

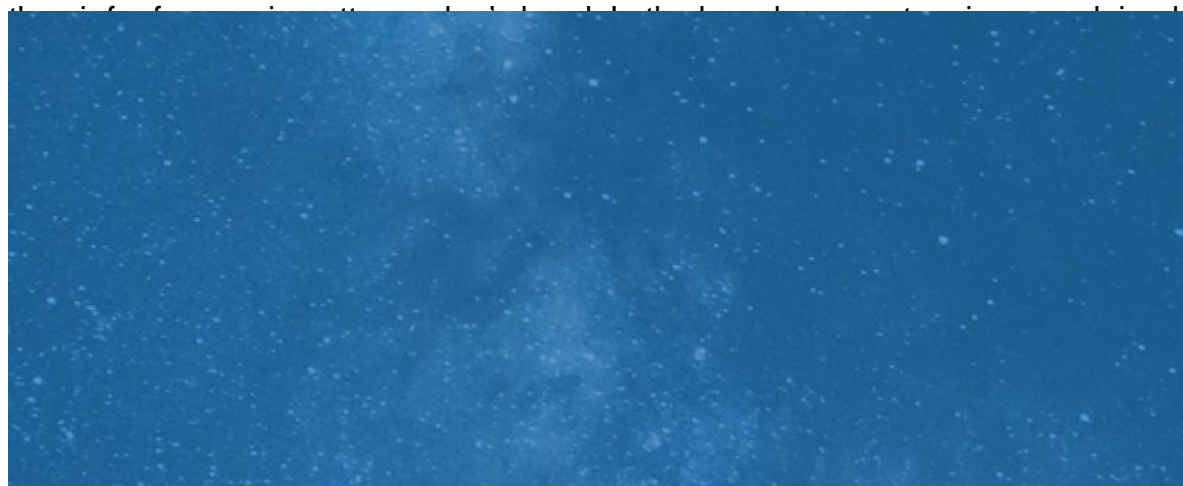
# Scientists developed ‘smoke rings’ of light

Smoke rings are being seen in a brand-new light.

Doughnut-shaped structures called vortex rings are often seen swirling through fluids. Cigarette smokers can form them with their mouths, volcanoes can spit them out throughout eruptions and dolphins can blow them as bubble rings. Now, researchers can produce the rings with light.

A basic vortex is an eddy in a liquid or gas, like a whirlpool ( *SN*: 3/5/13). Picture taking that swirling eddy, extending it out and flexing it into a circle and connecting it end-to-end. That’s a vortex ring. These rings take a trip through the liquid or gas as they swirl— for instance, smoke rings drift through

the air from a cigarette. The new technique, described in *Science* on June 2 in two articles, allows researchers to create vortex rings in a variety of locations.



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Optics scientist Qiwen Zhan and associates began with a vortex tube, a hurricanelike structure they currently understood how to develop utilizing laser light. The group utilized optics strategies to flex television into a circular shape, producing a vortex ring.

The light rings aren't that various from smoke or bubble rings, states Zhan, of the University of Shanghai for Science and Technology. "That's type of cool."

Zhan has an interest in seeing whether researchers might develop vortex rings out of electrical existing or an electromagnetic field. And additional research study of the light rings may assist researchers much better comprehend how geography– the geometry of doughnuts, knots and comparable shapes– impacts light and how it engages with matter.

Source: [Scientists produced 'smoke rings' of light](#)