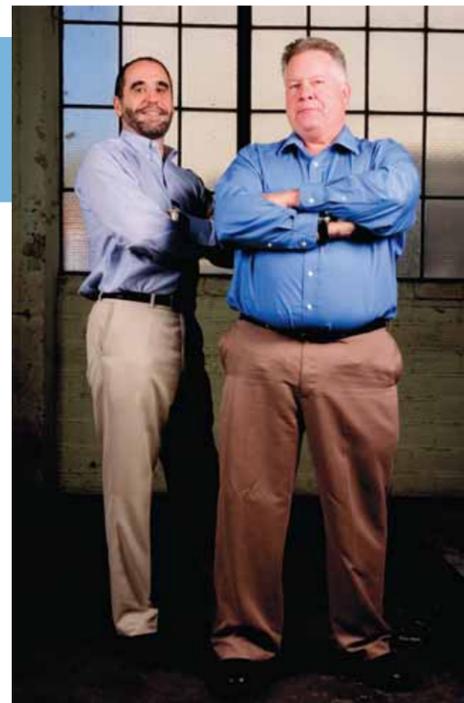


Nicholas Wright

KiteShip has won accolades for its concept of using giant kites to help propel large ships in the open seas.



Nicholas Wright

KiteShip CEO Jeremy Walker (left) and co-founder David Culp.

Go *fly* a kite

Entrepreneurs seek to clean the environment with kite power

by Sue Dremann

David Culp builds kites for a living — big kites. Some are larger than a football field, with a wingspan of 600 feet. They can pull a 600,000-ton ship, hover stealthily in the stratosphere or glide on the solar wind.

“Imagine what it’s like at cocktail parties when people ask you what you do for a living, and you say, ‘I build kites,’ said Culp, a tethered-aviation expert and president and co-founder of KiteShip Corporation, a Bay Area kite technology company with offices in Palo Alto and Martinez.

“They say ‘OK, what does your wife do for a living, because you’re sure not making a living making kites.’ Then when you say, ‘I’m building big kites to fly on ships,’ they start backing away toward the other side of the room.”

Culp laughs. His high-flying ideas are about to revolutionize how commercial ships sail the seas. Attached to sea-going vessels by a specialized cable, these humongous kites rise to the sky on a helium-filled dirigible and capture wind currents. Acting like tug boats, they use wind-power to reduce fuel usage and costs by an average 15 percent to 25 percent; which also translates into an enormous reduction in pollutants, he said.

When the first one sails, hopefully in 2007, it will be the largest flying structure in the world — beating KiteShip’s own 2002 Guinness world record.

The business world is taking notice. KiteShip recently won the California Clean Tech Open’s clean-transportation prize. The competition — created in Palo Alto by Silicon Valley entrepreneurs Michael Santullo and Laurent Pacalin to kick-start innovation in “green” technologies — is the richest contest of its kind, with \$500,000 in prize money and services from top Bay Area venture capitalists and companies, including Palo Alto law firm Wilson, Sonsini, Goodrich & Rosati and Lexus.

The amazing thing to CEO Jeremy Walker is that KiteShip beat out seven competitors involved in automotive technologies — for a prize offered by car company Lexus. KiteShip did not even fit into any of the transportation prize’s categories, which all revolved around road vehicles, Walker said.

But one cargo ship outfitted with one KiteShip system will save 2 million gallons of fuel per year — equivalent to the gas saved by 6,000 hybrid autos — and will reduce 2 million pounds of sulfur dioxide emissions annually, the equivalent of replacing every automobile in California with a hybrid, according to Walker.

“We’re delighted the judges took our wider view of transportation. Ninety-percent of everything goes by sea. The ocean is our commercial lifeline,” Walker said.

Although the concept seems like something out of

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 – David Culp, President and co-founder of KiteShip

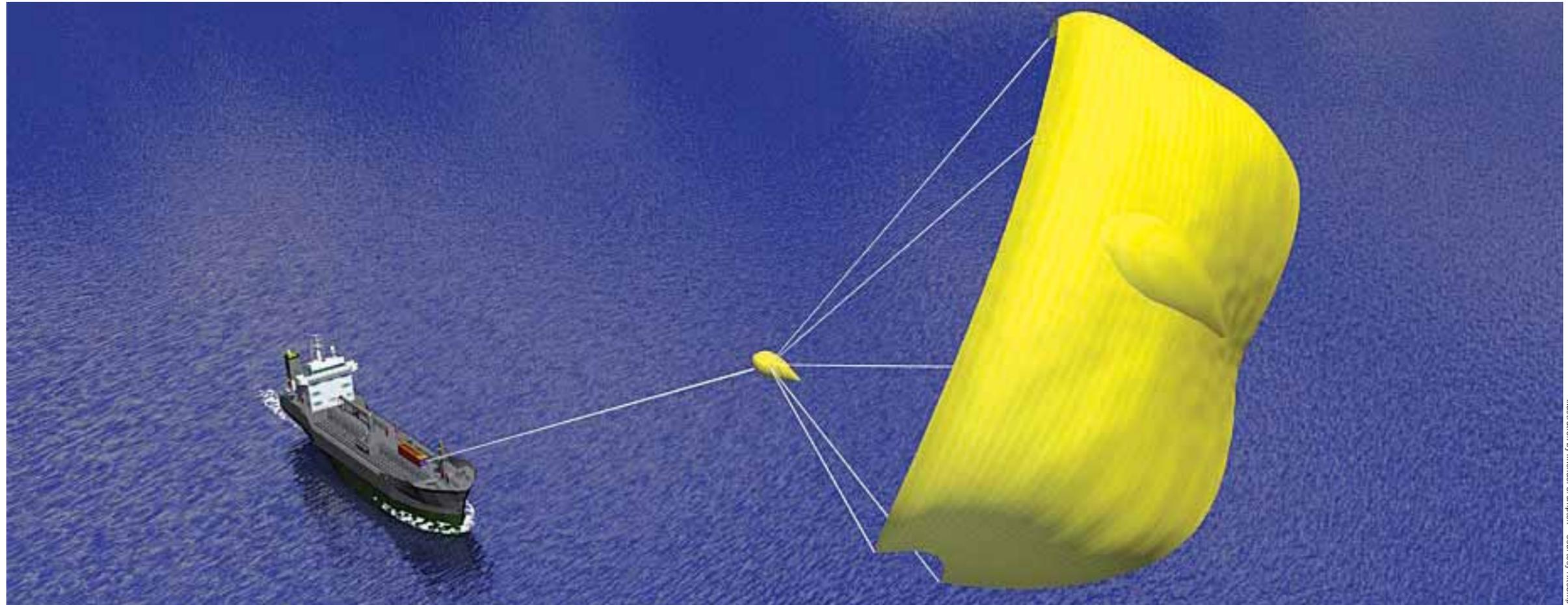


Illustration by Michael Crumpton – Courtesy KiteShip

The company expects the first kite-powered hybrid ships will be at sea in 2007, but other uses are being investigated. KiteShip kites may accurately and inexpensively drop humanitarian aid and heavy equipment, move multi-ton stones into replicas of ancient monuments and move logs in remote forestry operations in Alaska, Canada and Russia — or float in outer space.

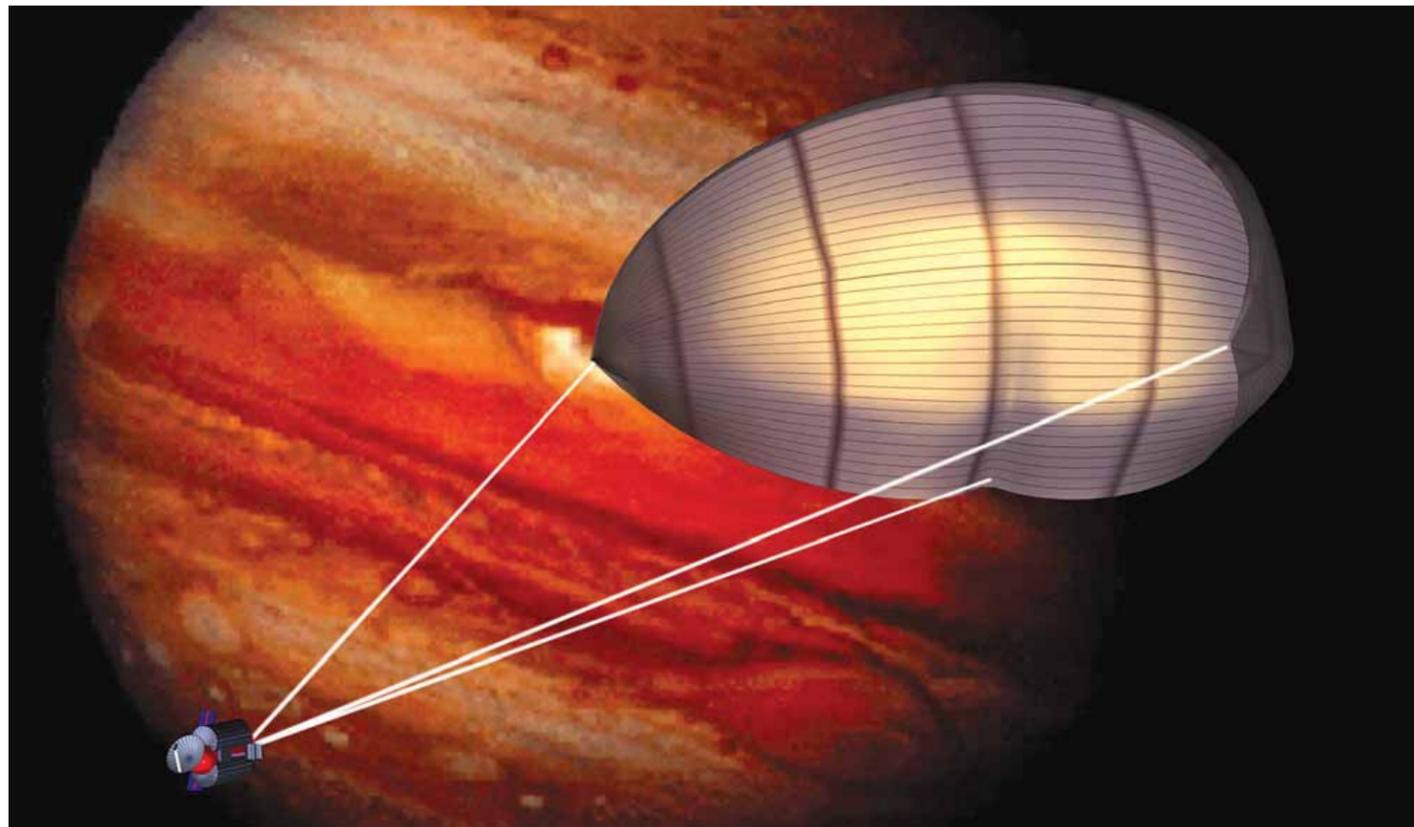


Illustration by Michael Crumpton – Courtesy KiteShip

KiteShip

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speculative fiction, it has been around since the 1920s. The hindrances that prevented such technology from taking flight have been eliminated in the last 30 years, Culp said.

Culp and Chief Technical Officer Dean Jordan co-founded KiteShip in 2001. Both men have been active in the traction kite industry (kites that pull objects) since 1973.

Culp was educated at Stanford, Westlawn and University of California at Davis in Engineering, Industrial and Sailcraft Design. He has designed and built boats and kites for speed-sailing and pleasure boats.

Jordan is a professional kite designer. He was the first to build ultra-light and hyper-lightweight kites, and was one of the first to perfect land-sailing kites for kite buggies.

Walker, an experienced ocean-racing skipper with extensive connections in the marine industry, is a Palo Alto resident. He has been a Silicon Valley executive and an adviser to clean-tech startups on product development, marketing and positioning for investment.

In 2001, Larry Ellison’s Oracle Racing, Inc. commissioned Culp to design a new type of kite that could pass stringent America’s Cup regulations. The kite was developed in secrecy in the Mojave Desert.

“Every time a car came by, we had to hurry up and take it inside,” he said.

KiteShip succeeded in five months but Ellison wasn’t interested in buying the product, Culp said. Ellison had learned that two Cup-racing competitors were trying to design a regulation-legal kite.

“He didn’t want to purchase the kite; he wanted us to prove it couldn’t be done,” Culp said.

The competitors abandoned their plans, and Ellison lost interest.

KiteShip began manufacturing the regulation-legal kites in 2003, after the secrecy agreement with Oracle expired. The OutLeader-brand kites are now sold for recreational yachts and power vessels throughout the world, he said.

KiteShip is creating traction kites for the commercial shipping industry. An oil tanker burns 5 tons of fuel an hour and is continuously on the move, 320 days per year. Transportation fuel prices have increased tenfold in the last 25 years, according to Walker. Five years ago, it accounted for 25 percent of operating costs; now it has spiked to 50 percent.

Shipping companies are generally happy if they can shave \$1 per ton from their fuel costs. Add a kite and it’s like taking the foot off the gas, Culp said. The wind keeps the ship’s speed up, but allows the engine to work less. A single sail can pull 100 tons; and that translates into a 15-percent to 25-percent cost savings.

“A fleet of eight tankers can save \$8 million a year,” Walker said.

Saving fuel also means reducing pollutants. Increasingly, ship owners are coming under pressure to clean up emissions. Ship-fuel comes from the bottom of the barrel. It’s the heavy sludge left after refining. It puts 33 percent more carbon dioxide into the atmosphere than gasoline. And it’s 900 times more polluting in terms of sulfur than truck diesel fuel, he said. Sulfur dioxide causes acid rain.

“The world’s shipping fleet uses 10 percent of the fuel of all road vehicles, but emits 50 times as much sulfur dioxide as all of the world’s cars and trucks combined,” he said. A single kite can cut back on fuel consumption and emissions by 20 percent or more, he added.

Kite-power has several advantages over sails. Sails fly from masts supported by the ship. As wind hits the sail, it can cause a ship to roll. Ballasts, weights, and other devices add tonnage and take up space to keep a mast-ship upright.

Kites, however, are free-flying. Lightweight kites made of spinnaker nylon, Kevlar and other materials are tethered to a

ship by a polyethylene cable, eliminating weight and rolling problems, and it can be stored in a box on the ship. Because it is mastless, it can be retrofitted onto existing ships. Carrier ships can’t be retrofitted with masts; they must be built from scratch at a cost of \$10 million to \$15 million. A single kite system for a 600,000-ton container ship, including wireless computer controls, could retail for \$2 million, Walker said.

A football field-sized kite can weigh up to 3,000 pounds. The helium blimp keeps it aloft so it won’t fall into the water and tangle up with a ship’s propellers, Culp said. When people tell him it can’t be done, that the kites are too big, he points out that the Hindenburg airship was almost as large.

KiteShip is getting ready to silence the nay-sayers. The company expects the first kite-powered hybrid ships will be at sea in 2007, but other uses are being investigated. KiteShip products may accurately and inexpensively drop humanitarian aid and heavy equipment, move multi-ton stones into replicas of ancient monuments and move logs in remote forestry operations in Alaska, Canada and Russia.

There is even outer space. Sailing doesn’t require wind over water or even wind over land, Culp said. KiteShip can harness the currents between the Earth’s jet stream and the adjacent still air or fly a pair of tethered wings in outer space on solar wind.

The company is working on programs to explore the surface of Mars. Land-sailors such as the Mars rover have a limited range because they can only exploit weakened solar energy, but kites flying on wind can cover hundreds of miles in minutes, taking photographs and dropping robotic equipment with pinpoint accuracy, or remain in stasis in a still-air zone, Culp said.

And if someone refuses to believe it is possible? “I can always tell them to ‘go fly a kite,’” Walker said. ■
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