



The Nature of Pattern





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Islamic Tile Patterns



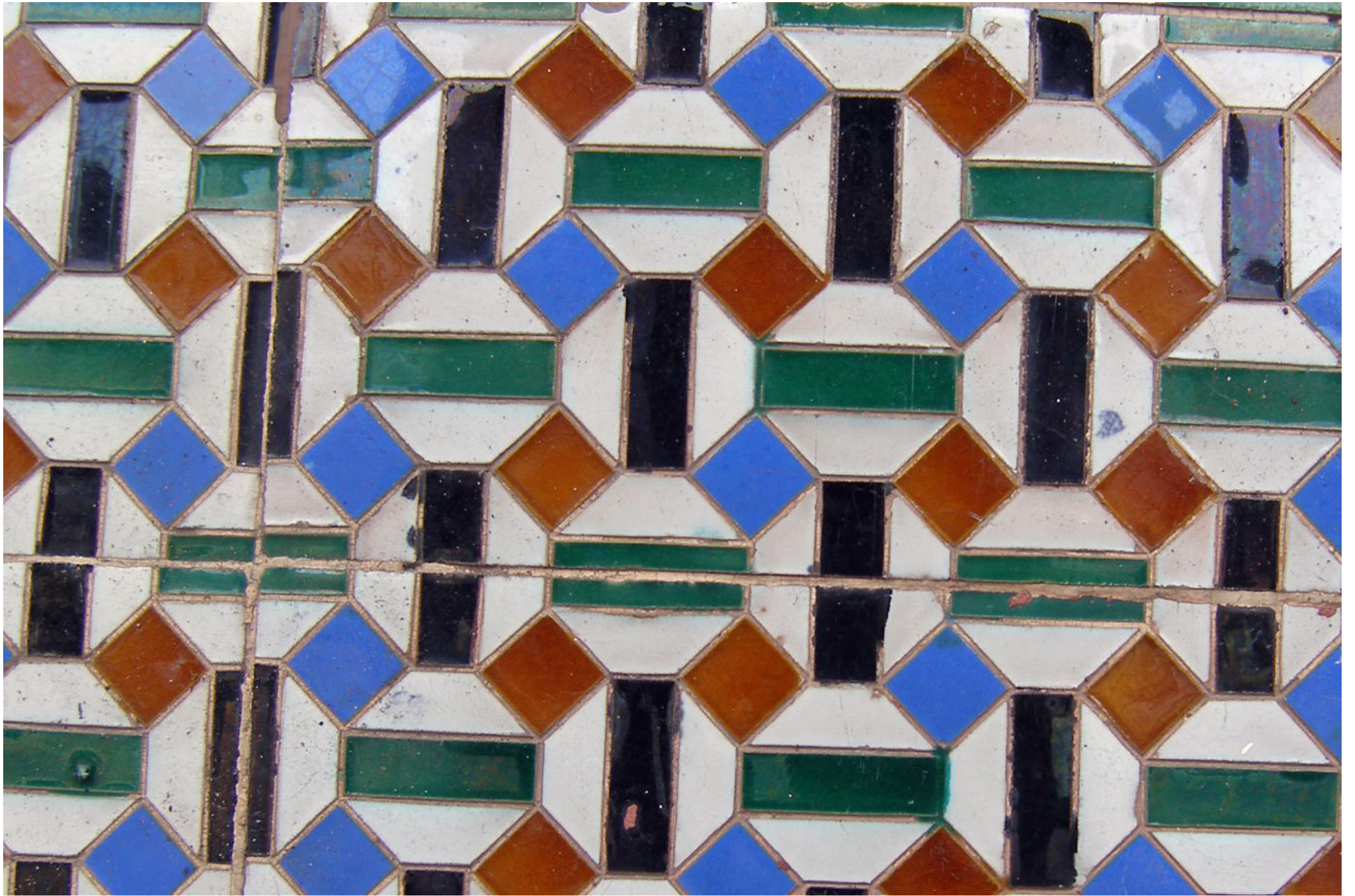
Islamic Tile Patterns



Islamic Tile Patterns



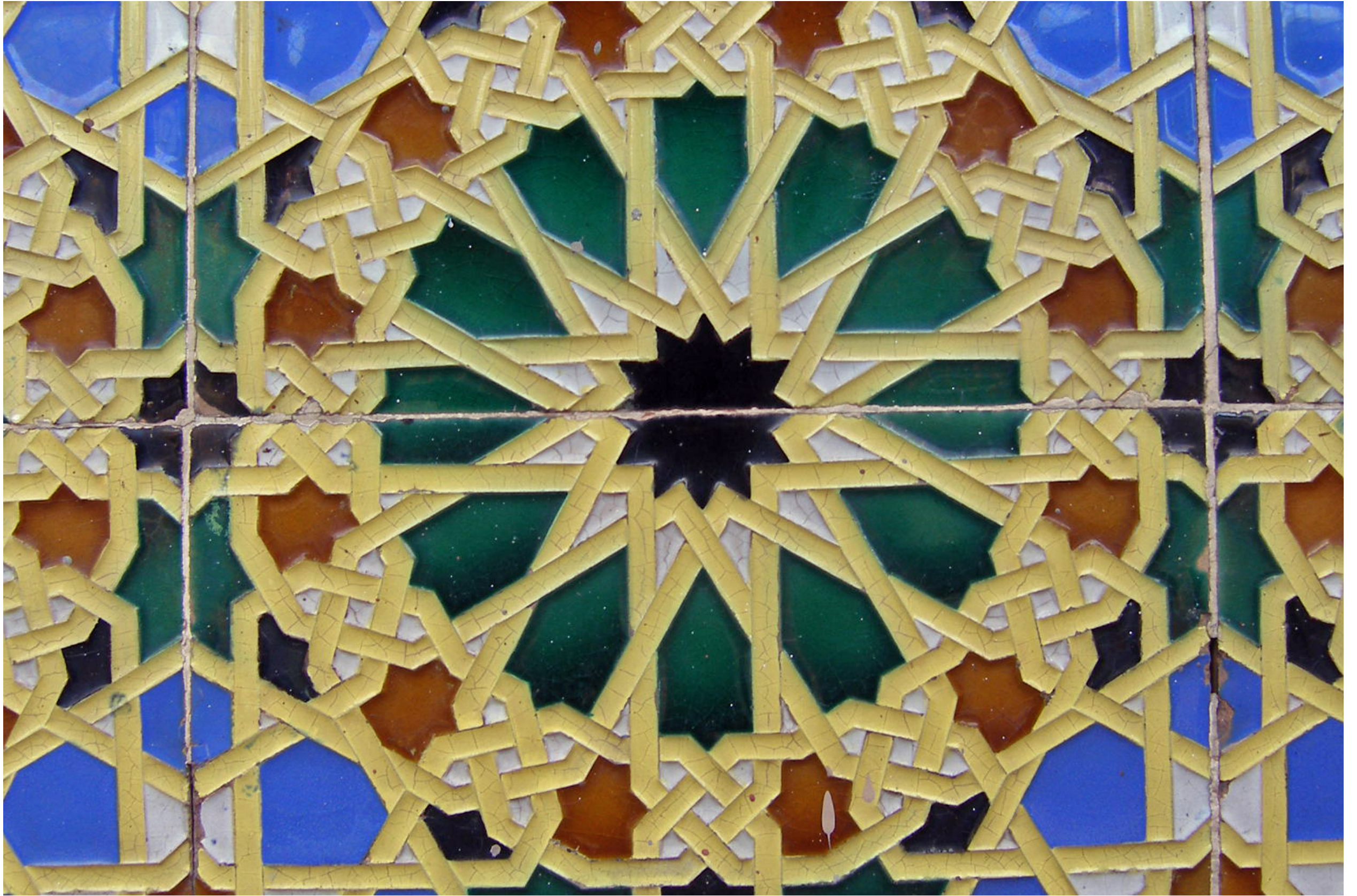
The Ellsworth Building **NILES**, *California*



Krafttile made in **NILES**, *California*



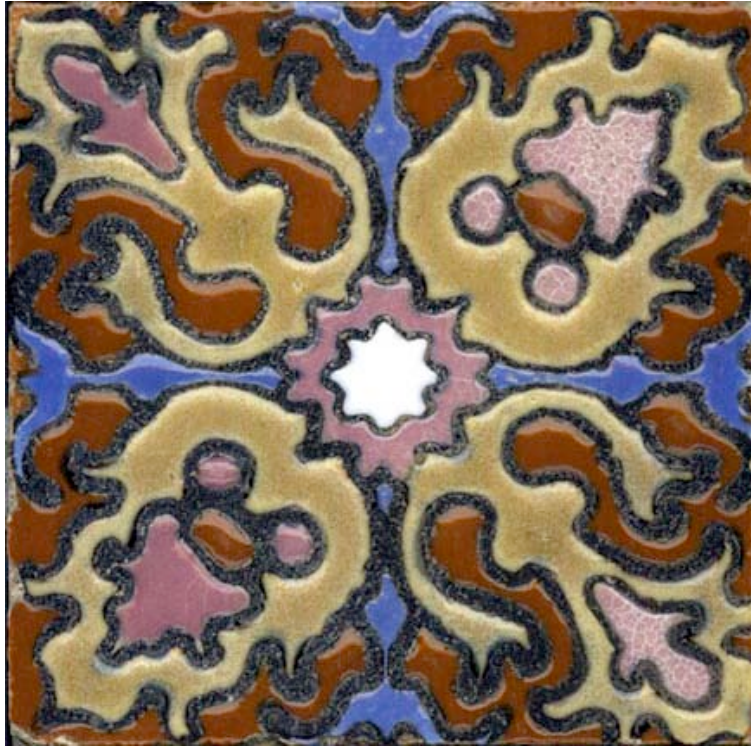
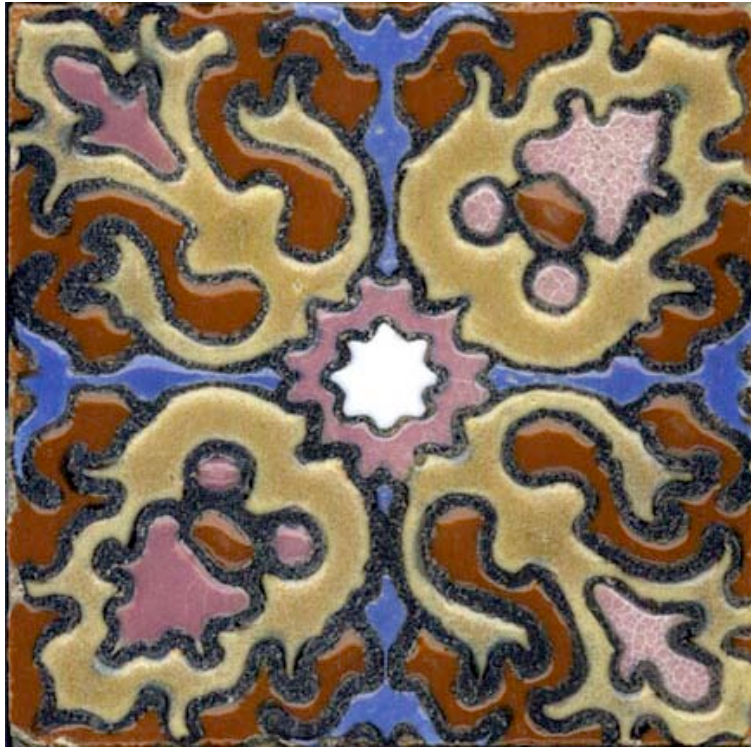
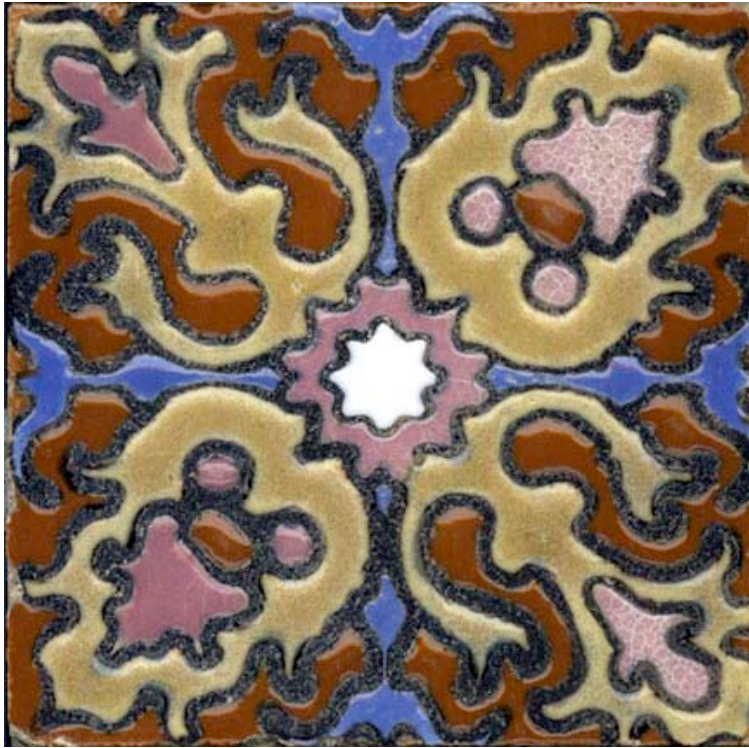
Krafttile made in **NILES**, *California*



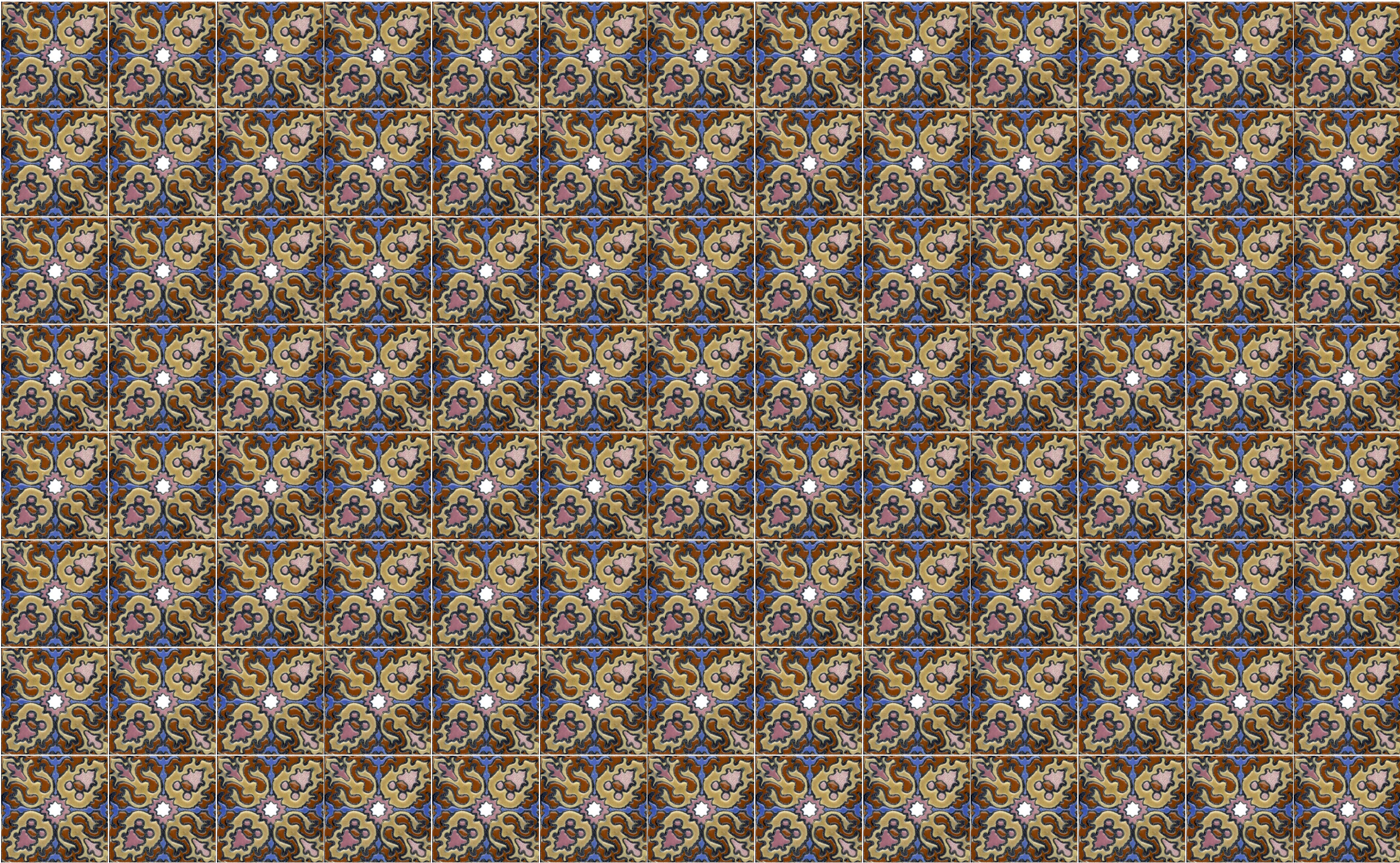
Krafttile made in **NILES**, *California*



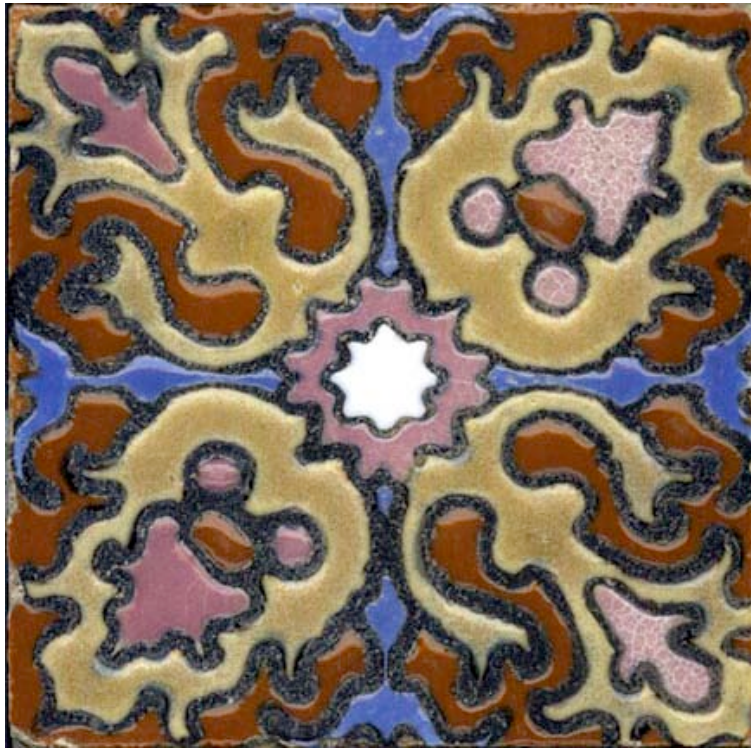
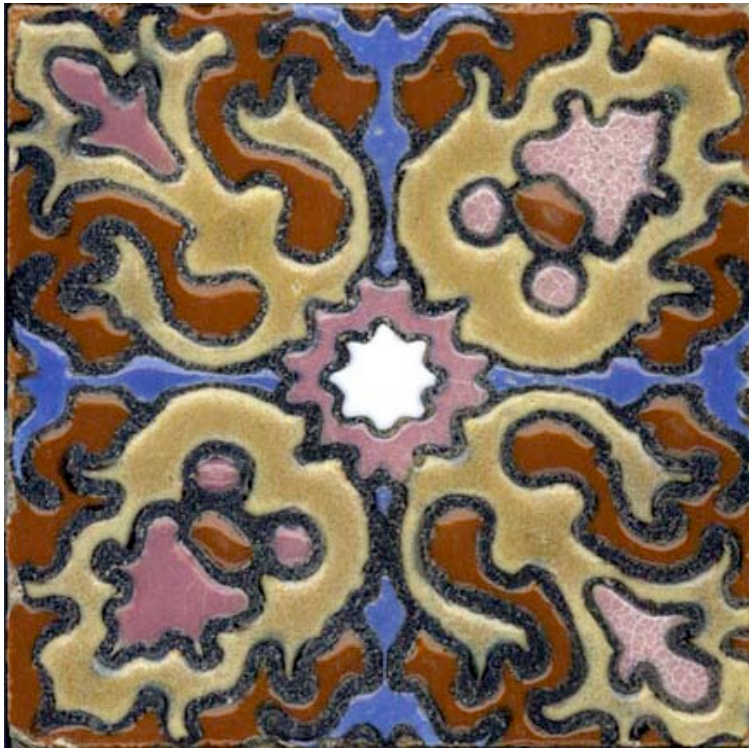
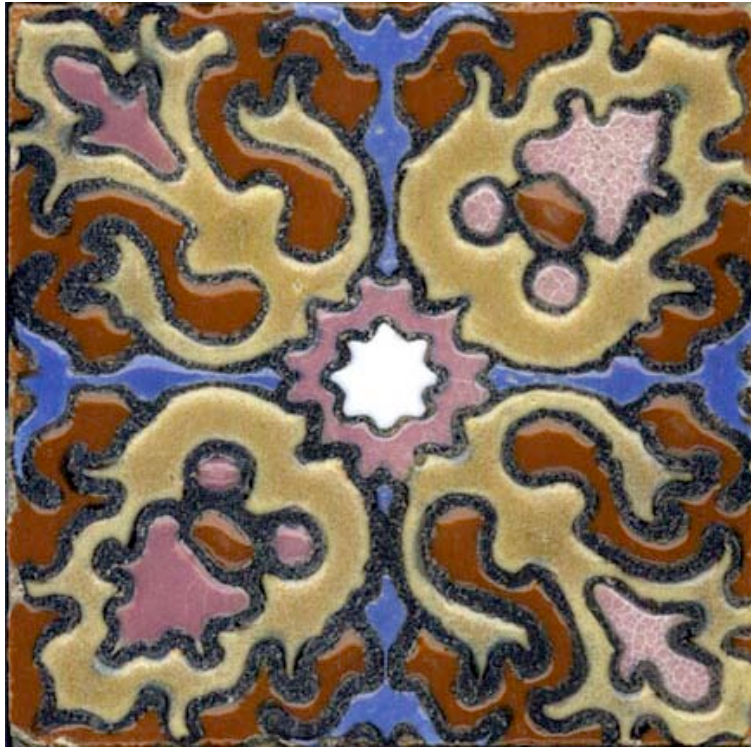
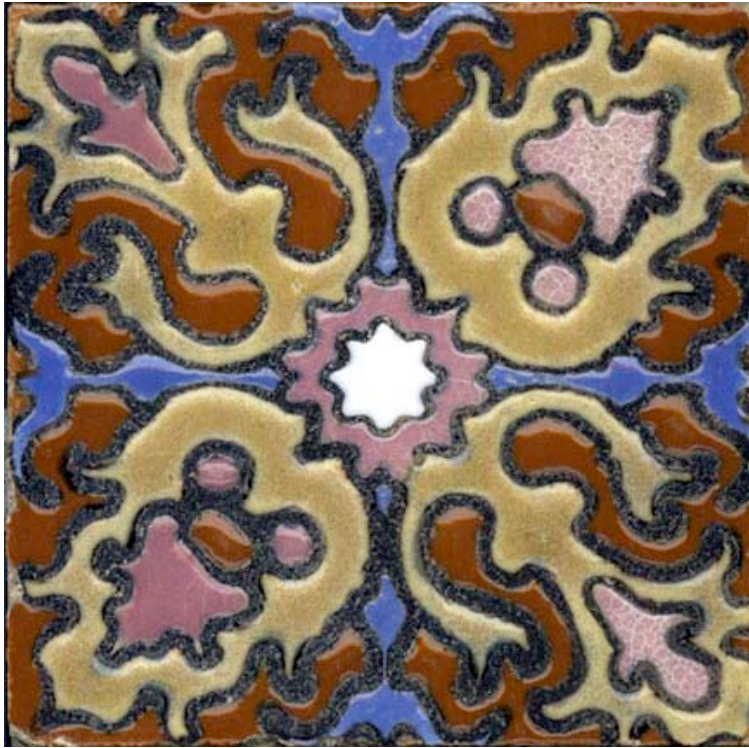
Kraftile made in **NILES**, *California*







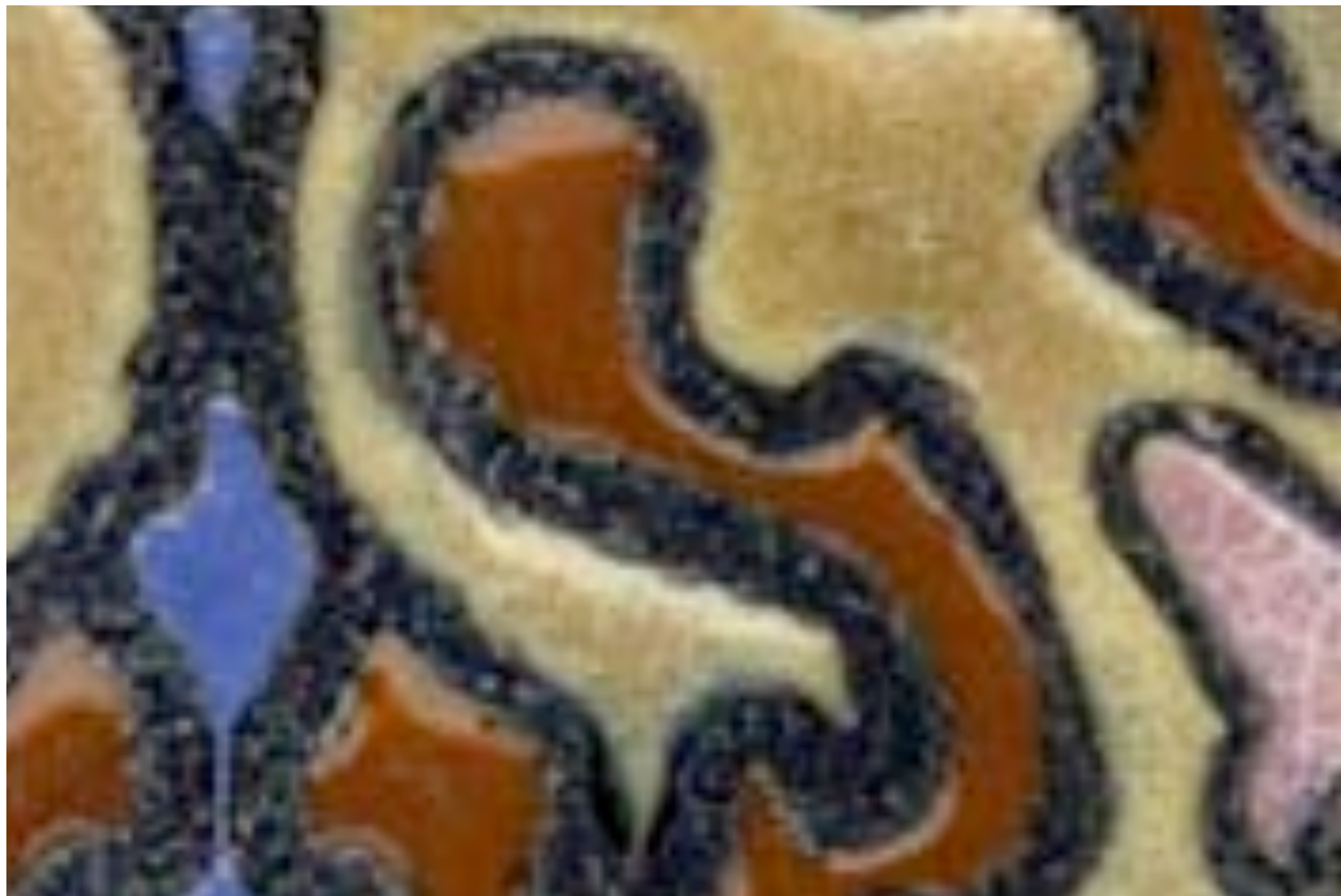














Scale

Matters



- Digital Edition
- Podcast
- Past Issues

In This Issue

You Are Who You Are by

Default: It may be off when you're on, but the brain network behind daydreams and a sense of self is no slacker

The Star That Ate a Mars:

Astronomers study white dwarf pollution for clues to extrasolar planet ingredients

Bad Breath: Studies are homing in on which particles polluting the air are most sickening — and why

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ANCIENT ISLAMIC PENROSE TILES

By [Julie Rehmeyer](#)

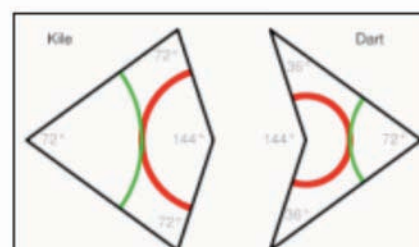
Web edition

[A+](#) [A](#) [Text Size](#)

When Peter J. Lu traveled to Uzbekistan, he had no idea of the mathematical journey that he was about to embark on as well.

The Harvard graduate student in physics was fascinated by the beautiful and intricate geometric "girih" patterns on the 800-year-old buildings there, and he wanted to know how ancient artisans had created them. He discovered more than just a clever construction method. He also found an entirely unexpected level of mathematical sophistication in the designs, pointing at mathematical ideas that weren't formally developed until hundreds of years later.

Lu's determination to find out took him on a journey through hundreds of photographs of Islamic architecture in the libraries at Harvard—and now it's landed him an article in *Science*.



Kite and dart Penrose tiles.

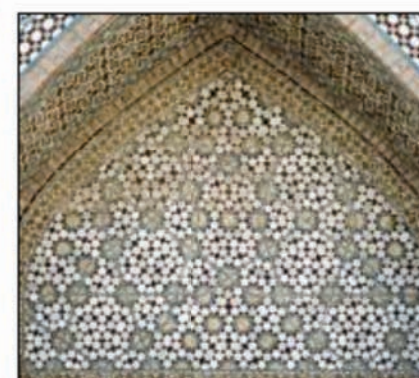
Wikipedia

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The only

mathematical tools the builders had available to them were straightedge and compass. Theoretically, all these patterns could be made by drawing the lines directly onto the buildings.

But Lu noticed that the patterns were astonishingly perfect, even over very large



[Enlarge](#)

Archway from the Darb-i Imam shrine in Isfahan, Iran, which was built in 1453 C.E. The larger pentagons outlined in pale blue were constructed using a large-scale girih tile pattern, and the small white pentagons were constructed using a small-scale girih tile pattern.

Image courtesy of K. Dudley and M. Eliafi.



[WHAT IS A FRACTAL?](#)

[JOURNEY INTO A FRACTAL](#)

[FRACTAL GALLERY](#)

[FRACTAL SHOP](#)

[FRACTAL LINKS](#)

A UNIQUE JOURNEY OF FRACTAL EXPLORATION

All of the images on this web page have been created with mathematics!

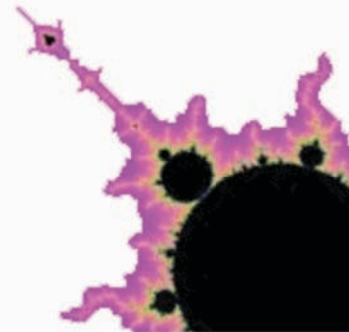


Fractals are where art meets mathematics to produce fascinating, pseudo life-forms, psychedelic images and hypnotic patterns.

You can use this web site to take an imaginary journey aboard the 'Mandel Sub' to explore the hidden depths of detail within these beautiful images.

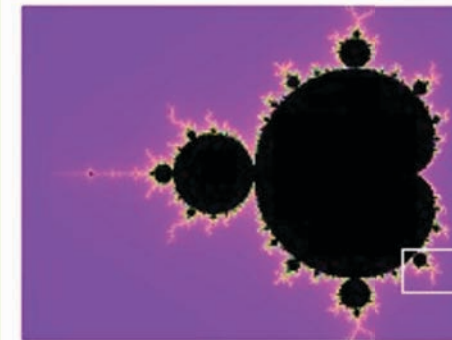
Click on the image (above) to see a larger version.

To find out more about fractals and how to make your own, choose one of the links in the menu. **To join us on a journey of fractal exploration, click here.**

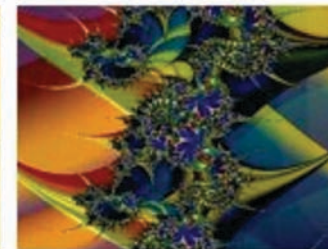
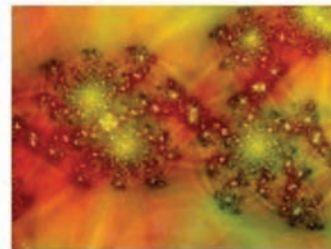
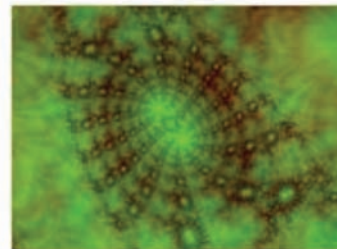


AN EXPLORATION OF FRACTALS

Climb aboard the 'Mandel Sub' for a journey into the depths of a fractal - a mathematical art form.



Fine prints of the fractal images you discover are available for purchase.



These images are small sections from our gallery images. Click on the [gallery link](#) to see the full fractal compositions.

October 31, 2007 | [4 comments](#)

Pollock or Not? Can Fractals Spot a Fake Masterpiece?

Complex geometric patterns turn up in non-Pollock drip paintings

By [JR Minkel](#)



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IMAGE 1 of 2

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FRACTAL, BUT NOT A POLLOCK:

Researchers say that fractal patterns are no reliable way to distinguish genuine Pollock drip paintings from similar works such as this fractal-laced creation of two undergraduate students.

ALEXANDRA ASH AND MICHAEL HALLEN

A new study attacks the technique of using fractals, the repeating patterns found in everything from coastlines to fern fronds, to help distinguish authentic Jackson Pollock drip paintings from paint splattered by lesser hands.

In a paper submitted for publication to a major physics journal, researchers report that previously published criteria for identifying genuine Pollocks based on the presence of fractals—patterns that recur in varying sizes like Russian dolls nested inside one another—would wrongly grant Pollock status to a pair of amateur drip paintings.

Some researchers, however, are skeptical that the new method faithfully replicates that of University of Oregon

physicist [Richard Taylor](#), who first reported eight years ago that five Pollock paintings contained distinctive splatters within splatters, which he has attributed to the way "Jack the Dripper" swayed over the canvas while dribbling paint from brushes, sticks or straight from the can.

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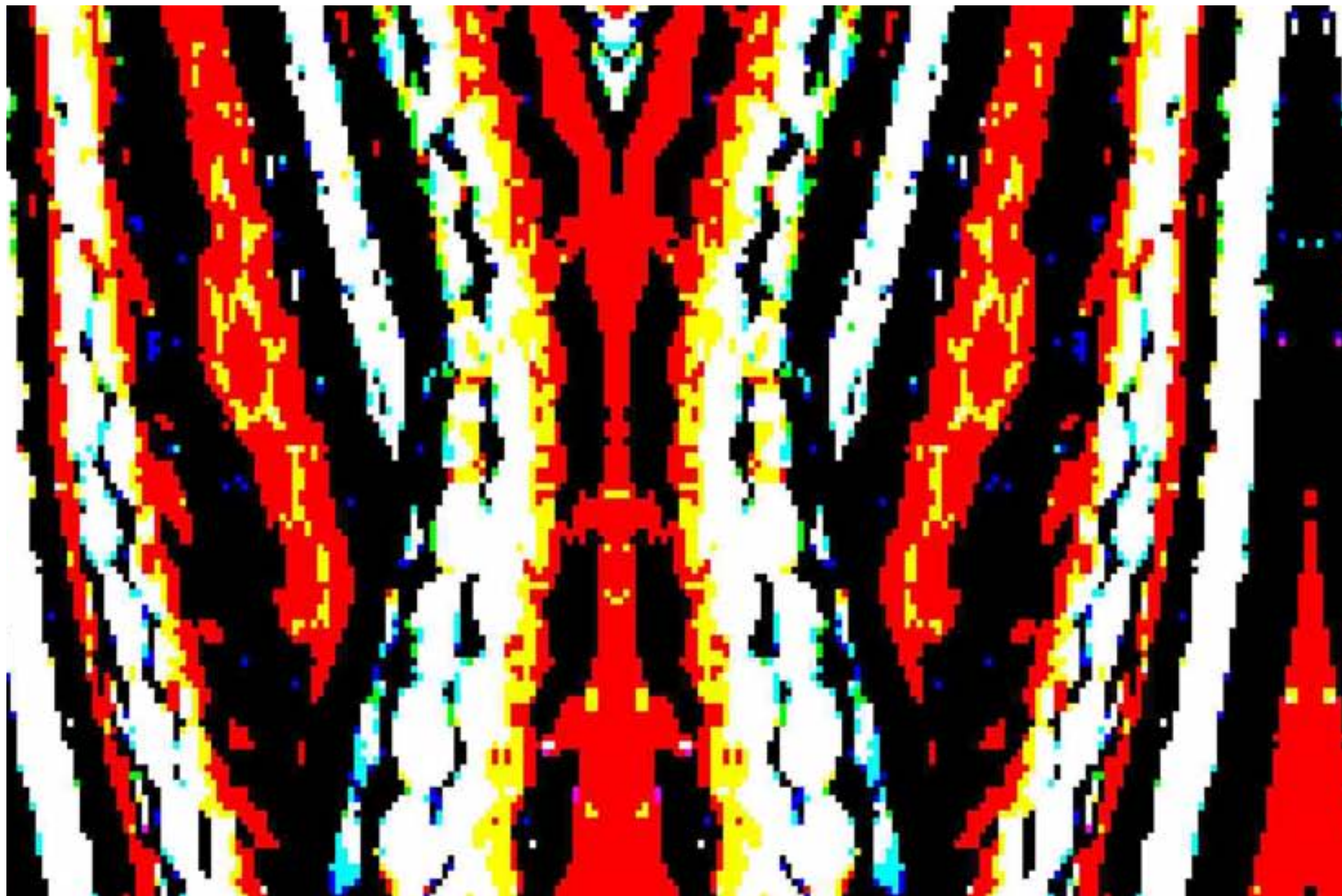
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Thumbs-up

Stumble!



Patterns from Nature

The minimum sampling



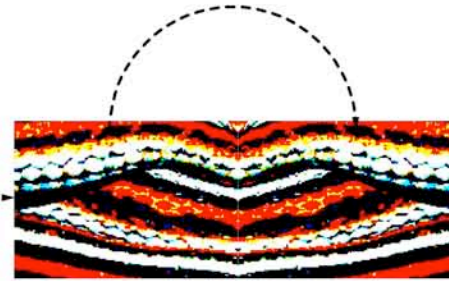




Francisco Garter Snake



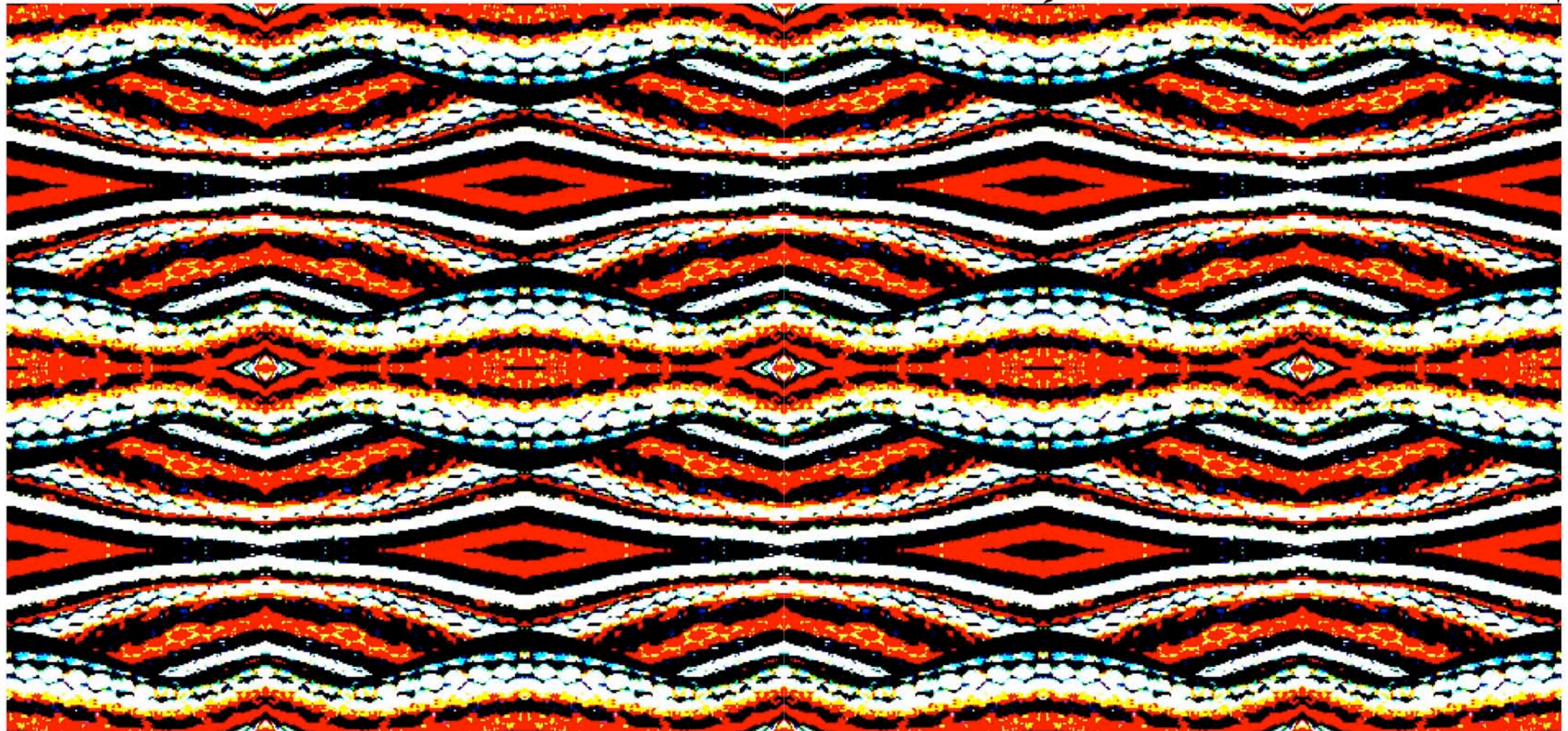
Image Tile



First Fold



Second Fold - Repeat Image



San Francisco Garter Snake Pattern No. 3 - For Ceramic Tiles, Rugs or Tapestries







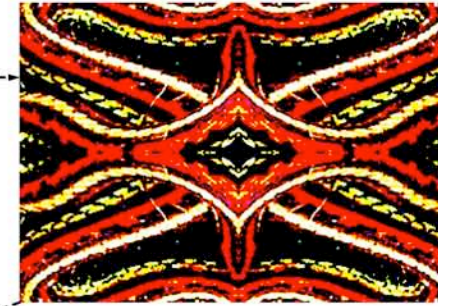
Francisco Garter Snake



Image Tile



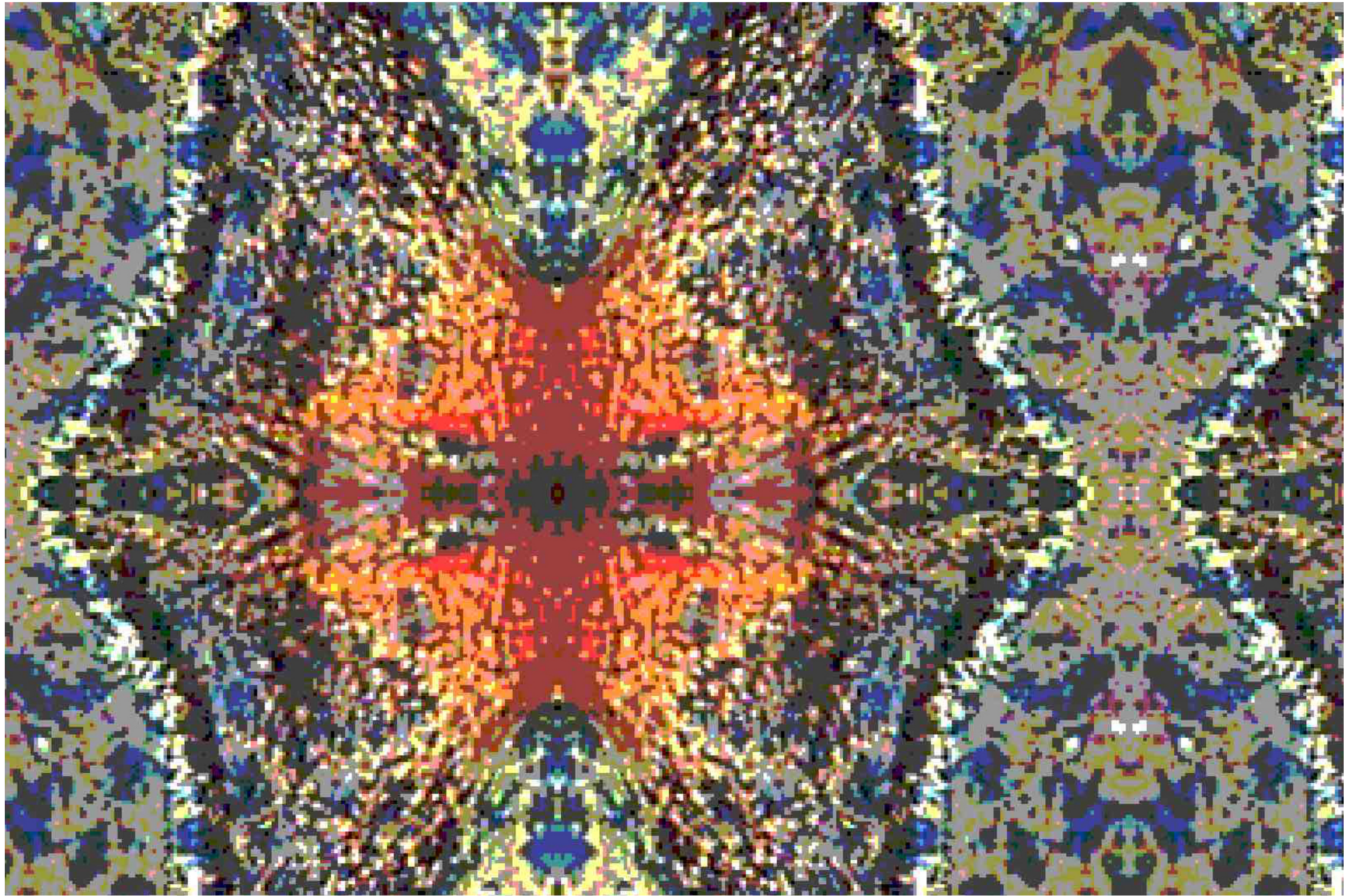
First Fold



Second Fold - Repeat Image



San Francisco Garter Snake Pattern No. 1 - For Ceramic Tiles, Rugs or Tapestries







Red Legged Frog



Image Tile



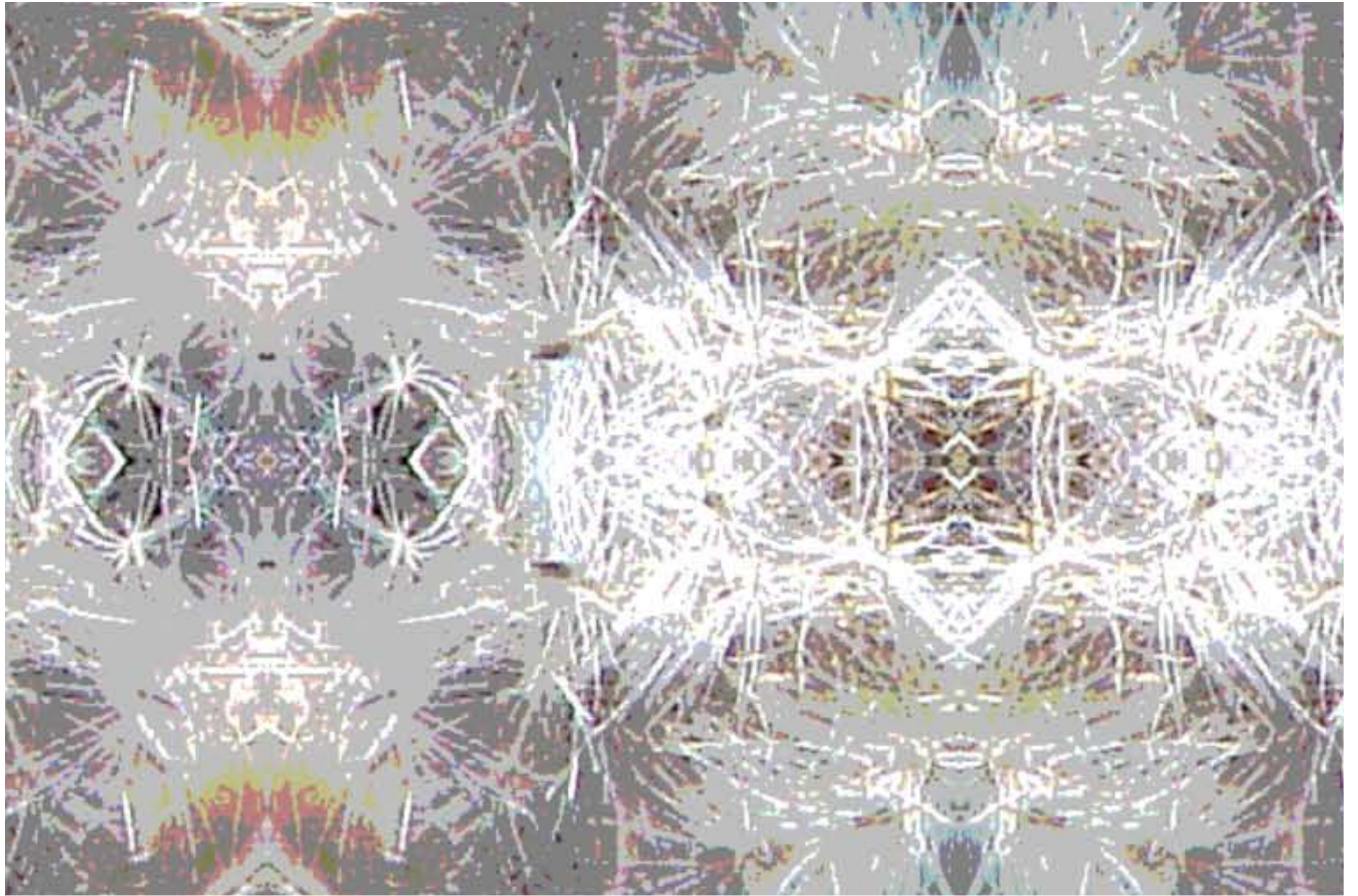
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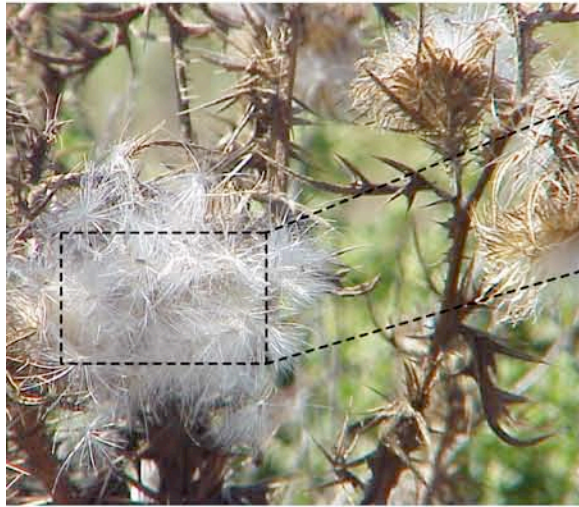
Second Fold - Repeat Image



California Red Legged Frog Pattern No 1 - For Ceramic Tiles, Rugs or Tapestries



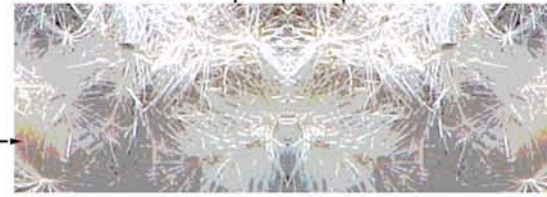




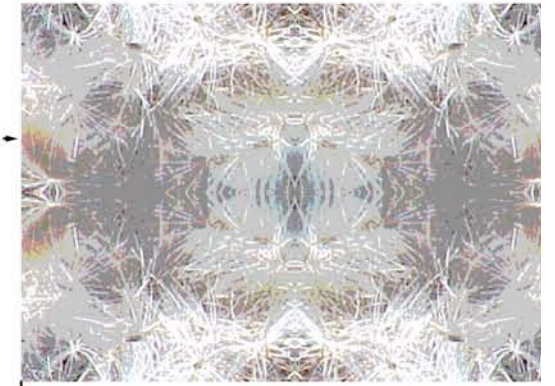
Thistle Detail



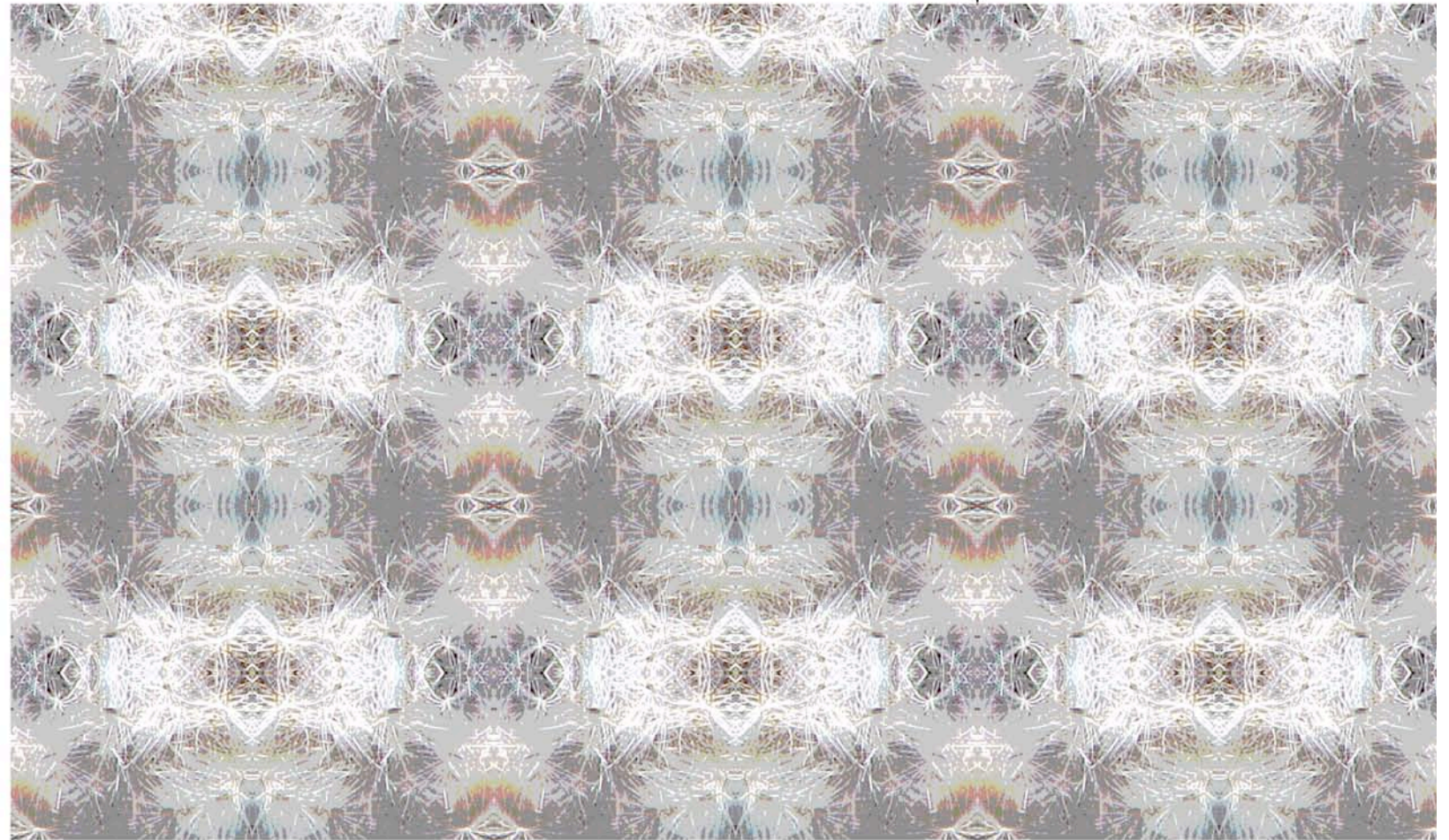
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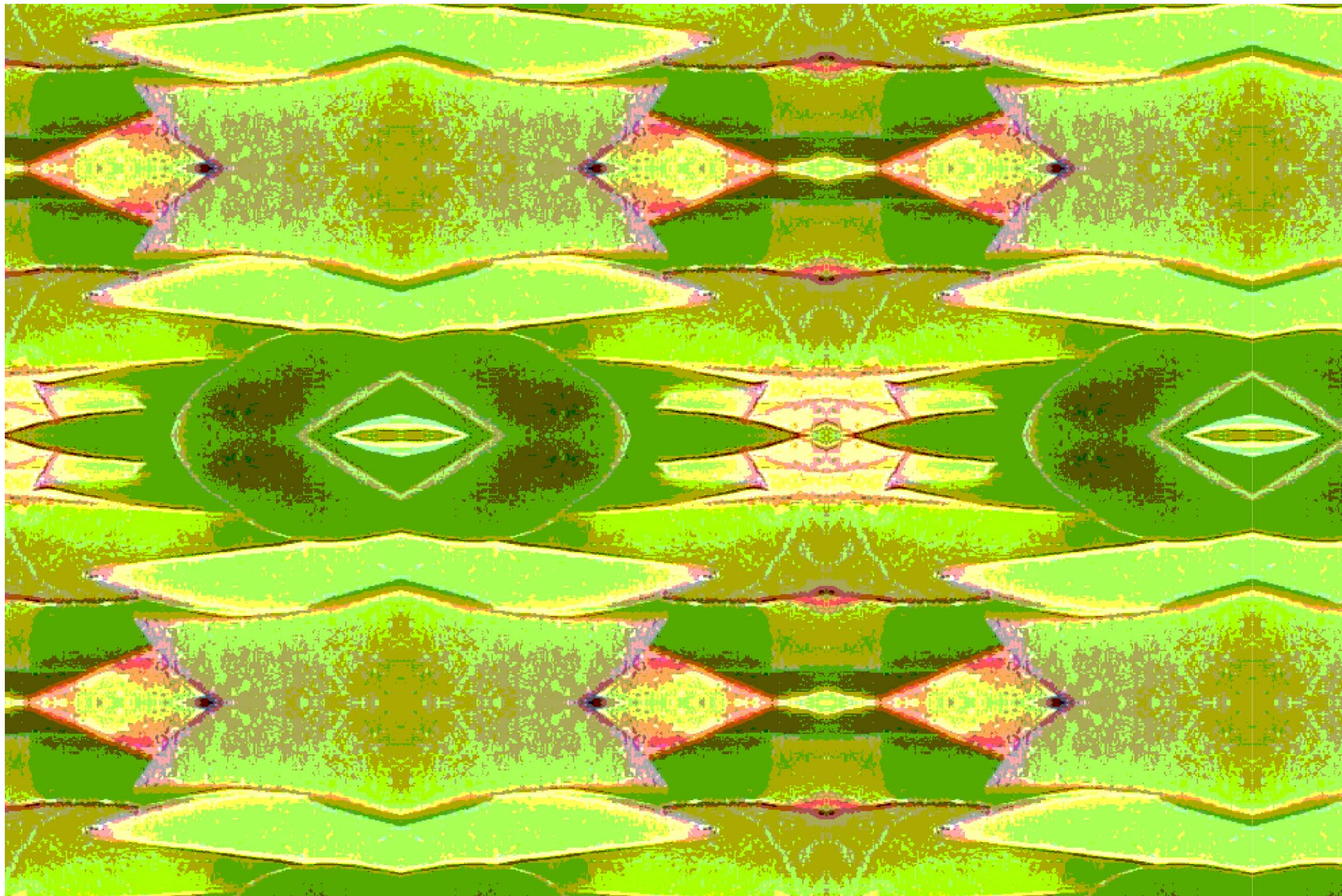
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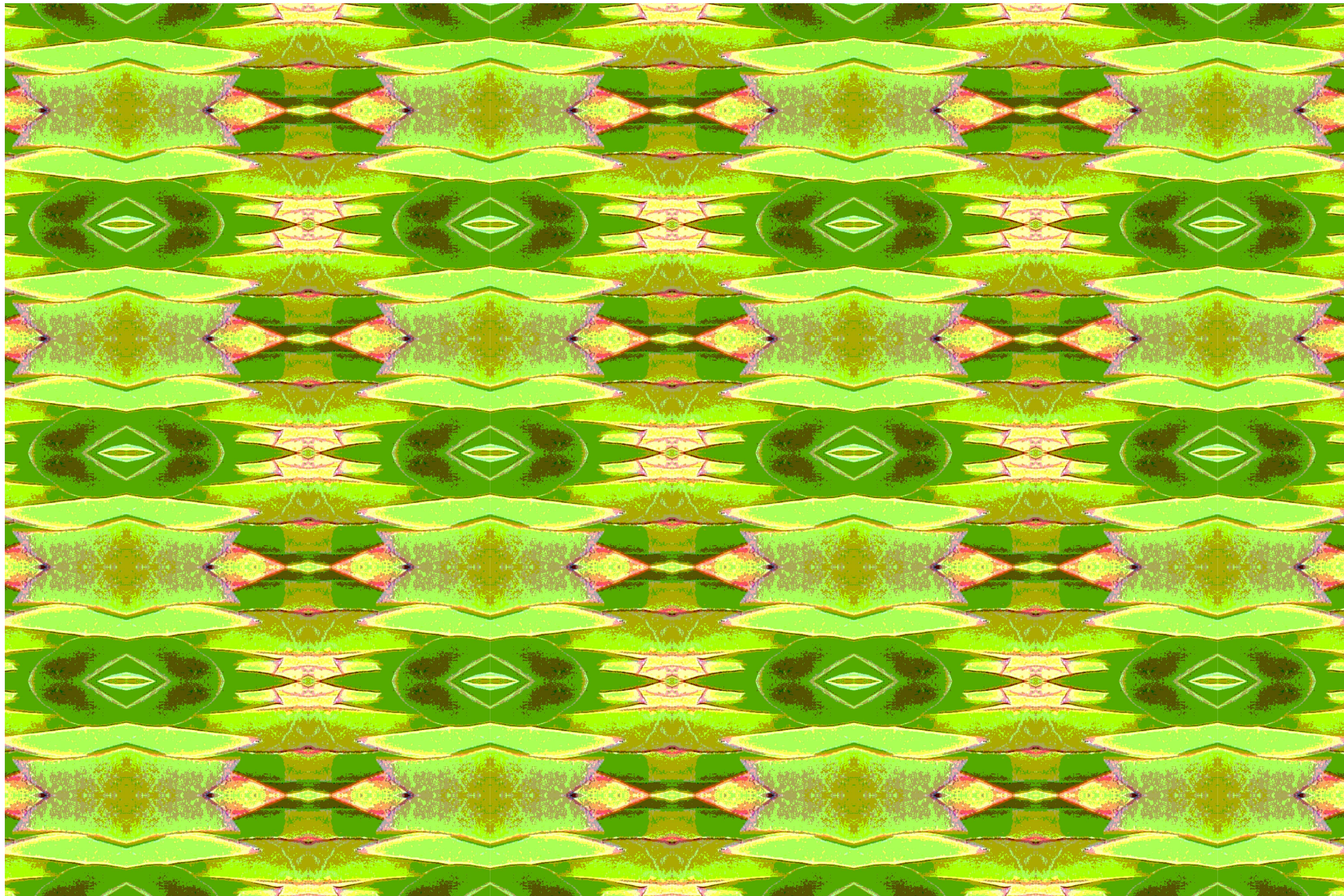


Second Fold - Repeat Image



Thistle Pattern No. 1 - For Ceramic Tiles, Rugs or Tapestries







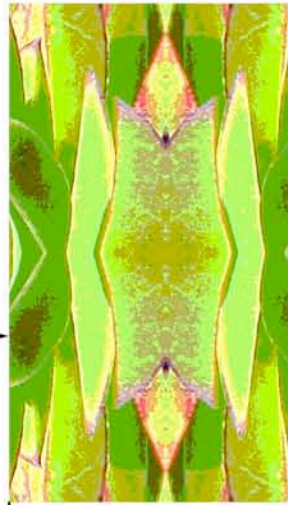
Ice Plant Detail



Image Tile



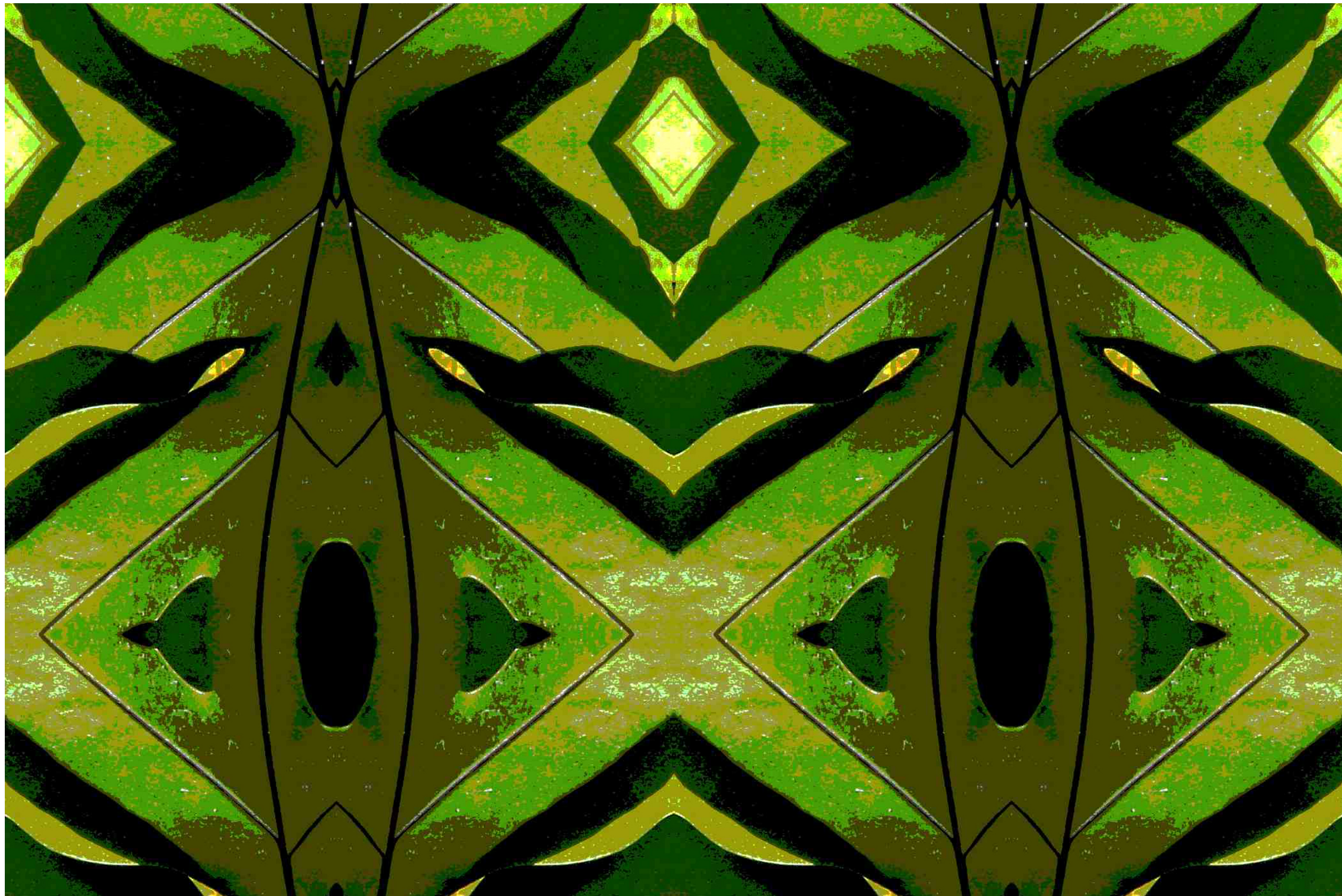
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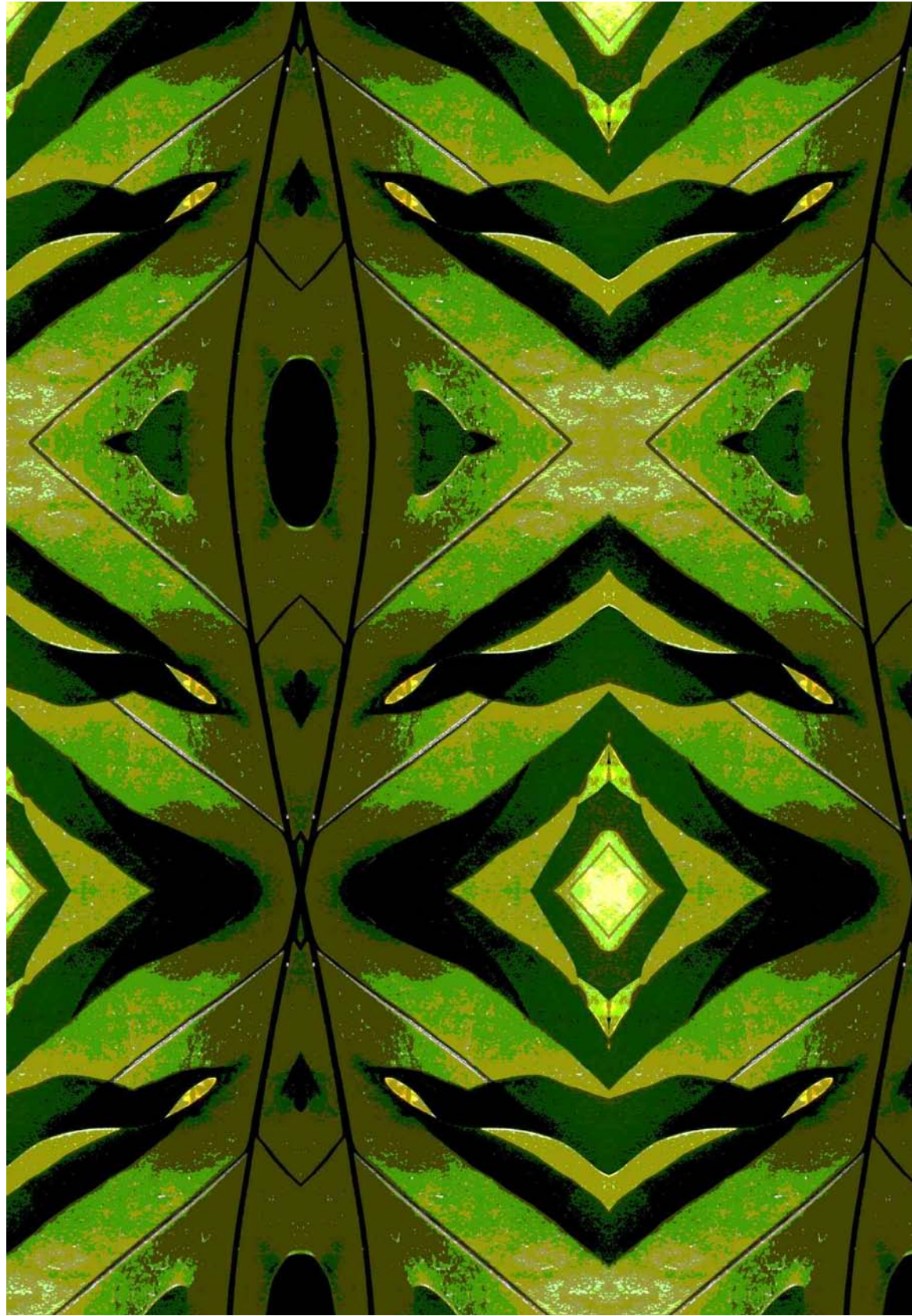


Second Fold - Repeat Image

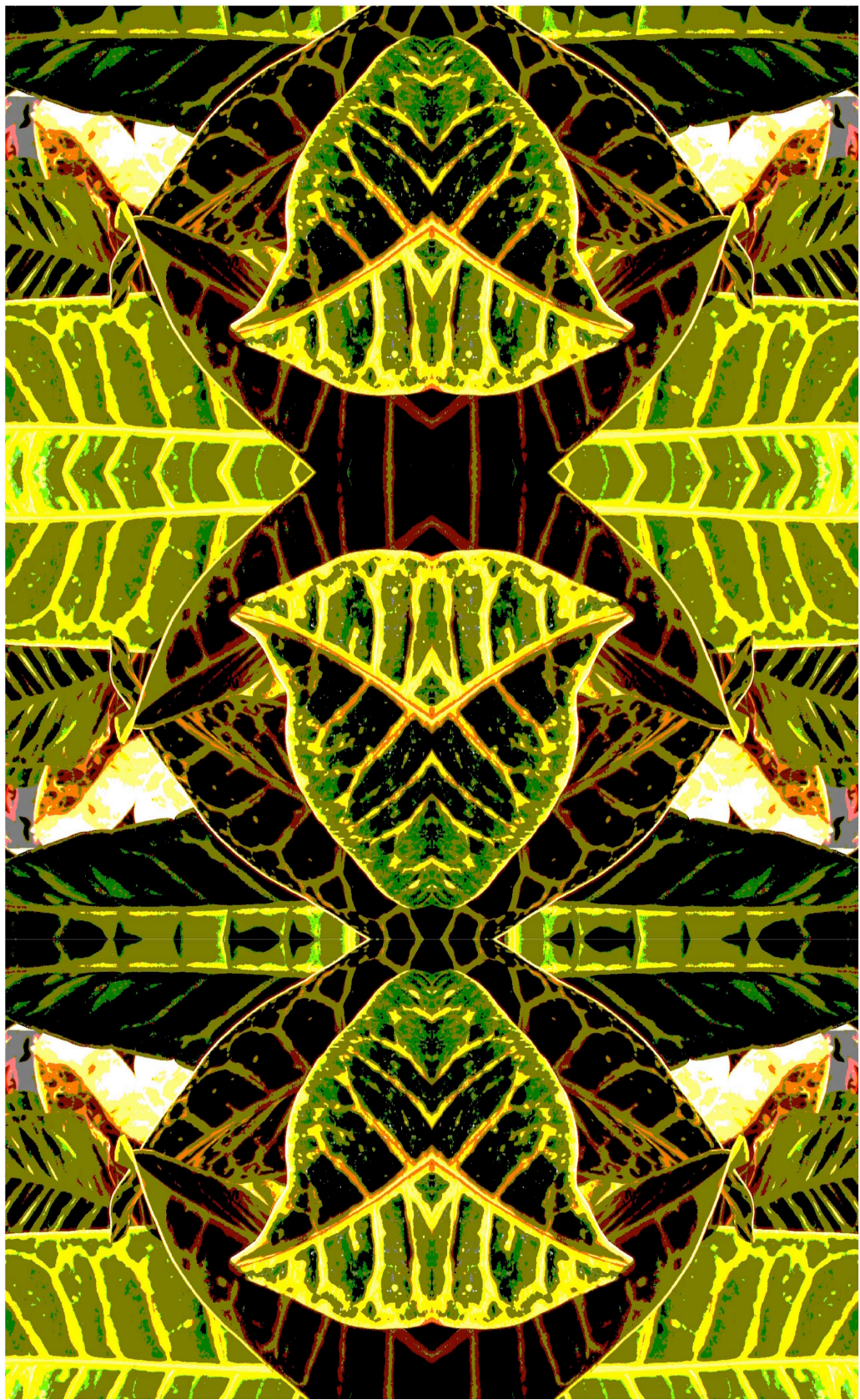


Ice Plant Pattern No. 1 - For Ceramic Tiles, Rugs or Tapestries









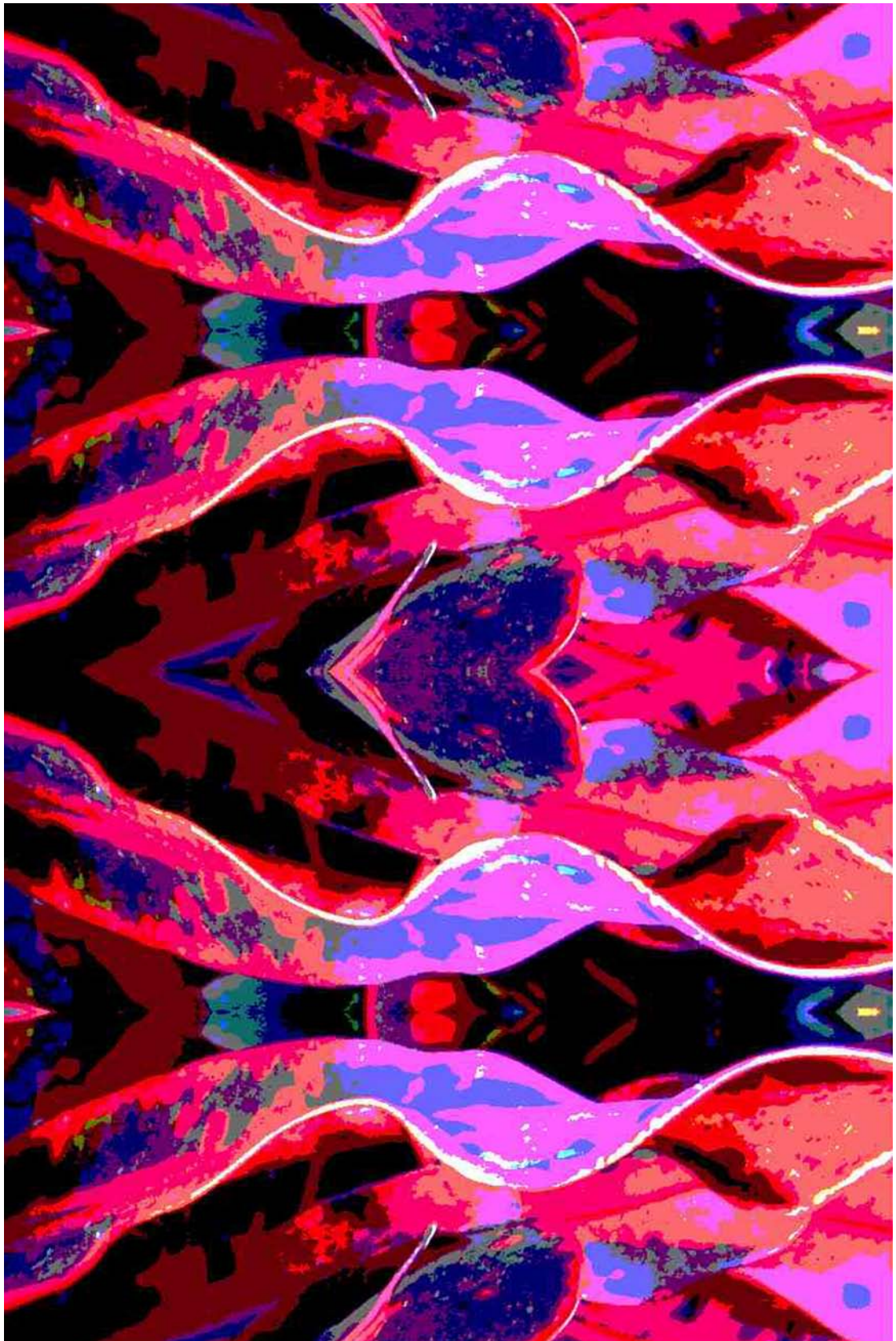




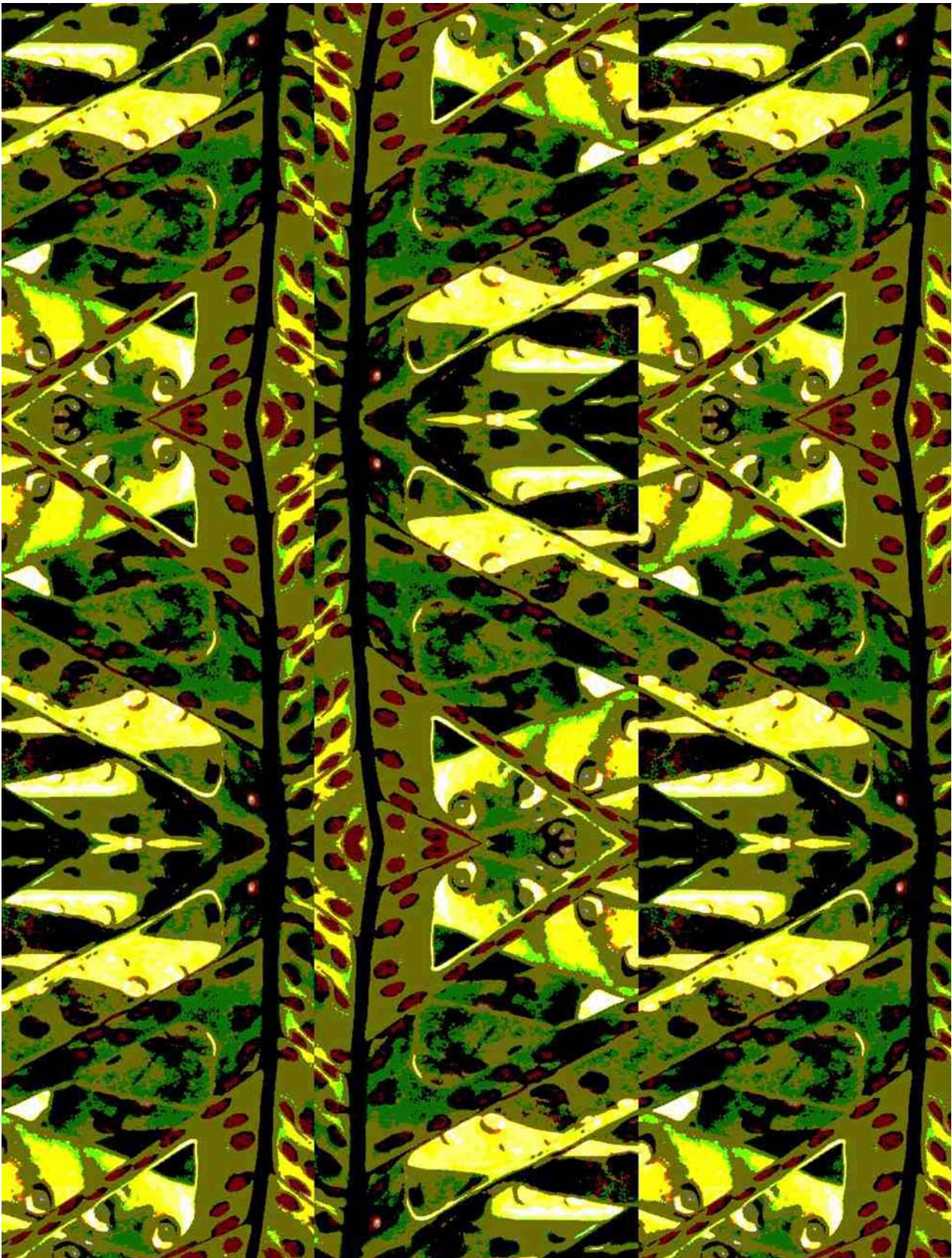




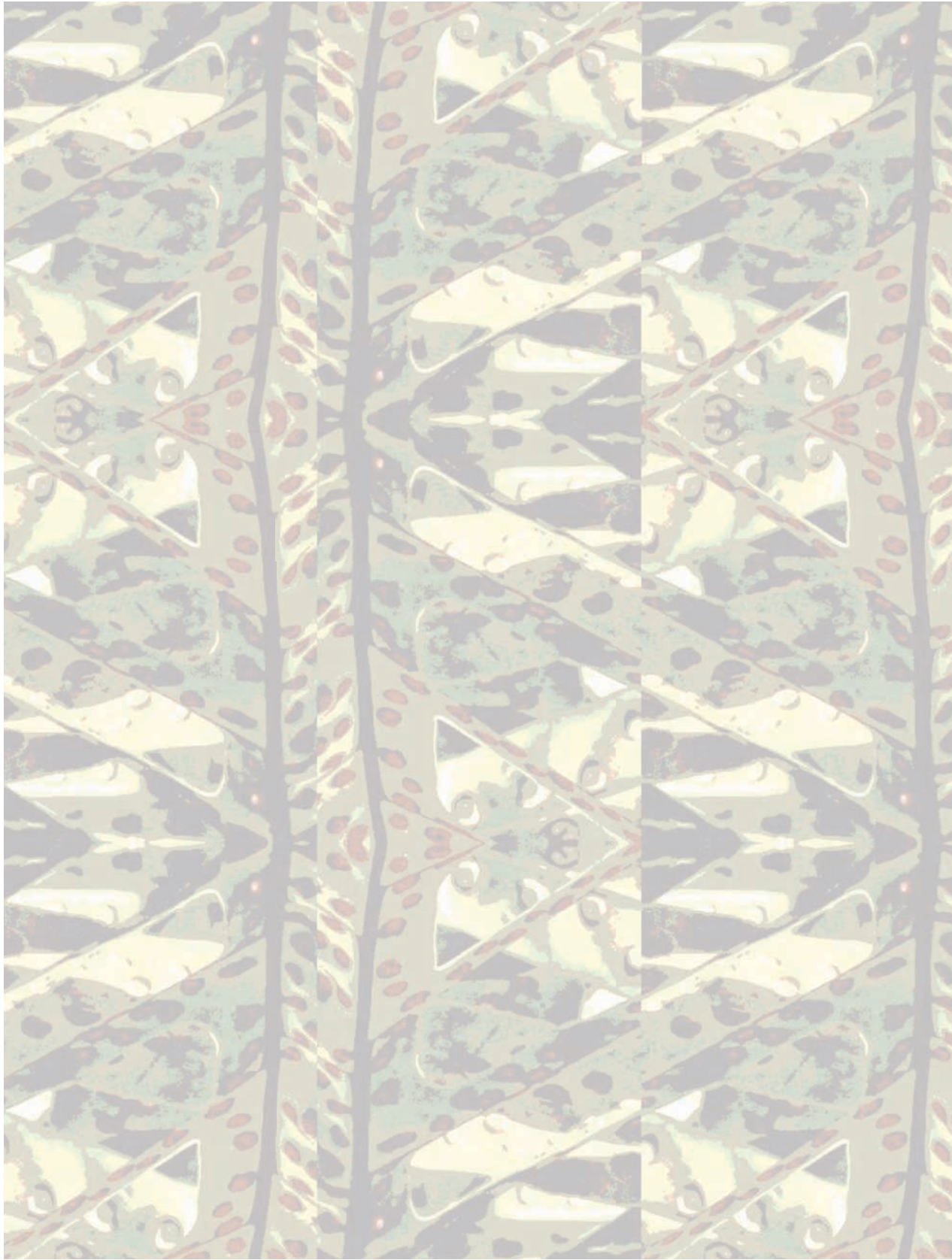


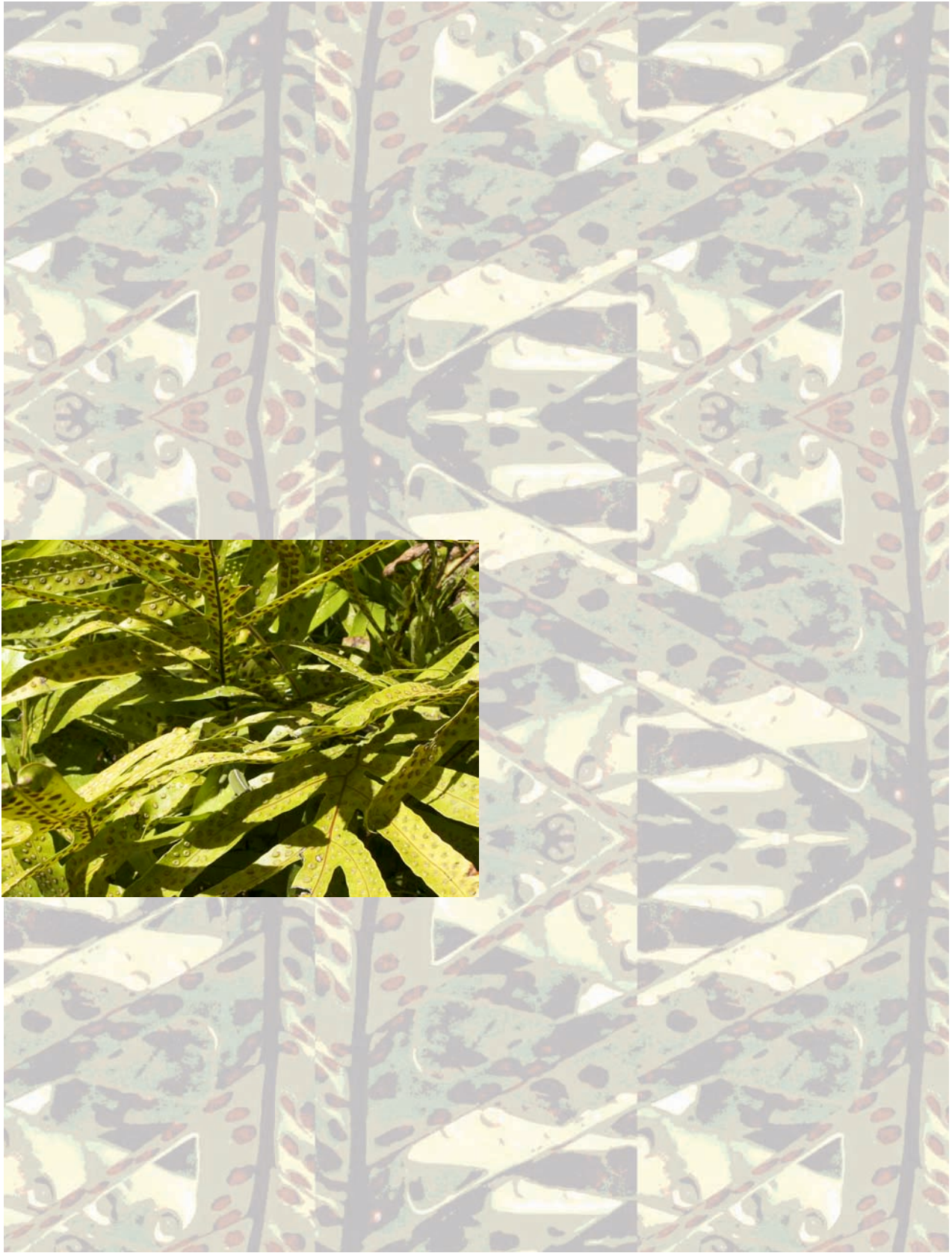


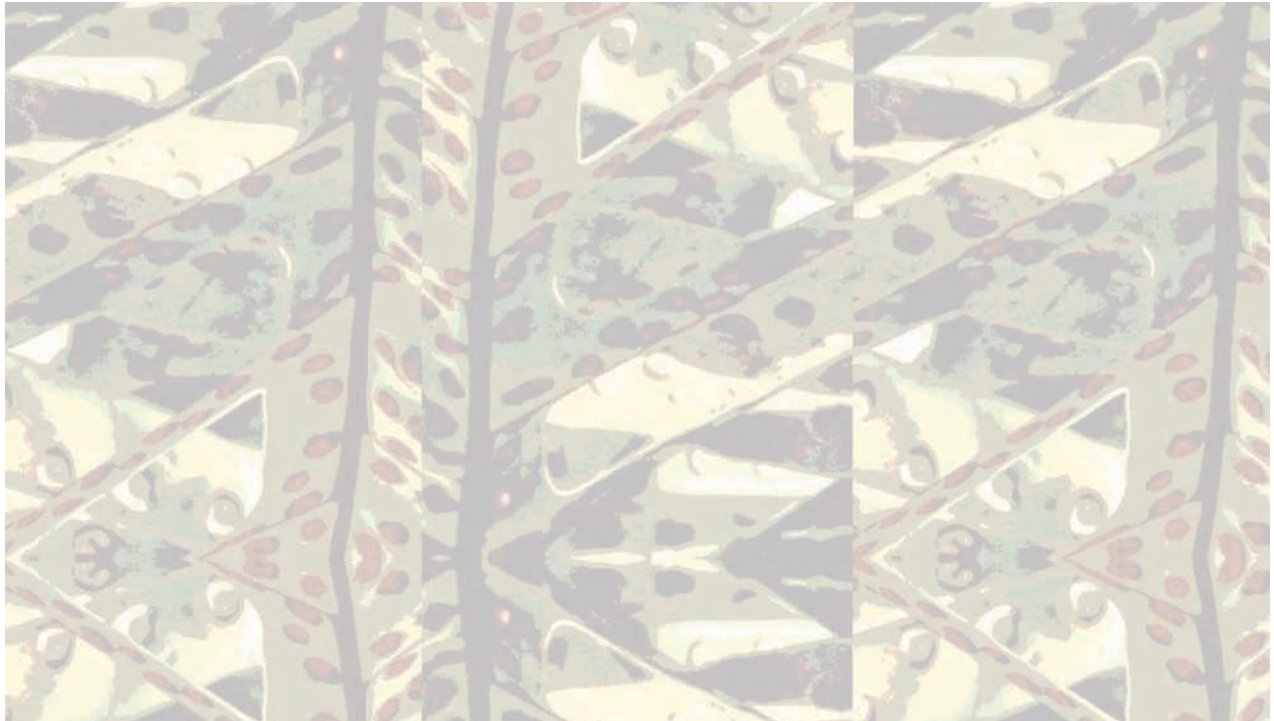


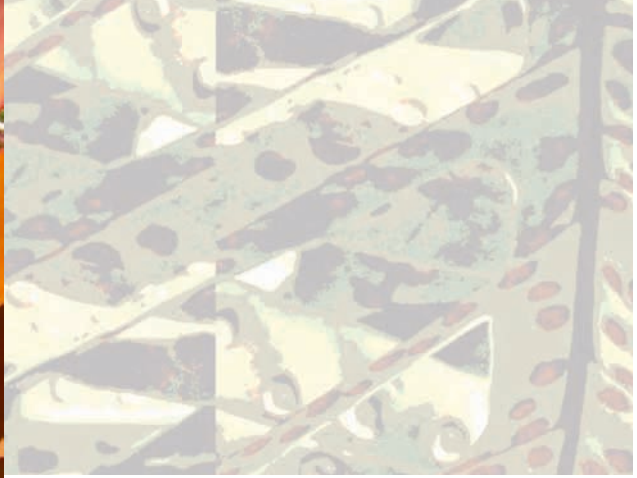
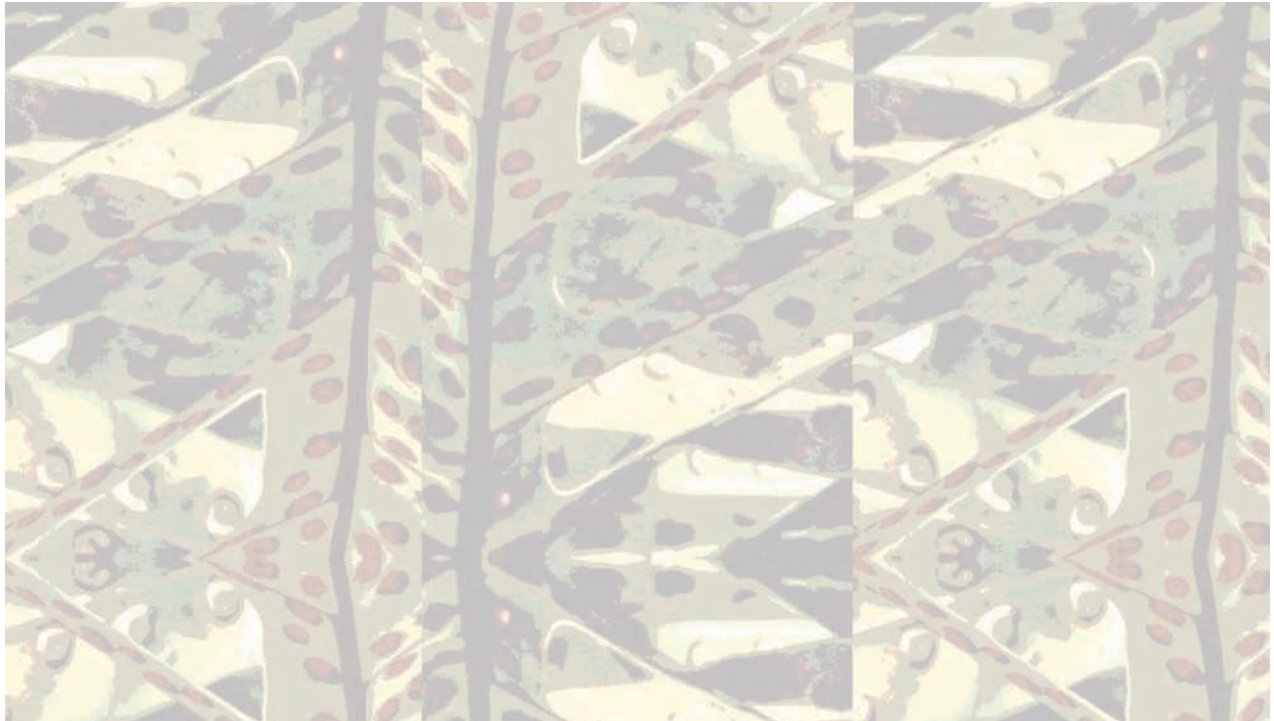
















Patterns from Nature

