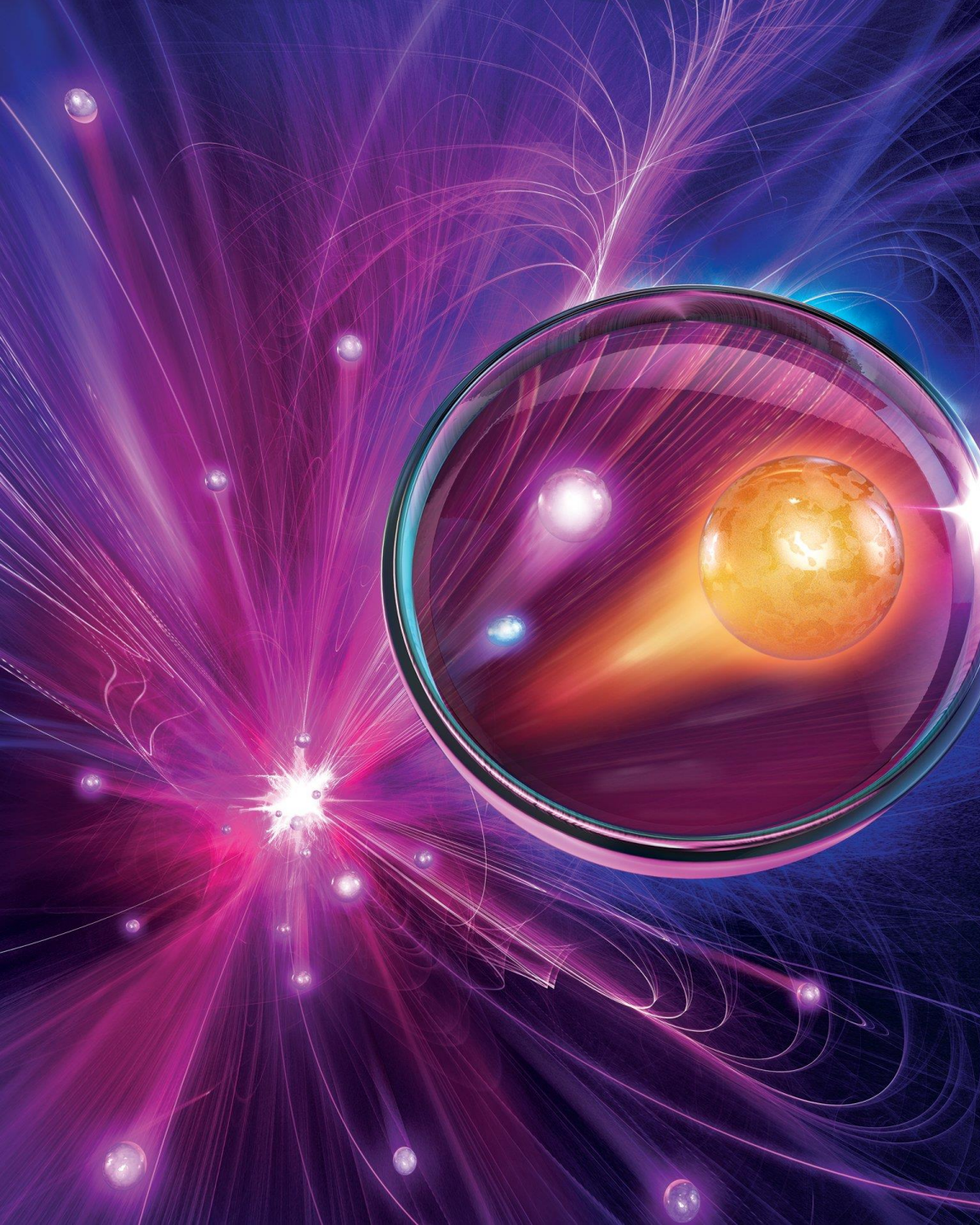


Themes in Physics and Art Virtual Exhibit

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Introduction

Through their work most artists capture objects and scenery that we can see, but what about the things that we don't see? Each of the following artists depicts some of the hidden structures of the universe and make the invisible visible. Some of these artists share their expertise in physics and capture the physical properties of bodies that are invisible to the human eye. Other artists offer their own interpretations of the hidden structures of space-time, their ideas about the collective, non-visible union between humans and space, or encourage us to challenge our own preconceived notions on reality.



The Neutrino Puzzle

Unknown, 2017

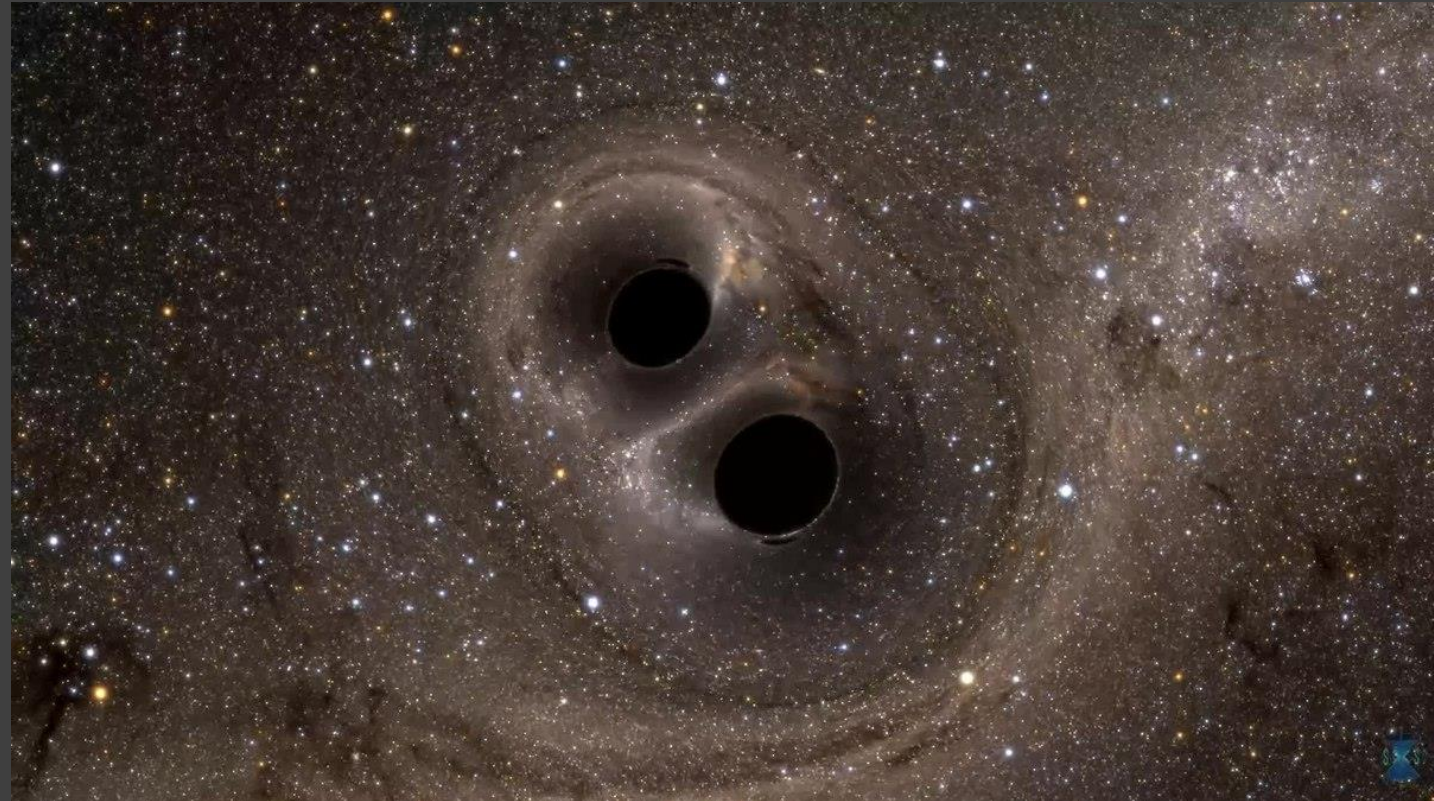
This artistic depiction of a neutrino found on the cover of a science magazine perfectly captures the essence of the wave-particle duality of the neutrino. Here we see the neutrino being shown almost as if it were a soap bubble – an object that takes up space while having extremely little mass. By doing this the artist manages to accurately capture the physical characteristics of a neutrino while creating an aesthetically pleasing piece. As a “hidden” object, neutrinos are impossible to accurately capture visually, however the artist instead captures the physical properties of the neutrino by using the soap bubble imagery to hint at the wave-particle duality.

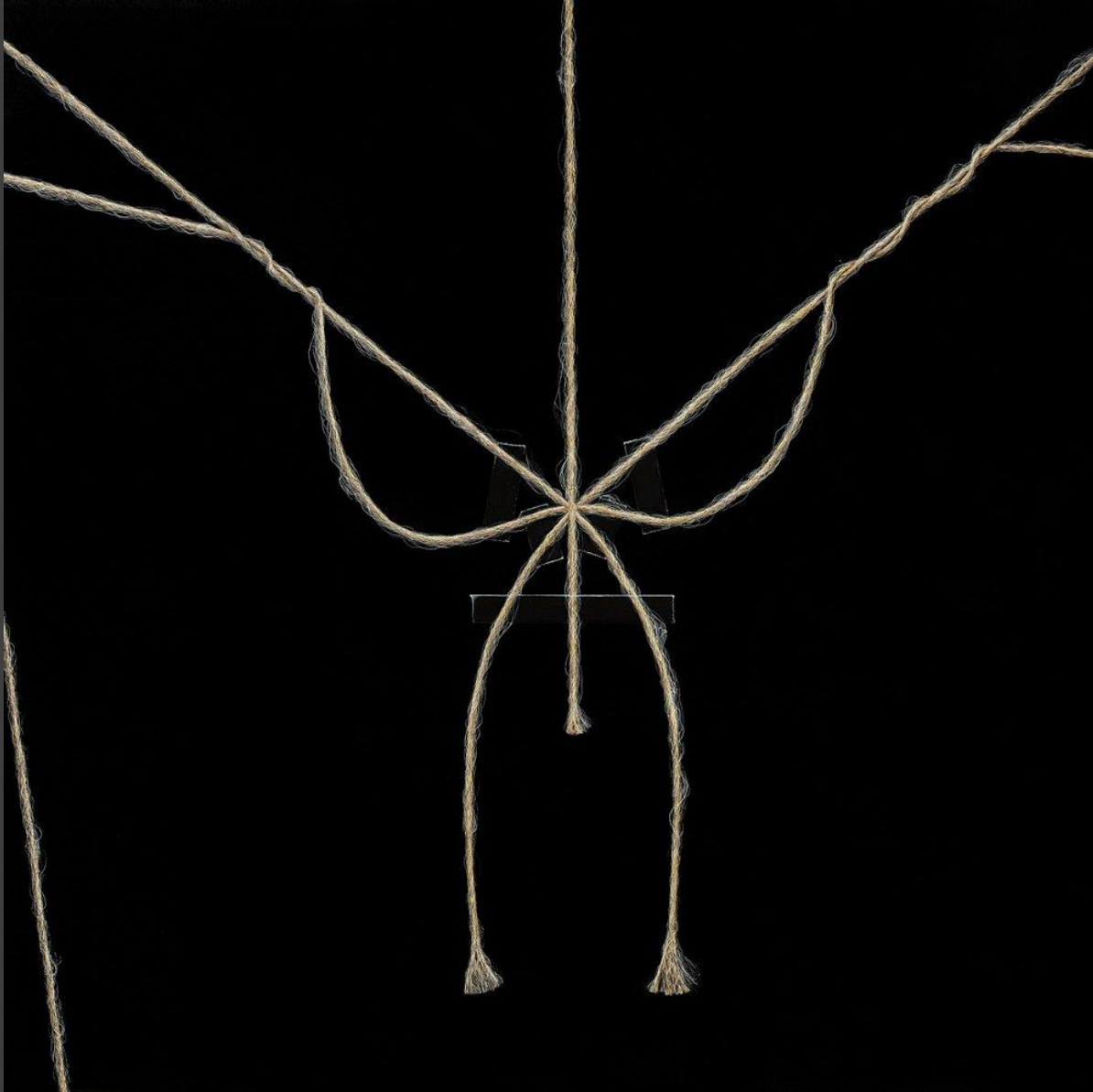
Black Hole Merger

LIGO, 2016

This short animation captures LIGO first detecting gravitational waves from a black hole merger. It depicts the two black holes getting closer and closer together until eventually they merge into one, causing a ripple through space-time. The animation also shows a gravitational lensing effect where the two black holes distort the background image. While a black hole cannot actually be seen within the visual spectrum, the artist accurately captures the motion of the black holes, and the distortion of space-time around them. This creates a beautiful image accessible to both physicists and the general public.

https://www.youtube.com/watch?v=I_88S8DWbcU





Align *Shea Hembrey*

This is one of two paintings in this exhibit by Shea Hembrey, who questions the nature of reality through his work. His goal is to depict the phenomena in nature that we don't see such as dark matter, dark energy and hidden structures, among others. In this painting he shows an "unstill life" where he captures the most basic building block of matter: the 1-dimensional theoretical strings that make up everything. It seems as if Hembrey decided to take the term "string" literally and paint an actual string that forms a geometrical shape. This is an interesting attempt to capture the pieces of matter that are hidden from us: the building blocks that are way too small for human sight.

Quantum Man

Julian Voss-Andreae,
2006

How does one visually capture quantum mechanics? Julian Voss-Andreae presents us with a successful attempt by creating a sculpture that appears solid when looking at it from one angle and then appears invisible when looking at it from a different angle. The intention is to symbolize the wave-particle duality dictated by quantum mechanics with a human figure that is both solid and wave-like. This sculpture accurately captures the physical properties of nature's invisible building blocks: point masses that behave as both a particle and a wave.





Girl With A Mandolin *Pablo Picasso, 1910*

This painting by Pablo Picasso is a prime example of what comes to mind when one thinks of cubism. Cubism was a unique movement beginning in the early 20th century that some theorize was a response to Einstein's theory of relativity. Cubism is thought to depict ideas such as simultaneity and multiple spatial and temporal dimensions as proposed with the theory of relativity. The representation of higher dimensions and multiple viewpoints is what gives cubism its wacky structure: the human figure appears distorted, as well as the space surrounding her. This suggests the presence of higher dimensions as well as simultaneity.



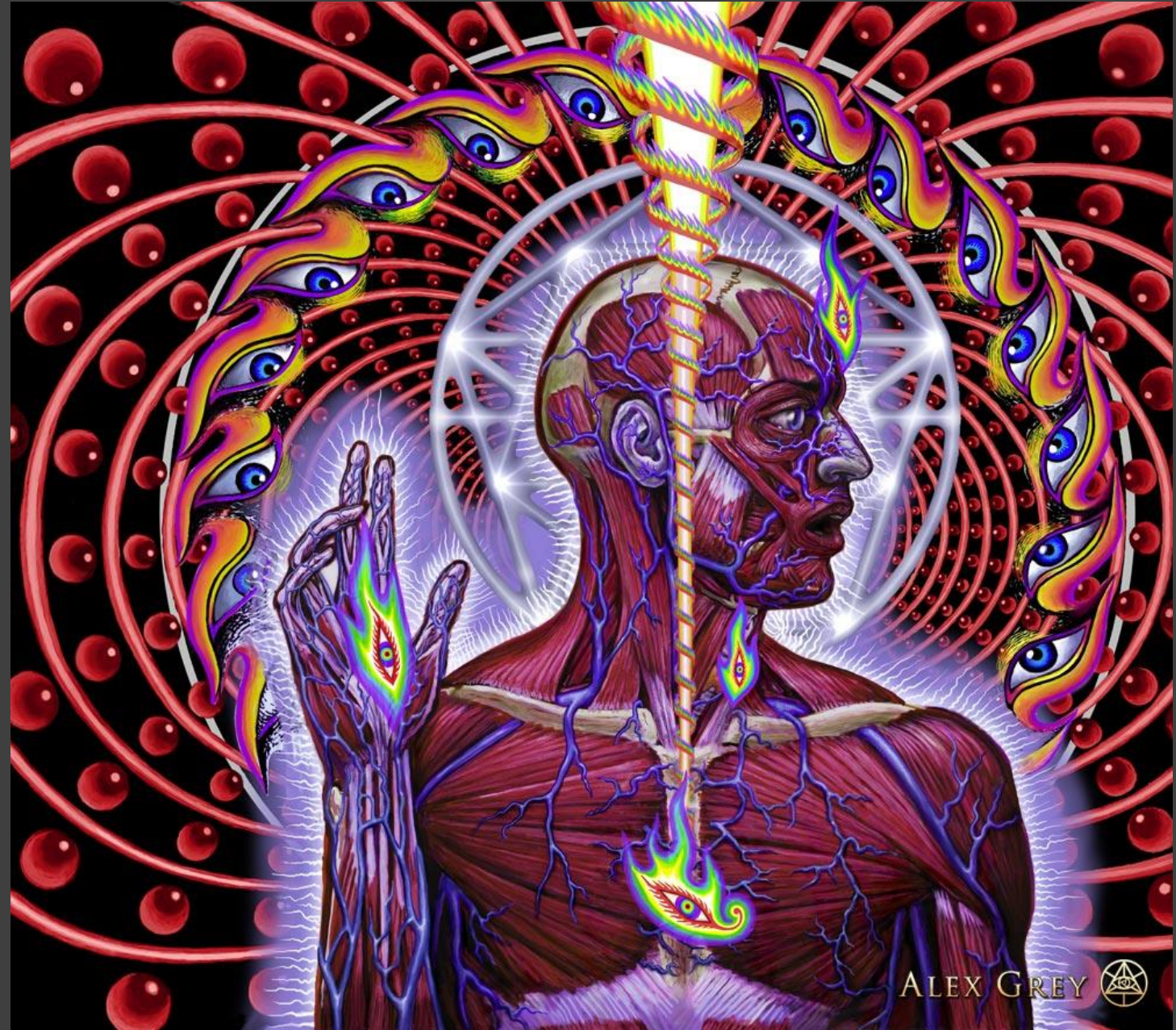
La Mariee (The Bride) *Jacques Villon, 1934*

The style of this painting suggests cubism with the way it depicts a distorted figure blending in with distorted space. The title of the painting suggests that it's supposed to represent a human bride preparing for a wedding. Looking closely, the viewer can see some hidden structures of the human figure such as pieces of a skeleton, and some basic structure of a bridal gown shown as pieces of fabric. Creating this abstract representation of a bride can suggest that the artist wants us to not just "see" everyday objects but think about what could be hidden underneath these objects, and the unseen structures we could possibly find.

Dissectional

Alex Grey, 2001

Many of Alex Grey's artworks apply multi-dimensionality to human figures and encourage the viewers to challenge their own perceptions of reality. Dissectional is one of Grey's works that depicts a human figure without the skin, revealing the unseen skeletal or muscular structure. This painting also includes a rainbow flaming eye motif, representing what is known as the "third eye" or the gateway into deeper perceptions of reality, and a revelation of a deeper structure unseen with normal human vision. This painting encourages the viewer to "use the third eye" to look and think more deeply, and to challenge themselves to ponder the hidden structure of reality.



Theologue

Alex Grey, 1986



This painting by Alex Grey challenges the viewer to examine the hidden structure of not just a human figure, but also the hidden structure of space. Before painting this, the artist envisioned an infinite regress of perspective grids, similar to what physicists and mathematicians use to depict the shape of space-time. Faint mountains are seen in the background, painted as if they were woven into the space-time grid, suggesting that the land we interact with is seamlessly interwoven in space. The way the human figure is pictured in the center, as if it's radiating its own perspective lines suggests that there is an unseen union of humans, their surroundings, and the fabric of space-time.

The Starry Night

Vincent Van Gogh,
1889

As one of Vincent Van Gogh's most famous paintings, naturally there are many interpretations as to what it means, and what it is exactly he was painting. The texture of the painting makes it fascinating to look at. To some it may look as if he's trying to capture the real air turbulence found in the atmosphere. We don't actually see air turbulence even though we know it's there, but perhaps Vincent Van Gogh did. Many believe that this painting came from a hallucination he had and was painting what he saw during that hallucination. Perhaps his mind forced him to see these colors and lines in the sky that didn't exist to most. Or perhaps his mind was revealing to him the hidden structures of Earth's atmosphere, offering him a deeper visual perception of reality.

