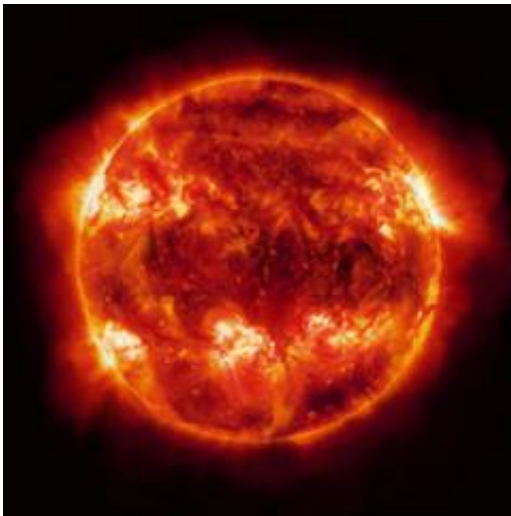


# Lockheed Martin pursues compact fusion reactor concept

October 16 2014, by Nancy Owano

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Lockheed Martin is making news this week with declarations about putting the Atomic Age on Restart and advancing in the realm of energy. "We are on the fast track to developing compact nuclear fusion reactors to serve the world's ever-growing energy needs."

The company's Skunk Works has provided new details to the public about its work in compact [fusion](#). "At Lockheed Martin Skunk Works, we're making advancements in the development of [fusion energy](#), the ultimate form of renewable power. Our scientists and engineers are looking at the biggest natural [fusion reactor](#) for inspiration – the sun. By

containing the power of the sun in a small magnetic bottle, we are on the fast track to developing compact fusion reactors to serve the world's ever-growing energy needs." Thomas McGuire, compact fusion project lead, said they think they can get to a prototype in about five years. "That's what we are doing here; we are testing the concept out." He said, 50 years ago when people were "super-excited" about nuclear power, "we tried putting it on everything," including airplanes. He said some big operational issues prevented widespread use. "Fusion is a much safer option," he stated. The next generation of airplanes not relying on fuel can just stay aloft—with unlimited range, unlimited endurance. That's what [nuclear fusion](#) can do for an airplane.

The old promise of Atoms for Peace was a noble one, but the technology wasn't right for it. "We can achieve that grand vision and bring clean power to people. The true Atomic Age can start," he said.

Lockheed defines fusion as "the process by which a gas is heated up and separated into its ions and electrons. When the ions get hot enough, they can overcome their mutual repulsion and collide, fusing together. When this happens, they release a lot of energy – about one million times more powerful than a chemical reaction and 3-4 times more powerful than a fission reaction." A reactor [small](#) enough to fit on a truck could provide enough power for a small city of up to 100,000 people.

In a discussion of the Skunk Works effort in Aviation Week, Lockheed's McGuire spoke about the company's interest in attracting interest in the project. "One of the reasons we are becoming more vocal with our project is that we are building up our team as we start to tackle the other big problems. We need help and we want other people involved. It's a global enterprise, and we are happy to be leaders in it," he said. "We have a long ways to go, and there are lots of challenges, but we have a path to do it and a community of fusion researchers and national labs. There's a collaborative atmosphere and we have got some really good

feedback so far." Lockheed Martin aims to get at a prototype in five years. According to the Aviation Week report, the prototype would demonstrate ignition [conditions](#) and the ability to run for upward of 10 sec. in a steady state after the injectors, used to ignite the plasma, are turned off. It would not be at full power like a working concept reactor, "but basically just showing that all the physics works," McGuire said.

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