FIBERSET
FOUNDER: Marie Walker
MISSION: Makes rocket parts out of composite materials

PHOTOGRAPHS BY BRAD SWONETZ—REDUX

Forget NASA. The real future of America's space program may well lie in a thriving desert town of entrepreneurs who aim at the stars.

ROCKET TOWN U.S.A.

BY JUSTIN MARTIN MOJAVE, CALIF.

OUTSIDE HANGAR 7, THE DESERT AND SKY STRETCH AS far as you can see, broken only by the distant Tehachapi Mountains and the occasional Joshua tree. Inside the hangar the view is equally dramatic. A rocket, 30 feet long, lies on its side. Nearby sits a large capsule, looking like something out of the Apollo program. But this is the Neptune program—run not by NASA but by Roderick and Randa Milliron, a husband-and-wife rocketry company.

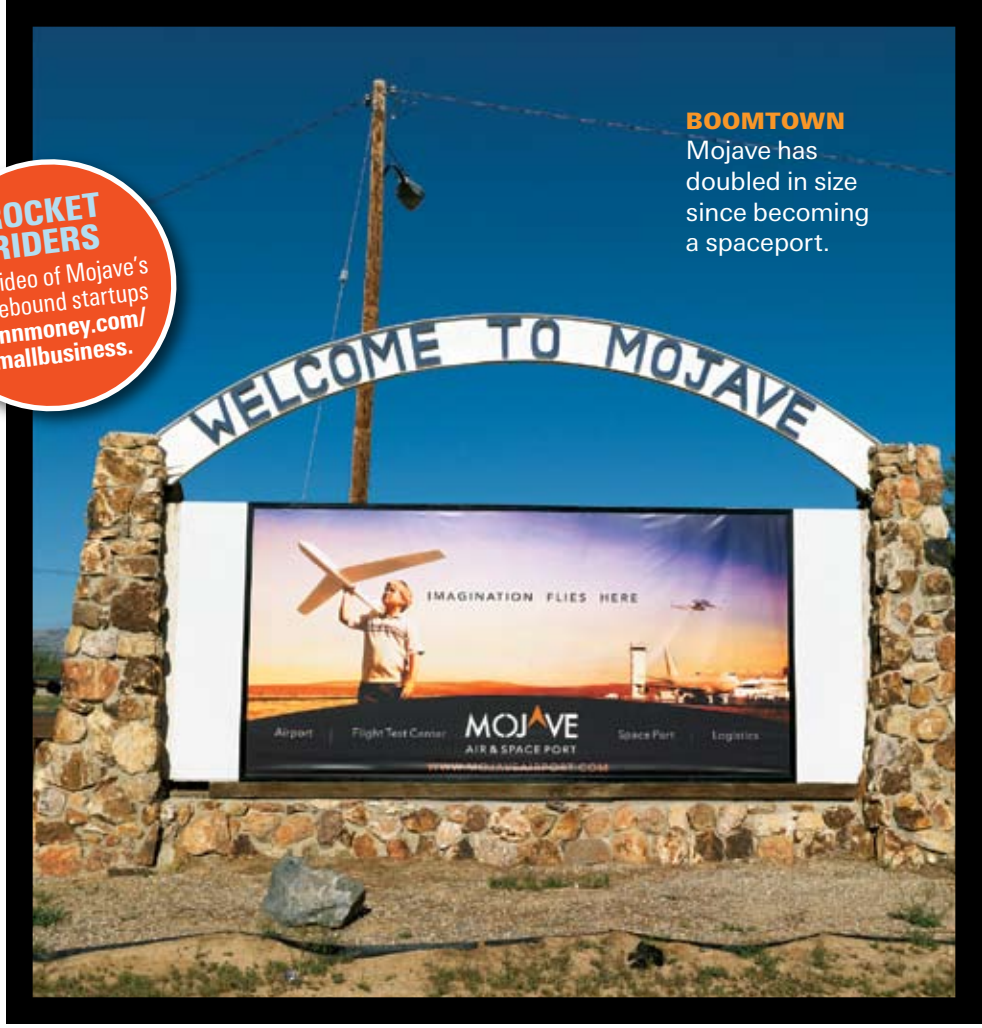
The Neptune sure looks convincing. But will it fly?

Welcome to Mojave, Calif., where "Will it fly?" is a constant question. The desert town is home to eight small rocket companies, twice the number of a decade ago. The town now boasts 4,000 residents, up from 2,700 five years ago, pursuing a galaxy of ambitious business models: space tourism, rocket-powered sports, and space-based experiments for corporations and scientists. Like any good business ecosystem, Mojave also has a growing cluster of companies that support the rocket firms: fabricators of exotic materials, parts suppliers, and even restaurants that cater to the space set.

Mojave can draw on a deep well of California aeronautics and engineering talent on the cheap. It is a 90-minute drive from Los Angeles, home to aerospace companies such as Lockheed Martin, and five hours from San Francisco. The pay at rocketry startups such as the Millirons' can be as little as $16,500 a year. Yet these companies lure fresh hires with the promise of inspiring work and a bargain-basement cost of living.

On average a Mojave home goes for about $150,000, less than a third the average cost in L.A. Still, Mojave is clearly in the boonies. The town doesn't even have a movie theater. "Here it's possible to test rockets in a very unpopulated area," says Mike Massee, a board member of the local Chamber of Commerce. "If something blows up, you're not going to take out an entire neighborhood."

ROCKET RIDERS
See video of Mojave's spacebound startups at **cnnmoney.com/smallbusiness.**



BOOMTOWN
Mojave has doubled in size since becoming a spaceport.

Another draw is Mojave's 12,500-foot runway, longer than anything at Los Angeles International. During World War II, Mojave's airport was used to train Marine pilots. After the war it became a private airfield favored by owners of vintage biplanes and decommissioned fighter jets. In 2004, Mojave's airfield became the first inland facility to receive FAA approval for space traffic.

That same year saw the first small company reach space: Scaled Composites, then owned by Mojave entrepreneur and airplane designer Burt Rutan. His revolutionary *SpaceShipOne* became the first private craft to ascend 62 miles to the edge of suborbital space, twice over two weeks. That netted him the $10 million Ansari X Prize, but even larger purses awaited. Last August, Northrop Grumman purchased Scaled Composites for an undisclosed sum. And Richard Branson commissioned Rutan to design and build the first batch of rockets for a space tourism business, Virgin Galactic.

This summer Rutan began testing *SpaceShipTwo*, which is twice the size of the original, in the nearby desert. Branson has taken $30 million in deposits from customers hoping to take a 2½-hour space flight. Virgin Galactic is hoping to launch in 2010, and has many would-be rivals. "All the rocket pioneers in town want to be like Burt," says Bill Deaver, editor and publisher of the *Mojave Desert News*. "The stakes are big, the money is big, the glory is huge."

Most Mojave rocket startups, however, are still operating on a shoestring. Roderick and Randa Milliron, both 57, have been operating out of Hangar 7 since 1996. On a microscopic revenue stream ($150,000 in 2007) they've managed to keep their business going, and in flush time have hired up to 25 employees.

To fund their dream, the Millirons seize any side project they can find. They consulted with the state of Texas about locating a spaceport like Mojave along the Gulf Coast. Hollywood studios have paid to record some of the engine tests that the Millirons have conducted out in the desert. Spaceship sound effects in movies such as *War of the Worlds* and *Serenity* are from their rocket engines.

"Rod and Randa are from another planet," says test pilot Dick Rutan, brother of Burt. "But nobody knows what's going to work. Lots of industries we now take for granted grew out of innovators trying things. We need a whole bunch of ideas—the weirder, the better."

"WE WANT OUR PASSENGERS TO EXPERIENCE A PRIVILEGED PERSPECTIVE FROM 250 MILES UP."

The Neptune, partly powered by a proprietary fuel that the Millirons identify only as Hydrocarbon X, certainly fits that bill. The Millirons are currently seeking funding for a series of test flights of their 90-foot multistage rocket next year. In the long run they plan to offer full space vacations for as many as six people at a time. After a month of training, passengers would spend a week in orbit before the capsule parachutes into the ocean.

Such a ride does not come cheap: The Millirons plan to charge $2.5 million a ticket, although the first ten Neptune passengers will get promotional fares of $250,000. (A Virgin Galactic ticket is set to cost $200,000.) "We're not interested in a short flight where you kiss the edge of space," says Randa. "We want our passengers to circle the earth, experience orbital sunrises and sunsets, and get a privileged perspective from 250 miles up."

Over in Building 25, you'll find a very different dream in progress. Instead of high-end space tourists, Dave Masten wants to capture the market for low-end space science. Masten is a Silicon Valley refugee who cashed in his options and moved here in 2006, after Cisco bought a small company he worked for. For a second act Masten is hoping to offer an alternative to an expensive NASA rocket program.

NASA regularly launches rockets to conduct zero-gravity experiments in the

INTERORBITAL SYSTEMS
CO-FOUNDERS: **Randa and Roderick Milliron**
MISSION: Offer weeklong space vacations for six people at a time

MASTEN SPACE SYSTEMS
FOUNDER: **Dave Masten**
MISSION: Create space-based research at low prices

earth's upper atmosphere. You can place your payload aboard one of these rockets. But competition is fierce, and the cost can be more than $1 million. Masten asked 250 recent users of NASA's rockets, If I could bring down the cost to around $25,000, would you conduct more experiments? The response was overwhelmingly positive, and Masten feels he's found a niche worth billions. For one thing, all computer chip makers need ever more precise crystals. In zero gravity crystals can grow with almost no defects.

Masten, 40, has also identified the nation's 58 million school children as a potential market. He plans to offer something called a SodaSat, a Coke-can-sized payload that for a $99 fee can be transported alongside larger corporate and academic payloads. "A kid could send a seed into space to learn how it's affected by microgravity," he says. "Wouldn't that be an amazing science project?"

To capture these markets Masten needs to build a craft capable of leaving the atmosphere, providing a few minutes of precious space time, and returning the payloads safely to earth. He has staked his hopes on the XA rocket, a squat, pyramid-like design. A prototype of the rocket sits in his hangar with a gaggle of exposed wires, tubes, and valves. So far Masten has conducted tests where the XA has risen only a few inches off the ground.

Not all Mojave companies are coasting on fumes. XCOR is the most prosperous of the local rocket startups, and the one with the best prospect of being the next Scaled Composites. Headed by former Intel executive Jeff Greason, 41, XCOR makes rocket engines for clients that include NASA. XCOR, now nine years old, even managed to turn a small profit in

MILLER AIMS TO CREATE A GIANT WI-FI HOT SPOT IN SPACE, SO THAT SPACE TOURISTS CAN SEND E-MAILS HOME.

Revenues for Masten are even more scarce than for the Millirons. Masten and his four employees have burned through $1.25 million, which includes his Cisco proceeds, funding from an angel investor, and money invested by friends. Masten has pretty much maxed out his credit cards as well. Still, he defiantly predicts better test results for the XA. "Ever since I was a little kid I wanted to build rockets," he says. "I still intend to."

2006, though it lost money in 2007 on revenues of $3.6 million.

Greason's most glamorous commission so far is developing the Rocket Racer, a light aircraft powered by rocket engines, for the Rocket Racing League. Think of it as NASCAR in the sky: As many as ten rocket planes race around a five-mile circuit, 17,000 feet in the air. There would be spectators, of course, but the RRL will be a truly made-for-TV sport. The planes will

XCOR
FOUNDER:
Jeff Greason
MISSION: Build the X-Racer for the Rocket Racing League

be mounted with cameras, and the track will be superimposed the way first-down lines are laid out in NFL broadcasts.

The RRL is the brainchild of Granger Whitelaw, an auto-racing investor who provided the financial backing for two winning Indy 500 teams, and Peter Diamandis, creator of the X Prize. Its first exhibition race will take place at an air show in August, and XCOR is one of two companies providing the Racers. The prototype, about the length of an SUV, is hidden behind a scrim in a corner of XCOR's hangar.

Greason continues to sweat the Racer's details. The Racer can be filled up in less than ten minutes, says Greason, but because pit stops will be as vital in the RRL as they are in NASCAR, he's working hard to pare that down. Then there are the plane's rocket flames. Whitelaw requested something visually dramatic, so Greason used a mixture of liquid oxygen and kerosene. The result "is enormously bright," he says. "I've seen it from about 15 feet away in daylight, and it's almost painful to behold."

To keep his workers focused on vehicle safety, Greason has laid down an unusual management rule: Each of XCOR's 25 employees, down to the receptionist, will eventually fly in one of the company's creations. When asked if she's looking forward to her flight, the receptionist nods and flashes a nervous smile.

After XCOR, the most successful spacebound small business belongs to Marie Walker, 47. Her 40-employee company, Fiberset, makes lightweight rocket parts out from composite materials and had revenues of $2.4 million in 2007. It is privately held and profitable, according to Walker. A platinum blond with pink nails and a folksy style, Walker is hardly what you would expect a rocket entrepreneur to be. Raised in a cash-strapped family in a nearby town, she took a job at Fred Jiran Glider Repair, which made parts for mail-order kit planes. She married a co-worker, Jim Walker, a self-taught engineering whiz, and the couple left to found Fiberset in 1983.

The company built a client list that included aerospace companies and boatmakers. All that was threatened in 2003, when the pair went through a messy divorce, and Marie wound up with the company. "I wasn't sure I could run it," she says. In fact, she not only held on to the client base but expanded it to rocket companies, for which Fiberset makes nose cones and another parts.

Walker's success prompted her to give back to Mojave, where she organizes a model-rocket competition at a local school. Entrants are required to come up with a marketing plan for a space business that would launch 25 years from now. "I want these kids to be exposed to the opportunities they'll have right here in their own community," she says.

You see a lot of long-term thinking at all levels of the Mojave ecosystem. Take Jim Miller, 39, who left a low-level telecom job in L.A. in 2001. His Mojave company, High Desert Wireless, provides Internet service to the hangar headquarters of rocket pioneers. Revenues have doubled each year and now stand at roughly $500,000, and the company is profitable, Miller says. But that's not where his dream ends: Miller aims to create a "giant Wi-Fi hot spot in space," so space tourists can send e-mails home.

Many of these plans are hatched at the Voyager Restaurant, the greasy spoon of choice for rocketeers. Unlike many of its customers, the Voyager boasts healthy revenues—$500,000 in 2007—and double-digit profit growth, according to owner Marie Saady.

The Voyager is packed at breakfast time, and a palpable buzz travels through the room when eminences like Dick Rutan arrive. Mojave's more confident entrepreneurs order the Perfect Landing (eggs, bacon, and sausage patties), while others seem better suited to the Crash Landing (the above, mixed up on a tortilla). Either way, it seems a fair bet that space business will still be here when the town's grammar school rocketeers are all grown up. □

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