

Uncertainty of Structure, Quantity and Space as our Reality

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Abstract

As an artist and non-mathematician, my description of the concept of uncertainty and flux is an artistic expression. It relates to the use of color and luminance or brightness, as well as the structural design in my paintings. The three paintings I have created use hand drawn tiling patterns, (not computer generated). They demonstrate different methods of achieving the state of visual uncertainty and flux, that I experience as my reality. What is reality? How do we form our judgments? How can reality be represented, given our different backgrounds in mathematics, science and art? The creative impulse has inspired artists and mathematicians to confront the universal question about reality. Mathematics and art are related in that they both present a view of aspects of the structural order of reality manifested in our environment or the universe. Yet, they speak a different non-verbal language and seek it through different lenses.

Introduction

My story of creative work begins several decades ago. It is about my passion to create works of art using light and transparency to become a sculptured space. These sculptures use the method of dispersion of white light into spectral colors through diffraction and refraction that visually result in a light image in space. My other sculptures use handmade mosaic tiles (tesserae) to create patterns on a hyperbolic plane. (Both were presented at the Bridges conferences).

These two types of sculptures led to my current work using light or luminance and patterns to achieve an uncertain and fluctuating space in one's visual perception. This journey has been long. It included making holograms and traveling to ancient mosaic centers of the world such as Ravenna, Rome, Palermo, Istanbul and Seus in order to study tessellation patterns and luminosity. I studied with artisans in Italy to learn the craft of making tesserae to use in tessellation patterns. This process is exacting, like a jeweler cleaving a diamond.

My current paintings combine my two interests and address structure and uncertainty as the reality we encounter. I am not a mathematician. I have devised my own independent rules based on the physiology of visual perception and principles of aesthetics. My language of abstraction is visual and the terminology I am using is the vocabulary used in the discipline of art history.

Color and luminance are different. Light is a physical entity. But, color perception is a series of wavelengths of light that our brain processes. Our perception of color depends on such factors as luminance and the detection of edges, shadows, and the resolution. Fragmented pieces and broken color visually result in an uncertain form and unstable space.

Luminance is perceived lightness. It allows us to perceive depth, three-dimensionality, and optical movement. When there is an abrupt contrast of light and dark, we recognize the object or shape. But, in a gradual transition or a discontinuity of edges due to the use of low contrast, then the shapes become visually unstable and jittery. They shimmer and "float". They achieve an ambiguous and visually uncertain space. Therefore, when looking at these paintings, the questions to be asked are : what is the reality of what we perceive? What do we see? What do we experience?

Irene Rousseau's Paintings Using Color, Luminance and Patterns
(all paintings copyrighted by Irene Rousseau)

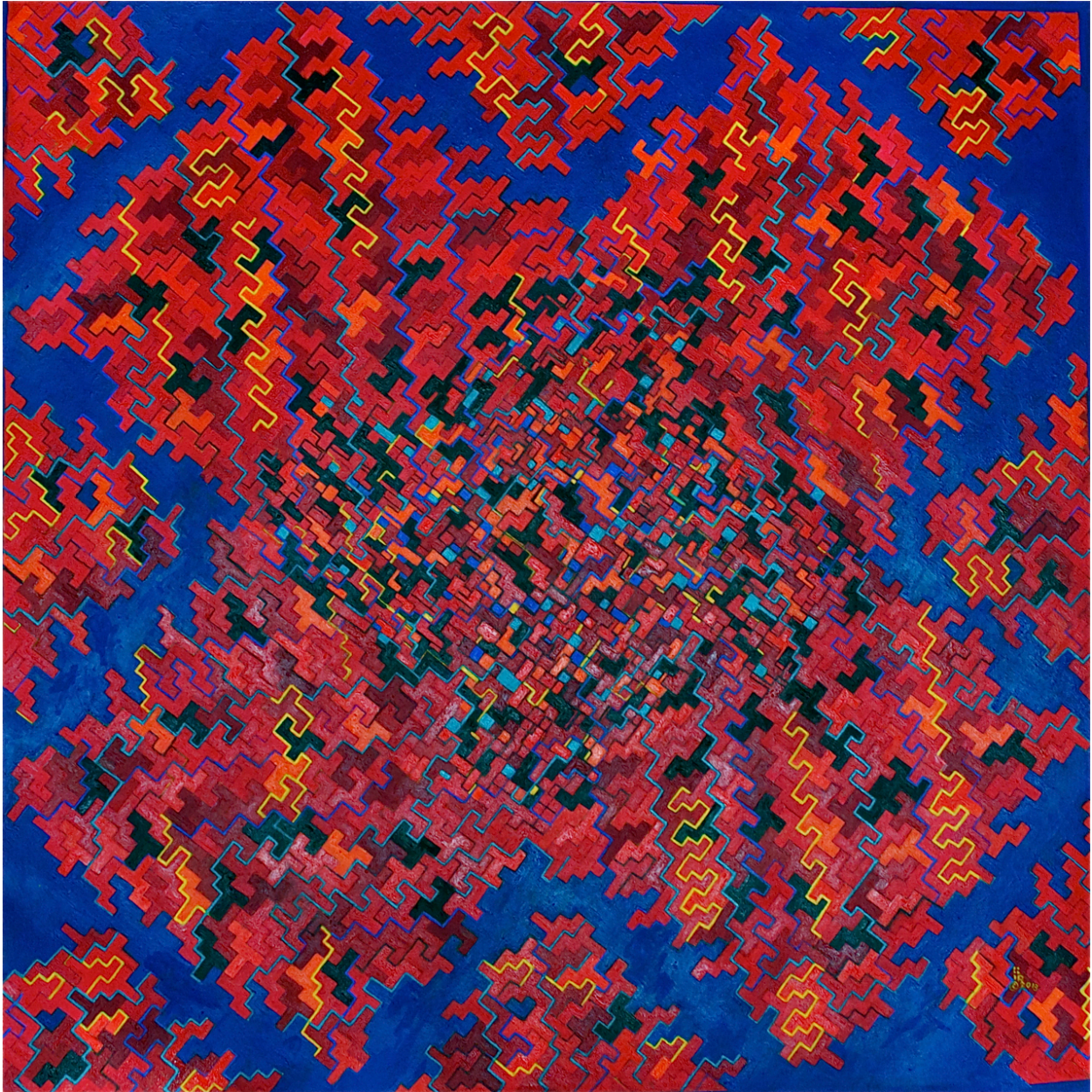


Figure 1: *Stretching the Space*, 36"x36", oil on canvas, 2013.

This painting begins with a geometric conception on a two dimensional plane. It is based on a grid with linear expansions of interlocking patterns that are enclosed with open spaces. It is a sequence of numbers that are combined to stretch the space. The square unit module is a unifying element and consists of a sum of multiples that are distributed over the surface. These inner spaces are finite but have a structure. The spaces enclose a combination of a number of continuous units. The central core consists of rotated

interlocking patterns, cutting across and overlapping contour lines, that result in subdivided spaces, color shifts and fragmentation, which disguise the geometry.

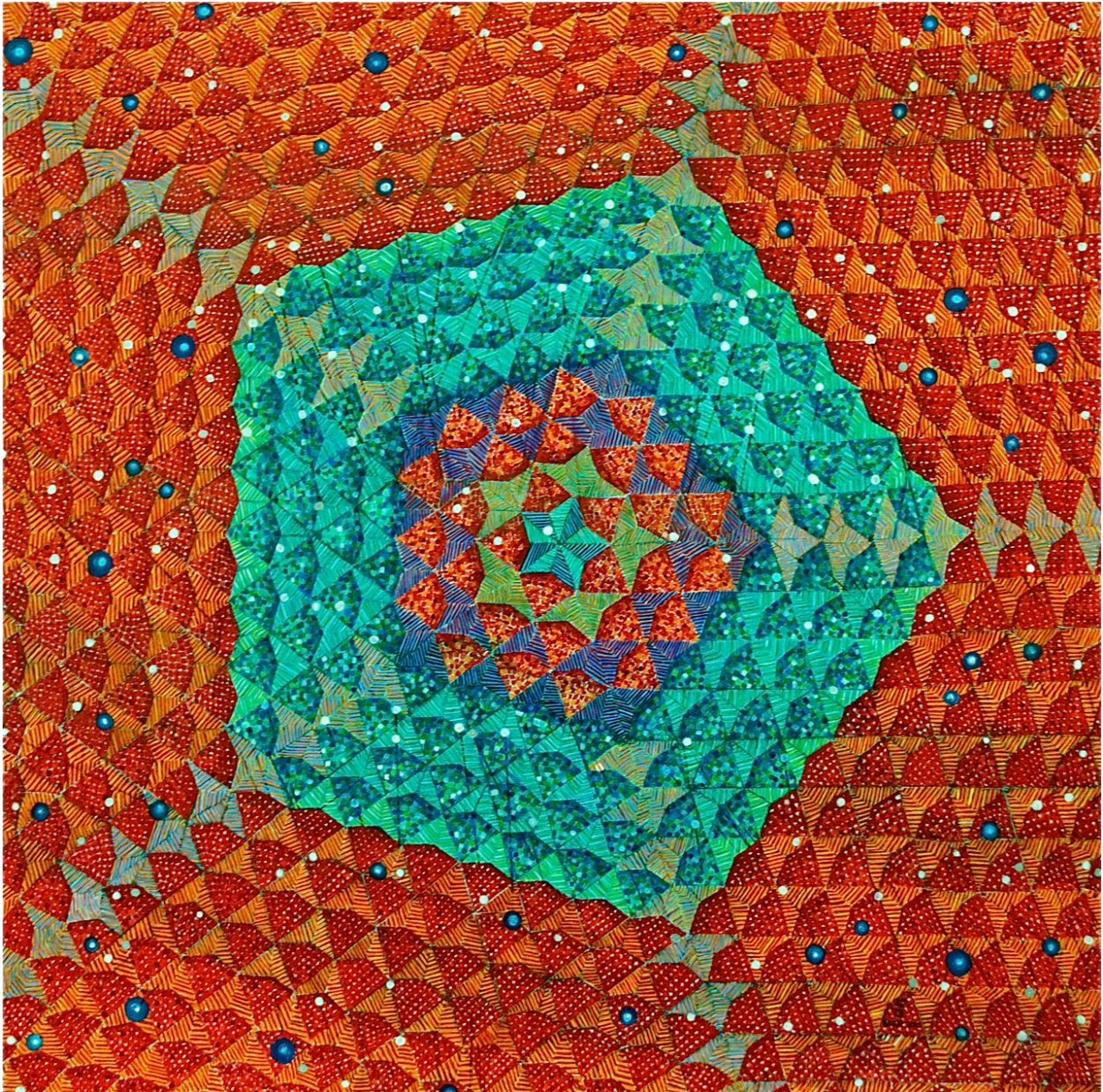


Figure 2: *Tiled Space: patterns of change*, 40"x40"x1", acrylic on canvas, 2011-2012.

This painting covers the plane with space-filling geometric shapes. The dominant tiling pattern consists of colored shapes that are darts and kites that combine or subdivide space. It sets up spatial relationships of parts to the whole. Broken colors and fragmentation seem to make the shapes appear to shimmer. The pentagon seems to “float” in an undefined space. Although the shapes are defined, and the tiling patterns are geometric, the interplay of light and color, shifting gestural marks and edges, result in a shimmering, unstable and uncertain space. The shape is clear but the location is not.



Figure 3: *Honeycomb Lattice*, oil on canvas 48''x48''x 2 ½'', 2012.

This painting is composed of space-filling hexagons. They shimmer and jiggle in space. The hexagonal framework is a complex tiling pattern. The tiled structure is visually three-dimensional due to the use of varying luminance. Differences in luminance define the red triangles, which are composed of hexagons, as they emerge as three-dimensional forms flipping back and forth depending on the viewer's gaze. These triangles also combine to form a large dart and kite as the central image of the canvas. Superimposed linear networks denote independent planes that visually bend and twist, and advance and recede as they "float" in and out of uncertain spatial dimensions.

Conclusion

What have we learned? Our perception is based on observations and analytical explanations, though our understanding is through different lenses and perceptions.