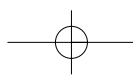


# The Hypotheses of Hope

Sculptor Michael Oliveri constructs hydroponic towers to grow tomato plants from seeds that once travelled in outer space, cascading neon-green waterfalls and streams that flow under black light, and videos of surfers riding an eternal cosmic wave with hyper reality. Oliveri recognizes that the Internet is the ultimate equalizer, at once making it impossible to distinguish between credible and dubious information, both grounded in and outside current scientific practice and theory. Humorously, from specific scientific observations about fullerenes, hydroponics, and sonic growth, the sculptor makes the point that innovation often occurs not as a result of structured research, but of accidental discoveries.

Reviewed by CAROLE J. VANSICKLE

'NASA Nourishment' is a mylar-lined room containing three hexagonal light-towers, each flanked by two large barrels and surrounded by hexagonal floor-panels that provide additional light.







Some reviewers label Michael Oliveri "pseudo-scientific," but he prefers a gentler term. "I'm interested in soft science," he insists. "All the hypotheses that might someday be accepted fact - the ideas that aren't real yet, but that you just hope are true."

With his most recent sculpture series, *Ultraviolet Acquiescence and Deep Space Drip Culture*, Oliveri depicts the true spirit of scientific endeavors - successful, failed, unproved or abandoned - as a dynamic and interactive conversation based not in reality but in potential.

With the advent of the internet, all the concepts that used to float slightly outside the orbit of 'hard' science have found a voice, he explains, and these voices form a discourse that mixes art and philosophy with just enough fact to make you hope it's all real - at least for a little while.

In his latest installation, Oliveri manifests this hopeful discourse by combining deep-space theory and hydroponic growing techniques with a casual surfer ideology that allows him to explain everything from the nature of the universe to the compact power of a seed with a simple "everything has a wave to it. The whole universe is about waves."

The real truth lies somewhat deeper. When you enter Oliveri's installation, you swiftly realize that the universe may be comprised of waves, but this world was created by power and light. And once your eyes get used to the glare, it becomes apparent that Oliveri's light show isn't about the light, it's about the humble tomato plants - not so humble now - quartered deep within his sculptures and maintained by a unique and dynamic hydroponic growing system that adjusts artistic endeavor around the needs of these seedlings and their continued growth.

**Left.** The 'NASA Nourishment' sculpture combines deep-space theory with hydroponic growing techniques.

**Below Left.** The primary focus of the series is the tomato plants, grown from seeds returned from space following a 1984 NASA experiment.

**Below Right.** These plants were special because of the optimism that sent them into space in the first place.





**Top.** The 'UFO' (Ultrior Farming Operation) is a large, glossy black structure whose eight windows glow promisingly in the near-dark.  
**Center.** Inside 'UFO', tomato plants hang upside down in clear buckets.  
**Bottom.** Nutrient 'rain' is collected in the bottom of the sculpture and recycled continuously.

### Hopeful Science

Michael Oliveri didn't know he would end up with upside down tomato plants when he first began researching *Ultraviolet Acquiescence and Deep Space Drip Culture*. He didn't know that his high-school interest in hydroponics would play a role in the sculpture series at all.

"But everything in life comes full circle eventually," he says. "The question is how and when you close the loop and see the complete picture."

This series, which uses water, nutrients, sound and different frequencies of light to convey Oliveri's impressions of the universe in which we all live, began as a query in a search engine.

"Some time ago I read an article indicating that our universe - the whole cosmos - may be finite," he said.

The supporting evidence, compiled by astronomers using a NASA satellite to measure afterglow radiation from the Big Bang, indicates that the universe is relatively small, and that a "hall-of-mirrors illusion" tricks computer simulations into depicting a space that stretches on forever.

"This in no way is accepted as fact," Oliveri admits, "but wouldn't it just be really neat if it were true?"

Oliveri 'googled' the term "Bucky Ball Universe" - the name of a theory arguing that our cosmos is shaped like a geodesic dome and bounded on all sides by hexagonal planes. "In effect," he says, "they're saying we live in a soccer ball." What appeared in his results list, along with some definitions and weird science, was an article on carbon60 molecules, called fullerenes.

"This fullerene is a combustible super-molecule composed solely of carbon and hydrogen," explains Oliveri. "Two scientists won a Nobel Prize in 1996 for 'inventing' it in 1985, but then in 1999 a researcher in Mexico found the same molecule on a meteor during a content analysis."

Currently, some chemists theorize that Carbon60 may in fact be the "primordial" molecule upon which all life is based.

Because the multiple atoms in the molecule form a hollow, closed cage - a structure replicated throughout Oliveri's sculpture series and thought to be one of the strongest basic constructions in existence - the molecule can trap gasses inside. Scientists theorize that the volatile gasses that contributed vital aspects needed for life in Earth's atmosphere may have been delivered via fullerene molecules.

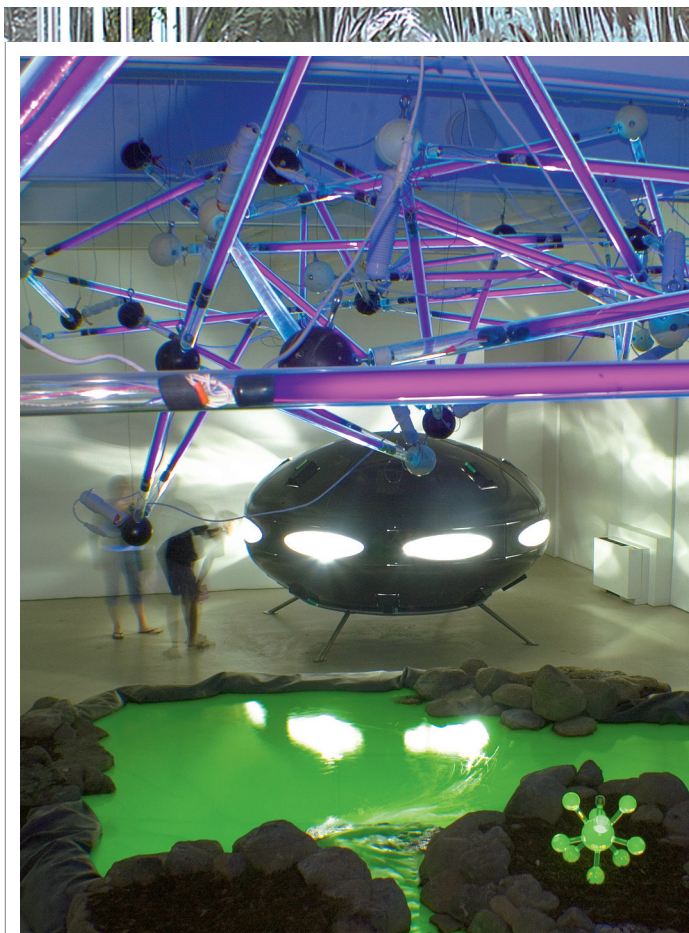
"So, if you track my search progress, I have this original molecule that is shaped like the universe, which takes me back to NASA and the satellite dish," Oliveri laughs.

And that took him to the tomatoes. In 1984, NASA sent millions of tomato seeds into outer space for five years in hopes that anti-gravity would have some phenomenal effect on their growth. Then three million elementary-school children were invited to use the seeds in science projects across the country.

"One of the biggest science experiments ever," says Oliveri gleefully.







'Ultraviolet Environment One'. A glowing stream of dye-infused water courses smoothly past the 'UFO sculpture'. Overhead black lights model a complex molecular structure.

The artist purchased some of these seeds on eBay, and *Deep Space Drip Culture* was born.

### Fertile Ground

Oliveri's series consists of two separate spaces containing the two foci of the installation - titled 'NASA Nourishment' and 'UFO (Uterior Farming Operation)' - that house the tomato plants.

'NASA Nourishment' is a mylar-lined room containing three hexagonal light-towers, each flanked by two large barrels and surrounded by hexagonal floor-panels that provide additional light. A sound system repeats a tone derived from running a finger around the glass edges of the towers - another one of Oliveri's "hopeful" endeavors to give the plants as much encouragement as possible.

"When you enter the room, you feel absolutely oppressed by light," he says. "But beyond that, you're physically assaulted by the sheer force that it takes to grow something from a seed."

The idea behind the bass effects is that special harmonic frequencies will encourage plants to absorb more nutrients through their leaves, leading to increased levels of health and growth. Oliveri personalized the idea by broadcasting a sound derived from his plants' personal environment. Ironically, by altering the frequencies from those prescribed for tomatoes by the sonic experts, he has retained the hopeful quality of the concept but likely eliminated any real benefits.

In keeping with the theme of weight and power, the physical construction of 'NASA Nourishment' is phallic, he says. But the results of this intense focus on the tomatoes are not, in fact, as good for the plants as you might expect.

"There is actually too much light in the room for the plants to tolerate," Oliveri reveals.

Under the direction of botanist Sue Arlott, gallery staff removed some of the lighting from the towers in order to save the tomato plants from drying up completely.

The second room's contents function as a more feminine foil to the unadulterated force of 'NASA Nourishment'. Components in this area combine to create a softer, womb-like experience with visible cycles of light and nourishment that combine to create a cutting-edge growing environment for the space-age tomatoes.

This room's main lighting is ultraviolet; black lights overhead model a complex molecular structure. A glowing stream of dye-infused water, titled 'Ultraviolet Environment One', courses smoothly past 'UFO', a large, glossy black structure whose eight windows glow promisingly in the near-dark.

Inside 'UFO', tomato plants hang upside down in clear buckets, while a nutrient 'rain' is collected in the bottom of the sculpture and recycled continuously. Artificial sunlight inside the structure flickers on and off in 10-minute intervals during the day.

"I designed the ship around the light," says Oliveri. "The most cutting edge solar panel research uses parabolic dishes to



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focus light on one panel instead of relying on the collection capacity of enormous banks of panels. The two parabolic dishes create a closed environment that focuses exclusively on the plants, and any light that is not absorbed by the plants is refocused back to the centre - due to the closed environment - and sent back to them again."

This continual refocusing, he adds, emphasizes the "poetic beauty of light within a finite universe endlessly mirroring itself."

Plants cannot utilize light waves outside of the visible spectrum, which renders the black-lighting exclusively metaphoric, says Oliveri, but the effect of the glowing interior of the UFO reflects the artist's faith in science and mirrors unbelievable power and potential housed in every tiny seed in a gentler fashion than 'NASA Nourishment'.

"The black lights indicate the potential for vision outside our normal spectrum," Oliveri explains. "The knowledge I'm employing to grow the tomatoes is nearly eclipsed by the reverse image of what might be true in the future, and that unknown is symbolized by the alternate environment in which 'UFO' exists."

#### Laboratory of the Arts

'NASA Nourishment' bombards a viewer with the sheer power behind the simplest act of growth, and 'UFO' - although comparatively gentler - also originally wrought havoc on the very plants that give the series its heart.

Oliveri, who is Chair of Digital Media at the University of Georgia and does most of his research in Athens, Georgia, maintains the tomato plants with the help of Sue Arlott, a

botanist at the Drew Mathieson Greenhouse at the Bidwell Training Center horticulture technology department. The exhibition is housed at the Wood Street Galleries in Pittsburgh, Pennsylvania.

The installation has evolved over time and is dynamic in every sense of the word as artist and botanist struggle to reconcile artistic vision with practical growth.

The primary focus of the series is the tomato plants, says Oliveri. Unlike traditional hydroponic growers, the goal is not to have a "ton of tomatoes", he explains, but "it's really important that the original tomatoes stay alive."

When Arlott first saw the plants, she concluded that the tomatoes were "in dire need of help." High nutrient concentrations and prolonged high levels of light had severely burned the plants when Arlott agreed to try to fix the problem and maintain the sculpture for the remainder of the show's duration.

"It was a great benefit for our students," she says. "I was able to clearly illustrate the effects of extreme circumstances on hydroponic plants and then we tried different methods of resuscitating them."

Initially, Oliveri's plants were receiving 24-hour light and nutrients. Since tomatoes require 12 to 16-hour days, Arlott adjusted the nutrient solution from an EC (electrical conductivity) of 0.4 mS/cm<sup>2</sup> to a steady 3.0 and changed the flow of solution from 24 hours to 12 hours.


"Just over the past three weeks the plants have shown steady improvement," Arlott says. "They've tripled in size and are bearing fruit and blossom sets."

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Without the changes, Arlott believes that the plants - and therefore the sculpture - would have suffered irreparable rotting, burns and stunted growth.

"I'm grateful that she was willing to restore my work," Oliveri says. "By removing the plants from a traditional greenhouse or hydroponic setting and linking them to my artistic vision, I exponentially magnified the importance of their survival."

While many hydroponics stores accept casualties when raising plants, Oliveri could not afford to do the same. He feels that without the inclusion of those specific plants, his series would have lost a degree of the hope he intended to portray.

"These plants were special because of the optimism that sent them into space in the first place," he explains.

Arlott continues to monitor and maintain the sculptures' precious cargo, checking the plants twice a week with an EC meter, trimming dead leaves and adjusting the nutrient solution if necessary.

She says the tomatoes have "great heart and a strong will to live", not unlike Oliveri's faith in scientific investigation.

Their collaboration reflects this faith, as Wood Street Galleries now functions as a dynamic laboratory and further adds to the layers of discourse that Oliveri used as the basis for his original installation.

"Every change Sue makes adds to the amount of information out there about what works best in this vastly experimental agricultural arena", Oliveri says. "As the plants begin flourishing, the art itself becomes part of that soft-science culture that leads to new hypotheses, ideas and progress."

### Blossoming Belief

In Antoine de St. Exupery's fable, *The Little Prince*, the hero of the story, who comes from a planet with room only for his friend, a single rose, tells the narrator that "the stars are beautiful because of a flower that you don't see."

In a similar fashion, Oliveri's creations - towering structures emanating oppressive light, heat and sound - bring an innovative beauty to scientific investigation. Oliveri is by no means a traditional research scientist, but his creative process and the dynamic nature of his installations reflect the true beauty of scientific endeavor: a persistent hope that it will all somehow make a difference.

Oliveri looks to the stars for inspiration, and the stars are beautiful - for both him and those who experience his work - because of the answers that we don't yet see and the hope that we feel every time a new discovery appears as if it truly "might be real."

For more information go to website:

[www.conceptrecycling.com](http://www.conceptrecycling.com) or [www.woodstreetgalleries.org](http://www.woodstreetgalleries.org)

### About the author

Carole VanSickle is a contract science and technical writer based in Atlanta, Georgia. She served as interim editor on the last two issues of UGA Research Magazine ([www.researchmagazine.uga.edu](http://www.researchmagazine.uga.edu)), and has been heavily involved in writing about research, scholarly and creative activity throughout the University of Georgia.

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