

Visionary Distillations Exhibit
features art by
Robert Cassanova, Kim Dylla and Minna Newman Nathanson
November 8, 2010 through April 29, 2011
Sarah Tanguy, Guest Curator

Creative Visionaries and "The Rules"

Creative artists and scientists have a common trait: the ability to transcend current interpretation of reality and to visualize revolutionary concepts before formulating mathematical descriptions, performing laboratory experiments or applying a palette to a visual medium. Visionaries and geniuses share a common trait: the ability to transcend life's

Creativity and imagination, inspired by curiosity and the eternal quest for knowledge, are necessities in the visionary process, not luxuries.

---Robert Cassanova

experiences and leap vast intellectual distances to set a new course for others to follow. The true visionary delights in an unfettered and creative imagination, excited by the possibilities of future worlds and a curiosity driving their passion for knowledge. Many visionaries intuitively comprehend the mysterious and express their

revolutionary ideas as creative visualizations before the basis for their concepts can be described mathematically or justified with credible science. Visionaries have a passion for science and art. **Visionary science IS art!**

Various scientific laws, such as the laws of physics, are often the result of predictive explanations and mathematical modeling rather than a "true understanding" of nature's

Changes in both art and science, however, have the same root – the realization that things are not as we are accustomed to viewing them, that there is more to them than what our standard representations can portray.

----Bulent Atalay

secrets. "Laws" may also become modified as understanding and knowledge are achieved and are better labeled as "suggestions". "Rules and laws" in art and science are merely starting points and should not be restrictions of further understanding and creative expansion of artistic expression and scientific exploration. Healthy tension in scientific discovery and the arts is often caused by the lack of adherence to "rules".

Mathematics, Science and Visual Composition

Science, mathematics and nature as well as our psychological and artistic tendencies are predisposed towards symmetry, order, elegance and harmony. Mathematics may unite

Symmetry gives wings to our creativity. It provides organizing principles for our artistic impulses and our thinking, and it is a source of hypotheses that we can make to understand the physical world.

--Leon M. Lederman

our description of the universe and all of its beauty, but it doesn't necessarily "explain" phenomena in nature. Scientific laws, such as the "laws" of physics, are often predictive mathematical models of observed phenomena and may not contribute an "understanding" of nature's secrets. While mathematical modeling may provide insights into the process of understanding the physics of nature,

creative visualization of a new concept in science may occur before it can be accurately described mathematically.

The connection between mathematics, nature, art and science has been considered by numerous authors. The ubiquitous example is the connection between the Fibonacci series, the golden ratio, logarithmic spirals and the repetition of these expressions in nature

.....symmetry sits right at the intersection of science, art, and perceptual psychology.

--Mario Livio

as well as the tendency of the human visualization to prefer the composition described by these mathematical expressions. The golden ratio has been incorporated by visual artists in the pleasing composition of paintings and photographs. The golden ratio (rectangle) can also be used to cleverly give credence to the preference for human

visualization of focal points in artwork located approximately one-third of the distance from each of the borders. Unfortunately, this has led to the "rule-of-thirds" which may, if over emphasized, leads to the stifling of more creative visual works of art. Logarithmic spirals, another shape seen often in nature, can also be shown to be generated by the geometrical use of the golden ratio and the "golden rectangle".

One of our natural tendencies is to seek order and to resonate psychologically with repeated patterns in physical, acoustic, and visual stimuli. We tend to gravitate towards repeated patterns, structure and rituals that sooth our psyche and stimulate unfettered thinking. More often than not, observed patterns in nature provide hints of a true and deeper explanation of natural phenomena: growth patterns in plants, orbits of planets around stars, spiral galaxies in deep space, ocean waves, cloud formations, acoustic and electromagnetic waves, etc. Patterns provide hints of an underlying, basic "law" which describes the characteristics of the pattern and it's response to external stimuli.

Genius is the ability to transcend experience
AND
"The Rules".

---Robert A. Cassanova

Timeless Connections Between Art and Science

The following are a few of the photographs that exemplify spirals, order, symmetry, repeated patterns and the flow of light and form. Photographs were taken with a 4x5 large format view camera or a Hasselblad medium format camera using Kodak Tmax100 film. The use of the view camera, in particular, encourages a structured, ritualistic but flexible process to capture the photographer's vision of the scene in front of the lens. Most of the prints on display in this exhibit were printed in a wet chemistry darkroom using Ilford Multigrade fiber-based, silver gelatin paper.

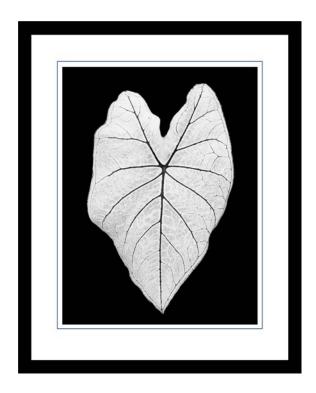
Order and Symmetry



Wormsloe Plantation Path



Magnolia on Vick Farm



Caladium



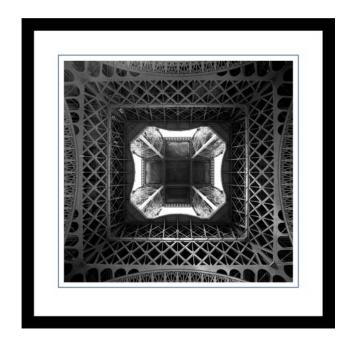
Foggy Morning on Swift Creek



Gorge of the Rio Grande



UVA Walkway





Beneath the Eiffel Tower

Musee d'Orsay, Paris



Catacombs of the National Cathedral

Patterns in Nature and The Flow of Light and Form



View of Valley from Bowl



Bowl Sandstone Strata



Coyote Buttes Wash

Spirals in Nature and Architecture







Moonflower Blooming



Nautilus Shell Reflection



St. Augustine Lighthouse Stairway

Eternal Visions

Much of our artistic and scientific energy is often consumed with the process of overcoming the momentum of past experience and unsubstantiated beliefs, and moving towards igniting our creative imagination of new works of art or breakthrough scientific discoveries and interpretations of nature's secrets. Our fascinations and passions are significant influences on our conscious and subconscious thoughts and can be a major factor in our persistence to pursue a pathway without artificial limits. A vivid imagination often drives our passion to explore new possibilities in art and science. Given an appropriately nurturing intellectual environment, these deep seated passions may lead to a long term vision that becomes a part of our enduring, innate being and be "eternal" for our lifetime. Our Eternal Visions point us towards the expansion of knowledge, emotional growth and creativity.

The following statement is included on the back of each photography as a reminder of the power of our personal *Eternal Visions*:

Eternal Visions

- Perturb the chaos and cause patterns to emerge,
- Light the darkness and ignite our passion for knowledge,
- Inspire our imagination and energize our creative spirit,
- Give us hope for a future without limits,
- Create a pathway to break free from stifling fundamentalism in art, science and religion.
- Provide context for elegance, beauty, order and symmetry.

----Robert A. Cassanova

Robert A. Cassanova, PhD

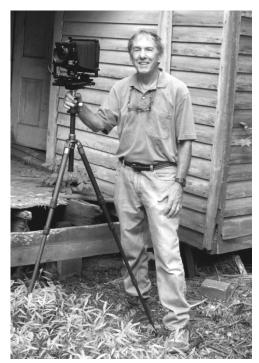
Education:

North Carolina State University, BS, Aerospace Engineering 1964 University of Tennessee Space Institute, MS, Aerospace Engineering 1967 Georgia Institute of Technology, PhD, Aerospace Engineering 1975 Experience:

Dr. Cassanova was the Director of the NASA Institute for Advanced Concepts (NIAC, http://www.niac.usra.edu) in Atlanta, Georgia from February 1998 through August 2007. The NIAC was focused on the development of revolutionary, advanced systems and architectures in the fields of aeronautics and space. Dr. Cassanova coordinated the operation of NIAC at the highest levels of NASA HQ and the NASA Centers. In addition, he has given numerous seminars and briefings at civilian and military agencies, private industries, universities, technical society conferences and civic associations. He is the recipient of the NASA Public Service Medal for exceptional contributions to the Mission of NASA. The NIAC team, including members from USRA, ANSER Corporation and NASA received the NASA Group Achievement Award.

Dr. Cassanova has expanded on the synergisms of art and science to build a highly acclaimed organization that encourages visionary investigators to explore revolutionary concepts stretching the possibilities of future scientific breakthroughs. NIAC funded concepts have been featured in numerous publications in the technical and popular science press as well as TV specials and a live, world-wide broadcast of the MIT Enterprise Forum.

Prior to becoming the Director of NIAC, Dr. Cassanova was Director of the Aerospace and Transportation Laboratory in the Georgia Tech Research Institute (GTRI). While in GTRI and in the School of Aerospace Engineering at Georgia Tech, he performed research in biofluid mechanics, solar thermal energy, acoustics, combustion and rarefied gasdynamics. His career also includes research in rocket plume testing and high altitude hypersonic flight at the Arnold Engineering Development Center in Tullahoma, Tennessee. He has over 60 publications in refereed journals conference proceedings.



Dr. Cassanova has a serious passion for photography and integrates the visualization process for science and art into his lectures on revolutionary creativity. He uses digital as well as medium and large format film cameras to capture scenic visions of order, symmetry and the flow of light and form. He remains a dedicated creator of black and white images on silver gelatin paper produced in a conventional, wet chemical darkroom.

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