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## Earth's Innovators

Some people think outside the box. Some don't think about boxes at all.  
**by Dashka Slater**

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### Jay Harman

CEO, Pax Scientific  
San Rafael, California  
[paxscientific.com](http://paxscientific.com)

Jay Harman doesn't usually sit in one place very long. He has worked as a naturalist with the Australian Department of Fisheries and Wildlife, founded one of Australia's largest technology companies, designed a pair of award-winning boats, started a boarding school to teach kids about the environment, sailed 27,000 miles on the Indian Ocean, and invented a noninvasive technology for measuring blood glucose and a method for encapsulating asbestos.



Nature uses the spiral in lilies, eyelashes, and galaxies. It makes a good fan too.

But when he spends time in nature, he moves very, very slowly. In the forest, he walks barefoot, off trail. "It can take me a couple of hours to go a hundred yards," he says. "Sometimes I just watch the ants."

Keeping nature unspoiled, he says, is "the only thing in life that interested me with any sort of power." He found the conservation work he did in Australia boundlessly frustrating: "I would work for two or three years on protecting an environment, and with a stroke of a pen, a politician would hand it over to bauxite mining," he recalls.

What was needed, he decided, was a different approach. "For me, the way to move forward was to try and develop technologies that actually assisted the environment, while also demonstrating to those people running the commercial world that they could make money," he says. "So I started examining the underlying principles in nature that give it sustainability."

Having spent a lot of his life watching water flow, both as a diver and as a sailor, one of those principles fairly leaped out at him. Liquids flow in a consistent pattern, a three-dimensional centripetal spiral. "You pull the plug in a bathtub, and you get a whirlpool," he explains. "The shape of that movement is common throughout everything, from the spiraling galaxies to the shape of your eyelash. And so what we did is reverse-engineer the whirlpool."

Harman's company, Pax Scientific, applied the spiraling geometric pattern

of the whirlpool to the design of a domestic exhaust fan and created one that is half as noisy and three-quarters more energy-efficient. What he calls the "Pax streamlining principle" also applies to industrial mixers, automotive cooling systems, water pumps, even devices for circulating blood in the body. His company now leases its technology to the producers of a wide variety of industrial, commercial, and residential applications. His team of engineers is working on methods for applying spiraling geometry to wind turbines, aircraft fuselages, and marine propellers.

Increasing the efficiency of everyday technology is a huge boon for the environment, Harman points out. "If you use three-quarters less energy, then you have three-quarters less pollutants going into the atmosphere." He hopes that designs like his are also changing the way the world looks at nature. "Nature has already solved every problem humans face and have ever faced," he says. "If you see nature as our university, you're not going to burn down the university; you're going to protect it."

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Photo by Lori Eanes.

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