



SPACE CADET

Thirteen years after Mike Fossum '80 graduated from Texas A&M, he went to NASA to follow a dream. Thirteen years after that, the dream came true when he abruptly left NASA behind—along with everything else on the planet.

by David Ferrell '02
Photos courtesy of NASA

Rocket science isn't easy. That's indisputable. Of the all-time toughest jobs needing the greatest skill sets, it probably joins brain surgery at the top of the list.

And while neurosurgeons are undeniably important and admirable, they—along with most other people—generally fail to capture people's imagination the way that astronauts do.

Escaping the earth's atmosphere and traveling into space means testing the limits of physical possibility and experiencing what most only dream of. Astronauts, perhaps more than anyone else, embody the greatest achievements and progress of the human race. Understandably then, they are regarded as heroes.

But for Mike Fossum, fame and recogni-

tion were never motivational factors to join the space program. The humble McAllen, Texas, product loves his job's potential for scientific exploration, not the attention it gets him.

Still, as the engineer-turned-astronaut prepared to join space shuttle Discovery's crew for its summer 2006 voyage, attention is just what he got.

The mission, officially dubbed STS-121,

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was just the second to take place since the Columbia tragedy of 2003, and with questions still lingering about the shuttle program's stability, the focus on Discovery grew sharper by the moment.

Not only would this mission be a major indication of the shuttle's overall safety, but it would either bolster or impede NASA's

ability to complete construction of the International Space Station. STS-121, like rocket science in general, would be extremely difficult, to say the least.

And as the federal government and national media looked upon this summer's launch with particular interest, those affiliated with Texas A&M University were equally entranced by Discovery.

That's because one of their own—a fellow Aggie—was on board ... and his role would be critical to any success the mission hoped to have.

BASIC TRAINING

Mike Fossum first experienced Texas A&M as a high school student in the mid '70s and after that initial brush with Aggieland, he was sold on the university.

“There was no doubt in my mind as I walked across that campus for the first time that this was the place for me,” he says.

Yet as certain as he was of his choice to attend school in College Station, he began to question whether it was ever going to happen.

At that time, Texas A&M began to experience a huge growth spurt that would continue over the next 30 years. As enrollment increased, the university struggled to keep up in certain areas—and student housing was one of them. >>



Fossum, though admitted to Texas A&M, had nowhere to live. It was a quandary that at the time threatened to end his days in Aggieland before they ever had a chance to start. In the end though, his dilemma proved to be a blessing in disguise.

Trying desperately to find a solution to his problem, Fossum stumbled onto something interesting. Apparently, joining the Corps of Cadets meant having a guaranteed place to stay on campus. Once again, he was sold.

With hair down to his shoulders, Fossum immediately strolled over to the Trigon, found the first person he saw in uniform and flatly stated, “I want to join the Corps.”

The cadet looked at him and laughed knowingly. He then peered around the corner and yelled out, “Hey ... we got another one!”

But Fossum would quickly prove to be anything but just “another one.”

“Mike, along with several of his Classmates, really got it as far as how to work together as a team,” said Paul Pausky ’78, an upperclassman of Fossum’s from within Squadron 3. “From the beginning, it was glaringly obvious that he was a natural leader.”

It turns out that Pausky’s premonition was dead-on. By Fossum’s senior year, the once unsuspecting youth who simply wanted a place to live was named commander of his outfit. Even now, Fossum points to that experience as being a catalyst for his future career.

“I learned so much in the process of going through my four years in the Corps,” says Fossum. “I didn’t really know what I was getting myself into, but it changed my life.”

Indeed it did. Prior to joining the Corps, Fossum had no intention of going into the military. During his time as a cadet, however, he was introduced to aspects of the armed forces that were new, exciting and challenging to him.

And so, as his graduation drew nearer, he decided to pursue an Air Force commission—a decision that would not prevent him from further education, it turned out.

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Just a year after receiving his bachelor’s degree in mechanical engineering from Texas A&M, Fossum completed a master’s degree in systems engineering at the Air Force Institute of Technology in Ohio.

Shortly thereafter, he got his first taste of NASA when the Air Force assigned him to work at Johnson Space Center to help develop shuttle flight operations. That encounter inspired Fossum to revisit a boyhood dream he never before gave serious thought to fulfilling—becoming an astronaut. Suddenly, it seemed like it might actually be a possibility.

Fossum’s renewed focus took shape in hard work and more schooling. He was selected to

attend Air Force Test Pilot School at Edwards Air Force Base, California, where he graduated in 1985.

For the next eight years Fossum would stay at the base, serving as an F-16 flight test engineer in the Mojave Desert. But then, in 1993, NASA came calling again. Fossum, recognizing the opportunity, resigned from active duty and moved with his family to Houston to work at Johnson Space Center, this time as a systems engineer.

In this capacity, Fossum’s main responsibility was to evaluate the Russian Soyuz spacecraft as an emergency escape vehicle for the International Space Station. Later, he was selected to participate in a major redesign of the new space station—a project he would become quite familiar with in the years to come.

In 1996, Fossum acted as a technical assistant for space shuttles, supporting design and management reviews. A year later, he was again a flight test engineer—this time on something called the X-38, a prototype crew escape vehicle for the space station.

It all culminated in 1998, when Fossum was selected by NASA for astronaut training. His dream was coming true, and it was just a matter of time before his date with destiny would arrive in the form of a mission.

Then, in the fall of 2003, after years of shuttle simulations, survival training, data analysis, situational tests and intense instruction, Fossum was called upon ... and Discovery was waiting for him.

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sions,” Fossum said before the launch. “I’ve been very lucky and now is my time.”

MISSION CRITICAL

On February 1, 2003, as space shuttle Columbia was re-entering the earth’s atmosphere, structural malfunctions caused it to suddenly disintegrate in the Texas sky. All seven members of its crew were killed.

It was a day of unspeakable tragedy, both for NASA and the entire United States. It was an especially sad day for Mike Fossum, whose work had brought him so close to those involved in the accident.

“The members of the Columbia crew were all friends of mine and that really hurts,” he said. “With something like that, you attend more memorial services than you wish you ever had to think about.”

Following the disaster, NASA was left searching for answers as to what went wrong. They found that a large piece of foam insulation lining the external fuel tank broke off during the launch, struck the shuttle’s left wing and left the ship’s thermal protection system too vulnerable to endure re-entry.

In the wake of the tragedy, NASA slated a series of missions to be part of its “Return to Flight” recovery effort. STS-121 would be the second such mission, and its primary objectives were to perform maintenance on the International Space Station and to test shuttle repair techniques.

The mission would feature two scheduled spacewalks by a pair of qualified astronauts. The first would be Piers Sellers, who had performed similar spacewalks on a previous voyage. His partner would be mission specialist Mike Fossum, a first-time astronaut whose

performance in a series of specialized training sessions earned him the job.

As the crew prepared for take-off, several factors presented cause for concern—the greatest of which were safety issues regarding the external fuel tank foam that continued to plague NASA.

Following Columbia, shuttles were suspended from flight for a little over two years as NASA scrutinized the shuttles’ problems and worked to solve them. The first flight afterward was STS-114—also aboard Discovery—in the summer of 2005.

STS-121 was scheduled to fly six weeks after they returned, but it didn’t work out that way. During that first shuttle launch, a one-pound piece of foam again came off the external fuel tank. Although the crew did return safely, NASA’s engineers were left confused and cautious. Fossum’s trip would be delayed by months as NASA worked to secure the crew’s safety.

“There’s nothing that’s really inherently safe about sitting on top of four million pounds of explosives,” quips Fossum. “But there’s risk associated with a lot of things that are worth doing.

“You just balance things and manage that risk to the best of your ability, and you also trust the people, the professionals and the friends that are in this with you.”

And while the time spent maintaining the shuttle was unquestionably important, it also threatened to leave the crew a little rusty on the procedures and technological intricacies they spent so much time training on.

“With this, you can’t just be trained on something last year and expect to remember all the details,” says Fossum. “There’s a lot to remember that needs to be fresh in your mind.”

In addition to that challenge, the delays only



THE RIVALRY REACHES NEW HEIGHTS

The Texas A&M-University of Texas rivalry has spanned more than 120 years in homes, workplaces and, of course, the gridiron. In 2006, the friendly feud found its way into outer space.

The crew of Discovery featured not just Aggie Mike Fossum, but also Stephanie Wilson, who earned a master’s degree in aerospace engineering from Texas in 1992.

The two naturally engaged in good-natured joking throughout their training, as well as on the actual mission.

During an in-flight call to Fossum, Texas Gov. Rick Perry ’72 personally invited the duo to join him at the Nov. 24 showdown between the Aggies and Longhorns.

“Oh, that would be awesome,” Fossum responded. “I look forward to helping Stephanie eat a little crow.”

Long live the rivalry.

The Discovery crew (from left to right): Mike Fossum, Thomas Reiter, Mark Kelly, Steve Lindsey, Lisa Nowak, Stephanie Wilson and Piers Sellers.



added to the already growing excitement he had about the mission. For Fossum, the space station was a particular source of intrigue. Earlier in his career, he’d spent countless hours over several years designing it. Now he’d be one of the few people who would actually see it in space.

Still, what excited him the most were his spacewalks and the chance to witness the planet rotating beneath him.

“I can’t wait to see the earth, not through thick panes of glass, but through the relatively thin visor on the helmet ... to see the oceans and continents rolling by with my own eyes,” he said prior to the launch.

Overall, Fossum and the other astronauts had to wait nearly a year for their flight, as >>>

NASA wasn't taking any unnecessary chances. When all was said and done, the voyage of STS-121 could have resembled a science experiment gone awry. The actual result was quite the opposite. It was more like a Hollywood movie.

After days of heavy rain in Florida, space shuttle Discovery blasted off over Kennedy Space Center on a bright and sunny Fourth of July—America's 230th birthday. It was the first human spacecraft ever to launch on an Independence Day holiday, and it was a success.

The mission itself would prove to be equally impressive. Originally scheduled to last 12 days, NASA extended it to a 13th in order to fit in a third spacewalk for Fossum and Sellers.

For Fossum, it was quickly apparent how much the experience meant to him.

"I wish I was part poet and not mostly engineer, because, really, the words escape me," he said in a television transmission.

But the astronauts had little time to revel in the wonder of space travel. The crew faced numerous objectives that were absolutely critical to the future of the shuttle program.

Included in the journey was a six-ton cargo exchange with the space station. Along with that, Discovery left behind a European Space Agency astronaut who would stay to work at the orbital outpost for another six months.

The space station itself was a major source of concern for NASA. After Columbia's final mission in 2003, it was left only halfway complete. Finishing construction of it by 2010, as anticipated, would be a daunting task, especially with the recent problems facing the shuttles.

Discovery would open the door for NASA to resume the station's assembly. While docked there, the crew repaired a construction crane that had been immobilized the year before. They restored its movement, thereby allowing construction to continue with future missions.

Of extreme importance were the crew's efforts to implement repair techniques to the heat shield, should subsequent shuttles ever again experience in-flight damage.

On their spacewalks, Sellers and Fossum tested various tools and methods for external repairs. One such instrument was an extension to the shuttle's robotic arm that could be used to make repairs to heat shielding underneath the shuttle. Prior to using this technique, the job could only be done while docked at the space station.

When the crew returned to Cape Canaveral, Florida, on July 17, they were celebrated and rightly so. Discovery accomplished all of its assigned objectives in what turned out to be a picture-perfect mission for NASA. They had overcome the foam insulation hazards, strengthened the safety of the shuttle program and re-established construction capabilities on the space station.



Mike Fossum's Aggie buddies present him with a commemorative shirt for his mission. From left to right: Russel Jones '84, Skip Moore '66, Fossum, Lee Flagg '82 and Martin Cabaniss '83.

Houston was joyous, and Aggies everywhere were proud of their astronaut.

TO AGGIELAND ... AND BEYOND

Mike Fossum was not the first Aggie in space. That honor belongs to William Pailles '81, who earned his master's degree at Texas A&M and was a payload specialist aboard Atlantis in 1985.

Fossum is also not the only Aggie currently working at NASA. There are actually hundreds of Aggies serving there in various capacities.

Fossum is, however, a die-hard Aggie whose love for his school is second to none. When



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asked, he still credits much of his success to the experiences he had in Aggieland.

"Texas A&M gave me a really strong foundation," says Fossum. "The education was important, but for me it was the culture of A&M that made a difference.

"It was the culture of teamwork and camaraderie. It was the belief that there was something here that was more important than you."

He was frequently seen floating around Discovery in Texas A&M apparel, proving that even at 220 miles above the earth's surface he's still an Aggie at heart.

"Part of me is there at A&M on that campus no matter where I am," says Fossum. "Other schools don't have that same kind of feeling."

Fossum still slips back to campus every once in a while, and he still stays in touch with his Squadron 3 buddies. They have a "dead elephant reunion" every year, at which former students from the last 40 years rent cabins in New Braunfels, eat barbecue and relive their old days in Aggieland.

Yet even more stirring than Fossum's support of A&M over the years is Aggies' support of him during his mission.

Prior to lifting off this summer, a few of Fossum's Aggie friends at NASA presented him with a specially-made A&M mission polo he could wear during the trip to remember his roots.

Ten days into the mission, Texas Gov. Rick Perry '72 called to congratulate Fossum through a communications link arranged by mission control.

On July 12, scores of Aggies crowded the Outpost Tavern, a bar not far from Johnson Space Center, to hold a Yell Practice in Fossum's honor.

"Everyone will remember this because of what the Aggie family did," said one spectator. "Anytime an Aggie does something great like this, we celebrate."

But Fossum, always modest, is humbled by the celebration and quick to shine the spotlight on others. He'd rather use the focus he gets from this experience to share a heartfelt message of purpose with the next generation of Aggies.

"Don't be afraid to dream outrageous dreams," he says. "Hang onto them and let that dream be something that spurs you on and work a little harder ... it could take you on the adventure of a lifetime." 🍌