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## Rethinking Fireworks

### Greener Ways to Celebrate the Fourth

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Synonymous with American Independence Day, fireworks have been around for thousands of years. Earliest versions originated in China, where people tossed bamboo stalks into a fire to ward off evil spirits, which exploded as the hollow areas of the stalks heated up. Later, a Chinese alchemist invented gunpowder—a mixture of potassium nitrate, sulfur and charcoal—that when poured into bamboo sticks, created the first fireworks.

#### Environmental and Health Impacts

Today, most fireworks are made of non-biodegradable plastics and harmful chemicals. When set ablaze, they release smoke and particulate matter, polluting the ground, air and water. Viewing fireworks poses health risks, particularly to people with preexisting ailments. It's best to watch them from far away and upwind of the launch site or indoors through a closed window. Pet owners lament the noise pollution these pyrotechnics produce, and every year injuries and fires result when people unsafely light their own rockets at home.

#### Greener Fireworks

While climate-neutral fireworks don't exist, some products are more eco-friendly. The Walt Disney Company has patented a new technology to replace gunpowder by using compressed air to launch fireworks—a potentially safer, quieter and less polluting alternative. European fireworks manufacturer Weco Feuerwerk

(weco.de) is gradually replacing plastic components with compostable, plant-based fibers.

A particularly troublesome compound is perchlorate, which helps fireworks burn longer, but inhibits thyroid function after repeated exposure. A cleaner alternative is nitrogen, which produces less smoke and fewer dangerous byproducts. With less smoke, smaller amounts of toxic metal salts are needed to produce the brilliantly colored flames. For now, nitrogen-based fireworks are much more expensive and not widely used in outdoor settings. Indoor, low-smoke pyrotechnics are available through DMD Systems at [AngelFire.com](http://AngelFire.com).

#### Planet-Friendly Alternatives

Drone light shows involve the launching of hundreds or even thousands of unmanned aerial vehicles equipped with powerful LEDs that light up the sky. The drones are reusable, silent and do not release chemicals. Because they are controlled digitally, an almost infinite combination of movements, colors and artistic expressions are possible.

Lasers can also paint the night sky. The most compelling displays are done professionally, but a colorful and exciting light show can be created at home with a portable projector.

To add red, white and blue charm both indoors and out, solar-powered or LED string lights or lanterns can decorate the home.