

Lichtenberg Figures: The Fractal Patterns of Lightning Strike Scars



Being struck by lightning is a dangerous and scary experience and can even be fatal. Sometimes, the electrical discharge can leave a tattoo-like marking or scar known as a [Lichtenberg figure](#). The patterns created are known to be examples of fractals.

Lichtenberg figures are branching electric discharges that sometimes appear on the surface or the interior of insulating materials. They are named after the German physicist Georg Christoph Lichtenberg, who originally discovered and studied them. When they were first discovered, it was thought that their characteristic shapes might help to reveal the nature of positive and negative electric “fluids”.

In 1777, Lichtenberg built a large electrophorus to generate high voltage static electricity through induction. After discharging a high voltage point to the surface of an insulator, he recorded the resulting radial patterns in fixed dust. By then pressing blank sheets of paper onto these patterns, Lichtenberg was able to transfer and record these images, thereby discovering the basic principle of modern Xerography. This discovery was also the forerunner of modern day plasma physics.

Although Lichtenberg only studied 2-dimensional (2D) figures, modern high voltage researchers study 2D and 3D figures (electrical trees) on, and within, insulating materials [Source: [Wikipedia](#)]. Below will find a small gallery of people who were struck by lightning and the fractal pattern it left behind.

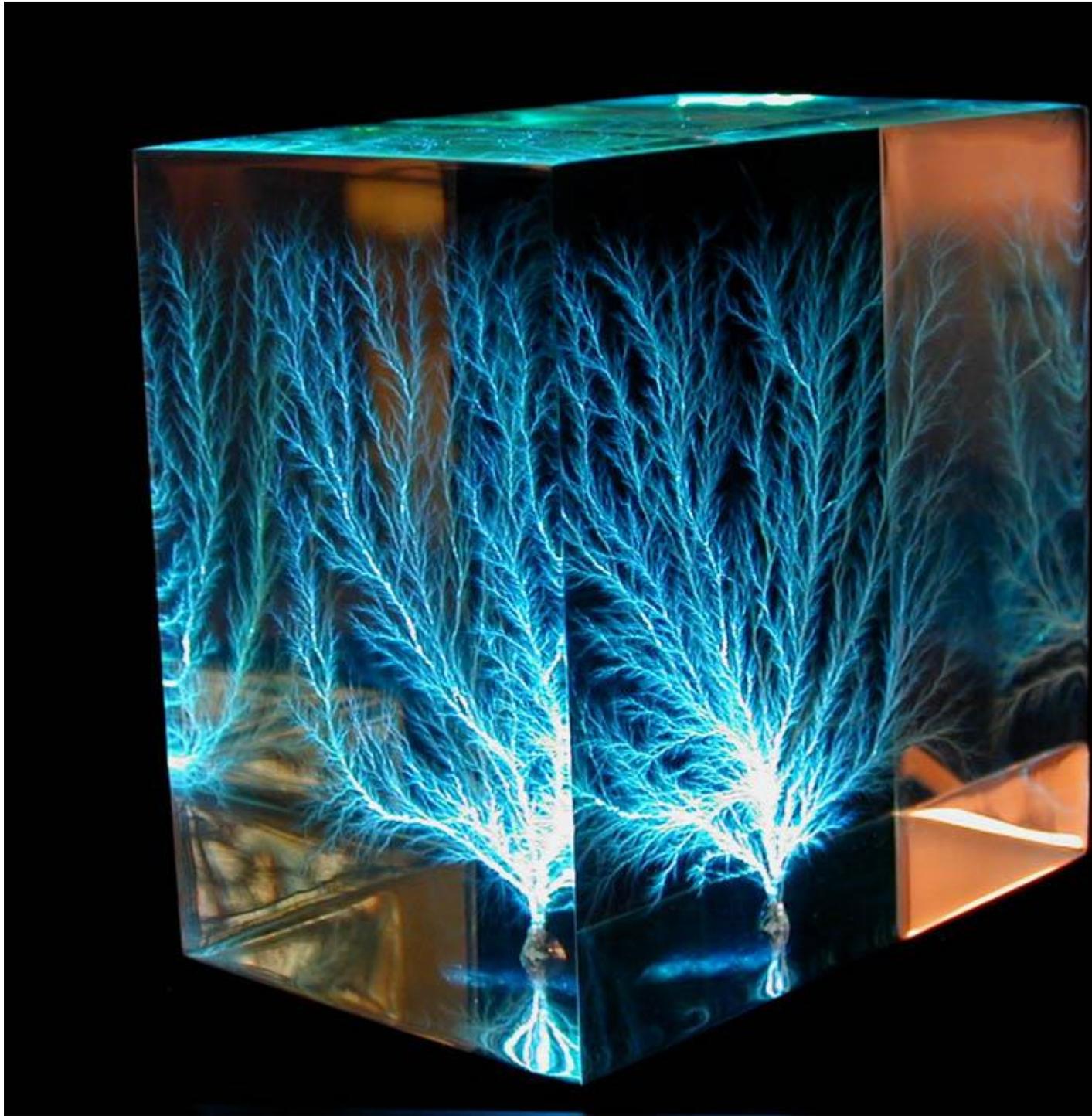












Photograph by Bert Hickman, <http://www.teslamania.com>

These dramatic "[keraunographic](#)" marks are sometimes referred to as "lightning flowers" or "lightning trees." They tend to occur on the arms, back, neck, chest, or shoulders of [lightning strike victims](#).

As the tech blog Gear Diary reported, [Winston Kemp earned this intricate body art](#) during a spring storm when he went outside to save his pumpkins. Ironically, Kemp is an electrician, but it wasn't his job that put him in contact with this electrical jolt; it was a bolt from Mother Nature in his own backyard.

The 24-year-old says he saw something bright and heard something loud hit his neighbor's yard, but he didn't feel a thing.

"I just came back inside like nothing was wrong. Umm ... my arm was sore. But I didn't ... I don't think I saw any marks until 30, 45 ... [it was] maybe an hour before I saw the marks," he tells Gear Diary.

Kemp says it didn't hurt when it happened, but a few hours later his arm started to feel achy and sore. Big blisters started forming on his skin the next day, which his girlfriend, a pre-med student, carefully lanced and covered to prevent infection.

"The feathering marks are formed by the transmission of static electricity along the superficial blood vessels that nourish the skin," says Dr. Mathew Avram, director of the Dermatology Laser and Cosmetic Center at Massachusetts General Hospital in Boston.

"They're the kind of marks that when an emergency medicine doctor sees it, you know exactly what the diagnosis is -- a lightning strike," he explains.

"These are an unbelievably rare thing to see," adds Avram.

What you tend to see is a superficial burn to the top part of the skin, he says. If the person was wearing a belt buckle or the skin was sweating a lot during the lightning strike, the fern-leaf patterns may be deeper.

Although Kemp did not go to an emergency room, Avram said a trip to the ER is generally a good idea, so you don't get any secondary infections from the skin wounds.

Usually the red marks fade within hours of the lightning strike, though Kemp's lasted longer than that. It's a good idea to put an antibiotic ointment or Vaseline on the affected skin several times a day until they completely heal.

Even a month after the lightning strike, Kemp said he still felt "random pains" running down his left arm and the skin felt tender.

"That's not surprising," says Avram. "Any time there's an injury to the skin you can get nerve sensations afterward and the redness from a burn can last for months."