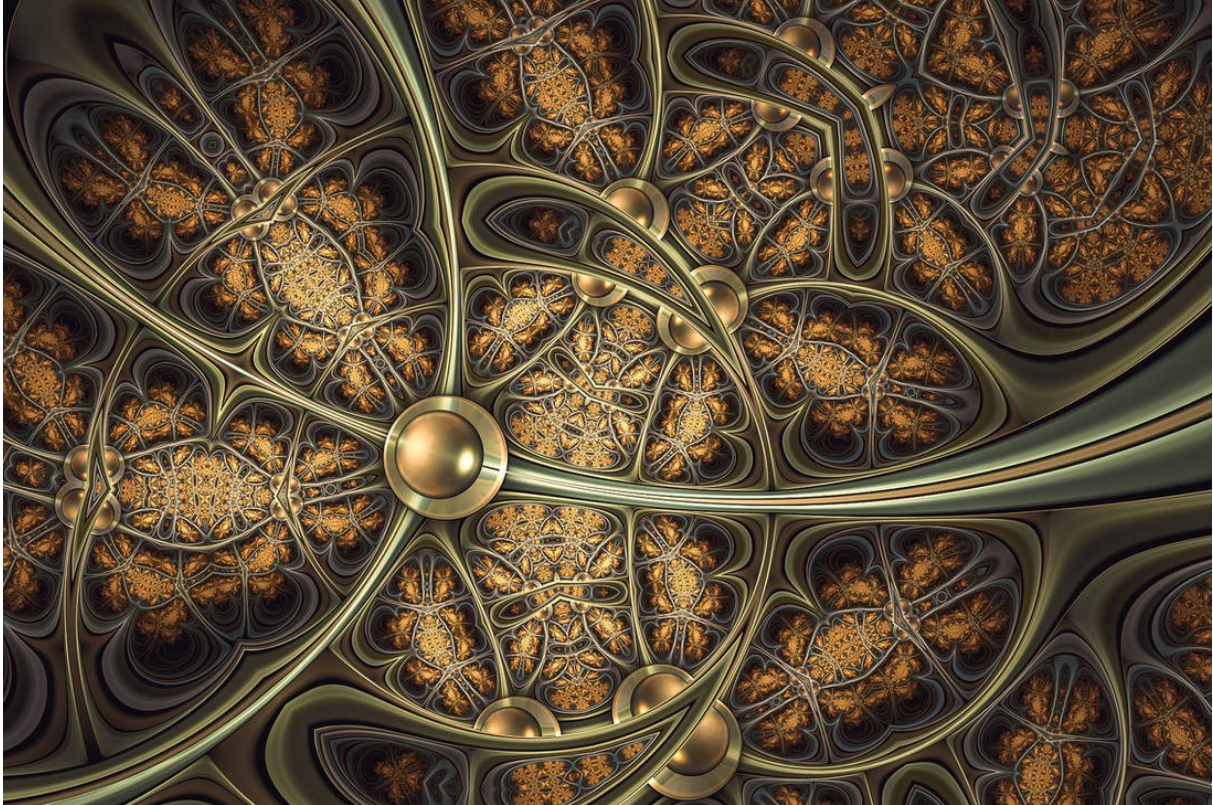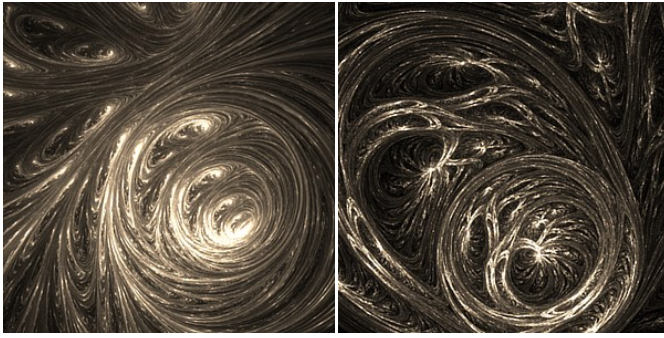
With spherical

A spherical "inverts" a circle - so applying a post linked spherical to a variation that creates a circle (bubble, hemisphere etc) also creates a framework with a round hole in the middle. Below, a checkboard pattern (left), with a bubble final transform (middle) and post spherical (right).
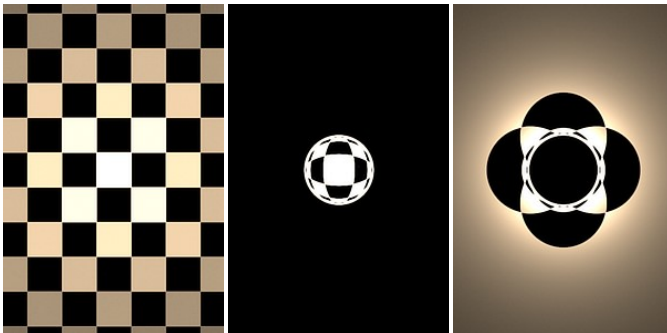
Lets build a simple example: place 2 transforms with hemisphere, and add a linked spherical transform to one of them. The result should look somewhat like this: [Hemisphere + Inverted Hemisphere](#)
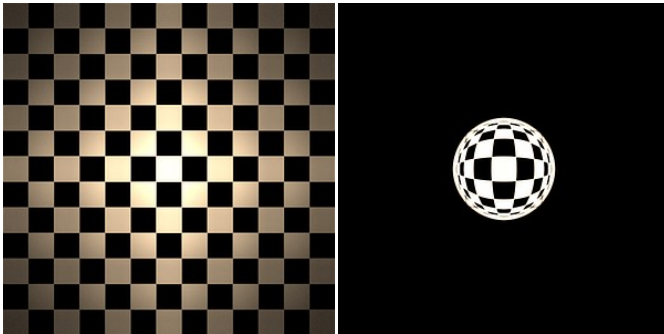
Two examples of what can be achieved with this technique: 2 hemispheres (left) and hemisphere + scry (right).

Hemisphere with curl

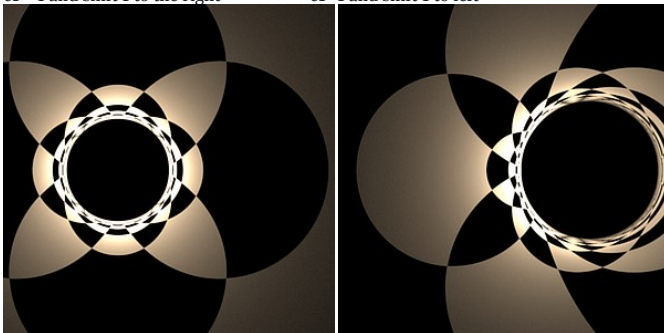You can create something similar to the results above using curl instead of spherical.

Below, checkboard pattern (left) and a hemisphere applied to it (right):

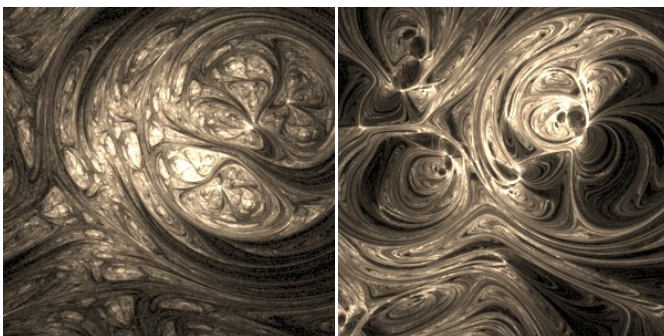Now, we apply curl (different settings way be used):

c1=-1 and shift 1 to the right   c1=1 and shift 1 to left
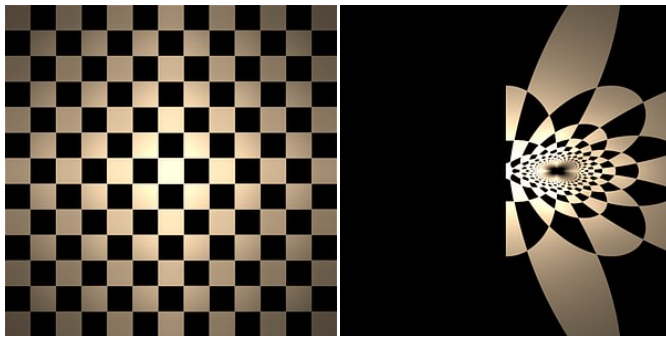

Example parameters: [Double hemi with curl example](#)
Below, a mix of hemi and scry and a double scry previews just to show the potential of the method.


Halfplane with curl

In the previous examples, we inverted a circle. Now, we will take a halfplane and use curl to transform it into the inverse of a hemisphere / bubble.

Below, I first apply a DeltaA transform on a checkboard pattern to turn it into a half plane:

Now, we add a linked transform with curl to transform the half plane into something with a round hole in it 😄
On the left, curl with c_1=-1, on the right, c_1=-0.5 and a horizontal shift of 0.5.
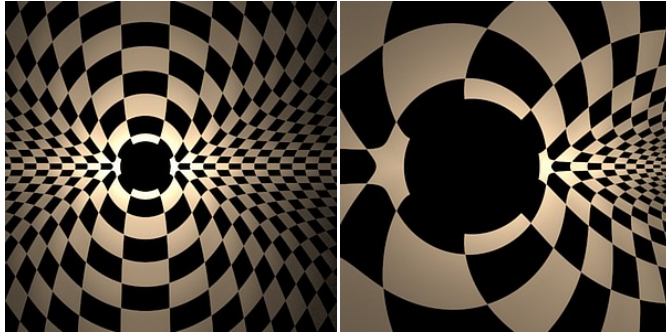
And, of course, some simple example parameters: [DeltaA with hemisphere](#)
Below, a few examples of what can be achieved with this technique: