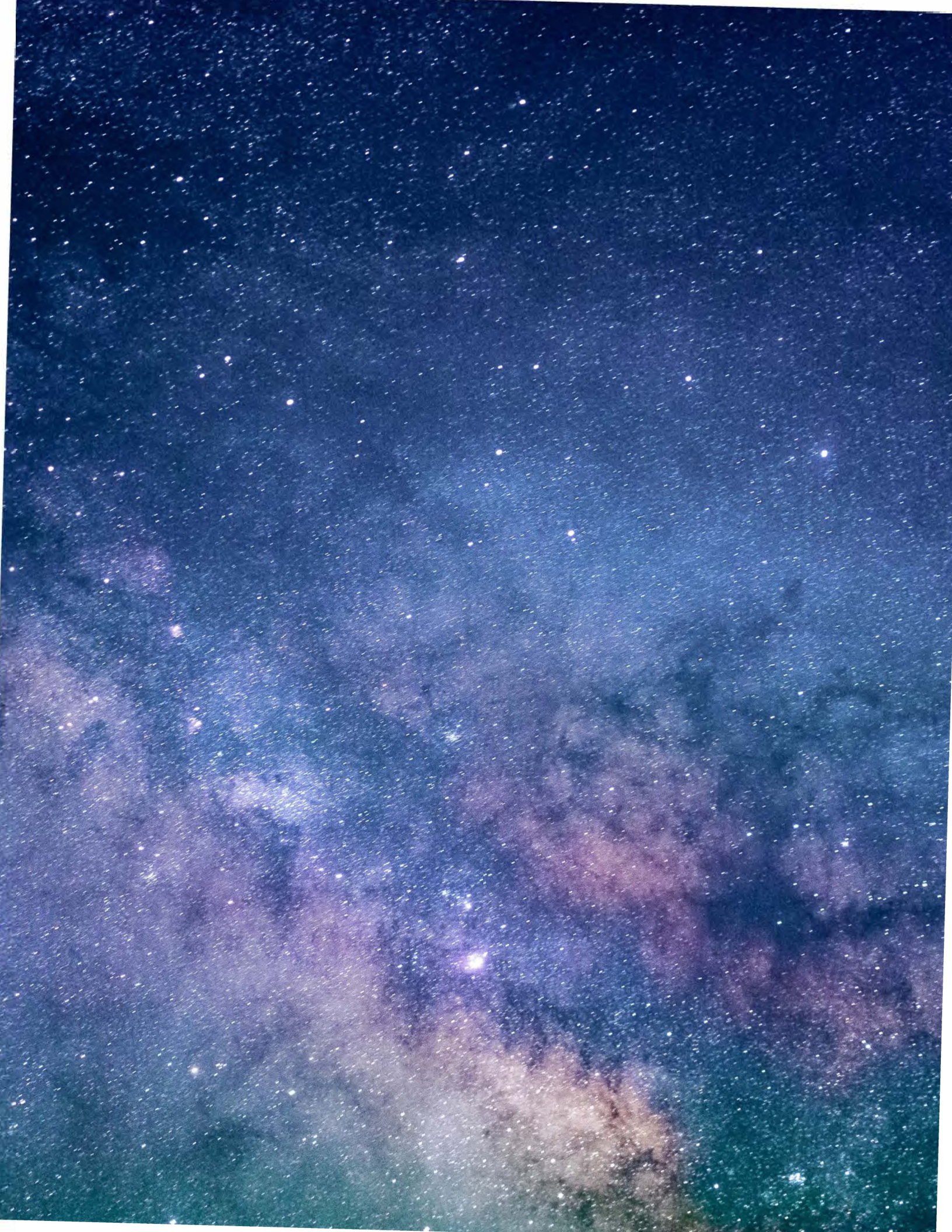


SPACE WORKFORCE COALITION







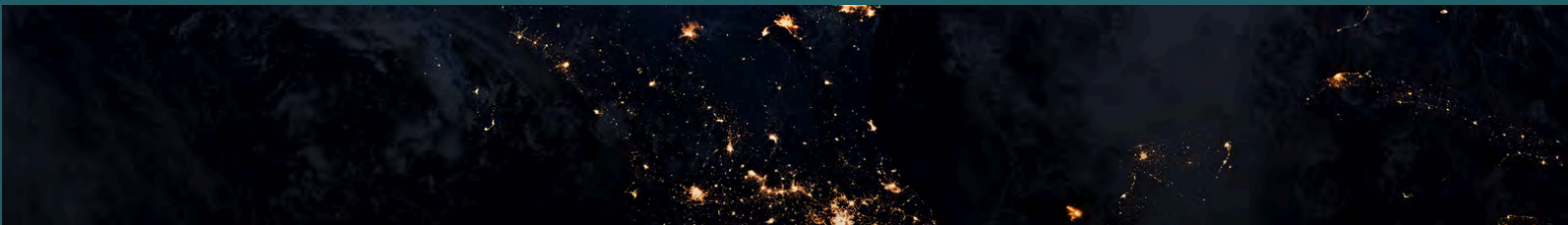
SPACE WORKFORCE COALITION

The Space Workforce Coalition (SWC) is a national Community of Practice created to address the current and future workforce needs of the space sector. SWC members regularly connect to learn from one another, and share approaches, and resources to attract, train, and retain people in the space industry.

SWC has developed regional programs in Florida, the Gulf Coast of Louisiana and Mississippi, Southern California, Alabama, and Colorado to collaborate with service providers including community colleges, and unions, to demonstrate a replicable and scalable approach to attracting, training and creating employment opportunities, particularly for people from backgrounds traditionally underrepresented in STEM jobs.

The coalition was established in 2022 with 19 companies and organizations in three states and now has expanded to more than 50 companies, organizations and institutions across the federal, state, regional, and local levels in six states.

To date the coalition has developed scalable models that combine incentives, training programs, and stakeholder relationships.



COALITION PARTNERS

A photograph of the Space Shuttle Columbia being mated to the External Tank and Solid Rocket Boosters on the Mobile Launcher Platform. The orbiter is being moved by the Orbiter Transporter System (OTS) along the crawlerway. The orbiter has "USA" written on its side. The orbiter is being mated to the External Tank and Solid Rocket Boosters on the Mobile Launcher Platform. The orbiter is being moved by the Orbiter Transporter System (OTS) along the crawlerway. The orbiter has "USA" written on its side. The orbiter is being mated to the External Tank and Solid Rocket Boosters on the Mobile Launcher Platform. The orbiter is being moved by the Orbiter Transporter System (OTS) along the crawlerway. The orbiter has "USA" written on its side.

ALABAMA

CALIFORNIA

COLORADO

FLORIDA

LOUISIANA AND MISSISSIPPI
GULF COAST REGION



SPACE WORKFORCE COALITION SCALABLE MODELS

Florida Approach

Establish Space Florida Academy

Through quarterly aerospace industry convenings, together with Space Florida, Florida REACH Office, FloridaCommerce, Florida Department of Education, and CareerSource Florida and workforce training providers, essential skills have been identified and prioritized by aerospace employers.

These skills are developed through programmatic offerings by workforce training providers throughout the state resulting in industry credentials placed on Florida's Master Credentials List. Training providers offer classes for individuals to earn these in-demand industry credentials. Training providers include school districts, technical colleges, state colleges, universities and local workforce boards.

In order to inspire and equip a younger talent pool to consider the myriad of careers in space, the launch of Space Florida Space Academy will be implemented in many of Florida's school districts within their existing high schools' career and technical education programs to provide the opportunity for students to earn many of the in-demand credentials before high school graduation.

Louisiana & Mississippi Gulf Coast Approach

Expand Sector Partnerships for Advanced Manufacturing Training Programs to Include Space

The Greater New Orleans Regional Aerospace and Advanced Manufacturing Partnership (RAAMP) is a sector partnership model to increase awareness, exposure, and access to space workforce training and work-based learning opportunities. RAAMP includes three pillars: business attraction, workforce development, and STEM education. The partnership is leveraging existing advanced manufacturing training programs to increase the number of people trained with the skills the space industry needs, e.g. welding, and aerospace technicians. An outcome of the DOL-led registered apprenticeship accelerator includes the establishment of the first-ever aerospace technician registered apprenticeship program in Louisiana. This model emphasizes identifying cross-sector skills to create the scale for training and education programs.



SPACE WORKFORCE COALITION SCALABLE MODELS

California Approach

Grow Pathways to the Space Workforce Through Apprenticeships

Space-Flex is a scalable training strategy that includes career development, competency-based apprenticeships and work-based learning opportunities focused on manufacturing and IT occupations. Registered apprenticeship programs for occupations including Aerospace Systems Assembler, Aerospace Systems Technician, Optics Manufacturing Technician, Electronics Assembler, RF Assembler, and RF Technician and Manufacturing Facilities Maintenance Technician. Space-Flex curricula are flexible enabling each to be tailored to the specific needs of industry employers. The program partners with stakeholders in the PK-12 education, post-secondary education, and workforce boards to identify the priority skills and prospective students and place students on the path to employment via pre-apprenticeships and apprenticeships that enable them to earn while they learn.

Colorado Approach

Train for In-Demand Skills and Building a Bigger Talent Pipeline

Colorado has a history of producing highly educated, highly skilled aerospace professionals. However as the industry has grown, so has the need for a larger workforce with a greater diversity of skills. Colorado will work with aerospace partners to identify the skills that are most in-demand and then partner with education and training providers to build programs that develop those targeted skills. Colorado is also developing more credential opportunities, increasing the emphasis on advanced industries, and strengthening our K-12 STEM education to get more Coloradans interested in careers in space.

Alabama Approach

Create Pathways to the Space Workforce for Service Members

The My Future in Space initiative is a space-focused transition and veteran employment solution that includes direct pathways to the space workforce. Through the public-private partnership, in-demand space skills and occupations are mapped to military occupation codes that aid in employment matching and connecting. Matched service members will complete short upskilling courses prior to employment.

CASE STUDY: FLORIDA



AT A GLANCE

In Florida, there is a strong coalition of aerospace employers, state agencies, state trades associations, and training providers, including school districts, technical colleges, state colleges, universities and local workforce boards, convening, specifically, to propose workforce solutions and plan of implementation.

OBJECTIVE

To convene with the strong coalition of Florida stakeholders to propose, plan, and implement workforce solutions.

SOLUTIONS

The following are highlighted outcomes as a direct result of these employer-focused, statewide coalition convenings:

Essentials skills: Identification of an exhaustive skills list for aerospace and related industries, including advanced manufacturing, construction, cybersecurity, and logistics. The timeline to develop these essential skills is outlined from secondary to postsecondary education offerings.

Master Credentials List: Florida maintains a Master Credentials List which includes specific industry credentials used in workforce training programs throughout the state. This list is revised and updated every three months. As new skills are identified, placement on this list for training providers can ensure the best talent is trained and available.

Training providers: Through this statewide coalition, aerospace employers can be connected, directly, to training providers in the region of their project needs. Through this connection, custom-designed and accelerated training programs can be generated to meet project timelines at/near the desired project location.

Space Florida Space Academy: School districts throughout the State of Florida implement Space Florida Space Academy within their existing high schools' career and technical education programs. This effort groups priority skills development and industry certifications into several clear career pathway options for students in areas such as advanced manufacturing, construction, cybersecurity and logistics. A high school student will graduate from Space Florida Space Academy with industry certifications and credentials, as well as work-based learning opportunities, equipped to embark on a career of their choice.

STEPS TO SUCCESS

- Form industry coalition with stakeholders
- Convene regularly
 - identify industry needs
 - identify essential skills necessary for the industry
- Develop a Master Credential List
- Connect aerospace employers to training providers
- Engage with school districts to provide career pathway options for careers in aerospace



CASE STUDY: LOUISIANA & MISSISSIPPI GULF COAST



AT A GLANCE

Greater New Orleans Inc. (GNO, Inc.) is the regional economic development non-profit organization serving the 10-parish region of Southeast Louisiana. The Greater New Orleans Regional Aerospace and Advanced Manufacturing Partnership (RAAMP) is an initiative of GNO, Inc.

OBJECTIVE

To create equitable employment opportunities in Aerospace and Advanced Manufacturing, particularly for people from backgrounds traditionally underrepresented in STEM jobs.

SOLUTION

Greater New Orleans Region One Center for STEM Internship Suite Program

GNO, Inc.'s Greater New Orleans Region One Center for STEM (GNORocs) Internship Suite, a leading STEM initiative, offers the HBCU Innovation Internship Program and the Black Engineering Collective of Greater New Orleans. The HBCU program provides hands-on experience and mentorship for students from Historically Black Colleges and Universities in STEM and Startup tracks. The Black Engineering Collective recruits minority engineering students at Louisiana's 4-year colleges. These programs merge industry, community, and education, creating a sustainable workforce pipeline. GNORocs cultivates talent, fosters collaboration, and promotes inclusivity, addressing STEM workforce needs and empowering individuals for innovation and economic growth.

Women In The STEM Economy (WISE) Women

W.I.S.E. Women NOLA is a mentorship program designed to engage young women in authentic conversations regarding STEM careers. The program inspires them to pursue STEM programming in their schools and encourages them to choose STEM pathways where they are underrepresented. This increases diversity and inclusion within the STEM business ecosystem of the Greater New Orleans region. Graduating mentees are pursuing engineering majors, and every eligible mentee is enrolled in STEM-based AP/Dual Enrollment courses.

Nunez Community College Solar System Exhibit + Aerospace Technician Training Program and Registered Apprenticeship Accelerator Partnership

Nunez Community College, situated in Chalmette, Louisiana, hosts the state's only Aerospace Technician Training Program. With NASA Michoud, Boeing, Lockheed Martin, and Vivace nearby, Nunez is primed to educate future aerospace and advanced manufacturing leaders. To meet industry demands and engage students, Nunez introduced a Voyage Mark II scale model solar system walking exhibit across campus and they plan to enhance the Aerospace Technician Training Program by adding a registered apprenticeship track, supported by industry partners like GNO, Inc., and Jobs for the Future. This earn-while-you-learn model will provide accessible opportunities for individuals to enter the space industry.

STEPS TO SUCCESS

- Identify underrepresented populations in STEM careers
- Collaborate with organizations who serve those populations
- Provide opportunities for education and experiences to inspire pursuit of STEM careers



CASE STUDY: CALIFORNIA



AT A GLANCE

The Southern California HUB, led by Northrop Grumman Systems Corporation (NGC) and the South Bay Workforce Investment Board (SBWIB) are implementing Pre-Apprenticeship and Registered Apprenticeship programs to serve occupations relevant to the Space Industry. These programs are replicable and portable across the nation

STEPS TO SUCCESS

- Form industry consortiums, councils, or working groups
- Formalize commitment
- Convene regularly
 - identify industry needs
 - Identify regional educational programs that support the talent pipeline
- Align regional, state, and federal resources
 - intermediary partners
 - grant funding to round-out the support for the initiative

OBJECTIVE

To respond to the Space talent crisis with a collaborative effort to expand programs nationally by identifying, aligning, and leveraging necessary stakeholders.

SOLUTION

In the Los Angeles area, stakeholders have been working in concert to serve the Space industry for many years. A collaborative approach was developed to meet employers' needs. Weekly convenings, outside of employer meetings, occur to ensure consistency and collaboration while attending to shared client needs. Providing seamless access to the workforce system, education partners, and apprenticeship resources is critical to success.

Northrop Grumman Systems Corporation (NGC) Machining and Electronics occupations were developed using a pre-apprenticeship to registered apprenticeship model with all partners named herein and using El Camino College as the US DOL Apprenticeship sponsor and pipeline for student talent. Through Space-Flex, this successfully demonstrated model is being duplicated for NGC Space for the functions responsible for maintaining their complex equipment, systems, and manufacturing environment. For NGC Space, the South Bay Workforce Investment Board (SBWIB) is the apprenticeship sponsor, El Camino College is responsible for the student pipeline, and the support team will remain consistent. By supporting NGC with two different apprenticeship sponsors, efficiencies have increased, which has allowed for better collaboration and support by this regional team.

Many individuals on this team work nationally, and SBWIB is applying to the US DOL to move their standards to national standards so this team can continue to serve this employer, this industry, and this proven model on a national basis.

This closely aligned group of stakeholders also collaborates to apply for various foundation, local, regional, state, and federal grants supporting the Space-Flex mission. Regardless of eligibility, stakeholders come together to determine capacity and bandwidth, select the lead grantee, support the development of the grant applications, and perform industry outreach to strengthen the application and eventual grant performance.

CASE STUDY: COLORADO



AT A GLANCE

Colorado has the highest concentration of private aerospace employment in the U.S. Nine major aerospace companies operate in the state with over 500 space-related companies and suppliers. Colorado is home to more than 30 federal laboratories and five major research universities as well as significant national security space missions and units. The aerospace industry is fueled by a robust innovation ecosystem, high-quality talent, strong community collaboration, and a cluster of national assets and resources.

"Colorado is proud to be home to the largest Aerospace economy per capita in the country, including national security, civil, and commercial space. We are committed to ensuring all Coloradans and businesses can thrive as well as educating, inspiring, and developing our future Aerospace workforce which will drive innovations for generations to come."

- Lieutenant Governor Dianne Primavera



OBJECTIVE

To develop aligned workforce strategies that promote the expansion and diversification of Colorado's aerospace workforce to possess the skills required for a growing and dynamic aerospace ecosystem.

SOLUTION

Colorado is leveraging our robust and connected Aerospace community and the dynamic leadership of the Polis-Primavera administration to develop aerospace workforce strategies. The Colorado partners joining the National Space Council's Space Workforce Coalition include the Offices of the Governor/Lt. Governor, the Colorado Office of Economic Development & International Trade, the Colorado Space Coalition, Colorado Space Business Roundtable, and the Colorado Chapter of Citizens for Space Exploration. We hope to add additional associations, education and training providers, government agencies, and aerospace businesses as this work develops.

Colorado has already invested in the development of a youth aerospace apprenticeship program and teacher externships. Our community college system is engaged in a landscape analysis to determine our highest-demand aerospace careers and training gaps. Colorado will focus on implementing these initiatives while leaning on our partners and the Space Workforce Coalition to scale the work. Colorado will work with the Space Workforce Coalition to braid local, Tribal, state, and federal workforce development efforts; identify gaps and opportunities for additional work; and collaborate on national solutions. We recognize that space is for everyone, and we will work to make that a reality.

Colorado Office of Economic Development and International Trade (OEDIT) strives to empower all to thrive in Colorado's economy. It promotes economic growth and long-term job creation by supporting small businesses and encouraging business expansion across the state. Unique to Colorado, the Governor has a full-time manager to champion specifically the Aerospace and Defense industries.

The Colorado Space Coalition (CSC) is a group of industry stakeholders working to make Colorado a center of excellence for aerospace. CSC members promote Colorado's significant space assets as well as advancing legislation vital to industry growth and success.

Colorado Space Business Roundtable (CSBR) is a gathering of aerospace professionals. It helps position and connect businesses within the state's thriving aerospace sector. It is committed to open-source knowledge transfer that keeps aerospace professionals well-informed, and to ensuring members unfettered access to those experienced in raising capital, both human and fiscal. CSBR members are part of an alliance that is influencing and promoting business growth in Colorado.

The Colorado Chapter of Citizens for Space Exploration promotes awareness of the benefits of America's Human Space Exploration Program and support for NASA. Part of a multi-state organization of U.S. taxpayers who support America's investment in human space exploration, the organization is made up of private citizens, small business owners, students, teachers, space and non-space business representatives, and county and municipal officials.

CASE STUDY: ALABAMA



AT A GLANCE

Alabama launched the Alabama Space Roundtable in September 2023. Tapping into an integrated workforce development ecosystem, this solution connects the dots across existing programs to improve effectiveness and better measure outcomes and impact for all stakeholders.

STEPS TO SUCCESS

- Utilize existing integrated workforce development system
- Establish baseline perception on careers in the space industry for data collection
- Build excitement
 - educate on industry and pathways
 - develop space boot camps
 - create video highlights
- Collaborate with College Systems to support accelerated training programs
- Tap into underutilized workforce

OBJECTIVE

To enhance discovery, growth, and retention of STEM space talent by tapping into an integrated workforce development ecosystem. The holistic approach is built around three pillars: Inspire, Prepare, and Employ.

SOLUTION

INSPIRE

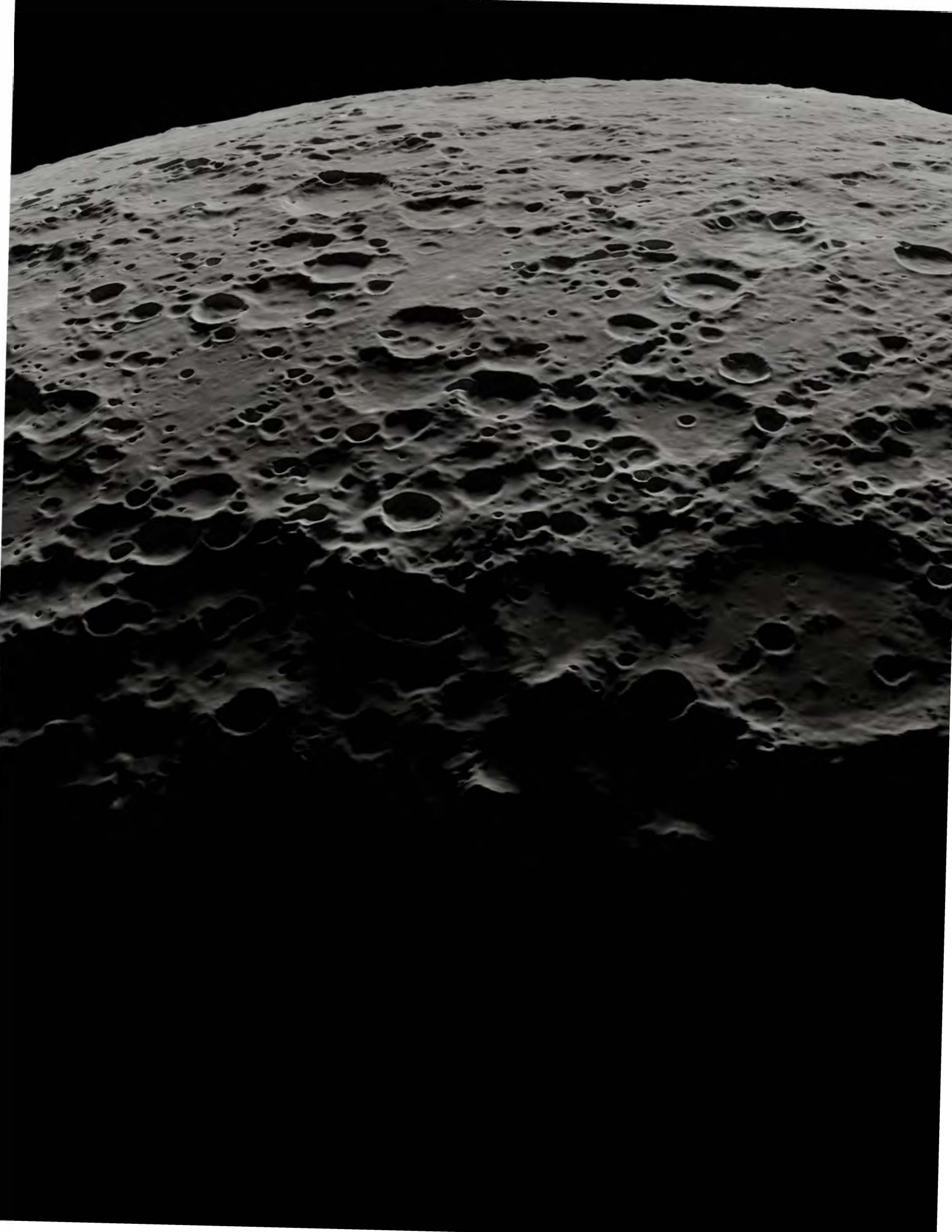
- Establish baseline student perceptions and use engaging industry and pathway content to shift perceptions and measure student/family impact.
- Build space boot camps, and modules, for middle/high school students to excite them about the space industry and seamlessly integrate them into the 19 high-demand pathways and relevant 2-year and 4-year programs.
- Create short videos highlighting employee success stories in space careers with local employers to post on websites, and social media, and send to school systems.

PREPARE

- Alabama Community College System (ACCS) Innovation Center is collaborating with North AlabamaWorks, Futures Inc., and leading space employers to create fast-track training programs to support 11 pathways with the fastest training for entry-level employment.
- Fast-track programs will be piloted with regional high schools, job seekers, and incumbent workers to train students and integrate them into space pathways at Drake and Calhoun.

EMPLOY

- The military represents the highest concentration of job-ready talent for the U.S. space industry.
- Employers struggle to crosswalk job requirements to the 15,000+ military occupation codes (MOCs) and rank structure of the military.
- Alabama is collaborating with Futures Inc. to match and connect transitioning service members and Alabama National Guard members with space employers and their job openings.
- Army (Fort Liberty), Navy (Norfolk), and the Alabama National Guard represent more than 29,500 candidates, within the next 12 months.



SPACE WORKFORCE COALITION PARTICIPATING ORGANIZATIONS

Multi-State Supporting Organizations

Aerospace Industries Association
American Institute of Aeronautics and Astronautics

Florida

Space Florida – lead organizer
NASA – federal partner
Airbus-OneWeb Satellites
Amazon
Blue Origin
Jacobs
L3 Harris
Lockheed Martin
Boeing
SpaceX
Southern Region Education Board
Valencia College
FLATE
Florida School Districts
Local Workforce Boards
Orange Technical College
Wilton Simpson Technical College
Riveroak Technical College
Big Bend Technical College
Charlotte Technical College
Eastern Florida State College
Osceola Technical College
Daytona State College
Indian River State College
University of Florida
University of South Florida
University of Central Florida
Embry-Riddle Aeronautical University
Florida Semiconductor Institute
CyberFlorida
FloridaMakes
Associated Builders and Contractors
Florida Technology Council

Alabama

North Alabama Works – lead organizer
Futures, Inc. – lead organizer

Louisiana and Mississippi Gulf Coast Region

Greater New Orleans, Inc. – GNO RAAMP – lead organizer
NASA Michoud Assembly Facility
NASA Stennis Space Center
Boeing
Lockheed Martin
Vivace
Blue Origin
Latriam
Nunez Community College
Dillard University
Southern University at New Orleans
Xavier University at Louisiana
University of New Orleans
Board of Regents
Louisiana Community & Technical College System
Louisiana Economic Development
Louisiana Workforce Commission

California

South Bay Workforce Investment Board – lead organizer
Northrop Grumman
El Camino College
Boeing
Celestron
Murti
Rocket Lab
Space Vector Corporation
Training Funding Partners
Lockheed Martin Corporation
Institute for American Apprenticeships
Eravant
Magnetika
Relativity Space
Starburst
Stellant Systems
Virgin Galactic
California Manufacturers & Technology Association (CMTA)
Cal Poly Pomona
West Los Angeles College

Colorado

Office of the Colorado Governor – lead organizer
Office of the Colorado Lt. Governor – lead organizer
Colorado Office of Economic Development & International Trade
Colorado Space Business Roundtable
Colorado Space Council
The Colorado Chapter of Citizens for Space Exploration

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This project received a portion of \$5,820,000 (.007%) from a grant awarded under the Apprenticeship Building America grant, as implemented by the U.S. Department of Labor's Employment and Training Administration.

This program is provided by equal opportunity employers. Auxiliary aids and services are available upon request to individuals with disabilities by calling in advance to CRS 1-800-735-2922



Space Workforce Coalition