

# PROFILE

## Gwynne Shotwell



**PRESIDENT, SPACE EXPLORATION TECHNOLOGIES CORP.**

## Aiming to Break the Cost Barrier

Since bursting onto the scene in 2002 promising cheap but reliable launches for satellite projects on shoestring budgets, Space Exploration Technologies Corp. (SpaceX) has yet to put a single spacecraft in orbit. But that has not stopped the Hawthorne, Calif.-based company from setting its sights on two of the hardest markets to crack: NASA human spaceflight and the launch of U.S. national security payloads.

After six years of effort and three back-to-back rocket failures, SpaceX finally achieved orbit last September with a demonstration launch of its Falcon 1 rocket.

The two-stage vehicle is slated to lift off again in April on a long-planned mission for the Malaysian Space Agency.

SpaceX's launch manifest is dominated for the next several years by Falcon 9, a bigger, more powerful rocket currently on the launch pad at Cape Canaveral Air Force Station in Florida awaiting a summer launch for an unidentified U.S. government customer.

Later this year, SpaceX will launch its first demonstration flight for NASA's Commercial Orbital Transportation Services (COTS) program, a \$500 million public-private partnership to help SpaceX and Dulles-Va.-based Orbital Sciences develop the means to de-

liver cargo to the international space station after the space shuttle is retired. In December, NASA awarded SpaceX and Orbital Sciences two new contracts worth a combined \$3.5 billion to haul cargo to the station through 2016. Chicago-based PlanetSpace protested the award, putting the contract on hold pending a resolution.

SpaceX President Gwynne Shotwell is leading the company's efforts to fill out its Falcon 1 and Falcon 9 manifest with a mix of government and commercial customers.

Shotwell's promotion to president in December put her in charge of SpaceX's day-to-day operations as the company seeks to deliver on an ambitious launch manifest while fielding a new rocket and a reusable, pressurized space capsule called Dragon. The company's founder and chief executive, Elon Musk, intends to continue to be a driving force behind SpaceX's strategic plans, which include capturing a share of the U.S. Air Force's Evolved Expendable Launch Vehicle (EELV) business and selling NASA on using Dragon to ferry astronauts to the space station. Shotwell discussed plans for SpaceX with *Space News* staff writer Becky Iannotta.

### How is SpaceX doing financially?

We have money to continue our work in 2009 with no new contracts. We're in very good shape. I think almost everybody in the aerospace industry is laying people off. We're still hiring and we're giving raises. We grew tremendously last year — we're up to 625 or 630 staff.

### Is SpaceX planning any acquisitions?

No. SpaceX is growing, but mostly organically. Counterintuitive to efficient operations, we find that the more we progress the more we bring in-house. We find that SpaceX departments and groups can provide the product, the pieces of the rocket, more cost-effectively, more reliably on time, on schedule and on budget than many of the vendors or suppliers we've worked with, so we continue to increase the amount that we do in-house.

### Who is your competition?

I can tell you where I think my competition is in the Falcon 9 class. Falcon 9 is about \$40 million. India's Geosynchronous Satellite Launch Vehicle is probably next, but they can't throw a payload as large as Falcon 9 can handle. Land Launch is next, then Soyuz. Sea Launch is \$100 million or so, and the lead position on Ariane 5 is around \$130 to \$140 million.

### Why should government and commercial customers choose SpaceX over other launch providers?

With Falcon 1 we've demonstrated that we have the technology and the team to get to orbit. Falcon 9 is designed from the ground up to be even more reliable than Falcon 1 and offers reliability features superior to other vehicles. These other vehicles are

great vehicles with great track records. But fundamentally, architecturally, Falcon 9 is a more reliable vehicle; we just need to get it operational. Then it just turns out to be a matter of price.

We can talk about an example. Two EELVs were launched last year and the infrastructure payment for that was somewhere between \$1.2 billion to \$1.6 billion in addition to maybe \$110 million a piece for the actual launches. No one could call that cost-effective. The price for a commercial Falcon 9 launch is about \$38 million. There's no question the government buys launches in a different way, requiring the launch service provider to do more analysis and provide more documentation. So a Falcon 9 launch might cost the Defense Department \$50 million.

### Are you concerned that some start-ups that would otherwise buy launches from SpaceX could find themselves in trouble amid the global economic crisis?

If they need to go out to the debt markets or equity markets, they could be. On the other hand, we're having some of the more conservative operators approach us as well now because they need cost-effective solutions. They can't continue to afford launching their systems on these very expensive rockets.

### How do you expect SpaceX to fare under the administration of U.S. President Barack Obama?

If you look at some of the things that Mr. Obama has been pushing — entrepreneurship, small business, cost-effective products and services — I think we're in good shape. I don't think he's ever made some philosophical remark contrary to what SpaceX is doing or plans to do. If you couple that with declining budgets and the need to find more cost-effective ways to get things done,

right now we're the answer in space launch.

### Who are your government customers?

The Pentagon's Operationally Responsive Space Office paid for Falcon 1's third flight. We still have a contract to launch a TacSat, and we're working with U.S. Naval Research Laboratory right now to find a launch opportunity that fits within their budget. The Defense Advanced Research Projects Agency paid for the first two Falcon 1 flights.

There have been a lot of rumors that we've had a lot of government financing of our product and we haven't. The COTS program is the only program where there's actually been some nonrecurring development dollars associated with it. Although they gave us \$278 million, there are three demonstration flights included in that. So if you were to do the math, pricing Falcon 9 Dragon flights at \$80 million apiece, that works out to \$240 million. So less than \$40 million covers the development. SpaceX is paying for the rest.

### What other government business is SpaceX going after?

We are definitely going to compete for the EELV program. We've been working with the Air Force. They've given us a set of criteria to meet before they'll on-ramp us.

Hopefully we'll be successful this year selling the Air Force a Falcon 9 demonstration flight. We don't want them to wait for two successful flights and then start a procurement, because a procurement takes a year or more to conclude and then you still don't launch for another two years.

If they wait, the Air Force would continue for the next three years to pay almost a billion dollars for a flight on EELV while Falcon 9 is launching successfully and often.

It's an uphill battle. They have the EELV industrial base that needs to stay in business.

### Is SpaceX looking for commercial customers?

We're negotiating at least 10 more commercial Falcon 9 flights — which I think will close in the next six months — and eight upgraded Falcon 1 flights. All those missions are to be executed from 2010 through 2013.

### What about adding crew capability to Falcon 9's Dragon spacecraft?

There are two major pieces that need to get worked for that to happen. First is the crew accommodation — basically the couches, the crew interfaces and environmental control system. The big piece is the launch escape system. We've designed the structure to accommodate a concept for a launch escape system, we just need to design, build and qualify it.

It's going to take \$350 million to \$400 million to finish that development over about 24 months, so it's not something that SpaceX can take on in the near term on our own. We could chip away at it and do it in the long term.

### How will the PlanetSpace protest of NASA's cargo resupply contract awards to SpaceX and Orbital Sciences affect the schedule for transporting cargo to the international space station?

Hopefully that's not going to move the launch back. We want to execute. The timing is right because we will have finished the COTS demonstrations six or so months prior and it would be great to continue with the momentum associated with the international space station servicing. We don't think anything negative will happen to our award other than a delay. On the flip-side, it's possible that SpaceX could get all the flights. We'd love to accommodate it.