

ART MEETS SCIENCE

by AARON HOOVER
ENGINEERING WRITER
NEWS & PUBLIC AFFAIRS
UNIVERSITY OF FLORIDA

ORIGINALLY PUBLISHED IN
EXPLORE, RESEARCH AT THE UNIVERSITY OF FLORIDA
FALL 1998, VOL. 3, NO. 2

ORIGINALLY PUBLISHED IN

EXPLORE, RESEARCH AT THE UNIVERSITY OF FLORIDA

FALL 1998, VOL. 3, NO. 2

ART MEETS SCIENCE

by AARON HOOVER
ENGINEERING WRITER
NEWS & PUBLIC AFFAIRS
UNIVERSITY OF FLORIDA

Lightning cuts through the air in a microsecond, but when it hits the ground it sometimes leaves a glassy trail of fused sand that can last centuries.

To some, so called “fulgurites” look like pieces of dirty glass. But to electrical engineers, fulgurites are lightning’s tangible legacy, delicate pieces of “fossilized lightning” that require painstaking excavation to reveal.

And to renowned artist Allan McCollum, the objects can be a metaphor for natural and human creativity.

In the summer of 1997, engineers at UF's International Center for Lightning Research and Testing worked with McCollum, an internationally acclaimed contemporary artist, to create fulgurites that will be the centerpiece of an exhibit that debuts this fall in Tampa.

Science and art are often thought of as opposed, but the collaboration shows they can intertwine in ways that enrich scientists and artists alike. McCollum says he learned much about the practicalities of research and the strange phenomenon of lightning. The engineers were always fond of fulgurites -- they once excavated a 17-foot fulgurite recognized by the Guinness Book of World Records as the longest ever -- but the project gave them a fresh perspective.

"I think it heightened our interest in fulgurites, which are practically of interest because they go to underground power lines and communication lines," says Professor Martin Uman, director of the lightning center and chair of UF's Department of Electrical and Computer Engineering.

Fulgurites have long fascinated people, but until McCollum, no one had experimented with making the objects above ground with triggered lightning.

McCollum, 53, has exhibited in the Museum of Modern Art and Whitney Museum of American Art in New York, and two years ago his work appeared with a collection of American sculptures in an exhibit at the White House. In recent years, his work has examined the crossover between art and science. He chanced upon an article about Uman's research in *Discovery Magazine* and began researching the topic.

Two years ago, a vacation in Sarasota presented a unique opportunity: a collaborative project for the University of South Florida Contemporary Art Museum and the Museum of Science and Industry in Tampa. Jade Dellinger, a New York City-based independent curator, and Margaret Miller, director of the USF museum, helped get McCollum in touch with Uman.

As it happens, Uman studied art in college and paints as a hobby. He embraced the project, which the Museum of Science and Industry agreed to underwrite with \$10,000 from a



McCollum excavates a paper-thin fulgurite from the sand in much the same way a paleontologist might remove a fragile fossil from the ground

combination of city, state and county grants for the lab's costs for rockets and other expenses.

So in the summer of 1997, McCollum and Dellinger, coordinator of the project, moved into a motel in Starke and began visiting the lightning lab every day.

McCollum suggested that the researchers try to create the fulgurites above ground, an idea embraced by Dan Cordier, an experienced fossil excavator who has helped excavate several fulgurites on the site.

Cordier filled PVC tubes with different minerals, all of which could be found in the sand at the site, something important to McCollum's artistic goals. To ensure the lightning penetrated the minerals, Cordier ran a thin wire through the pipes, then connected it to the 35-foot lightning tower. Rockets launched from the tower trail a thin wire intended to provide a conducting path for the lightning to strike back to earth.

Over the course of a few weeks, a handful of strikes gave Cordier and the artist a look at how fulgurites formed in different minerals. Zircon proved McCollum's favorite.

"It was very evident very quickly that zircon made a very beautiful, precise, kind of regularly swirled fulgurite," McCollum says.

But the trailing-wire method creates open-ended fulgurites, and McCollum sought a fulgurite with closed ends because he intended to reproduce many copies, and closed-end figures are cheaper and easier to reproduce. At Uman's suggestion, Cordier and McCollum decided to try arcing electricity between two electrodes.

"Martin suggested we try the old Frankenstein electrode approach," Cordier says.

Cordier and McCollum placed zircon in a red trash receptacle sandwiched between two electrodes, then connected a wire from the rocket directly to the electrodes. A storm blew up, and McCollum pressed the 'fire' button. Dellinger, meanwhile, with the help of photographer Robbie Land, used a camera capable of shooting 500 frames per second to record the event, capturing some 60 separate images.

The small fulgurite, resembling a bone, that resulted pleased McCollum and perplexed the engineers, who anticipated he would prefer a more complex figure with lots of branches, wild colors or other unique characteristics.



The 10,000 fulgurite sculptures molded from the original McCollum created at Camp Blanding are the centerpiece of “Petrified Lightning from Camp Blanding,” an exhibition opening October 23 at the USF Contemporary Art Museum.

Science, as well as art, benefited from the project.

“Every strike we get that has fulgurites, we learn something new,” Cordier says. “Probably the biggest thing we learned from

working with Allan – which we didn't know and hadn't given any consideration to – is that clays seem to inhibit fulgurite formation.”

Today, fulgurites are merely a scientific curiosity, but with their unique optical properties they may one day prove useful to the electronics industry or in other applications, Cordier says.

McCollum says he gained a fresh perspective from working with the engineers, and vice versa. For example, other engineers began experimenting with making fulgurites using such materials as marbles.

I think there was just a sort of natural curiosity about another person's way of seeing, so each person comes away with a new way of looking at their own discipline,” McCollum says.

A company in Sanford that uses sand to create tourist souvenirs is producing 10,000 copies of the fulgurite for the McCollum exhibition, set to debut at the USF Contemporary Art Museum on October 23 in connection with a simultaneous exhibit and presentation on the project at the Museum of Science and Industry.

While the installation's final “look” is still evolving, McCollum says: “I think I'm going to build a very large table and just sort of pile the fulgurites on top in a heap.”

The installation will be accompanied by at least 40-50 small booklets that discuss lightning and how fulgurites are created, McCollum says, adding that he hopes to use the exhibit and booklets to convey a message about inspiration and creation.

“I wanted to make an object that . . . suggested instant creating, almost the way an artist creates, or the way the universe creates.”

Related web site:

<http://arts.usf.edu/museum/allan.html>

THE EVENT

PETRIFIED LIGHTNING FROM CENTRAL FLORIDA

A PROJECT BY ALLAN MCCOLLUM

CONTEMPORARY ART MUSEUM
UNIVERSITY OF SOUTH FLORIDA
MUSEUM OF SCIENCE AND INDUSTRY
TAMPA, FLORIDA