



**Rebecca Kamen:** *CONTINUUM*

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December 1, 2015 - February 13, 2016

GreaterReston**ArtsCenter**

Front cover image: *NeuroCantos* (detail), 2015, acrylic on Mylar, rock; variable dimensions  
Photo credit: Mimi Xang Ho

## ***Continuum*: The Art of Rebecca Kamen**

The title of Rebecca Kamen's exhibition at the Greater Reston Arts Center (GRACE)—*Continuum*—references the artist's ongoing exploration of the intersections between art and science. It also acknowledges the fact that Kamen's intellectual journey with this subject began at GRACE in 2009 with her *Divining Nature* exhibition, a poetic evocation of the periodic table of elements. The exhibition drew significant crowds to GRACE, and well-earned acclaim to Kamen, positioning her as a prominent figure in the nascent STEAM movement (Science, Technology, Engineering, Arts, and Math). Her current work represents a continuum in her artistic exploration of scientific concepts, as well as her return to GRACE.



Rebecca Kamen, *Divining Nature*, October 1 – November 14, 2009, Greater Reston Arts Center  
Photo credit: Angie Seckinger

Kamen's blending of art and science has a long pedigree in the history of art. Consider the engineering feat represented by the Egyptian pyramids; the mathematical principles of the ancient Roman architect Vitruvius; the anatomical studies and fantastic machines envisioned by Leonardo da Vinci during the Renaissance; the long tradition of natural history illustration, perfected by artists like Maria Sibylla Merian and John James Audubon; the fractured planes of 20th-century Cubism, informed by Einstein's theory of relativity; the mathematical tessellations of M.C. Escher; and the technologically complex, carefully engineered environmental projects of artists like James Turrell and Christo. In Kamen's work, however, science is not something to be employed in the creation of the work; it is the subject of the work itself. Over the years, the artist's engagement with scientists both past and present has provided her with inspiration and raw material for her work. Like her hero, neuro-anatomist Santiago Ramón y Cajal, Kamen utilizes art to explore complex scientific concepts such as the periodic table, neuroscience, black holes, and inner and outer space.

Much has been said of the elegant connections Rebecca Kamen has drawn between art and science. But far less has been said of her artistic process. For an artist keenly interested in the intersections between art, science, and (by extension), technology—Kamen's process is, in many ways, quite traditional. Her pieces are created through many hours of laborious work, hand-cutting Mylar sheets with a blade to create elaborate patterns, which are enlivened by the application of acrylic paint. The Mylar forms are then layered, folded, or shaped into the elegant sculptures that comprise Kamen's installations.

This exhibition includes earlier works Kamen created from wire, exploiting

the malleability of that medium to create sculptures that are tangible, yet open, evoking a sense of motion and kinetic energy. These works date to the artist's initial interest in examining space. Her recent installations, *Portal* and *NeuroCantos*, examine the nature of inner and outer space. Kamen's collaborative work with sound artist Susan Alexander and with poet Steven Fowler adds an additional dimension to the experience of her installations. Alexander's sound piece for *NeuroCantos*, which features the sound of actual neurons firing, is punctuated by the words of Cajal and Steven Fowler—creating a multi-sensory, interdisciplinary experience.

Kamen has spoken openly and eloquently about her early struggles with dyslexia, and how what was once considered an academic disability became, for her, a means of visualizing connections unseen by others. Her ability to discern these connections, to envision highly abstract concepts, and to translate those understandings into tangible visual objects, has resulted in a body of work that enlightens, illuminates, and inspires all those with an interest in the complex mechanics of the universe.

## **Holly Koons McCullough**

Executive Director / Curator - Greater Reston Arts Center



*In the Beginning*, 2003, acrylic on Mylar, 36" x 24"

# Artist Statement: *Continuum*

***“The most beautiful thing we can experience is the mysterious. It is the source of all true art and science.”*** Albert Einstein

As a young girl, I fell in love with discovery. With awe and wonder, I spent my childhood investigating the world of elements with a simple chemistry set, and used that set to create elaborate science-fair projects. Insatiable curiosity and a deep love of learning created bridges between seemingly unrelated disciplines. As a result, I have devoted my life to an intuitive examination of properties that overlap from discipline to discipline. I remember the thrill when my first cardboard telescope magically connected me with the cosmos, and can still summon my feelings and fascination as I continue to explore its matter and meaning. These fond memories are the beginning of a journey dedicated to the pursuit of “knowing” that continues to inform and inspire my life and work as an artist.

My interest in the relationship of art and science developed in the mid-1980s, while collaborating on a project exploring Eastern and Western contributions to science and technology with Chinese sculptor Zhao Shu Tong. Further investigation of the intersections of art and science informed the creation of *Matter*, a series of complex wire sculptures. Created earlier in my career, these works planted the seeds for my initial discoveries and observations about the relationship between inner and outer space. The work was created for an exhibition in 2005 at the American Center for Physics, celebrating the 100th anniversary of Einstein’s discovery of special relativity. In the exhibition essay, curator Sarah Tanguy describes the work:

*With science as her inspiration, Kamen avidly probes the world around her to*

find a means to describe her research. Rich in associations, her work draws on intuition and the language of abstraction to convey individual ideas and emotions. And though not literally kinetic, her wired-based sculptures succeed in suggesting motion and change, while instilling an empathetic wonder in the viewer.

Research at the Center for Astrophysics at Harvard University and in the neuroscience division of National Institutes of Health has provided exciting insights into the relationship between inner and outer space, and has been the catalyst for the *Portal* Installation. Inspired by gravitational wave physics and the notion of Gedankenexperiment (thought experiment), the installation interprets the tracery patterns of the orbits of black holes, and celebrates the 100th anniversary of Einstein's discovery of general relativity.

The *Continuum* exhibition is retrospective in nature. It also showcases two new multi-media installations: *Portal* and *NeuroCantos*, exploring the relationship and poetics of inner and outer space. The *Portal* installation, like many art/science projects, has been collaborative in nature. Dialogues with scientists at the Center for Astrophysics; with Scott Hughes, astrophysicist and professor of physics at Massachusetts Institute of Technology; and with Manuela Campanelli, Director of the Center for Computational Relativity and Gravitation at Rochester Institute of Technology, have been extremely informative, and inspired the concept for the installation.

Sound artist Susan Alexjander has created a haunting soundscape utilizing a variety of sounds originating from outer space, including sonic frequencies representing a binary pair of orbiting black holes, enhancing the experience of this installation for the viewer.



*NeuroCantos* investigates how the brain creates a conduit between inner and outer space through its ability to perceive similar patterns of complexity at the micro and macro scale. The installation celebrates how art can form new bridges of understanding between the diverse fields of scientific research, astrophysics, and neuroscience. It explores insights gained by rare opportunities to research at the Center for Astrophysics, National Institutes of Health, and the Cajal Institute in Madrid, and celebrates art's ability to re-image science.

The initial seeds for perceiving a relationship between inner and outer space were planted during my tenure as an artist-in-residence in the neuroscience program at NIH, researching the work of neuro-anatomist, Santiago Ramón y Cajal. Trained as both an artist and scientist, Cajal won the Nobel Prize in 1906 for his discovery of the relationship of neurons to the nervous system. Cajal's use of metaphor in describing his research continues to be a muse in the development of my work.

The initial spark for *NeuroCantos* was and continues as an ongoing dialogue with British poet, Steven J. Fowler. This began when we met as fellows at the Salzburg Global Seminar in Austria, in February of 2015, during a five-day seminar that explored "The Art of Neuroscience." Our burgeoning friendship continues to serve as a catalyst for correspondence investigating the nature of the mind and the poetics of inner and outer space.

Within *NeuroCantos*, which translates loosely to "brain song," the suspended, intricately cut cone-shaped sculptures represent the complexity of neuronal networks in the brain, and the ability of these networks to transform chemical and electrical signals into patterns of perception. Below the cones are circular, overlapping cutout shapes symbolizing the similarity

of patterns at both the micro (inner – the brain) and the macro (outer space) level, creating a bridge through patterns between astrophysics and neuroscience. Placed in the center of the circular forms are rocks mimicking similar shapes, and representing a connection to nature. These patterns are similar to those found within inner and outer space.

The installation is further enhanced by Susan Alexjander's spoken word soundscape that explores how the brain interprets fragments of information in creating new meaning and understanding.

Terry Lowenthal's video projection of "Moving Poems" adds a kinetic element to the content of the installation. Utilizing a quote from Cajal, bookended by fragments of Steven Fowler's poems, the video adds another level to the complex patterning inspired by the poetics of inner and outer space.

The *Continuum* exhibition provides an exciting opportunity to continue to foster an ongoing, multidisciplinary dialogue that offers new and innovative ways to understand the relationship between art and science.

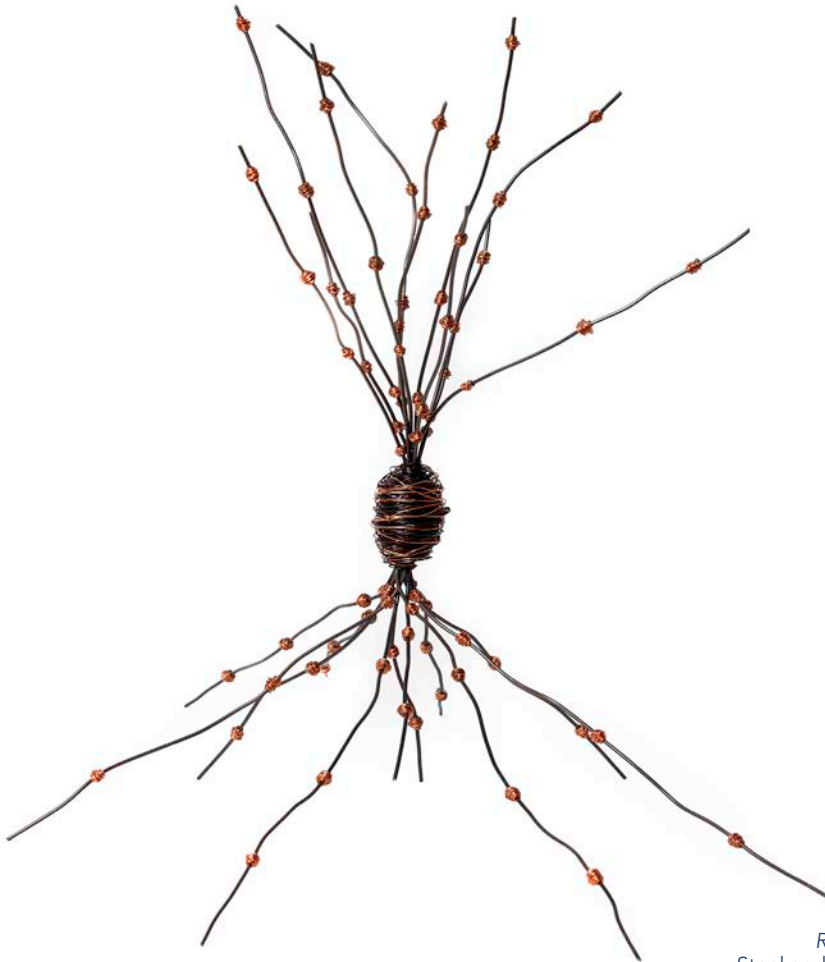
**Rebecca Kamen** - Artist  
[www.rebeccakamen.com](http://www.rebeccakamen.com)



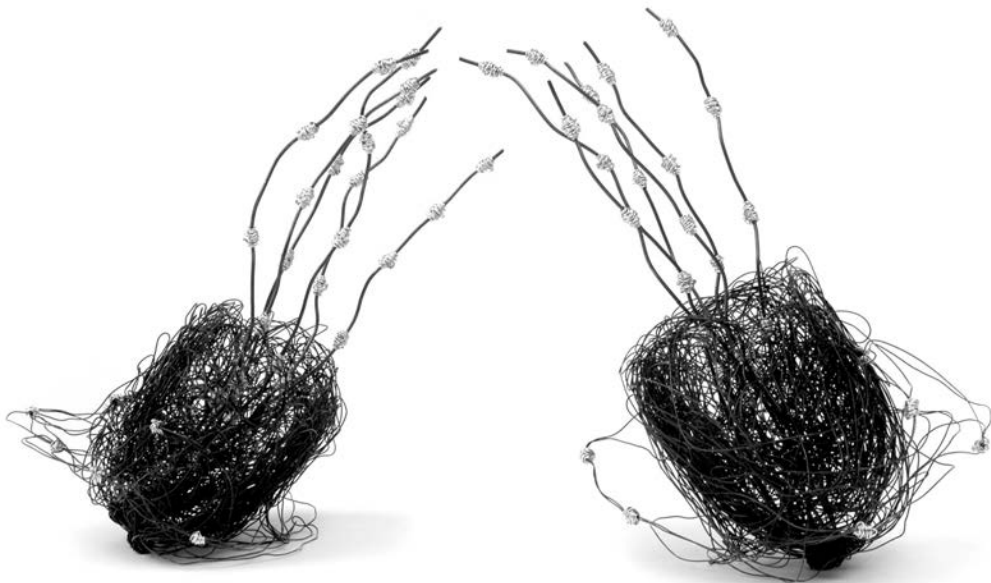
*Cosmos for Carl*, 2005  
Steel and copper wire  
17" x 12" x 10"  
Photo credit: Greg Staley



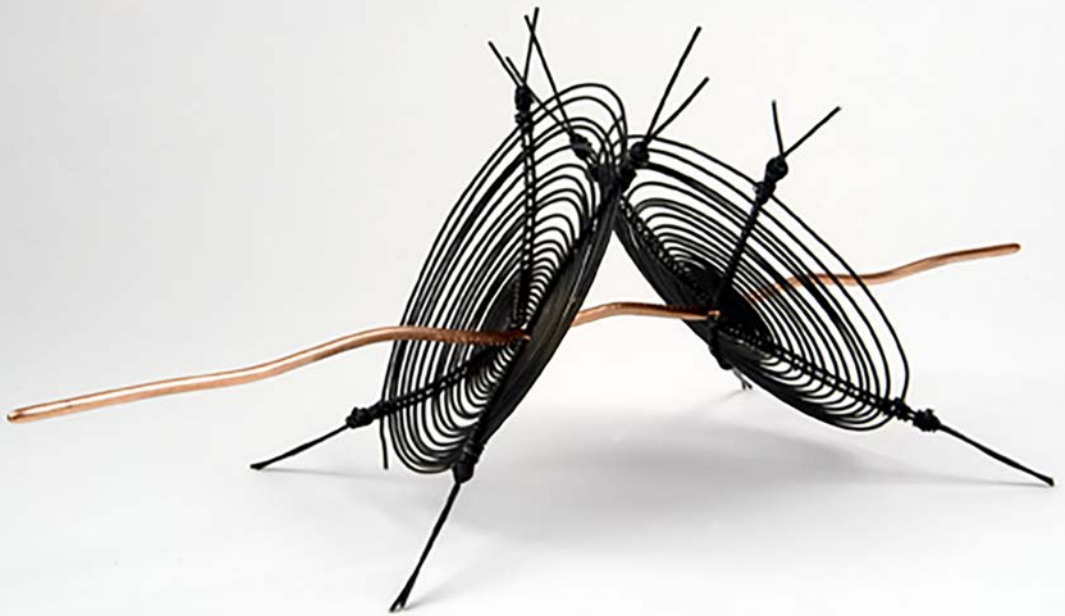
*Doppler Effect*, 2005  
Steel and copper wire  
10" x 12" x 10"  
Photo credit: Greg Staley




*Release*, 2005  
Steel and copper wire  
13" x 16" x 13"  
Photo credit: Mimi Xang Ho



*Synapse*, 2005  
Steel and galvanized wire  
9" x 14" x 8"  
Photo credit: Greg Staley



*Wave Ride: For Albert, 2005*  
Steel and copper wire  
4" x 17" x 5"  
Photo credit: Greg Staley

The artwork consists of several white, multi-layered, flower-like sculptures of varying sizes. These sculptures are positioned on a background that is vertically split into two colors: a vibrant green on the left and a warm yellow on the right. Each sculpture is supported by a thin, dark rod. The lighting creates soft shadows on the background, giving the pieces a three-dimensional appearance. The overall composition is minimalist and elegant, evoking a sense of a garden or a natural environment.

*Elemental Garden, 2011*  
Mylar and fiberglass rods  
Variable dimensions  
As installed at the  
Taubman Museum of Art  
Roanoke, VA



*Portal (detail), 2014*  
Mylar, fossils  
Variable dimensions  
As installed at  
James Madison University  
Harrisonburg, VA  
Photo credit: Gary Freeburg



# **NeuroCantos Soundscape**

## **Susan Alexjander**

The brain is a busy place...its activity never stops. Sensations continually play in our heads, creating whimsical patterns and connecting us to the external world as we go. Although we usually call these activities thoughts, for me they are also like little mantras ('cantos' means 'songs')....sonic events from the unconscious as it tries out new ideas, stirring and re-forming to bring just the right mix of meaning to our conscious mind.

Consciousness, in fact, represents only the tiniest fraction of the sensory information our brains actually receive through our eyes, ears, taste, touch, etc. Every second our senses take in the staggering amount of eleven million bits of information, but only about seventy-seven bits ever make it to our conscious awareness...the rest is unconscious, or subliminal. Who or What, then, is doing the sorting? Who decides what is meaningful and what should be discarded? Who is the master sculptor behind the curtain? This is the ultimate, fascinating mystery.

I decided to include spoken language, specifically the poetry of Steven J. Fowler and quotes by neuro-anatomist/artist Santiago Ramón y Cajal, because words are so like the bits of meaning that float to the surface and manifest, often in incomplete form, to our awareness. Cajal's art and his marvelous insights and descriptions of the brain (he is considered to be the father of modern neuroscience) have long inspired sculptor Rebecca Kamen who envisioned this project. Also I could not resist including an elegant Castilian accent as well as the original Spanish. Cajal (Joe Brise) is the steady ground and 'inner voice' of the soundscape as he guides us to ponder the

Universe: "As long as our brain is a mystery, the universe, the reflection of the structure of the brain, will also be a mystery." He concludes with a radical and exciting idea: "Any man could, if he were so determined, be the sculptor of his own brain."

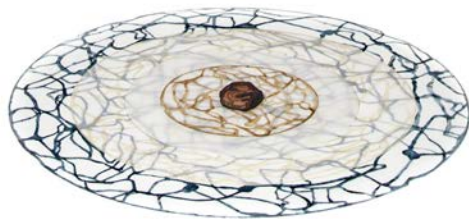
The other (very busy) voice in counterpoint is Steven J. Fowler, British poet, who generously allowed me to use his earlier written correspondences (also called *Neurocantos*) with Rebecca Kamen as they, together, pondered the nature of mind. The voice you hear is his own.

Both Fowler and Cajal make many references to the mysteries of the Universe, and to "patterns of as above, so below." This is an important theme for us in *Continuum*; our installations reflect the inner and outer realities of the brain and cosmos (*Portal*) as they weave together a dance of "butterflies and black holes." Sounds include NASA space sounds and neuronal activity with generous permission from the laboratories of neuroscientists Alain Destexhe, France, and Nelson Spruston, Janelia Research Lab, Ashburn, Virginia.

**Susan Alexjander** - Composer

[www.oursounduniverse.com](http://www.oursounduniverse.com)

*NeuroCantos* (detail), 2015  
Acrylic on Mylar, rock  
Variable dimensions  
Photo credit: Mimi Xang Ho



# ***Neurocantos***

## **Steven J. Fowler**

The *Neurocantos* began with Rebecca Kamen. Not with her artworks, not with the experience of meeting her energetic and endlessly generous personality over a week in Salzburg. Not even with her insight into scientific principles currently quite beyond my understanding. But all of these things, and none of them, saturated and superimposed her remarkable epistolary language. Rebecca writes incredible emails. This is a compliment we should give more considering the ubiquity of electronic correspondence in our time. Her emails are expressive, eloquent, and kind, but more than this, what was so unusual, is that they were suffused with an understanding that seems to be the golden ticket in my field – they were essentially interdisciplinary. That is, they seamlessly fused scientific and artistic understanding into one mode. And beyond that, they did so in a very specific wielding of language.

This is what I do, what I see my profession as, wielding and deploying language, refracting the endless, infinitesimal mulch of our experience of the world in semantics. Poetry, to me, is clearly the use of the materials that we converse and lecture (some more than others) in, for a purpose other than conversation and didactic statement. Where sculpture works in material and then uses language to discuss this work, poetry must mould the thing others contextualize in. That is why I do not see anecdotal, first person narrative, subject led poetry as poetry, in the 21st century. And it is why, at a time when I was seeking to grasp and reflect the language and concepts of neuroscience, my burgeoning friendship with Rebecca provided me with the material I needed to make a beginning. In her emails, I found concepts, expression,

rich language material, and I began to remix it. Taking her words, phrases, her understanding, and redeploying it, then making additions, alterations, reorderings, so the poems began to form.

The path was lit, I could then write freely, remix other sources, neuroscientists like Daniel Margulies, medical textbooks, contemporary neuroaesthetics papers and more.

When asked to explain my poems, as I invariably am, I prefer to question why the onus falls on my work to maintain clarity. Nothing of value is clear without context, and context is not possible without study, without education. Music requires an ear, science requires training. It is not poetry's place to offer gratification to the impatient, it is not a palliative. Science isn't clear unless you have the code, and what is that? Time given to gain expertise. Why isn't this the same for art and for the collaborations between art and science? With time and rereadings my poems become clear. They are not representations of ideas that exist wholly elsewhere, in the mind, of the human brain. They are language material deployed to mirror neuroscientific ideas, not represent them.

To be able to expand my writing in the company of someone as extraordinary as Rebecca has been a privilege and a delight. A constant inspiration, an exemplar of someone who has figured out the root of wisdom, as it seems to me – erudition, hunger for knowledge, humility and kindness. And to have my words sit in print and in the brilliant soundscape of Susan Alexander, to feel like this small gesture I have made in the world has a presence in the firmament of such interesting artwork, well it is the reason I write.

**Steven J. Fowler** - Poet  
[www.stevenjfowler.com](http://www.stevenjfowler.com)



LOBE

TO REJECT YOUR INTERPRETATIVE  
CONSTELLATION

TO KEEP ME HERE TO MY LIFE AS A  
CHILD

A MEDICINAL TRACE OF  
REMOVING YOU FROM THE WORD

CONSTELLATION KEEPS RESONATING

IT'S RELATIONSHIP IS TO PERFECT

THE NOTION OF NEURONAL BATHWAYS

AS BOTH CONDUIT & CATALYST FOR

CHEMICAL & ELECTRIC FIBERS

INFORMING BOTH MEMORY & NARRATIVE  
SELF

AS LONG AS CONNECTING US DEEPLY WITH  
OTHERS

*Lobe, 2015*

In collaboration with poet, Steven J. Fowler

Digital print of silkscreen

15" x 22"

The mission of the Greater Reston Arts Center is to enrich community life by promoting involvement and excellence in contemporary visual arts.

We gratefully acknowledge the leadership of our Board of Directors, and the valued support of our sponsors, members, and patrons. We are also grateful to the participating artists in this exhibition, who have contributed with patience and enthusiasm to its implementation.

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## GreaterRestonArtsCenter

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