



Welcome to Vol. 9 No. 10 of Design Science News, the e-bulletin of the Buckminster Fuller Institute

Design Science News brings you news from around the world related to humanity's option for success and comprehensive design science. It also features updates from BFI and periodic special offers for our members.

Buckminster Fuller Challenge deadline is this Friday!



There are only a few days left to enter the 2009 Buckminster Fuller Challenge! **The deadline is Friday, November 7th at midnight Eastern time.**

We have streamlined the entry process this year, so if you haven't started yet - don't worry - there is still time to submit your solution.

The [jury](#) was announced last Friday and we are honored to have such a visionary, accomplished group on board to select this year's winner.

For information about the Challenge, the entry process, and more, visit <http://challenge.bfi.org>

Help us improve BFI.org

BFI is working with Professor David Walczyk's Usability Leadership graduate students at Pratt Institute to study the effectiveness of BFI.org and to help us improve the website for our readers and members.

We need your help to make this study a success and to inform the evolution of BFI.org!

Professor Walczyk's students have put together a brief [survey](#) for site users and we would greatly appreciate you taking a few moments to complete it.

We are especially in need of testers in the NYC area who can give a half-hour to an hour of their time to participate in in-person testing at Pratt. If you would like to participate, please indicate this on your survey.

Thank you!

BFI starts hands-on structure workshop for artists, designers, architects, students, etc.

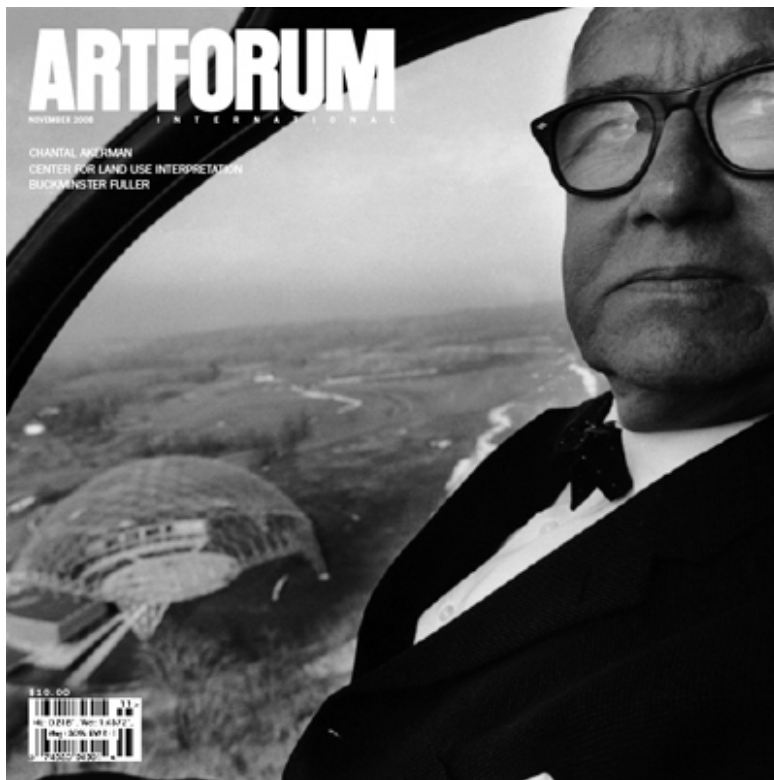


On November 1st, BFI, with the help of long-time friend Kurt Przybilla, installed a 14 foot diameter dome on the roof of our office building in Williamsburg, Brooklyn.

The installation coincided with an inaugural meeting for local designers, artists, architects, students, etc. interested in hands on activity influenced by the work of R. Buckminster Fuller. Fuller's work, like that of any great inventor, continues to generate curiosity and enthusiasm within younger generations of individuals to design and build things of their own. Working under this assumption, BFI hopes to foster a forum for collective project design, construction, and exploration. A forum for those that want to build.

For more information about the project please contact Will Elkins at [will \(at\) bfi \(dot\) org](mailto:will@bfi.org).

Bucky featured in the November issue of ARTFORUM



The November issue of ARTFORUM features several engaging [essays](#) on Fuller and his far-reaching legacy. Architectural historian Sean Keller traces Fuller's long career through the lens of today's challenges.

In addition to Keller's survey, architect Thom Mayne, artist Fritz Haeg, and architectural critics Michael Wang, Kevin Pratt, and Helene Furján offer distinctive takes on Fuller's impact on realms ranging from buildings to biology and beyond. Keller, Mayne, and Wang's evaluations are available online. For the rest, check out the November (print) issue of Artforum.

TRENDS & PERSPECTIVES

The statistical universe



We cannot see farther into the universe because the big bang happened only 14 billion years ago and light from distant regions has not had enough time to reach Earth. Yet subtle clues are beginning to reveal some of the properties of the regions of space hidden beyond our cosmic horizon. Our world appears to be only a small part of a “multiverse,” an expanse vastly larger than the visible universe, and for the most part completely different from it.

To account for what we do see, cosmologists invented a theory many years ago called “inflation,” in which a brief, ultra-accelerated expansion of the early universe stretched space to a size far greater than what we observe. Inflation explains why, despite the violence of the big bang, the universe appears to us uniform and smooth, and the theory has made predictions confirmed by measurements of subtle variations in the radiation left over from the big bang. But inflation does not really make the universe more uniform - just huge. If inflation is correct, then the billions of light-years that our telescopes probe are a mere dot on a far vaster canvas. (Source: [Seed Magazine](#))

We're very excited to have Adam Bly, Founder and Editor-in-Chief of Seed Magazine and Seed Media Group participate as a 2009 Buckminster Fuller Challenge [juror](#)

http://www.seedmagazine.com/news/2008/10/the_statistical_universe.php

Does nature break the second law of thermodynamics?



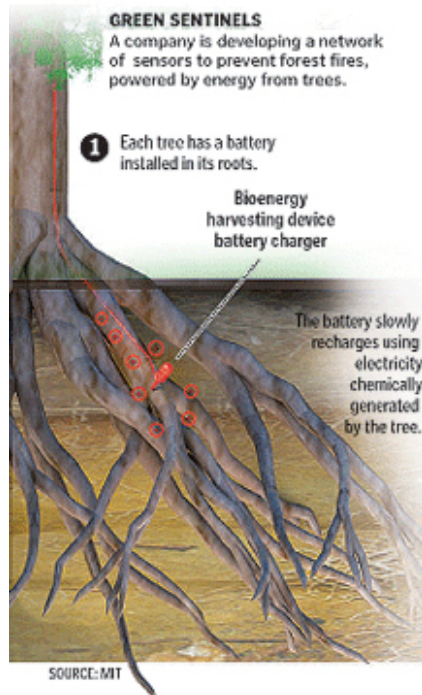
Science has given humanity more than its share of letdowns. It has set limits to our technology, such as the impossibility of reaching the speed of light; failed to overcome our vulnerabilities to cancer and other diseases; and confronted us with inconvenient truths, as with global climate change. But of all the comedowns, the second law of thermodynamics might well be the biggest. It says we live in a universe that is becoming ever more disordered and that there is nothing we can do about it. The mere act of living contributes to the inexorable degeneration of the world. No matter how advanced our machines become, they can never completely avoid wasting some energy and running down. Not only does the second law squash the dream of a perpetual-motion machine, it suggests that the cosmos will eventually exhaust its available energy and nod off into an eternal stasis known as heat death.

Ironically, the science of thermodynamics, of which the second law is only one part, dates to an era of technological optimism, the mid-19th century, when steam engines were transforming the world and physicists such as Rudolf Clausius, Nicolas Sadi Carnot, James Joule and Lord Kelvin developed a theory of energy and heat to understand how they work and what limited their efficiency. From these nitty-gritty beginnings, thermodynamics has become one of the most important branches of physics and engineering. It is a general theory of the collective properties of complex systems, not just steam engines but also bacterial colonies, computer memory, even black holes in the cosmos. In deep ways, all these systems behave the same. All are running down, in accordance with the second law.

But despite its empirical success, the second law often seems paradoxical. The proposition that systems steadily run down seems at odds with the many instances in nature not only of disorganization and decay but also of self-organization and growth. In addition, the original derivation of the second law has serious theoretical shortcomings. By all rights, the law should not apply as widely as it does. (Source: [Scientific American](http://www.sciam.com/article.cfm?id=how-nature-breaks-the-second-law))

<http://www.sciam.com/article.cfm?id=how-nature-breaks-the-second-law>

Scientists tap into tree power



Scientists have solved a long-standing mystery behind the source of a faint electrical current in trees - and it wasn't as hard as they thought.

For years, inventors and scientists have driven nails into trees, wired those nails to nearby metal spikes, and wondered at the faint but predictable electrical current that resulted.

Explanations for the power source ranged from a static energy field in the earth's crust, to the possibility it was generated through rust and corrosion, similar to the old do-it-yourself potato clock experiments.

Now, a team of MIT scientists, using platinum electrodes and everyday ficus house plants, have found that the faint current actually comes from an imbalance in pH between the soil and a living tree. And that discovery is already sparking discussions about novel ways to use that electricity - including as a power source for a tree's own fire alarm.

"All the exotic theories have to be rethought," said Andreas Mershin, the lead scientist in a study published in August in the peer-reviewed on-line science journal PLoS One. "The energy potential is simply due to pH difference."

"When we started this project, we thought it was going to be very complicated and in the end it ended up being very simple," Mershin added.

Mershin - who began his research in 2006 at the behest of Canton-based MagCap Engineering and then persuaded his skeptical bosses at MIT to let him spend a year developing it - found that five to 300 nanowatts of current can be reliably tapped from every tree every time. The greater the pH difference between tree and soil, the more

energy was produced, he found.

The discovery has, in turn, posed a question. “Now the question is: What do you do with it?” said Mershin. (Source: [The Boston Globe](http://www.boston.com/news/science/articles/2008/10/13/scientists_tap_into_tree_power/))

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Solar thermal power may make a sun-powered grid a reality



Planted in the New Mexico desert near Albuquerque, the six solar dish engines of the Solar Thermal Test Facility at Sandia National Laboratories look a bit like giant, highly reflective satellite dishes. Each one is a mosaic of 82 mirrors that fit together to form a 38-ft-wide parabola. The mirrors' precise curvature focuses light onto a 7-in. area. At its most intense spot, the heat is equivalent to a blistering 13,000 suns, producing a flux 13 times greater than the space shuttle experiences during re-entry. “That’ll melt almost anything known to man,” says Sandia engineer Chuck Andraka. “It’s incredibly hot.”

The heat is used to run a Stirling engine, an elegant 192-year-old technology that creates

mechanical energy from an external heat source, as opposed to the internal fuel combustion that powers most automobile engines. Hydrogen gas in a Stirling engine's four 95 cc cylinders expands and contracts as it is heated and cooled, driving pistons to turn a small electric generator. The configuration of the dish and engine represent the fruit of more than a decade of steady improvements, developed in collaboration with Arizona-based Stirling Energy Systems.

On a crisp morning this past January, Andraka and his colleagues fired up Dish No. 3. The temperature was around freezing, and the sky was 8 percent brighter than average—the contrast between the cold air and the hot sun helps the engine run more efficiently. When power began to flow from the 25-kilowatt system, it did so with the highest conversion efficiency ever recorded in a commercial solar device: 31.25 percent of the energy shining onto the giant dish flowed into the grid.

To Bruce Osborn, president and CEO of Stirling Energy, this merely confirmed something that he already knew: The system, which his company calls the SunCatcher, was ready to exit the laboratory. “The rocket science is already done,” he says. The challenge remaining is to turn the prototypes into a low-cost, mass-producible design—“just a question of good, old-fashioned engineering,” according to Osborn. To that end, Stirling Energy signed the two largest solar energy contracts in history with two Southern California utilities, promising to build up to 70,000 SunCatchers and provide power for a million homes. Construction starts next year. (Source: [Popular Mechanics](http://www.popularmechanics.com/science/research/4288743.html))

<http://www.popularmechanics.com/science/research/4288743.html>

RESOURCES

Join a mass experiment in futurist speculation with the game Superstruct



Check out this [interview](#) with Jamais Cascio, scenario design lead for the innovative massively multiplayer forecasting game [Superstruct](#)

We're honored that Jamais Cascio will also serve as one of the 2009 Buckminster Fuller Challenge [jurors](#)!

Four big-thinkers' ideas on going green, ending poverty

Views from Wangari Maathai, the Clinton Global Initiative, Van Jones, and Paul Hawken.

<http://www.treehugger.com/files/2008/10/go-green-end-poverty-four-big-thinkers.php>

The big to-do list - scientific challenges facing the next (American) president



This month marks the 50th anniversary of NASA, which was launched a year after the Soviet Union lofted Sputnik into orbit, a feat that threatened to accelerate the communist rival's lead over the U.S. in spaceflight technology. It's probably fair to ask whether any U.S. president might once again be in a position to respond to such a huge scientific and technological challenge.

Former Vice President Al Gore's vision, for example, of creating 100 percent carbon-neutral electrical power in the next decade might be one such challenge—and something Gore specifically likened to a 'moon shot'—requiring commitments, coordination and funding at every level of the public and private sectors.

But candidates may have to revise their ambitions and spending plans in the wake of the \$700-billion federal fiscal bailout, which promises to put a massive dent in taxpayers' pocketbooks. Jeffrey Sachs's analysis of the financial crisis paints a sobering picture for the incoming administration. Hence, it may be tough to pin down funding commitments for science and technology between now and election day.

According to a report by the Information Technology & Innovation Foundation, the campaign platforms of both McCain and Obama "incorporate substantially more focus on

innovation and technology policies than their predecessors' platforms in the 2004 election.” (Source: [Scientific American](#))

<http://www.sciam.com/article.cfm?id=presidential-to-do-list>

EVENTS

R. Buckminster Fuller, The History (and Mystery) of the Universe in Portland, Oregon from October 14th to December 7th



photo: Owen Carey

Portland Center Stage presents the award-winning play *R. Buckminster Fuller, The History (and Mystery) of the Universe* on stage at Gerding Theater at the Armory in Portland, Oregon.

[Click here](#) for more information and to buy tickets.

Watch a trailer for the play [here](#)

Imagination On Behalf Of Our Planet, ASCI's 10th International Digital Print Exhibition



The digital prints in this exhibition are the result of the 10th annual juried, international competition organized by Art & Science Collaborations, Inc., a 20-year old New York City nonprofit organization. The exhibition's purpose is to demonstrate how digital technology is enabling new aesthetic imaging possibilities and conceptual statements. In the competition prospectus, entrants were challenged to "boldly envision on behalf of our planet" by asking the following questions:

What are the artists, designers, architects, scientists, and technologists of the twenty-first century thinking about our current environmental challenges? Can their artwork imagine new, positive approaches to sustaining life on Earth? Can it inspire us to confront the consequences of our current ways of living? Through the almost limitless possibilities of digital image technologies, we invite competition entrants to examine their environmental concerns, indulge their fantasies, and then share their fabricated/montaged visions of how a sustainable future might look, which also may include new types of hybrid forms: plants, animals, humans, cities, transportation systems, and food supply.

For more information, visit: <http://www.asci.org/index2.php?artikel=994>

Have you come across interesting Design Science news articles, resources, or events?

We invite you to forward them so we can consider them for inclusion in future e-bulletins. Send them to: [designsciencenews \(at\) bfi \(dot\) org](mailto:designsciencenews(at)bfi(dot)org)

If we use your suggestion for future e-bulletins and you would like to be credited by name, please indicate it in your e-mail.

Thank You!

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