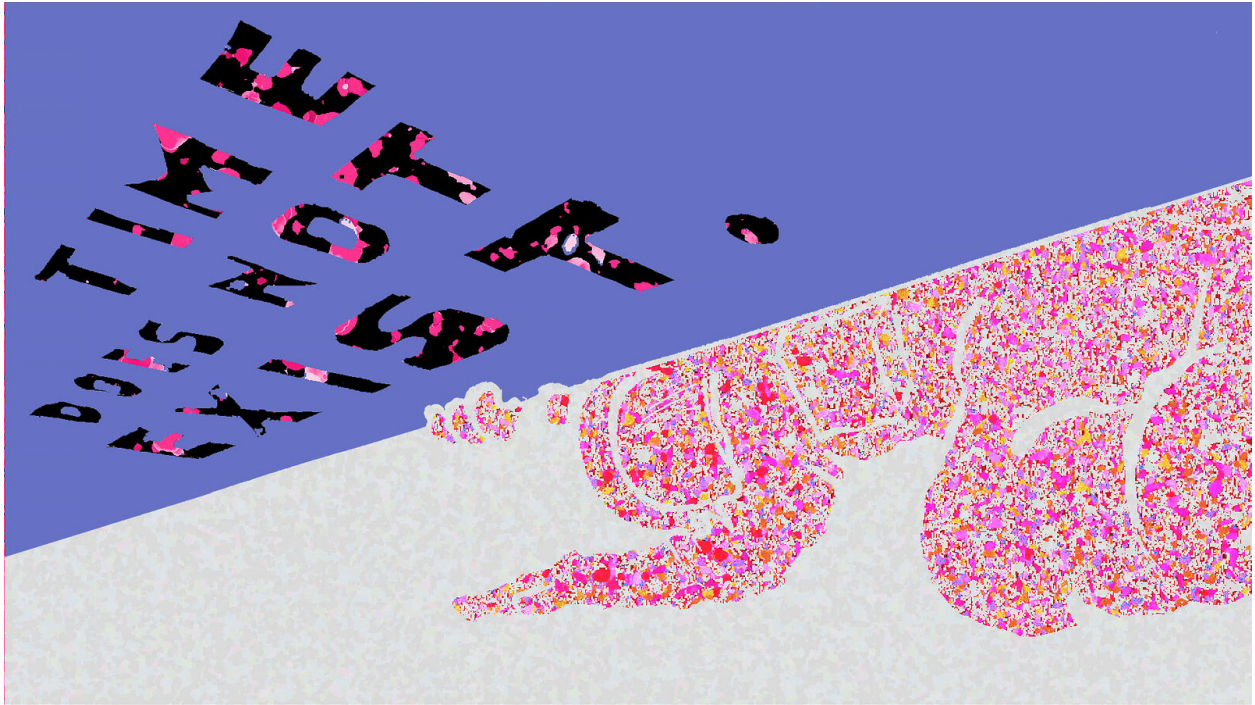


CRISTIN TIERNEY

symmetry
dimensions of particle physics



Artwork by Luca Buvoli

Luca Buvoli's art explores COVID spacetime

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By Karmela Padavic-Callaghan

In a recent exhibit, the artist wove fantasy and physics to illustrate the temporal funk of living through a pandemic.

Early in the COVID-19 pandemic, when New York City went into lockdown, artist Luca Buvoli found himself reimagining Albert Einstein's ideas about time.

Two years later, his artwork "A Brief History of Time (Under Covid) - in 7 Lessons" was the centerpiece of a solo show entitled "Astrodoubt and the Quarantine Chronicles (An Introduction)" at the Cristin Tierney Gallery. The show, curated by former Guggenheim and Smithsonian curator John G. Hanhardt, documented an experience of the pandemic through the lens of science and communicated complex physics ideas in a newly accessible way.

"I was, like all of us were, exposed to many conversations about the slowness of time under COVID," he says. There seemed to be a disconnect "between the traditional Newtonian time that we are attached to, in general experience, and this relentless, slow, anxious time."

He asked himself: How could he describe the alien nature of COVID time? He found the answer in physics.

Buvoli is a multimedia artist whose last academic brush with physics was during his childhood in Italy, when he attended a high school that aimed to prepare students for a career in science or technology. He pursued art instead, but he says scientific ideas kept ringing in his ears.

This resonance has shown up in his art before. For a series, he once worked with NASA to experience facets of astronaut training and, to better understand the constraints associated with conducting research

during a typical stay on the International Space Station, challenged himself to imagine being in orbit and to produce one new artistic concept a day for 180 days.

For years, his work has explored the intersections of science and art, experimental rigor and subjectivity, hopeful futurism and the uncertain present. When COVID time became both a practical and a personal concern in 2020, he turned to this same space for meaning and inspiration alike.

In Einstein's theory of special relativity, time breaks many "rules" that we presume in our daily lives. For instance, it slows down for the fastest objects in the universe. Einstein's theory further led physicists to the concept of spacetime. Spacetime can be described as a single fabric that our perception of the world is projected upon, an elastic grid that bends into deep valleys and infinite funnels. It is a recurring theme in Buvoli's new work.

The artist's "7 Lessons" series, which consists of one animation for each lesson inspired by the book *Seven Brief Lessons on Physics* by Carlo Rovelli, centers on a character Buvoli calls Astrodoubt. Always portrayed in an astronaut's suit, Astrodoubt is a person of unspecified gender, race and age who is confronted by principles of physics in their daily activities.



Artwork by Luca Buvoli

In one lesson, Astrodoubt pours spacetime, like coffee, into a cup. In place of a filter, the cup is topped with a cone mapped onto a set of three axes. Physicists commonly use cone-shaped diagrams like this to show how light travels through spacetime—originating at one point and spreading out over time. Einstein revealed that information cannot travel faster than light, so only events that fall inside the light cone can be causally related to the event at its pointy bottom.

“I actually imported the grid and the diagrams directly from Stephen Hawking’s *A Brief History of Time* and tried to humorously transform them into the domestic spaces and objects that we were living with,” Buvoli says.

Later in the same “lesson,” the light cone appears nestled within a shelving unit where Astrodoubt stores their cup. Astrodoubt’s arm is shown in segments, one for each part of the sequence of motions they

must carry out to place the cup on the shelf. It is as if the artist implies that for a person constantly worrying about a deadly disease, each action becomes a very deliberate sequence of smaller, causally related decisions. And those decisions are limited, as illustrated by the cup-sized light cone confining possible futures to just a small corner of spacetime.

“I attempted to incorporate humor and absurdity into these pieces to try to relieve and release the tension that most of us, if not all of us, experienced during those months,” Buvoli says.

Although Buvoli started “7 Lessons” in response to living under lockdown, he found in the process new ways to use art to bring complex physics ideas to an audience of non-scientists. “This is a project that took thousands of hours of immersion and hundreds of hours of reading, which made me aware of the limitations of language for describing what we experience,” he says.

For the lesson on quantum mechanics, for example, he wrestled with different ways to visually represent probability and indeterminacy. He says he imagines Rovelli strove in a similar way to explain abstract, mathematical concepts in words. “The work of a physicist in trying to explain such a concept is a work of approximation, a work of simplification in the hope that that concept can be, so to speak, translated,” Buvoli says.

For further inspiration, Buvoli turned to science fiction films like the original *Tron*, the covers of science fiction books, and the graphic style of comic books. His training in the arts led him to incorporate ideas and

styles developed by modern art movements, from cubism and expressionism to Salvador Dali's surrealist melting clocks.

Historically, physicists have relied on dramatic thought experiments, such as the twin paradox or Schrodinger's cat, to illustrate their points. Buvoli says he hopes that his work can, in addition to documenting the anxiety of the past three years, achieve a similar goal.

"Part of my purpose was to create this bridge between art viewers, comic book fans, and scientific readers," he says. "My hope would be that scientists or people who are interested in science would be thinking, 'Oh, this could be an interesting visualization,' and that people interested in the arts or graphic novels would feel encouraged to delve into current scientific theories."