

The Space Workforce Incubator for Texas (SWIFT) presents:

The Space Cowboy Initiative

Building the Skilled Trades Backbone of the New Space Age



Photo Credit: SpaceX

About SWIFT

SWIFT is a nationwide space workforce organization, born in Texas. We unite community colleges, universities, technical schools and industry around one purpose: building the workforce that makes the space economy real. We work on factory floors and in classrooms. We turn what employers need into pathways that schools can deliver.

Our Mission: Building connections. Testing limits. Launching rockets.

Every partnership starts from what employers need. The result is the skilled, credentialed workforce the space industry is desperate for, in Texas and in every state that wants to follow.

Building connections. We turn employer job postings into skills profiles that industry validates. Schools use the profiles to match their courses to real jobs.

Testing limits. Students build, weld, wire, and test real hardware to industry standards. Competitions add the deadlines and inspections of a production line.

Launching rockets. Students design, build, and fly rockets, payloads, and satellites. Each launch gives them a flown project to show an employer.

Our Vision: Dreaming big. Doing more. Launching America.

We connect the people who build with the people who dream. The space economy is shifting from research to production. The designs are proven. The contracts are signed. The delivery clocks are running. The value in the space economy will come from the people mass producing hardware..

Dreaming big. Across Texas, students dream of a bright and prosperous future. Most have never seen a path into the space industry. We show them that path and connect them to the companies that need them.

Doing more. Space companies are building that future now. They hire welders, technicians, and operators faster than schools can train them. We bring companies and schools together so that the training matches the jobs.

Launching America. Together, employers and employees in the space economy are launching America into a new frontier of exploration, discovery, and bright, profitable futures.

SWIFT's flagship program is the Space Cowboy Initiative. This report is its case and its invitation. When the report says "we," it means SWIFT and **you**.

Meet the Board + Advisors:



Geoff Tudor (President)

Spearheaded the legislative team that funded the Delta Clipper and the Clementine missions - paving the way for SpaceX, Planet Labs, and the new space movement.



Dr. Leon Vanstone (Vice President)

Rocket Scientist, storyteller, recovering academic. Leon founded the Texas Rocket Engineering Lab at UT Austin.



Heather Wagner Reed

Award-winning founder and CEO of Juice Consulting, a leading PR and marketing firm in Austin serving the technology + innovation, creative and workforce industries.



Harvin Moore

Sits perfectly at the intersection of space and education. Began his career working on the world's first commercial rocket launch.



Joseph Kopser

U.S. Army veteran, technology innovator, and policy leader focused on national security, energy, and workforce development.



Sandy Barker (Advisor)

Designed simulators and trained astronauts for NASA. Built compliance, quality, safety, and training programs for Firefly Aerospace.



Jennifer Warren (Advisor)

Workforce strategist specializing in CTE pathway development across Texas, covering cybersecurity, accounting apprenticeships, aerospace, and advanced manufacturing.

Executive Summary

Introducing the Space Cowboy



Technicians install a Miranda engine at the test stand in Briggs, Texas. *Credit: Firefly Aerospace*

The Space Cowboy Initiative is a roadmap for any state to build the skilled-trades workforce of the space economy, deliberately and at scale. Supply that industry with every worker it needs, and the industry builds itself around you. That is how a state becomes a gateway to the space economy, and Texas is the proof that one can be built on purpose. The Initiative rests on one idea: workforce is not a supporting function of the space economy. It is the catalyst that unlocks it. Where the trained hands are, the contracts, the factories, and the launch sites follow.

The Space Cowboy Initiative is not a proposal. It is already running. SWIFT works today with school districts, community colleges, and universities to connect their graduates to the space companies that need them. We built the Space Economy Jobs Report from real job postings, and we are turning it into skills profiles, one for each role the industry is hiring, to align curricula with what employers actually need. We are exploring a partnership with a national registered apprenticeship sponsor so that Space Cowboys can earn while they train. SWIFT was a founding partner of Space House at SXSW. And with a grant from the U.S. State Department,

SWIFT is now bringing the same pipeline to New Zealand's space industry. When the federal government funds the export of the Texas model, it means Texas is doing something right.

The space economy has become a manufacturing economy, and that shift is why SWIFT built the Space Cowboy Initiative. The people who build it are the Space Cowboys: the welders, technicians, and operators with the pioneering spirit Texas made famous and every state can claim. SWIFT named them Space Cowboys because it captures the spirit of the commercial space movement. It captures the untamed grit of the historical frontier with the futuristic ambition of exploring the cosmos. It creates a distinct cultural identity for modern space workers who see themselves as pioneers. They're disrupting tradition, embracing failure, and chasing the unknown in a maverick culture with an outlaw spirit.

The data says the gap is skills, not graduates, and the Jobs Report is the Initiative's first product. Jobs follow workforce density, and Houston proved density can be built deliberately; SWIFT is building it across Texas and showing other states how. The workforce already exists, in oil fields, hangars, and technical colleges, in Texas and in every state with an industrial backbone. Mapping it to what employers need is the core of the Initiative. SWIFT has started. Join us.

The job profiles, the curriculum alignment, and the hiring connections are open to every district, college, employer, and policymaker who wants to see their state thrive. Reach out.

WILL YOU JOIN US?

Join the Space Cowboy Initiative

The job profiles: skills profiles for every role the space industry is hiring, built from 5,000 real postings. Available to any institution that asks.

Curriculum alignment: we will work with your district, college, or university to map your programs to what employers need.

Hiring: we connect employers to the programs that already match their floor.

info@swiftrocket.org | swiftrocket.org

The Opportunity

California did not become the richest state in the union by accident. It captured the internet. Today the tech sector employs 1.8 million Californians directly, 4.2 million with the jobs it supports, and pays the state \$56 billion a year in taxes: three of every ten dollars Sacramento collects. One IPO, Facebook in 2012, was projected to put \$2.5 billion into the state budget over five years, on its own. That is what it looks like when a state owns an industry. The companies, the capital, the paychecks, the headlines, and the seat at every table where the future is decided.

Space is that industry now, and it is not yet owned. The global space economy reached \$686 billion in 2025, up 12% in a single year, and the forecasts that once looked ambitious now look timid. McKinsey and the World Economic Forum projected \$1.8 trillion by 2035. Then SpaceX went public in June at \$1.77 trillion, closed its first day above \$2 trillion, and Morgan Stanley now projects that one company alone will generate \$3.4 trillion a year by 2040, five times what the whole industry earned last year. Yet there is still an incredible amount of market share still to be captured in the space economy. Count every company racing to build orbital infrastructure, satellite constellations, and space-based manufacture, and the real number will dwarf anything forecast five years ago. This industry will generate trillions of dollars and millions of jobs over the next decade.



NASA astronaut Joe Acaba tests Intuitive Machines' Moon RACER rover at NASA's Johnson Space Center in Houston, Texas. Engineers and technicians watch and take notes. *Credit: NASA/Josh Valcarcel*

The jobs are already here, and they pay. The U.S. space economy supports 373,000 private-sector jobs at an average of \$155,000 in compensation, more than double the national average wage. Starbase alone has put \$13 billion into South Texas in two years and supports 24,000 jobs. The industry is forecast to add 300,000 high-wage jobs over the next decade, and most of them will not be for engineers. They will be for welders, machinists, technicians, and operators: space-qualified skilled trades, most of them open to a high school graduate with the right certificate.

If Texas captures half of that growth, roughly the share California takes among the leading states today, that is 150,000 careers and, at the Texas aerospace average wage of \$121,500, roughly \$18 billion a year in paychecks, most of them landing in the rural counties and industrial towns where a job like that changes a family. It is the tax base of a new Fort Worth. It is a generation of young Texans who never have to leave the state to build the future. And it is the prestige that comes with it.

In 1962, President Kennedy said, “We choose to go to the Moon in this decade and do the other things, not because they are easy, but because they are hard.”

Every state can make that choice now. The space economy will lift all of them. The states that choose to build its workforce will rise the most. It is anyone's to play for. Texas has the people. Texas has the schools. SWIFT is connecting them to the industry.

SWIFT interviewed two Space Cowboys. Both have their names on the Moon. Neither could tell the next person how to follow them.



James Holster

Titanium spacecraft welder, Firefly Aerospace. High school diploma.

“There isn’t a school that teaches titanium aerospace welding. So where are you going to get it?”



Anthony Montz

Hardware-in-the-Loop lead, Firefly Aerospace. GED.

“It’s very hard for me to articulate the path. I wish I had a better answer for you.”

That is the map SWIFT is drawing. Full interviews in the Appendix.

Contents

The Space Cowboy Initiative is a roadmap for any state to build the skilled-trades workforce of the space economy. The opportunity is enormous. The industry cannot fill the jobs. SWIFT interviewed two of the best in the business. Both have hardware on the Moon. Neither could tell the next person how to follow them. Read the rest of the report for the detail...

The New Space Paradigm [page 10] The space economy has become a manufacturing economy. The designs are proven and the contracts are signed. The constraint has moved from the drawing board to the factory floor, and the work is export-controlled by law, so it cannot move offshore. These are American manufacturing jobs, for a generation.

The Space Cowboy [page 14] The space-qualified tradesperson: the welder who builds the rocket, the technician who tests it, the operator who launches it. Nearly half of the entry-level jobs ask for a high school diploma. Almost every one pays above the \$69,770 national average wage. They are hands-on, so automation has not replaced them, and they last.

A Data-Driven Reality [page 17] The gap is skills, not graduates. SWIFT analyzed 5,000 postings from 27 space employers (SWIFT Space Economy Jobs Report, August 2025). 47% of entry-level roles ask only for a high school diploma, and they go unfilled. One in eight openings is for a welder. One in three asks for a technical certificate. 48% of postings offer tuition reimbursement: employers are training their own workforce because the pipeline does not deliver.

A Proven Blueprint for Growth [page 22] Jobs follow workforce density, and Texas has watched it happen. California takes nearly half of new space openings among the top five states. In 2017 Blue Origin put BE-4 engine production in Huntsville, Alabama, for its propulsion workforce, and NASA followed with the Artemis lander. Houston had the history. Alabama had the hands. Then Houston built the density it lacked with the EDGE Center at San Jacinto College, and Intuitive Machines, Axiom Space, and Venus Aerospace followed.

A Texas Institution: Cowboys and Pioneers [page 26] Texas has the workforce. It needs the connections. The skills the space economy needs already live in Texas's oil and gas, aviation, and manufacturing training base, in the community colleges, technical schools, and high schools near the sites where the industry is growing fastest. Texas does not need a new workforce. It needs to connect the one it has.

The Space Cowboy Initiative [page 31] SWIFT is building this now, and scaling it, with partners at every level: school districts locally, CTE programs, community colleges, and universities statewide, employers nationally, and the U.S. State Department internationally. SWIFT will not do this alone, and should not. It is one small part of Texas, one pioneer in a state full of them. Join us.

The New Space Paradigm



Rocket Lab workers celebrate the completion of the first Archimedes rocket engine. *Credit: Rocket Lab*

For too long, space workforce strategy has been built around a single image: the rocket scientist. Brilliant. Credentialed. Irreplaceable. That image was accurate for its era. It is no longer accurate for today's new space paradigm. The industry has moved, and the workforce pipeline has not followed. Every great quarterback knows the rule. You do not throw to where the receiver is. You throw to where he is going to be. The ball leaves your hand before the play has opened, on the faith that your read of the field is right. The winner is not the team with the strongest arm. It is the one that sees where the game is headed before anyone else does. The states that become its gateways will be the ones that anticipate its workforce needs, while everyone else is still throwing to where the receiver was.

The global space economy reached \$686 billion in 2025, up 12% in a single year, and Novaspace forecasts it will cross \$1 trillion by 2034. That number is staggering, but it is already a historic underestimate. When McKinsey and the World Economic Forum projected the space economy would reach \$1.8 trillion by 2035, it was considered ambitious. Then, in June 2026, SpaceX went public at a \$1.77 trillion valuation and closed its first day of trading worth more than \$2 trillion. A single launch provider realized that entire prediction a decade early, in one afternoon. Morgan Stanley now projects that SpaceX alone will generate \$3.4 trillion a year by 2040, roughly five times what the entire industry earned in 2025. The real number, when every company racing to build orbital infrastructure, satellite constellations, and space-based compute is counted, will dwarf what any forecast from five years ago dared to project. The Space Economy will generate trillions of dollars in real economic value and millions of jobs over the next decade.



Teams from NASA, Boeing and White Sands Missile Range stand beside a Starliner test capsule after rehearsing landing recovery and crew extraction in New Mexico. *Credit: NASA/Bill Ingalls*

These are no longer startup companies raising their next round to prove out a design. The designs are proven. The technology works. The contracts are signed and the delivery clocks are running. This industry has crossed the threshold from research to production, and production is not an engineering problem. It is a manufacturing problem. The majority of the economic value created by the space economy over the next decade will not come from people who design rockets. It will come from the people who build them, at scale, on schedule, day after day. That workforce is the Space Cowboy.

Without Space Cowboys, none of the trillions materialize.

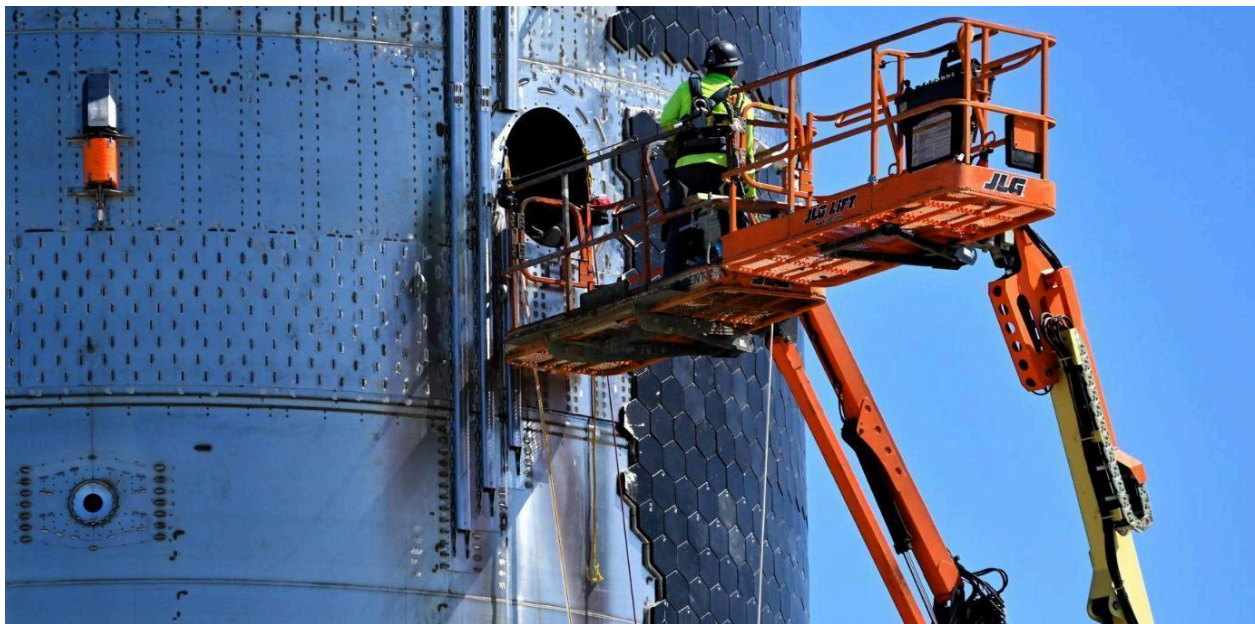
The companies racing to capture these trillions are making this unmistakably clear: they are focused on production at scale. SpaceX is constructing a Gigabay at Starbase in Texas, a facility designed to produce up to 1,000 Starships per year, which Musk described as "by some measures the biggest structure in the world." When asked about the ceiling, Musk replied simply: "Yes, at massive volume. Maybe as high as 10,000 ships per year." Meanwhile, SpaceX is already manufacturing roughly ten Starlink satellites every single day. Blue Origin has announced TeraWave, a 5,408-satellite constellation targeting enterprise and government connectivity, and filed with the FCC for Project Sunrise, a network of more than 50,000 orbital compute satellites. In late March 2026, Musk unveiled TERAFAFAB, a joint venture between SpaceX and Tesla targeting over a terawatt of compute output per year, with roughly 80% destined for space. Closer to home, Firefly Aerospace more than doubled its revenue in 2025 and is guiding toward \$420 to \$450 million in 2026, driven not by another fundraising round but

by delivery contracts with hard milestones. CesiumAstro raised \$470 million to build a 270,000-square-foot manufacturing facility west of Austin. Its CEO called it a "scale moment": "We're moving from breakthrough to becoming part of the American industrial backbone."

The constraint has moved from the drawing board to the factory floor.

Space Economy companies are no longer raising money to do more research. They are generating revenue by building things, on schedule, at scale. The constraint has moved from the drawing board to the factory floor, and the workforce that operates that factory floor is not engineers. It is welders, machinists, avionics technicians, and systems operators. For every engineer who designs a system, the industry now needs a team of space-qualified skilled tradespeople to build, test, and maintain it.

This is manufacturing. Washington and the state capitals are spending real political capital to bring manufacturing back to American soil, and they are looking for industries that will stay. Space is one of the few that cannot leave. Rockets, spacecraft, and the parts that go into them are export-controlled under federal law. Without a federal export license, they cannot be built anywhere but here. No company can simply send this work to China or India. No cheaper labor market can take it. **These are American manufacturing jobs by law, for as long as the industry exists, and the industry is only getting bigger.**



Workers repairing Starship in Boca Chica, Texas. *Credit: nasaspaceflight.com*

If the majority of the space economy's value is created on the production floor, what does a state capture if it cannot staff that floor? **The answer is simple and brutal: Nothing. Not a contract. Not a facility. Not a job.**

The space economy will generate trillions of dollars over the next decade and is already being described in terms that dwarf that figure over the next century. The ambitions on the table right now, from 10,000 Starships to a terawatt of orbital compute to tens of thousands of satellites delivering AI infrastructure from low Earth orbit, do not get built by PhDs writing papers. They get built by Space Cowboys. That workforce is the catalyst. Without it, none of the rest materializes. Not the contracts, not the factories, not the launches. The Space Cowboy is the catalyst in this story. The Space Cowboy is the one who makes it real.

This is a rising tide, and it lifts every state that builds for it. But there will be gateways, the places the industry trains, builds, and launches from, and there will not be many. Nobody inherits one. The states that build the pipeline now will anchor the factories, the launch sites, and the industrial corridors that compound for decades. The states that wait will still share in a stronger American space economy. They will not be its gateways. The only way to lose is to wait.



Workers guide the Boeing Starliner capsule onto its Atlas V rocket before NASA's Crew Flight Test. *Credit: United Launch Alliance*

The Space Cowboy



Hands on the hardware: technicians fit fins to a Falcon 9. Credit: Pauline Acalin (@pacalin)

The Space Cowboy is a defining new archetype for the 21st-century space age. The space-qualified technical tradesperson. A Space Cowboy is anyone whose skill, grit, and imagination make space possible. People who show up with their hands and turn a vision into operational hardware in orbit of the earth. They are the workforce that moves space from a laboratory experiment to a mass-production industry. They are the builders, operators, and innovators who stand shoulder-to-shoulder with engineers and scientists, lab coats and work boots, working side by side.

The Space Cowboy is a defining new archetype for the 21st-century space age.

It Pays to Be a Cowboy: Figure 1 shows what space economy jobs pay. Almost every position in the SWIFT Space Economy Jobs Report sits well above the \$69,770 national average wage. Only a handful of internships and entry-level roles fall in the \$40,000 to \$60,000 range, and pay climbs sharply from there. The industry is not just hiring. It is paying a premium for these skills.

These are not minimum wage jobs. They are careers, many of them in rural communities where the economic impact compounds further still.

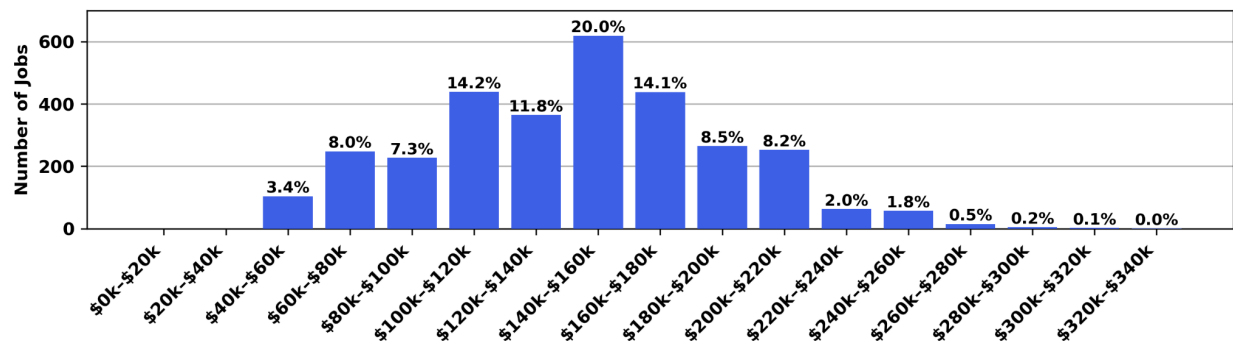


Figure 1 - Salary distribution across the full dataset of the SWIFT Space Economy Jobs Report (August 2025)

It also pays to be a Cowboy for a long time. As artificial intelligence takes over more of the work done at a desk, the Space Cowboy stands in the one place software cannot reach: on the floor, with hands on the hardware. Building, testing, and launching flight vehicles is hands-on work, and it is work that automation has not replaced. These are people doing work only people can do, in an industry that is growing faster than it can hire, and they are paid well to do it. For a generation choosing careers in the shadow of AI, that is not a small thing. It is the whole thing.

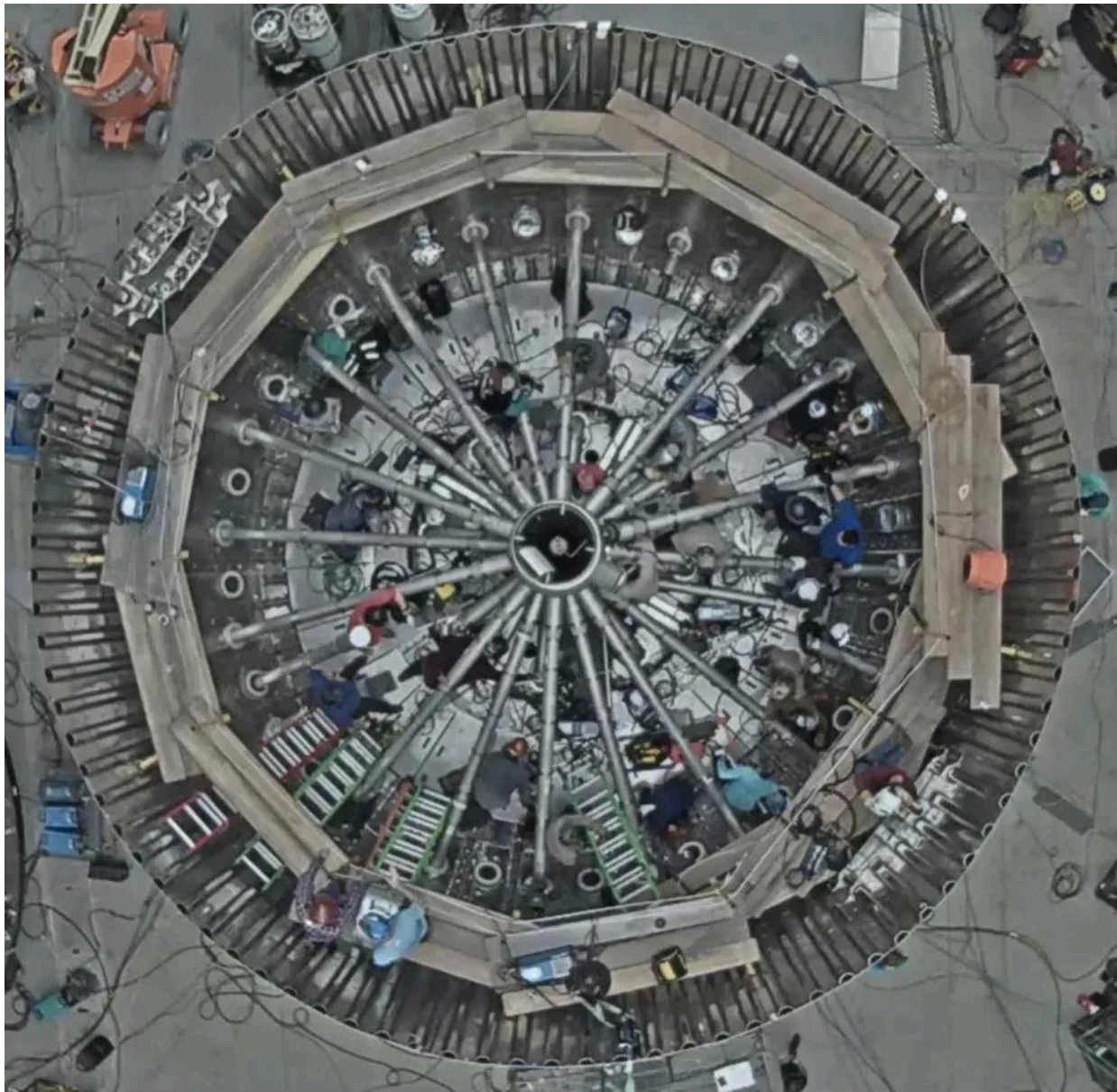
Shoulder to Shoulder

As the space economy matures into a production-heavy ecosystem, the composition of the workforce is shifting. The **SWIFT Space Economy Jobs Report (August 2025)** shows a roughly 50/50 split between degree-holding engineers and skilled tradespeople. However, as we move toward high-velocity manufacturing, that ratio is tipping.



The Michoud Assembly Facility workforce and NASA team pose with the Artemis II SLS core stage before it shipped by barge to Kennedy Space Center. *Credit: NASA/Steven Seipel*

The picture of the Starship section below provides a visceral look at this new reality. The image of a Starship Super Heavy booster section demonstrates the sheer volume of hardware, thousands of feet of precision piping and hundreds of critical welds, that makes the Space Cowboy the essential character of this era. The traditional Rocket Scientist archetype is nowhere to be found. Instead, you can count over 20 skilled technicians swarming the interior, navigating a labyrinth of complex feed systems and high-pressure plumbing. This is the face of the modern space workforce. It is not a sterile clean room. It is a high-intensity industrial environment. The bottleneck is no longer "How do we design this?" but rather "Who has the skills to build this at scale?"



Over twenty technicians work inside the engine section of a Super Heavy booster, fitting the plumbing that feeds its 29 engines. Boca Chica, Texas, July 2021. *Credit: Elon Musk via Twitter*

A Data-Driven Reality

To build the right workforce, a state must first understand the one the industry actually needs, and that is harder than it sounds. The space economy exists outside the boundaries of traditional labor metrics. There is no single classification in the Bureau of Labor Statistics (BLS) or Bureau of Economic Analysis (BEA) that fully captures the modern space workforce. Standard tools like O*NET and SOC codes frequently blur or omit the very occupations that power this sector. As the BEA itself noted in its recent [U.S. Space Economy Workforce statistics](#):

"Little is known about the occupations within these industries, resulting in an incomplete understanding of the current skillsets of the space workforce and future skills needed to support the growing space economy."

To help clear this data fog, the SWIFT Space Economy Jobs Report employed a bottom-up methodology. Rather than relying on top-down labor classifications, the report aggregated and analyzed 5,000 active job postings from 27 leading space employers as of August 2025, a sample large enough to represent a significant share of all open space economy positions in the United States at that time. Each posting was reviewed and structured using a custom taxonomy designed to encode role requirements, skills, and qualifications systematically across employers. The result is the most direct window available into what the space industry actually values today, not what legacy workforce frameworks assume it does.

What the data reveals contradicts the Apollo-era rocket scientist archetype almost entirely. The SWIFT Space Economy Jobs Report surfaced five findings that should reshape how every state, Texas first among them, thinks about its workforce strategy.



Figure 2 - Five findings from the SWIFT Space Economy Jobs Report (August 2025)



Technicians install an RS-25 engine on the Artemis II SLS core stage at NASA's Michoud Assembly Facility in New Orleans. Credit: NASA/Michael DeMocker

When these findings are considered together they lead to a number of compelling conclusions. Each finding tells part of the same story. Together, they define the opportunity:

1. **Jobs follow workforce density.**
2. **Degrees are optional but skills are not.**
3. **Credentials signal readiness.**
4. **Employers are paying to close the gap themselves.**
5. **One in eight space economy jobs is for a single profession: welding.**

Jobs follow workforce density. The report found that California holds roughly a third of all existing aerospace jobs but captures nearly half of all new space economy openings in the top five states (SWIFT Space Economy Jobs Report, August 2025). The states that built the biggest pipelines capture the most growth, because they can supply the workers, and that growth attracts more employers. The next section shows what that mechanism did to Houston, and what Houston did about it.

Degrees are optional but skills are not. Nearly half of all entry-level roles, 47%, require only a high school diploma (SWIFT Space Economy Jobs Report, August 2025). Yet those roles go unfilled. The gap is not in graduates. It is in hands-on, industry-ready skills that traditional education still struggles to deliver at scale.

Credentials signal readiness. One in three job postings specifies or prefers a technical certificate or industry standard as a condition of hire. These are not competencies taught at R1 universities. They are taught at community colleges and technical schools, the very institutions Texas has in abundance but has not yet aligned to industry demand.

Employers are paying to close the gap themselves. Nearly half of all postings, 48%, offer tuition or training reimbursement. These programs rarely cover four-year degrees. They fund short, targeted certification courses and technical training. Companies are hiring first and upskilling after, because the pipeline is not delivering what they need. As the report notes, some have gone further still, building bespoke talent pipelines directly into high schools and post-secondary programs. But these efforts are one-off, must be recreated by each new employer, and do not scale. Critically, startups cannot commit the resources to build their own programs. They simply go to the states where the talent already exists. A unified statewide pipeline would change that entirely, turning Texas into the gravitational center that pulls space economy companies in rather than watching them settle elsewhere.

One in eight space economy jobs is for a single profession: welding. Not engineering. Not software. Welding. And despite a strong national supply of welders, these positions remain persistently unfilled. The challenge is not a shortage of people who can weld. It is a shortage of people who can weld to the exacting certifications and precision standards that space manufacturing demands. That is a curriculum problem, not a talent problem, and it is one Texas is well positioned to solve.



James Holster welds the feed system lines for the Blue Ghost Moon lander in the clean room at Firefly Aerospace, Cedar Park, Texas. *Credit: Firefly Aerospace*



James Holster in the clean room at Firefly Aerospace, Cedar Park, Texas. Credit: Firefly Aerospace

Space Cowboy: James Holster

Titanium spacecraft welder, Firefly Aerospace. High school diploma. Twelve weeks of welding school.

It is staggering that one in eight open jobs in the space economy is for a single profession. It is more staggering that they stay open, in a country full of welders. A welder who can pass a structural test cannot walk onto a spacecraft floor. Titanium orbital tube welding is a different trade: flight hardware, zero defects, a skill fewer than a hundred people in the country have and no school teaches. We know, because we interviewed one of them.

James Holster's name is on the Moon. He put it there with a welding torch. Every drop of propellant that flowed through Firefly's Blue Ghost lander flowed through lines he welded by hand. No college. A single working mother, no money for school, and a Navy recruiter offering \$25 an hour. Twelve weeks of Navy welding school is the whole of his formal training. He learned the rest on nuclear submarines, where a bad weld kills the man standing next to it. *"I put a lander on the Moon with a high school education. I wasn't even top of my class. I failed out of a welding school once. But I didn't give up."*

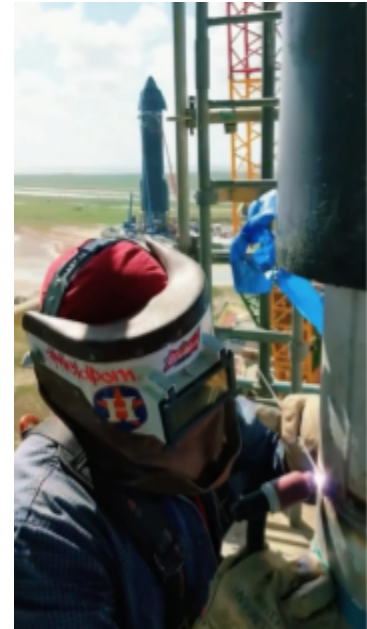
It took him twenty years to get there, six rejected applications to SpaceX, and one director willing to take a chance. *"I kept applying and kept applying. It's a little bit of luck and a lot of perseverance."* He is one of the best in the country at what he does, and every step of how he got there was an accident.

Now his son wants to follow him. Not gates and fences: the kind of welding that flies. And James, whose hardware sits on the Moon, cannot find him a door. *"There is no real place to get the certification for what I do. There isn't a school that teaches titanium aerospace welding. So where are you going to get it?"* One of the best welders in the world cannot get his own son into the trade. If the system fails James Holster's kid, it fails everyone's. That is the gap SWIFT exists to close.

Full story: [Appendix, A Real Space Cowboy.](#)

Taken together, the SWIFT Space Economy Jobs Report reveals a sector whose rapid growth has outpaced its workforce pipeline, creating what the report calls a double misalignment. Education is not producing credentialed, job-ready talent at the scale the industry needs. And the industry itself has not yet established the shared standards that would allow educators to align their programs. The result is high wages, unfilled roles, and companies forced to become their own training institutions.

This misalignment is not a crisis, it is an opportunity. The SWIFT Space Economy Jobs Report estimates that the U.S. space economy could add \$428 billion in economic value and 300,000 additional high-wage jobs over the next decade. No single state yet dominates this landscape the way California dominated the internet era, and that window will not stay open indefinitely. The states that move now to build coordinated pipelines between education and industry will not just capture more jobs. They will shape the industrial base that underpins American space leadership for the next century. The industry's current bottleneck is not a shortage of PhDs; it is a shortage of people who can manufacture, operate, and maintain the infrastructure of the stars. As Mike Edmonds, Senior VP at Blue Origin, succinctly put it: *"We need welders. Lots of amazing engineering has happened, and now we need welders."*



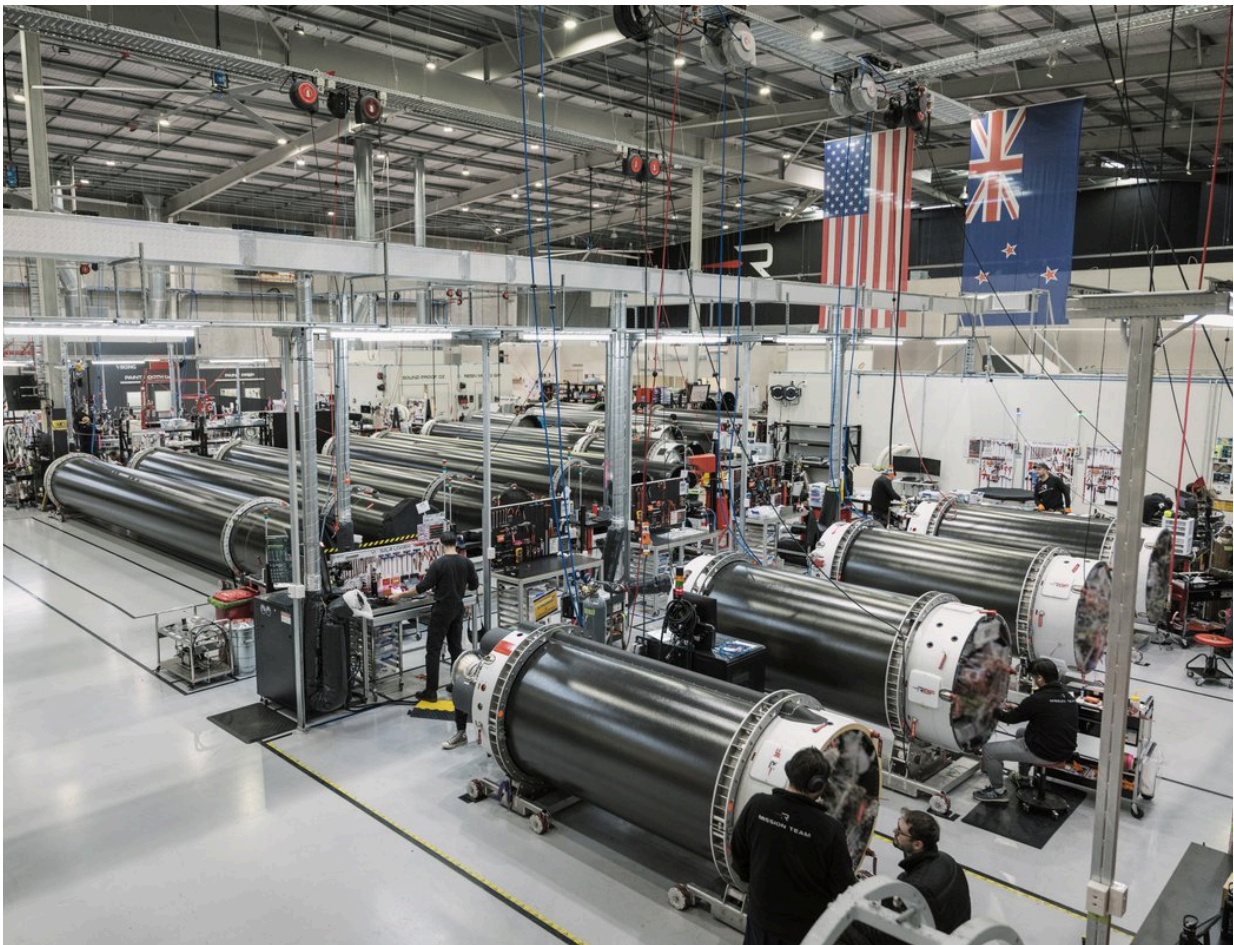
A welder works within view of Starship at Boca Chica, Texas. Credit: weldernation

The Space Economy Jobs Report is the Space Cowboy Initiative's first product. SWIFT is now turning its findings into a skills profile for every role the industry is hiring.

The real challenge lies in closing this gap by mobilizing the institutions best equipped to train this new archetype. The community colleges. The technical schools. The high schools embedded in the rural communities where space industry operations are growing fastest. Texas has those institutions. What it needs now is the strategy to align them.

A Proven Blueprint for Growth

Jobs follow workforce density. That is the finding every state should take seriously, and it is how Silicon Valley was built. California's university-driven workforce pipeline anchored the digital revolution, made the internet Californian, and locked in the state's economic power for decades. The mechanism is self-reinforcing: the state that can supply the workers wins the employers, and the employers deepen the pipeline. California leads in space today for the same reason, and it earned that lead. But the space economy is young, its gateways are still being decided, and it is anyone's to play for. Texas has already watched the mechanism work up close, and learned the lesson the hard way.



Workers across the production lines for Rocket Lab's Electron orbital-class launch vehicles. This photo includes the 100th Electron rocket built by those workers. *Credit: Rocket Lab*

A Case Study in Alignment: The Houston Evolution

For decades Houston held an unrivaled reputation as Space City. NASA's Johnson Space Center made it the heart of human spaceflight and mission control. That legacy was real, hard-won, and world-class. And when the industry shifted from exploring space to building hardware at scale, it was not enough.

Houston had the history. Alabama had the people.

In 2017 Blue Origin chose Huntsville, Alabama, for BE-4 engine production. Its reason was simple: Huntsville already had the propulsion workforce, built over decades around Marshall Space Flight Center and the Saturn V. Two years later NASA gave Marshall leadership of the Artemis lunar lander program, citing that same propulsion expertise. The engine plant deepened the workforce. The deeper workforce won the next program. That is workforce density at work, and it worked against Houston, which had the history and the mission control but not the density of hands on the factory floor.



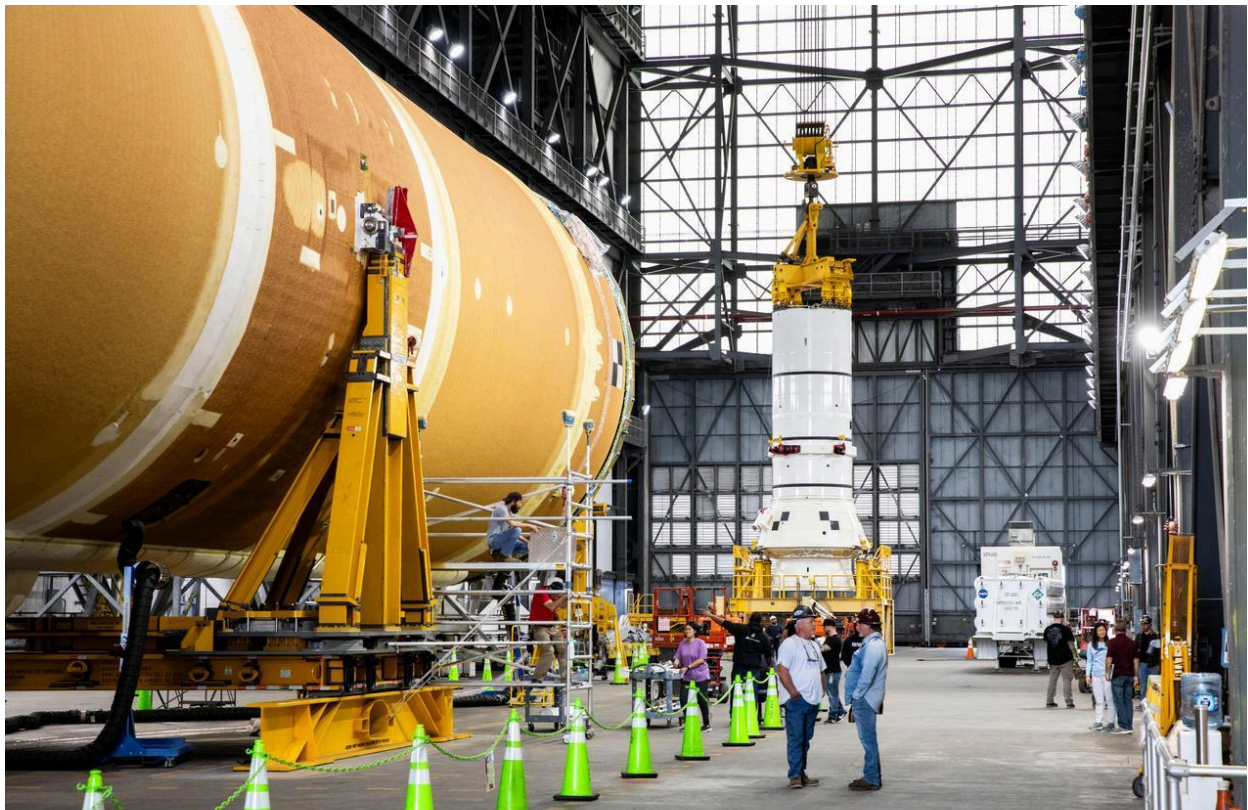
ULA technicians guide a Blue Origin BE-4 engine onto the aft end of a Vulcan booster. *Credit: United Launch Alliance*

The Strategic Pivot: The EDGE Center

Houston's answer was the EDGE Center at San Jacinto College: a deliberate decision to build the density it lacked, in composites, aerospace structures, electrical assembly, and mechatronics, next to the Houston Spaceport. Intuitive Machines chose Houston. Axiom Space chose Houston. Venus Aerospace chose Houston. The flywheel Huntsville had by inheritance, Houston built on purpose, in a few years, at the scale of one region.

The flywheel Huntsville had by inheritance, Houston built on purpose.

Today, Houston operates as a coordinated flywheel. Education and training produce industry-ready talent. Companies at the spaceport absorb and refine that talent. The resulting growth attracts more capital, more companies, and more workforce into the region. What emerged was not just a workforce program. It was a self-reinforcing ecosystem, and it was built by deliberately investing in the Space Cowboy.



Engineers and technicians attach a crane to an SLS solid rocket booster aft assembly in the Vehicle Assembly Building at Kennedy Space Center. The Artemis II core stage lies beside them. *Credit: NASA/Glenn Benson*

Houston's success reveals the insight that sits at the heart of the Space Cowboy Initiative: workforce is not a supporting function of the space economy. It is the catalyst that unlocks it. When skilled trades are deliberately aligned with industry demand, they do more than fill jobs. They enable entire markets to form.

The EDGE Center is a microcosm of what Texas can achieve at scale. The state already possesses every underlying component: universities, community colleges, technical schools, and emerging space infrastructure embedded in the communities where the industry is growing fastest. What is missing is not capability. It is coordination.

Houston proved density can be built deliberately. SWIFT is building it for the whole state. That is the Space Cowboy Initiative.



The RFA team stands in front of the first RFA One rocket on its launch pad at SaxaVord Spaceport, Shetland, Scotland. Credit: Rocket Factory Augsburg

A Texas Institution: Cowboys and Pioneers

This is Texas's untapped workforce: a deep reservoir of technical grit found in our rural communities, high schools, community colleges, technical colleges, and industrial corridors. Where the instinct is to squeeze more rocket scientists out of the same elite universities, Texas can do something few states can: mobilize an army of Space Cowboys from institutions that are already embedded in the communities where space industry operations are growing fastest. High schools, two-year colleges, HBCUs, and regional universities near test sites, launch facilities, and industrial corridors, serving students and working adults who can be trained quickly into production-ready technicians. By building a formalized space workforce pipeline around these institutions, Texas can supply the technical backbone the industry desperately needs faster than almost anyone, and write the playbook other states can use.



Firefly's propulsion and test team at the Miranda engine test stand in Briggs, Texas. *Credit: Firefly Aerospace*

California did not build Silicon Valley by inventing a new kind of person. It built it by recognizing that the engineers, programmers, and builders already clustered around Stanford and Berkeley were exactly what the emerging technology economy needed, and then deliberately connecting them to the companies that needed them most. The workforce was already there. What California provided was the alignment.

Texas stands at an identical inflection point, with one crucial advantage. The skills the space economy needs most are not found in elite research universities. They are found in the industrial corridors, oil fields, aviation hangars, and technical colleges that have defined Texas working life for generations. Our early work examining the curricula and certifications most valued by space industry employers confirms what many in the industry already suspect: much of what the space ecosystem demands already exists within Texas's current training infrastructure.



Firefly Aerospace technicians around their Blue Ghost lander. *Credit: Firefly Aerospace*

Across our discussions with industry leaders, a consistent pattern has emerged. The skills and credentials most in demand come from two domains where Texas does not just compete but leads.

Texas has built deep expertise in skills areas critical for the space economy.

The first is traditional aerospace standards and certifications, including aviation maintenance, avionics, and aerospace manufacturing. These disciplines emphasize precision, systems integration, and flawless reliability. Texas has built deep expertise here across decades of defense and commercial aviation work, and that expertise translates directly to space

manufacturing. The second is oil and gas technical standards, forged in some of the most hazardous, high-pressure, and volatile operating environments on earth. In these settings, discipline, procedural rigor, and systemic reliability are not best practices. They are matters of life and death. The Permian Basin does not produce workers who take shortcuts. It produces workers who understand that a single mistake in a complex system can be catastrophic, and who have been trained to prevent it.

Wildcatter grit and a pioneer's spirit are what make a Space Cowboy.

Like space, oil and gas demand perfection under pressure, coordination in complex systems, and calm precision in dangerous conditions. A Texas roughneck who has spent years managing high-pressure systems, volatile materials, and narrow safety margins in remote conditions is not a candidate who needs to be convinced that the work is serious. They already know. That instinct, that training, that culture of accountability under pressure is directly transferable to space operations, where the stakes are even higher and the margin for error is even thinner.



About 70 Mars Science Laboratory team members stand with the Curiosity spacecraft in JPL's Spacecraft Assembly Facility, Pasadena, California. *Credit: NASA/JPL-Caltech*

Space Cowboy: Anthony Montz

Hardware-in-the-Loop lead, Firefly Aerospace. GED. No degree.

The industry knows what it needs. *"The physics was figured out a long time ago. We know the math. Go get the aerospace degree, that's great. But this shakes down to the technician level too. You've got to have the best welders in the world. These are class three articles, zero workmanship defects, zero material defects. You have to be the best at what you do. We're not building hoverboards."* That is Anthony Montz, and he knows what he is asking for, because he is one of the people he describes.

Anthony Montz's name is on the Moon too. He got there at fifty, by accident. A high school dropout with a GED and a trade-school electronics certificate, he spent thirty years walking through whatever door opened next: Apple tech support, fifteen years behind a bar, a national vodka brand, a laptop repair business he built and sold.



"Every role I ever took, I felt like I had to prove I was smart, because I didn't have the credentials." Then a lockdown documentary about a launch, a resume sent on a whim, and a technician job at Firefly for less than half his old wage. *"It's a huge pay cut. But it's opportunity."*

Two years later he was rebuilding the lab that proves a spacecraft works before it flies, and his hardware helped put Blue Ghost on the Moon. *"Nobody thought I could do it. I killed it."* Nothing on his resume said he belonged in a clean room. Everything in his working life had trained him for it. The talent was already there. What was missing was the map.

A young person close to him now wants to do what he did. *"He sees me and says, you did all that without any college degree? So now he doesn't want to go to college, and he's asking me, well, how do I do it? And it's very hard for me to articulate the path. I wish I had a better answer for you."* Two Space Cowboys, both with hardware on the Moon, and neither can tell the next one how to follow. That is the map SWIFT is drawing.

[Full story: Appendix, A Pioneer of Many Frontiers.](#)

This is not a new story for Texas. From the wildcatters who drilled the first wells to the cowboys who faced down storms and droughts on the open range, Texans have always been defined by their willingness to take on the hardest environments, guided by grit, discipline, and a pioneering spirit that does not flinch at the frontier. The Space Cowboy is not a departure from that legacy. It is its next evolution: a new generation who bring the same courage, craftsmanship, and steadfastness to the most demanding and consequential frontier humanity has ever attempted.

Mapping that existing workforce to what employers need is the core of the Space Cowboy Initiative. SWIFT has already begun, with skills profiles and curriculum alignment across the state.

That is the work and it is not unique to Texas. By mapping existing curricula to employer demand and filling targeted gaps with certifications, apprenticeships, and stackable credentials, any state could rapidly deploy a comprehensive, industry-aligned workforce framework without starting from scratch. Stanford did not build new professors for Silicon Valley. It connected the ones it had to the industry taking shape around it. **America does not need to build a new workforce for the space economy. It needs to align the one it already has.**



A Firefly team at the base of a test tower in Texas. The liquid oxygen transfer line for the Eclipse rocket hangs inside the tower. *Credit: Firefly Aerospace*

The Space Cowboy Initiative

The Initiative rests on one idea: workforce is not a supporting function of the space economy. It is the catalyst that unlocks it. Where the trained hands are, the contracts, the factories, and the launch sites follow.

The Space Cowboy Initiative is a roadmap for any state to build the skilled-trades workforce of the space economy, deliberately and at scale. Supply that industry with every worker it needs, and the industry builds itself around you. That is how a state becomes a gateway to the space economy, and Texas is the proof that one can be built on purpose.

What SWIFT has made

The Space Cowboy Initiative is not a proposal. It is already running. SWIFT works today with school districts, community colleges, and universities to connect their graduates to the space companies that need them. We built the Space Economy Jobs Report from real job postings. We are turning it into skills profiles, one for each role the industry is hiring, and using them to align curricula with what employers actually need. We are exploring a partnership with a national registered apprenticeship sponsor, so that Space Cowboys can earn a wage while they train. And SWIFT helps to give the industry a voice. SWIFT was a founding partner of Space House at SXSW, which brought industry, NASA, and the public together in Austin during the week the whole world is watching the city. SXSW has asked for a bigger Space House in 2027.

"I'm glad somebody's finally doing it. It's about time." James Holster, Firefly Aerospace

The SWIFT model is traveling. With a grant from the U.S. State Department, SWIFT is now working to bring the same pipeline to New Zealand's space industry, the first step in taking what Texas builds to partners abroad. When the federal government funds the export of the Texas model, it means Texas is doing something right.

What comes next: Scale

The parts are in place: the employer intelligence, the skills profiles, the alignment work, the archetype. What comes next is scale. SWIFT is doing this today with a growing number of partners. We want to do it with every school district, every community college, and every university in Texas and beyond. We want to work with every state that wants the playbook and that takes more than SWIFT. It takes the districts, the colleges, the employers, and the state leaders who want to see their people thrive, working as one pipeline.

SWIFT's ambition is not a Texas space economy. It is a worldwide space economy with its heart in Texas: the place the industry trains, builds, and launches from, and the place it calls home.

WILL YOU JOIN US?

If you want to work with us, reach out (info@swiftrocket.org). SWIFT has built job profiles for the roles the space industry is hiring, drawn from real job postings. We will share them with any school district, college, or university that wants to align a program to them, and we will work alongside you to do it. If you are an employer, we will help you hire from the programs that already match your floor. If you are a policymaker who wants to see what has been built, come and look. Whoever you are, SWIFT's door is open.

This is pioneering work in every sense of the word. There is no established playbook for building a nationwide space trades pipeline. SWIFT is charting territory that has not been charted, building roads into country that has no roads yet, with the same pioneering spirit that has defined Texas at every frontier it has ever faced. We are cutting the trail in Texas so that every state can walk it.

The Space Cowboy is not just a workforce archetype. It is a declaration of what Texas is, and of what any state with grit, precision, and frontier courage can become. SWIFT's job is to build the pipeline that turns that heritage into the workforce backbone of the new space age, first in Texas, then wherever the industry lands.

Just as California made the internet Californian, Texas can make itself the home of the space economy. A rising tide needs a harbor, and America will need more than one. The institutions are here. The talent is here. The heritage is here. SWIFT is connecting them.

When historians write about the generation that built the space economy, they will write about the states that decided to build it. Texas has decided. Who reaches up next is up to you...



EngineerCredit: Firefly Aerospace.s lift the main body of NASA's Europa Clipper into the High Bay 1 clean room at JPL, Pasadena, California. *Credit: NASA/JPL-Caltech*

A Real Space Cowboy

James Holster, titanium spacecraft welder, Firefly Aerospace



James Holster in the clean room at Firefly Aerospace, Cedar Park, Texas. Credit: Firefly Aerospace

James Holster's name is on the Moon. He put it there himself, with a welding torch and no college degree, just a high school diploma, twelve weeks of welding school, and twenty years of refusing to quit. By almost any account he is one of the best titanium spacecraft welders alive. This is the story of how he got to the Moon, why it almost never happened, why he cannot get his own son onto the same path, and what SWIFT is doing so the next one does not have to get lucky.

Having your name survive for millions of years in space is a kind of immortality almost no one gets, and James has it twice (to date). His name is bolted to a lander in the gray dust of the Moon, where it will sit long after every person reading this is gone. No weather to erode it, no tide to take it. It will outlast the country he welded it in. The other copy rides that SpaceX Roadster, arcing past Mars on an orbit measured in human lifetimes, farther from Earth than almost anything humanity has ever made.

A hundred billion people have ever lived, and nearly every one looked up at the Moon and felt the old ache to go. A few hundred Firefly employees have their names on its surface now. James is one of them. A welder. A kid with no money for college who joined the Navy to get out of the house, and got there on grit and a burning torch.

Every drop of propellant and oxidizer that flowed through that Moon lander flowed through lines James welded by hand.

"I welded everything on that vehicle."

"I wanted to work at JPL, but I never thought in a million years I'd ever get there. And instead, I just went to the Moon."

Look up tonight. The Moon you see is not quite the same Moon humans have stared at for two hundred thousand years, because now there are things on it that humans put there. James is one of a vanishingly small number of people who can look up at that light and know, with total certainty, that he changed the Moon.

"Every morning I got to work, I would look up at the Moon, and it felt different. I'd think, you're still up there. Going to work hits different after that."

He did not need a doctorate to put it there. He needed twelve weeks of training and two decades of refusing to quit, learning everything the hard way, with no one to ask and no path to follow. He made it. He just took the long way. And that is the part that cannot stand: it should not take the next person twenty years, six rejections, and a lucky break to do what James did. But James is a pioneer. He had to be both the road and the traveler.

He would not put it that grandly. Ask him whether "Space Cowboy" fits and he just gets honest: he didn't grow up in Texas, but the principle is the same. Pioneer, explorer, cowboy. The explorer part he means literally.

"I want to see what's over that next horizon, that next bridge. I want to see what's on that next planet. I want to see what's on that next asteroid that we might land on. I want to go see this stuff."

And the work that takes him there is the kind nobody on the outside ever sees.

"They're going out there where nobody is, doing a job no one's ever going to see."

He reaches, unprompted, for the oldest version of the idea: the Roman legions got the glory, but someone cut the trees and built the road they marched on. James puts himself in that lineage.

"When that three-year-old gets to sleep tight in his crib in a space station, it's because I built that space station. It's not just a piece of metal. It's our legacy."

"A hundred years from now, when space is as boring as a taxi cab driver, you didn't get there by mistake. I built that road."

James Holster is proof the Space Cowboy is real, because he is one.

"I put a lander on the Moon with a high school education. I wasn't even top of my class. I failed out of a welding school once. But I didn't give up. This is not insurmountable. It is doable."

The only thing missing was the road, so he built his own: alone, in the dark, with no one ahead of him to follow. Six rejections, a stack of dead ends, the better part of twenty years. That is the road that carried his name to the Moon. Here is how he laid it.

The Long Way to the Moon

James did not set out to build spaceships. He set out to leave home, and welding was the fastest way out.

"I didn't want to sit at home like the rest of my friends. No money for college, single working mom, so I left as fast as I could. Welders were making like \$25 an hour to start. It was 2003. That's a lot of money."

He figured he would end up on a pipeline somewhere, Alaska or Texas, wherever paid. Eight and a half years later he got out, found welders still making \$25 an hour, and went looking for more. Aerospace paid more. He talked his way into Goodrich in San Diego, building thrust reversers for the 787, until that work got shipped to Mexico. So he aimed higher.

"I applied at SpaceX six times before I got in. I didn't quit. I kept applying and kept applying. It's a little bit of luck and a lot of perseverance."

He spent nearly five years welding on Dragon. The first time he walked in, it hit him.

"I'm making spaceships. That's cool. That's not college, but it's cool. It's better than college."

There was no strategy to any of it, and he is the first to say so.

"I kind of fell ass-backwards into it and got good at it, and I landed here. And I just ran with it."

Here is the fact that should stop anyone who thinks space belongs to PhDs. James has been to welding school exactly once, a twelve-week Navy program NASA still references, and that is the whole of his formal training. He learned on nuclear reactors and submarines.

"In the submarines, the part you're welding on, someone's going to be standing next to. It has to be perfect. Because if that fails, you just killed that guy with a bad weld."

Carry that standard to a rocket and you are fine. It is a mindset, not a diploma. What he does now, orbital tube welding on titanium spacecraft lines, is so rare that fewer than a hundred people in the country do it, and no school teaches it. What carried him was never a credential. It was the one thing no credential can grant.

"I can't teach passion. I can teach you to be a good welder, but I can't teach you to be passionate. I'm passionate about what I do. I love what I do."

So here is one of the best in the world at a thing the world is desperate for, whose hands made possible the kind of mission astronauts are celebrated for. And every inch of how he got here was an accident: a Navy recruiter, a wage that did not rise, a layoff, six rejected applications, a director who took a chance. The best outcome this system can produce, it produced by luck. That should not read like a triumph. It should read like a near miss, because for every James who found the right door, there is no telling how many never did.

The Road His Father Built

The cruelest proof that this is broken is not in the strangers who never found the door. It is in James's own house. James Holster has a son. He wants to be a welder like his dad, not gates and fences, the kind who builds things that fly. And James, whose name and hardware have landed on the Moon, does not know a way to get his own son there.

Sit with the ridiculousness of that. James spent twenty years building his path to the Moon. The whole point of a road, the reason the legions could march at all, is that someone went ahead and cut the trees. James cut them. And his own son, the one person who should by every right get to walk that road, is standing at the same trailhead his father stood at twenty years ago, facing the same uncharted, twenty-year climb. The road exists. It lives in James's hands and in his name on the Moon. There is just no way, right now, to hand it down.

"My son's talking about being a welder. I'd like him to get to that point where he has that aha moment. Holy crap, this is cool. I'm on the Moon. I'm on Mars."

His son can learn to weld a gate at a community shop. What he cannot get is the high-consequence training that makes someone trusted to weld a fuel line on a lunar lander. James got that in the Navy, but his son cannot enlist until he is eighteen, and Firefly will not hire a minor. Short of James personally walking him through the door of a company that cannot legally hire him, there is nowhere to go.

"There is no real place to get the certification for what I do. There isn't a school that teaches titanium aerospace welding. So where are you going to get it? You've got to get on-the-job training."

One of the best welders in the world cannot get his own son into the trade. If the system fails James Holster's kid, it fails everyone's.

SWIFT: The Short Road to the Moon

Which is exactly why SWIFT exists: to tear down the obstacles blocking people like James's son, and turn the way into the Space Economy into something you can see and follow. Start with the obstacle James names first.

"The biggest obstacle? I didn't have a clue what I was doing. I didn't have a road map. Nobody told me I could do this."

And it is bigger than him.

"There's no career path coming out of high school that leads you to JPL. It didn't exist. It still doesn't exist. There needs to be a set guideline for these kids to give them a direction."

The cost of that is not abstract.

"Kids will become what they can see. If you can't give them a road to becoming you, then they become whatever's in front of them."

They reach for whatever door is already open, an oil rig, a YouTube channel, because no one showed them another. So put something else in front of them. That is the whole idea behind SWIFT, and when James imagines it existing twenty years ago, he does not hesitate.

"It would have been nice to see a path. Not stumble so much, not fall and go down the wrong road. It would have been nice to see a career path of where I wanted to go."

"I'm glad somebody's finally doing it. It's about time."

And this is not sentiment, it is operations. Lose a welder tomorrow and an entire production line can come down to one or two pairs of hands, eighteen-hour days, real revenue exposed.

"Six to eight months to replace this person. With [SWIFT's] pipeline, we could replace them in a month. Having skilled welders lets us compete ... I need good rock-star welders."

Firefly is expanding production, and the stakes are concrete: if the talent is not here, the contracts go wherever it is. Plug every community college welding program straight into companies like Firefly and you do not just fill jobs, you let Texas say yes to the next mission, because the people to build it already exist.

Strip away the contracts and the production math, and what James keeps circling back to is simpler.

"We need dreamers. We need people to dream and then make that dream a reality. These young kids have got to get out of that mindset that they can't. We need to dare them to dream,

to be bold, to take that step into the unknown. You may fall on your face, but get back up and keep going."

Because the thing James cares about most is not a contract, or a vehicle, or even his own name in the dust of the Moon. It is the kid who has not started yet: the one in Midland who thinks working in space is out of reach, and his own son, who wants nothing more than to follow him. And the message to that kid is the one nobody ever handed James.

"You don't have to be an astronaut, but you can damn sure build that capsule, that moonlander he goes in. And that's just as cool as being an astronaut."

In a hundred years, when space is as boring as a taxi cab driver, that won't be an accident. It will be because people like James built the road to it. He is a Space Cowboy. He cut the trail. SWIFT is paving it, so the next one can simply walk. Ask him why he bothers, and he does not reach for the Credit: Anthony Montz.ognition.

"Being on that cutting edge, pushing those boundaries, not asking why, but why not. As much as I hate to say it, why do more people know who Kim Kardashian is than the great engineers we have, the ones really pushing and making things happen? It drives me crazy. But that's why I do this."

We asked James what it would mean to put that path in front of the next kid:

"It would be great. Inspiring this next generation to do what we do, it's almost as good as landing on the Moon."

And James would know.

A Pioneer of Many Frontiers

Anthony Montz, Hardware-in-the-Loop lead, Firefly Aerospace



Anthony Montz with Blue Ghost in its Falcon 9 fairing before launch, January 2025. *Credit: Anthony Montz*

Anthony Montz's name is on the Moon. He put it there with no college degree and no plan, just a GED, a trade-school certificate he says he never really used, and a working life that wandered through a half-dozen careers before it ever pointed at space. By the time he got there he was in his fifties. This is the story of how he reached the Moon, why he spent most of his life not knowing the door was even open to him, why he still cannot tell the next person how to find it, and what SWIFT is doing so they do not have to get lucky.

Having your name survive for millions of years in space is a kind of immortality almost no one gets, and Anthony has it twice. One copy is bolted to Firefly's Blue Ghost lander and the other was already there before he was born. Blue Ghost is sitting in the gray dust of Mare Crisium, where it will outlast everyone reading this and almost everything they will ever leave behind. His name is on a plaque bolted to it. No air, no rain, no rivers, no weather, no drifting continents to fold it under, not even a moonquake. The bootprints Apollo pressed into that dust more than fifty years ago are still crisp, and they will stay crisp for millions of years. Anthony's name will sit in that same perfect stillness, and as he points out, almost nothing in the universe can reach it.

"It's seismically dead. There's literally nothing, short of an asteroid."

A direct asteroid strike is the only eraser the Moon has, and the chance of one finding that exact patch of dust is the kind of odds you stop losing sleep over. The second copy of his name he did not put there at all. Blue Ghost came to rest beside a lunar mountain that mapmakers had named, generations before he was born, Mons Latreille. Mons. Montz. His name had been waiting on the Moon long before he was, as if the place had quietly held it for him until he found his way there.

"Once on the plaque, and once on the map. That's kind of fun."

Almost ten billion people live on this planet and almost all of them have looked up at the Moon at some point. A few hundred Firefly employees have their names on its surface now. Anthony is one of them, and he is among the unlikeliest on the list: a high-school dropout who tended bar for fifteen years, who came to spacecraft at 50 years old.

He waves off the grandeur of it. Ask him whether his name in the dust of the Moon defines him and he almost shrugs.

"I hope that's not what defines me. It's something I like to reflect on personally. When I'm walking my dog and the Moon is just blazing, I think about it. But it's not what defines me."

Look up tonight. The Moon you see is not quite the same Moon humans stared at for two hundred thousand years, because now there are things on it that people put there, and one of those people walks his dog under it and quietly knows he helped.

"I get goosebumps just thinking about it."

We picture the pioneer as a certain kind of person: someone who finds a single frontier and drives one deep path into it, year after year, until no one alive knows that ground better. Anthony is the other kind. He never drove one path. He crossed a dozen. Graphic design, Apple, fifteen years behind a bar, a national vodka brand, an electrical repair business he built from nothing and sold, and finally the avionics of a spacecraft. He is not a pioneer of a path. He is a pioneer of range.

And the range is the real story. At Firefly he runs Hardware-in-the-Loop, the systems that prove a spacecraft will work before it ever leaves the ground. He reaches for a movie to explain it.

"Think of Q in the James Bond movies. He makes all the cool stuff in the lab, then hands it to Bond to take out into the world. That's what I do for our spacecraft."

He builds the little world the spacecraft lives in first, so that every failure happens in the lab and never on the way to the Moon. Doing it well means standing at the center of the whole program, making every system, and every person who owns one, move as one, and he is sure he can only do it because he has already lived a dozen other lives. That is the kind of Space Cowboy Anthony is: not the one who masters a single craft for twenty years, but the one whose breadth becomes its own kind of mastery.

He would not put it that grandly. Ask him about the wandering and he is blunt about what it cost.

"I've wasted many, many years doing some silly things. I knew all my life I was a smart guy, but I didn't always apply it. So now I'm trying to make up for lost time in a big way."

He found space at fifty, by accident, and spent the decades before it not knowing a place like this would ever take someone like him.

"The vast majority of [my life]. Mostly because my lack of credentials forced me into things."

The one thing he never had was a map. No one ever told him that the bartending and the soldering iron and the years of reading a room added up to anything, least of all a spacecraft. So he did the only thing he knew how: he kept opening doors in the dark, one after another, until one of them opened onto the Moon. Here is how he found it.

A Pioneer of Many Frontiers

Anthony did not set out to build spacecraft. For most of thirty years he did not set out for anything in particular. He just walked through whatever door opened next.

"Everything I've tried to do, I've tried to do to the best of my ability. And it's always opened the next door. The times I lost jobs and thought it was the end of the world were almost always just the pathway to the next opportunity."

He left high school as a sophomore and never went back, picked up a GED, and took a two-year electronics degree at a trade school he says he never really used. He earned a graphic design certificate. His first real job was at Apple, walking developers through bugs on the first color laptop the company ever made. Then he watched his friends having more fun than he was, and opened a different door entirely.

"All my buddies were bartending and waiting tables and having all this fun. I thought, this is cool, but I want to go do that. So I pivoted. And I did it for fifteen years."

Fifteen years behind bars and managing nightclubs turned into cocktail consulting, which turned into a job as a national brand ambassador for a boutique vodka, traveling the country inventing drinks. When he finally wanted off the late nights he moved into selling wine, and the slower pace let him notice something: this was the early iPhone era, and people kept walking in with shattered screens. He taught himself to source parts and repair them. A single Christmas-Day call about a hot-chocolate-soaked laptop grew into a board-level repair business that, within eighteen months, was fixing two or three hundred machines a month. He ran it for the better part of a decade, made real money, and sold it. He never had to work again.

Then a door opened that he never saw coming, on a screen, during a lockdown.

"I remember watching a documentary on SpaceX during COVID. Seeing those people in front of mission control, cheering and crying and hugging. I thought, it would be incredible to be part of something like that."

He is the first to admit how arbitrary it was.

"It just happened to work out that it was space. If I'd watched something on Formula One, I'd have tried to chase a path in that direction."

He put his resume out, and three weeks later he was in Melbourne, Florida, reworking circuit boards for Raytheon and Collins Aerospace, living in a hotel five days a week on a contract renewed one month at a time. Eighteen months of that was enough. He went home to Austin and walked into Firefly on the very bottom rung, an avionics production technician, for less than half of what he had been earning.

"I was making sixty an hour at Raytheon. I came in at twenty-four fifty an hour at Firefly. It's a huge pay cut. But it's opportunity."

Read that resume again and look for the part that qualifies a person to touch spacecraft. There isn't one. Anthony has no engineering degree, no aerospace pedigree, nothing on paper that says he belongs in a clean room. What he has is a lifetime of teaching himself whatever the next door required, and a chip on his shoulder that never quite wore off.

"Every role I ever took, I felt like I had to prove I was smart, because I didn't have the credentials. If I didn't get something, I'd work twice as hard as the guy it came to naturally."

He calls it being wired a certain way.

"You have to be intrinsically motivated. I'm intrinsically motivated to do whatever I'm doing. I want to do it to the best of my ability. Period. Full stop. That's something in me."

That drive is what got him through the door. But it is not what made him good once he was inside. The turn that makes Anthony's story more than a string of jobs is this: the wandering was

not waste. It was the training. He walked into a spacecraft company with the one skill no engineering degree teaches.

"It's all those people soft skills. Years of talking to people over the bar, managing emotions, expectations, egos. Owning my own company, learning how to treat the people who work for you. All of it played into this role."

His job is to sit between every discipline on the program, avionics, propulsion, software, thermal, and payload, and make all of them deliver into a single testbed that actually works. Every frontier he ever crossed taught him a piece of how to do it. Ask him whether he would be as good at it without all those past lives, and the answer is immediate.

"The range is everything. It's my secret sauce. My ability to take on scope, manage it, and manage all the personalities that come with all those subsystems. I think it's what I'm the best at."

He had come in on the launch-vehicle side, but he kept walking past a clean room where a spacecraft was taking shape, and he knew.

"It was very clear to me. That's where I wanted to be."

He found his way in the way he had found his way into everything: by being the only one who could do the thing in front of him. He was, at the time, the only technician at Firefly certified to solder on flight hardware, so when a quarter-sized circuit board on a gimbal motor needed repair, they called him into the clean room. Then he volunteered for something far bigger, redesigning the lab's main testbed from a flat bench into a vertical rack, a job he openly told his director was past his experience.

"I told him, I've probably volunteered for something well outside my expertise. But I think I can execute it."

He took the testbed down on a Friday at noon and had it running again by three o'clock Saturday afternoon.

"Nobody thought I could do it. I killed it."

His teammates gave him a permanent role on the spacecraft team.

He had come to Firefly chasing a feeling. The scene that pulled him out of retirement was the one from the documentary: a room full of strangers coming undone the instant their rocket worked. In his second week he got to stand in exactly that room, watching Firefly's flight two leave the pad.

"I'm in a room full of people who put their blood, sweat, and tears into it. The rocket leaves the pad, it's successful, and everybody's cheering. But I had no emotional attachment to it. I thought, I did it, I'm here. But it didn't feel the same."

He had reached the scene he had been manifesting and found that it still belonged to other people. He had not earned it yet. That took another year and his own hardware. When Firefly pulled off Victus Nox, a rapid-response launch built to fly on twenty-four hours' notice, his hardware was on the vehicle and he was integral to getting the payload safely aboard. This time the feeling arrived, and it was his.

"That was my moment. I had hardware on the vehicle."

And if Victus Nox was the first time it felt like his, the Moon was that feeling made permanent.

So here is a man trusted at the center of a spacecraft program, with hardware that helped prove a Moon landing would work, and almost none of how he got there was planned. A documentary he happened to watch. A pandemic that happened to empty the offices he was willing to walk into. A trade-school education from thirty years earlier that happened to still be useful. This is the best the current system can do, and it did it by accident. That is not a success story. It is a near miss, because for every Anthony who opened the right door at the right moment, there is no telling how many stood in front of one their whole lives and never knew it was there to open.

Nothing to Hand Down

The cruelest proof that this is broken is not in the millions who never find the door. It is in the one young person who watched Anthony find his, and now wants to follow. Anthony is living proof, and that is exactly the problem. A bright kid close to him looked at a man who reached the Moon with no degree and drew the obvious conclusion: maybe he doesn't need college either. Now he wants to do what Anthony did, and he is asking Anthony how.

"He sees me and says, you did all that without any college degree? So now he doesn't want to go to college, and he's asking me, well, how do I do it? And it's very hard for me to articulate the path. I wish I had a better answer for you."

Sit with that. Anthony crossed a dozen frontiers to reach the Moon, but he never cut a single clean trail behind him. His path was thirty years of accident, luck, and refusing to quit, a road that only looks like a road in hindsight, and only for him. So when the kid asks for the steps, Anthony has none to give. He can name the raw material. He cannot name the way.

"You've got to have the soft skills, understanding tools and what they do, the desire to take things apart and put them back together. But I don't know that I have a great answer to that."

The aptitude is common. The on-ramp is not. The best counsel Anthony can offer is essentially the story of his own luck: get in somewhere willing to take a chance on a person without a pedigree, then prove yourself once you are inside.

"You've got to go in and show them you're smart, volunteer for opportunities, and solve problems."

That is not a path. It is a description of a lottery he happened to win, on twenty-four-dollar-an-hour odds, at fifty, because a pandemic emptied the offices and a documentary happened to be playing. And this is the man who knows better than anyone what the fog costs, because he spent most of his own life lost in it, never knowing a door like this existed for him at all. Now he watches a kid he cares about stand at the edge of that same fog, and the proof that it can be done still cannot say how. If the one person who made it through cannot point to the door, the system is not failing one young person. It is failing all of them.

SWIFT: Putting the Stars in Reach

This is exactly what SWIFT exists to fix. Not to mass-produce Anthonys and hope they get lucky, but to draw the map he never had and mark the door, so the next person does not need a pandemic and a documentary to stumble through it.

Ask Anthony how he would build that map, and his answer is SWIFT's whole thesis in a breath.

"You've got to find the kids that have that inherent desire to construct and deconstruct things, and put them in the room. If I could just get them in the room and get them to experience what it feels like."

He knows what is waiting on the other side of that room, because it is the thing that hooked him too.

"Our job is to fail. Find the failures. And when you succeed, when you find the one line of code or the one component that was causing the problem, there is no greater feeling in the world."

And the people who get to feel it are not only the engineers. Anthony is the first to honor the people with the degrees. But he is just as clear about where the work actually gets built.

"The physics was figured out a long time ago. We know the math. Go get the aerospace degree, that's great. But this shakes down to the technician level too. You've got to have the best welders in the world. These are class three articles, zero workmanship defects, zero material defects. You have to be the best at what you do. We're not building hoverboards."

He has spent his years at Firefly doing in miniature exactly what SWIFT wants to do at scale.

"Everything we're doing is the first time it's been done, certainly by us. So we're writing the policies, the procedures, the training material, all the documentation. So if I fall off the face of the Earth tomorrow, these young people have an outline for how to do it."

So ask him to weigh it, the rockets against the workforce, and he will not pick.

"You can't have one without the other. It's critical."

Because the thing Anthony cares about most was never a contract, or a vehicle, or even his own name in the dust of the Moon. The Moon, he says, is not what defines him. The people are: the young engineers on his team he is teaching to chase a failed test instead of fearing it, and the kid somewhere in Texas who has the same fire he had and no idea a place like this would ever take him.

"The number of people I'm able to touch on a daily basis, and the things I share with them that they share with others, it just keeps growing. It is my favorite part of the job, teaching these young people."

In a hundred years, when a name on the Moon is as ordinary as a name on a mailbox, that will not be an accident. It will be because people like Anthony crossed a dozen frontiers to reach that room, and then spent their time making sure the next person would not have to wander as far, or wait as long. He is a Space Cowboy. He found the door the hard way. SWIFT exists to mark it, so the next one can simply walk in.

We asked Anthony what he hoped he would be remembered for: the name in the lunar dust, or the people he is bringing up behind him.

"Landing on the Moon was an incredible achievement. But I hope the latter is my legacy, that I empowered a bunch of really smart young people to take all those zeros and ones on a screen and manifest testable hardware that flies."

And Anthony would know.

The Space Workforce Incubator for Texas



SWIFT

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