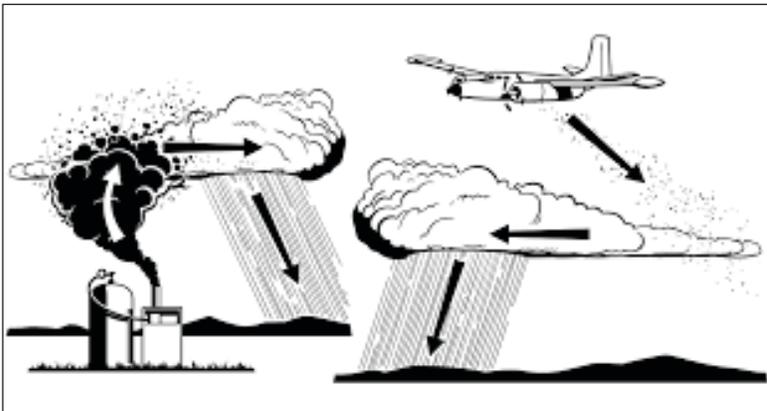


Silver News

- Cloud Seeding with Silver Iodide is Back
- Silver Plays Explosive Role in *Oppenheimer* Movie
- DNA, Silver Nanoclusters and Artificial Intelligence Team Up to Detect Tumors
- Silver Nanowires Mimic the Human Brain in Learning and Memory
- Tara Coins a New Model for Silver Bullion in Ireland
- Silver Sox for Horses Help Keep Them Healthy

Cloud Seeding with Silver Iodide is Back



Cloud seeding using silver iodide is accomplished in one of two ways: Dropping pellets from a plane or rocket or using ground-based generators.

Cloud seeding – a silver-based technology used worldwide for more than 50 years to increase rainfall – is making a comeback.

For example, some drought areas in Texas are boosting rainfall by about fifteen percent annually, an additional two inches, due to cloud seeding, according to the [West Texas Weather Modification Association](#), a rain enhancement group based in the City of San Angelo.

Other U.S. states are currently seeding or considering official programs, including Arizona, Idaho, California, and Colorado, although local jurisdictions often cloud seed independently. Mexican officials have commenced seeding in five states. Dubai, a city in the United Arab Emirates, has cloud seeded, and last year, China, which has the world's most active clouding seeding programs, used it to help replenish the Yangtse river basin, areas of which are in drought conditions. In total, more than a dozen countries have cloud seeding efforts.

In a twist, Chinese authorities seeded clouds prior to the Beijing Olympics in 2008 to drain moisture from clouds before the games so athletes would not compete in wet weather.

Cloud seeding is straightforward. Rods or particles made of silver iodide are floated into the air or dropped from planes into clouds. The silver iodide acts as a nucleus to which moisture can adhere and when the particles get heavy enough they fall as raindrops, or snow if the temperatures are cold enough.

Some scientists say that measuring the effectiveness of cloud seeding is difficult, as it's often impossible to know if the cloud seeding effort was the cause of rain or if clouds were ready to give up their moisture. Nevertheless, it's clear that more jurisdictions are looking to cloud seeding as a way to mitigate the effects of climate change.

Silver Plays Explosive Role in *Oppenheimer* Movie

Silver plays an important cameo role in the blockbuster movie *Oppenheimer* as the film's cinematographer Hoyte van Hoytema struggled to find a way not to use computer-enhanced effects, but to do them on camera instead – including the climactic Trinity Test bomb explosion. “Obviously, we couldn't make an explosion the size of the actual explosion so we used trickery,” he said in an interview with movie trade publication [Variety](#).

The ten-minute sequence in which viewers see the first-ever successful atomic bomb detonation had another layer of complexity, because it was filmed for IMAX theater presentations which offer large screens and high resolution. “We're suckers for this absolute depth of resolution that IMAX give us,” van Hoytema said. “But when you go to VFX (visual effects), you have to scan it, and the moment you do that, it loses half of its resolution.”

After a series of experiments, the cinematographer and his crew landed on a solution. “We created science experiments. We built an aquarium and dropped silver particles in it. We had molded metallic balloons which were lit up from the inside. We had things slamming and smashing into one another such as ping-pong balls, or just had objects spinning.”

The silver particles bouncing around the aquarium along with other debris gave the scene the perfect illusion of what the Trinity Test explosion really looked like from a close-up perspective.



UNIVERSAL PICTURES

In order to depict an atomic explosion without Computer Generated Images, the cinematographer of the movie *Oppenheimer* dropped swirling silver particles in an aquarium

DNA, Silver Nanoclusters and Artificial Intelligence Team Up to Detect Tumors

Most people know that DNA molecules carry genetic information from parents to children but scientists have known for several decades that it has other functions. For example, DNA has the ability to stabilize silver atoms in such a way that they glow under ultraviolet light making them useful in chemical and medical sensing applications.

This property allows medical practitioners to scan more deeply into bodily tissues to detect tumors and other abnormalities without the need for X-Rays which can be harmful if used too frequently or incorrectly.

“There is untapped potential to extend fluorescence by DNA-stabilized silver nanoclusters into the near-infrared region,” said Stacy Copp, assistant professor of materials science and engineering, [University of California, Irvine](#), in a prepared statement. “The reason that’s so interesting is because our biological tissues and fluids are much more transparent to near-infrared light than to visible light.”

Copp and her team tested many other materials that could bind with DNA and emit visible markers under ultraviolet light but silver nanoclusters appeared to work best. One of the main benefits of using the silver/DNA method is that silver is non-toxic compared to other possible materials that could be used. “There are lots of reasons why it would be exciting to use noninvasive, nonhazardous near-infrared light, which is basically heat,” Copp said. “But one of the biggest challenges is that we don't really have good, nontoxic fluorophores – molecules or nanoparticles – that emit this near-infrared light.”

Before deciding on a specific combination of DNA and silver, the team used machine learning, a subset of Artificial Intelligence, to analyze huge amounts of experimental data of various permutations to predict what colors might occur. For example, they used a computer tool that allowed them to learn what section of the DNA sequence gave different fluorescence colors from the silver nanoclusters.

Copp added: “Some of these algorithms can operate like a black box. You provide a data set to the machine learning algorithm, and it learns the trends in that data, and that helps you make predictions.”



STEVE ZYLJUS / UCI

University of California, Irvine's Stacy Copp led a team testing DNA/silver nanocluster combinations to detect tumors.

Silver Nanowires Mimic the Human Brain in Learning and Memory

Artificial Intelligence (AI) is prompting scientists to look more closely at how computer systems mimic the human brain and what they've found is remarkable.

Although AI systems can outperform human speed in some tasks – such as pattern recognition, for example – AI systems don't possess human-like intelligence nor do they perform well in fast-changing environments or without electricity.

However, a recent study has shown that networks of silver nanowires appear to learn and recall information in some ways similar to how humans execute these processes.

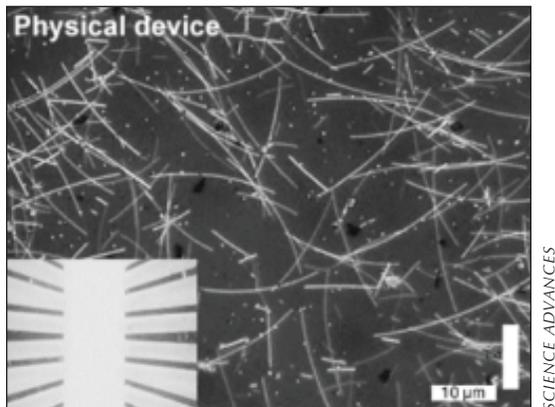
Alon Loeffler, PhD, researcher at the [University of Sydney](#), wrote in the [Conversation](#): “Our research explores non-biological systems that are more like human brains. In [a new study](#) published in *Science Advances*, we found self-organizing networks of tiny silver wires appear to learn and remember in much the same way as the thinking hardware in our heads.”

He added: “Nanowires self-assemble to form a network structure similar to a biological neural network. Like neurons, which have an insulating membrane, each metal nanowire is coated with a thin insulating layer.”

In one experiment, Loeffler and his colleague Professor Zdenka Kuncic were able to strengthen or weaken the pathways between nanowires, a process that corresponds to synapses in the human brain and how they reinforce or correct what's known as “supervised learning.”

They also found that they were able to activate artificial networks with stimuli along with a memory task, much the same way a person unites a recollection with something that happened to them. “The network ‘remembered’ previous signals for at least seven steps. Curiously, seven is often regarded as the [average number of items](#) humans can keep in working memory at one time. When we used reinforcement learning, we saw dramatic improvements in the network's memory performance,” Loeffler noted.

In conclusion, Loeffler wrote: “Human intelligence is still likely a long way from being replicated. Nonetheless, our research on [silver] nanowire networks shows it is possible to implement features essential for intelligence – such as learning and memory – in non-biological, physical hardware.”



Microscope image of silver nanowire networks that act similarly to the human brain.

Tara Coins a New Model for Silver Bullion in Ireland

Mark O'Byrne started Tara Coins earlier this year to fulfill a longtime need for silver bullion coins from Ireland. “The idea has been in gestation for nearly 20 years... At the time, I wanted to offer Irish bullion coins and bars but realized that there were none so I had to sell British, American, Canadian, and South African coins. I was always curious as to why we in Ireland did not have our own bullion coins, seeing as silver and particularly gold featured so prominently in our mythology and our history.”

He added: “The impetus was to have beautiful bullion coins that would capture the essence of magical mystical Ireland, its land, and people... precious coins that would act as a store of value but also be eye catching and unique works of art.”

Tara Coins is a new model, O'Byrne noted, as the company is an Irish designer and wholesaler of bullion and numismatic coins, rounds and medals. “This has never been done before in Ireland and to my knowledge, Irish bullion coins or rounds which are investment grade and of a purity of over 99.99% have not been minted before.”

These Irish coins are not issued by the Irish government and are non-legal tender.

O'Byrne added that the recently introduced Silver Tree coins, a celebration of Ireland's ancient past and abundant future, are proving very popular. Tara Coins has Irish distributors and [Bullion By Post](#).

In conclusion, he said: “There is a lot of fear out there in the world today and we hope the Silver Trees in their own small way may bring people a little bit of joy and peace of mind.”



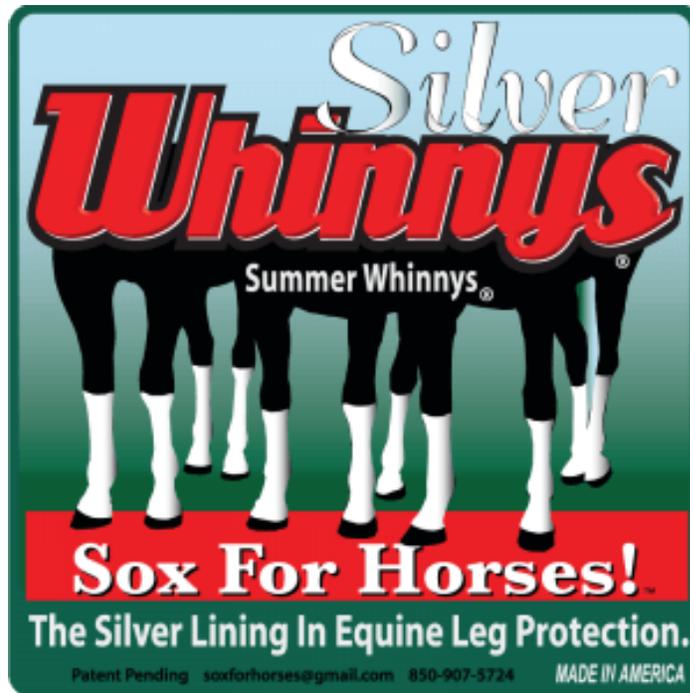
One-ounce Silver Trees of Life are the first Irish silver bullion coins (non-legal tender) or medals.

Silver Sox for Horses Help Keep Them Healthy

Although silver-imbedded clothing and bandages have become common for people, horses are now enjoying the benefits of the metal's ability to kill dangerous microbes – especially bacteria and fungi – and promote wound healing.

One company that has entered this market is [Sox for Horses](#) whose motto is “Using the Power of Silver to Protect Your Equine.” Company officials note about one of their products: “Equines can suffer from a variety of lesions that affect their lower legs: dermatitis, scratches, mud fever, dew poisoning, greasy heel, summer sores, and wounds. *Silver Whinnys* provide the critical qualities in bandaging/leg protection that allow non-responding cutaneous (affecting the skin) lesions to finally heal.”

Even though this company's focus is on horses, riders are not left out. *HiHo Silver Sox* are over-the-calf boot socks for equestrians that are made from the same material as horse sox but softer.



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