

Your Enterprise Partner for Global Support of

# Space Exploration & Defense



Photo Courtesy of NASA

**Jacobs**

Challenging today.  
Reinventing tomorrow.



Challenging today. Reinventing tomorrow.

For over 70 years, Jacobs engineers, technicians, and scientists have delivered integrated solutions to tackle the intricate challenges of space exploration and defense. With a vast global network of resources and over 7,000 employees supporting multiple NASA centers, other government users, and industry partners across the United States, the Jacobs team remains at the forefront, providing advanced engineering, research, and operations support.

We invent by imagining what is possible.

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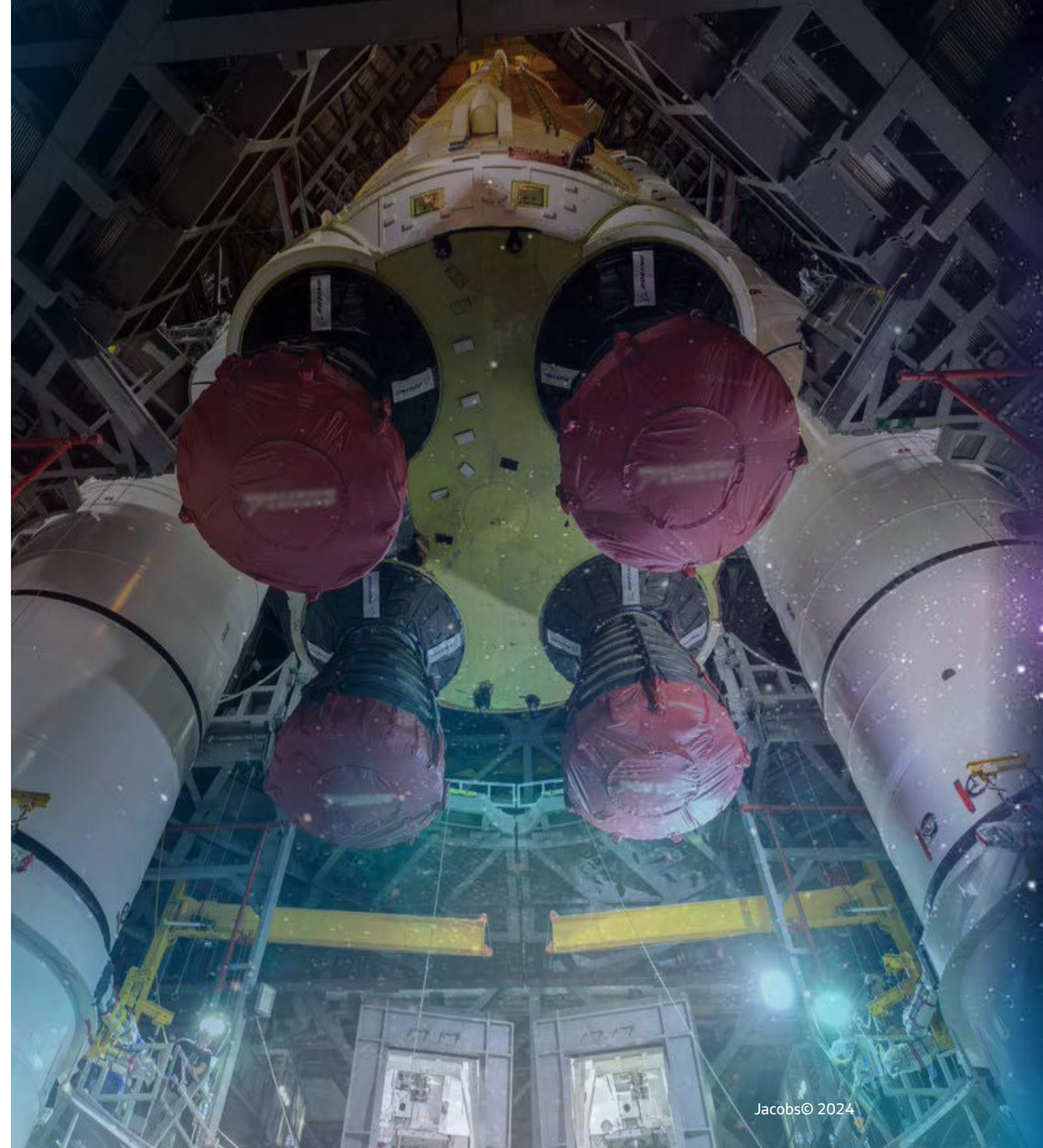
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# About Jacobs

At Jacobs, we're challenging today to reinvent tomorrow by solving the world's most critical problems for thriving cities, resilient environments, mission-critical outcomes, operational advancement, scientific discovery and cutting-edge manufacturing, turning abstract ideas into realities that transform the world for good. With approximately \$16 billion in annual revenue and a talent force of more than 60,000, Jacobs provides a full spectrum of professional services including consulting, technical, scientific and project delivery for the government and private sector.

## Always Above the Competition FY23 Rankings

- No. 1 – Aerospace (2023)
- Voted one of the *Fortune* Most Admired Companies
- Engineering News Record #1 Top 500 Design Firms (2018 – 2023)
- Environment Analyst #1 Environmental and Sustainability Consulting Firm
- Veteran's Magazine DiversityComm Best of the Best Veteran-Friendly Companies
- Voted one of *Forbes'* World's Top Female Friendly Companies 2023



## Jacobs at a Glance

**39+** countries

**60K+** talent force

**400** offices

**\$16B** annual revenue

**\$2.5B** in client savings

# Jacobs Focus Areas



## Scientific Discovery

*We solve some of the most complex challenges of exploration — both in space and closer to home. From wind tunnels to launch and from research to results, we invent by imagining what's possible.*



## Mission-Critical Outcomes

*For the first time in history, security and defense threats have no borders. From testing and training to intelligence and engineering and analytics, we work with defense, intelligence and law enforcement communities around the globe to ensure people, their information and our most critical networks stay protected.*



## Operational Advancement

*It is one thing to dream up new solutions. At Jacobs, we also deliver them. To turn abstract ideas into realities that transform the world for good, it takes foresight into what's possible, courage to create solutions for the unknown and the knowledge and skills to make them real.*



## Resilient Environments\*

*Environmental stewardship and climate change are the defining issues of our time. We tackle these challenges differently because we know that whatever we face, we have greater opportunities today to emerge stronger tomorrow.*



## Thriving Cities

*Prosperous communities. Healthy cities. A brighter future. By working together to build a better future for everyone, we envision and deliver cities that are smarter and more connected. Inclusive and competitive. Safe and resourceful.*



## Cutting-Edge Manufacturing

*Rapidly evolving, complex facilities require fast-paced, innovative solutions. Bringing an inspired blend of collaborative, creative excellence we deliver innovation — at any budget — from electronics to pharmaceuticals, to universities and governments around the world.*

## NASA's Largest Professional and Technical Services Provider

Jacobs brings subject matter experts with proven experience in their technical fields, delivering innovative solutions to exploration and research programs across the country. This work includes operations and maintenance of a variety of unique research and development facilities, including NASA arc jet facilities and wind tunnels.



Photo Courtesy of NASA

## Our NASA Portfolio

### Ames Research Center (ARC), Moffett Field, CA

Jacobs provides aerospace testing and facilities operations and maintenance and additional facility support services. Jacobs is also executing major R&D facility upgrades, extending the life and usefulness of these unique Ames test facilities for decades to come.

### Glenn Research Center (GRC), Cleveland, OH

At NASA's center for designing and developing innovative technology in aeronautics and space exploration, Jacobs' technical services support subsonic and supersonic wind tunnels, engine altitude chambers and components, space propulsion, as well as zero gravity and space simulation facilities.

### Goddard Space Flight Center (GSFC), Greenbelt, MD

In addition to developing and validating new technologies for future mission support, Jacobs provides electrical/electronic engineering support services to include the study, design, development, fabrication, integration, testing, verification and operations of space flight, airborne and ground system hardware and software.

### Johnson Space Center (JSC), Houston, TX

Jacobs provide space exploration integration systems engineering, astromaterials science, deep space research, and hardware reliability testing services at NASA's primary center for design and development for human spaceflight. Our engineers design and test life support systems, vehicles, flight hardware, software development, astronaut safety systems, and image analysis of space systems hardware.

### Kennedy Space Center (KSC), Cape Canaveral, FL

Jacobs is the prime Exploration Ground Systems contractor providing overall management and implementation of Kennedy's ground systems capabilities, flight hardware processing, and launch operations. This includes operating and maintaining the Vehicle Assembly Building, Launch Pad 39B, the Multi-Payload Processing Facility, the Booster Processing Facility, and the International Space Station science payload support laboratories.

### Langley Research Center (LaRC), Hampton, VA

Supporting NASA's revolutionary improvements in aviation, technology development for space exploration, and expanding the understanding of the Earth's atmosphere, Jacobs provides maintenance, operations, and engineering support at NASA's Langley Research Center. Langley is home to 270 Research and Institutional Facilities, 220 of which are classified as critical. Jacobs support includes operations and maintenance of subsonic-to-hypersonic wind tunnels, laboratories, test stands, and associated instrumentation.

### Marshall Space Flight Center (MSFC), Huntsville, AL

Jacobs is vital to MSFC's mission success by delivering exceptional engineering and science solutions. Our unique skills and products support MSFC's world-class facilities, including propulsion and launch vehicle development, advanced materials, manufacturing process development, systems engineering, integration, and flight software testing. We actively contribute to the development of the Space Launch System (SLS) and the Human Landing System, both critical components of the Artemis Program. Additionally, Jacobs is involved in Mars Ascent Vehicle development and the operation, maintenance, and enhancement of environmental control and life support systems.

# Our Proven Partnership with NASA

## Making Artemis a Reality

As prime contractor for NASA's Exploration Ground Systems Program, Jacobs is responsible for upgrading and maintaining launch systems and facilities at Kennedy Space Center in support of the Artemis Program. For the Artemis I mission, Jacobs provided full flight hardware processing, integration, test and launch and Orion recovery operations.

During this historic mission, the Orion crew capsule traveled a record-breaking 1.4 million miles, capturing stunning images of the Earth and moon before successfully splashing down off the coast of California. Jacobs supported the development and testing of Orion's heat shield and parachute system, which were instrumental in the successful landing. Jacobs was part of the team responsible for recovering Orion after splashdown and transporting it back to KSC for evaluation and disassembly.

Over the past 10 years, the Jacobs team has helped NASA redesign, modernize, and upgrade ground facilities and equipment at Kennedy. It is now enhancing systems to support the addition of crew for the Artemis II mission, including upgrades to the 6-million-pound crawler transporter, the 380-foot-tall mobile launcher, and the historic launch pad 39B. Future missions will return humans to the lunar surface – including the first woman and person of color. In addition to supporting NASA, the Jacobs team provides technical and engineering support to various commercial space companies, including Lockheed Martin, Boeing, Northrop Grumman and Sierra Nevada

## Exploration Ground System

As prime contractor for NASA's Exploration Ground Systems Program at Kennedy Space Center, Jacobs is responsible for the integration, processing, testing, launch and recovery of flight hardware for the Artemis Program. Following the highly successful Artemis I mission, the Jacobs team at KSC is preparing ground systems and facilities for the Artemis II mission, and processing of the first flight hardware – the solid rocket booster segments – is nearing completion.



Photo Courtesy of NASA

November 16, 2022, NASA successfully launched the Artemis I mission with the Orion crew capsule on top of the most powerful rocket in the world, the SLS.



## Space Launch System

NASA's SLS can deliver greater mass and volume with greater departure energy than any other operational rocket, and it is the backbone of NASA's human lunar exploration program. No other rocket can send astronauts and the Orion spacecraft directly to the Moon for the Artemis missions. Jacobs is part of the team of engineers who contributed to the success of the Artemis I mission, and we are continuing to support the development and evolution of the Space Launch System for future missions. Our engineers and technicians at MSFC and ARC are helping prepare for the Artemis II mission and supporting developing and testing the more powerful Block 1B cargo configuration.

## Human Landing System

Jacobs contributes to MSFC's Human Landing System (HLS) Program, providing a full spectrum of engineering support. Crews will board the HLS in lunar orbit and descend to the surface, where they will collect samples, perform science experiments, and observe the lunar environment before returning to orbit in the HLS. Our contributions to the HLS Program include systems engineering, power, propulsion, guidance, navigation and control (GN&C), docking systems, and landing site analysis. We also support developing and applying new materials and aerospace manufacturing processes.



Photo Courtesy of NASA

## Mars Sample Return Mission

Jacobs provides valuable engineering support to Marshall Space Flight Center's (MSFC) Mars Ascent Vehicle (MAV) development, revolutionizing space exploration with the groundbreaking concept of launching from another planet's surface and transporting sample tubes containing Martian rock, atmosphere, and loose surface materials into orbit around Mars for eventual return to earth. Our comprehensive support spans propulsion system design, analysis and testing, software, thrust control, systems engineering, and meticulous integration, ensuring the success of this historic mission.

## Orion

Jacobs is part of the team of engineers supporting development and construction of NASA's Orion crew capsule, which is built for long-duration, human-rated missions to the moon and into deep space. Jacobs is providing critical engineering, fabrication and testing of Orion's vital systems to validate strict reliability guidelines that will ensure mission readiness on the first crewed flight to the moon since Apollo 17.



Photo Courtesy of NASA

# Our Proven Partnership with NASA

## International Space Station

Jacobs supports cargo delivery to the International Space Station (ISS) for NASA under the Commercial Resupply Services contract at Kennedy Space Center, coordinating logistics of launch payloads in concert with commercial cargo platforms such as Northrup Grumman Cygnus and Japan Aerospace Exploration Agency HTV. We also support critical sustainment activities for ISS systems on our engineering and science contract at JSC.



## Gateway

Jacobs is helping design and test the Habitation and Logistics Module (HALO), a critical component of NASA's Gateway. Gateway will serve as an orbital space station providing support for lunar surface missions, docking ports for a variety of spacecraft, space for crew to live and work, and capabilities for scientific missions. The HALO module will feature a pressurized crew habitat with full communications, navigation, thermal control, and life-support systems. Our team will help test and develop critical life-support systems that will safely protect and sustain astronaut crews for extended periods of time aboard Gateway.

## Revolutionary Propulsion Engines for Deep Space Missions

Jacobs' Propulsion Engineers at MSFC helped develop and test NASA's first full-scale rotating detonation rocket engine (RDRE), an advanced rocket engine design that could revolutionize how future propulsion systems are built. Unlike traditional rocket engines, the RDRE generates thrust using a supersonic combustion phenomenon known as a detonation. This design produces more power while using less fuel and has the potential to power both human landers and interplanetary vehicles to deep space destinations, such as the moon and Mars.



## OSIRIS-REx

NASA's OSIRIS-REx spacecraft, after retrieving astromaterials from the asteroid Benu, safely landed in the Utah desert on September 24, 2023. These pristine materials were transported to JSC in Houston. Jacobs' curation technicians and scientists meticulously recovered 120.5 grams of fine-grained asteroid rocks, pebbles, and carbon residue—nearly double the initial recovery goal of 70 grams. The Jacobs and NASA team at JSC will continue to curate and collaborate with researchers worldwide, providing valuable insights into the oldest and most scientifically significant samples ever brought back to Earth. Jacobs' pivotal role in designing the laboratories and formulating procedures for handling the Benu samples underscores our crucial contribution to this groundbreaking mission.



## VIPER

NASA's Artemis robotic lunar rover, the Volatiles Investigating Polar Exploration Rover (VIPER), is designed to traverse the extreme environment of the South Pole of the moon in search of frozen water and other potential resources. Our engineers, scientists, and subject matter experts at JSC directly support the NASA team in VIPER systems engineering, integration, testing, and the design and fabrication of structural elements, motor controllers, and harnesses.

## Wind Tunnels

Jacobs is the world's premier provider of all wind tunnel-related services, delivering highly technical, innovative solutions across the entire life cycle, including wind tunnel design, fabrication, commissioning, operations, maintenance, condition assessment, and capital investment. Our wind tunnel services support a range of owners and users from automotive, freight trucking, aerospace, and Government Agencies. Jacobs operates NASA's wind tunnels, contributing to space access vehicle aerodynamic and propulsion research for NASA's Space Launch System and commercial companies such as SpaceX, Blue Origin, and Sierra Nevada Corporation.



## James Webb Space Telescope

Jacobs' team members at several NASA centers provided integrated solutions and superior technical support to help solve the most complex and hazardous challenges of development, test and launch of the James Webb Space Telescope (JWST).

At NASA's JSC, Jacobs supported the JWST program for over 14 years, modifying and upgrading the largest thermal vacuum chamber in the world – Chamber A – and performing the official 100+ day cryo-vacuum test of the JWST Optical Telescope Element & Integrated Science Instrument Module.

At MSFC, Jacobs' technical staff supported early testing of JWST components inside the X-Ray and Cryogenic Facility (XRCF), simulating the extreme environments that space hardware must withstand during space operations.

To prepare for JWST launch, Jacobs' staff performed Computational Fluid Dynamics (CFD) studies analyzing the potential for contaminants in the clean room at the launch site, modeling airflow with dust particles to determine particle tracks and impact points.

Jacobs' team members on the Electrical Systems Engineering Services III contract at NASA Goddard Space Flight Center provided logistical support to ensure breakdown, safe stowage, and packing of support equipment used in observatory testing was completed safely, correctly and on-time.



## Critical Client Solutions

### Full-Range Testing Services and Capabilities

Jacobs provides an extensive range of reliability testing and prototyping solutions for any aerospace hardware or software application, including: mechanical & electronics manufacturing, structural load testing, environmental testing (thermal/vacuum, electromagnetic interference, vibration), antenna performance, battery performance & failure testing, pyrotechnics testing, and hypervelocity impact testing. To add more fidelity to testing data, our teams apply unique analysis tools, techniques and computational models to ensure accurate results.

### Intelligent Asset Management Solutions

Jacobs addresses every aspect of asset management – from concept to retirement. From strategic planning, concept, design, construction, operations, maintenance or asset extension/retirement – we deploy our Asset Management Delivery Framework to improve asset effectiveness and reduce the total cost of ownership.

Proactive Intelligent Asset Management Solutions increase reliability, availability and performance of facilities, systems and operations, maximizing our clients' return on investment.

**\$80B+** assets managed

**150+** Certified Maintenance & Reliability Professionals

**50+ yrs** leading the shift to more efficient, data-driven O&M



## Designing, Building, and Operating the World's Most Advanced Facilities

“  
Jacobs is the No 1 ranked Architect, Engineering, and Environmental firm by Engineering News Record.”

Photo Courtesy of Orbex

## Commercial & International Space

Jacobs has planned and designed some of the world's most significant facilities and infrastructure, from the establishment and maintenance of military bases worldwide to some of the largest civil works projects. Jacobs provides a full spectrum of services, from policy and strategy through site analysis and project execution, helping our clients improve and diversify their planning and infrastructure to better fulfill their important missions.

- Master Planning & Installation/Site Planning
- Asset Management & Smart Installations
- Cost Estimating & Cost Management
- Design Management
- Cybersecurity Analysis and Planning
- Building Engineering
- Data Centers
- Microgrids
- Industrial Control Systems
- Communications & IT Networks
- Utility Infrastructure Studies & Capacity Analysis
- Value Engineering & Optimization
- Business Case Alternatives Analysis
- Energy Resiliency Planning
- Mission Assurance Assessments
- On-site Generation Solutions
- Renewable Energy Systems
- Defense Threat Reduction
- Environmental Planning
- Environmental Regulatory Compliance
- Climate Change Remedial Planning
- Commissioning, Retrocommissioning & Recommissioning
- Integrated Project Delivery
- Program Budgeting & Planning
- Project Controls, Accounting, & Reporting

### Assembly, Integration and Testing Facility

Axiom Space awarded Jacobs the architecture and engineering phase one design contract for its new 100,000 sqft Assembly, Integration and Testing facility to support its mission to provide access to low Earth orbit and assemble the first commercial international space station, which will provide a central hub for research to support microgravity experiments, manufacturing and commerce in low Earth orbit missions.

### Sutherland Spaceport

Orbex, an orbital launch services company serving the needs of the small satellite industry, is working towards launching its Prime rocket from Sutherland Spaceport near Tongue, Scotland. Jacobs, an investor in Orbex, has led phase one of the construction of the spaceport and it is envisaged that we will provide spaceport operations support, operations consultancy and engineering services.

## Protecting our Nation's Most Critical Assets

For more than 70 years, we've built a worldwide reputation for providing innovative solutions to Government, private companies and industries.

Photo Courtesy of DOD

## Defense Systems & Mission Solutions

In support of the Missile Defense Agency's (MDA) dynamic and evolving mission to defend against advanced threats, Jacobs provides integrated product and service solutions supporting MDA tests, training, and operations on the Integrated Research and Development for Enterprise Solutions (IRES) contract. This includes:

- Program integration and systems engineering
- Missile Defense System (MDS) mission operations and testing
- Wargames and exercises
- Modeling and simulation
- Enterprise IT, cybersecurity and communications
- Operations and maintenance of facility infrastructure

We deliver integrated solutions that support MDA's concurrent testing, training, and operations, enabling rapid and effective research, development, and testing to advance MDS capabilities

Beyond our key support to MDA, Jacobs provides critical mission solutions to U.S. Northern Command (USNORTHCOM), North American Aerospace Defense Command (NORAD), and U.S. Space Command (USSPACECOM) for space

mapping, surveillance, early threat detection and mitigation strategies for North America through the Integrated Tactical Warning/Attack Assessment (ITW/AA) and Space Support Contract II (NISSC II). This work includes:

- Operations, maintenance, and sustainment of current and legacy systems
- Mitigation of orbital conflicts
- Threat warnings and control from airborne, land-based, and space-based systems
- Operations and maintenance of classified communications
- Software and development integration

This crucial support enables timely responses to potential threats and provides critical information to various Commands directing defense systems and ensuring airspace protection.

We deliver innovative operations, maintenance, and sustainment solutions as well as experimental research and development for an expanding portfolio of U.S. Government, military, and commercial customers, driving added value while enabling critical missions and protecting our nation's most coveted defense assets.

# Defense Systems & Mission Solutions

## Cyber & Intelligence

When it comes to defending some of the nation's most sensitive digital assets, we're thinking ahead to the cyber threats emerging on the edge.

For the constellation of U.S. civilian, defense and intelligence agencies that have chosen to put their faith in Jacobs' capabilities, we have a 2,500+ workforce of professionals providing data and secure solutions across multiple domains – land, air, sea and space for mission-critical clients.

On any given day, our operations centers manage over half a million security events, and our service offerings provide the most advanced, integrated approach to cyber, security and intelligence. We provide 24/7 threat hunt and analysis on critical application and data for over 2,500 systems, as well as advanced data analytic and integrated digital solutioning for 16 of 18 Intelligence Agencies.

Jacobs offers accelerated data processing to improve data development, delivery and sustainment across multi-site, multi-domain and edge computing. We also deliver platform and data development support for geo-sensor technologies supporting mission payloads and National Security priorities. Specifically for aerospace clients, our Rapid Solutions team designs and delivers cutting-edge ISR payloads for space and airborne platforms, as well as high-performance advanced communication systems, tactical geolocation products, and aerial mapping systems.

## Supporting Key Missions

- Space Domain Awareness
- Counter Proliferation
- Space/Counterspace
- Defensive & Offensive Cyber Operations
- Collection Management
- Knowledge Management & Dissemination
- Counterintelligence & Human Intelligence
- Indications & Warnings (I&W)

Austal USA	General Dynamics	NASA
BAE Systems	Honeywell	Newport News Shipbuilding
Bell Helicopter	International Defense Agencies	Northrop Grumman
Boeing	Lockheed Martin	PCC Structurals
DOD		Raytheon Technologies

**Aerospace & Defense Clients**

## Missile Defense Agency

Our Jacobs Missile Defense Group provides enterprise-level, integrated technical solutions to support concurrent test, training, operations, enterprise communications, and IT environment for the MDA.

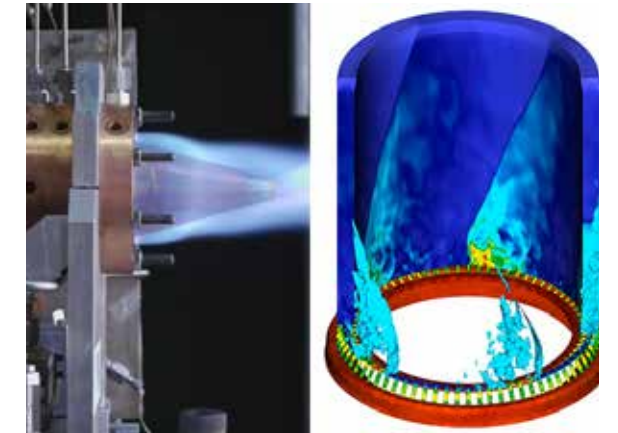


## NORAD

Our Jacobs North American Aerospace Defense Command (NORAD) Operations Group provides operations, maintenance, and sustainment of current and legacy systems for the surveillance and cataloging of space and early warning detection systems in support of USNORTHCOM, NORAD, and USSPACECOM.

## U.S. Air Force

Jacobs plays a crucial role in developing and implementing cutting-edge technologies to combat ever-evolving threats and fulfill the USAF's and USSF's defense mission. Our teams convert rocket propulsion science into practical tools for the nation's military personnel. Specifically, Jacobs offers on-site support for fundamental, exploratory, and experimental research and development to the Aerospace Systems Directorate West (AFRL/RQ-West). This assistance advances a broad range of rocket and space propulsion technologies for the U.S. Air Force Research Laboratory's Rocket and Propulsion Technology Research contract (RAPTR) at Edwards Air Force Base in California

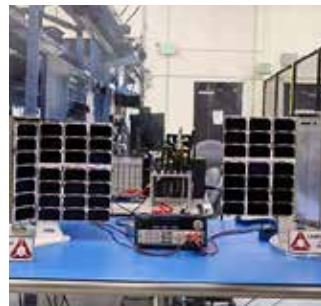


# Space Payloads and Aerospace Manufacturing

Jacobs has emerged as a disruptive designer and manufacturer of affordable, high-performing Space Radio Frequency (RF), Synthetic Aperture Radar (SAR), and Moving Target Indication (MTI) payloads and is growing into adjacent Signals Intelligence (SIGINT) mission areas. Jacobs' use of commercial 5G technology and state-of-the-art, high-volume, and high-quality electronics manufacturing processes facilitates rapid scaling to meet market demand. It also enables rapid tech refresh with the latest hardware, components, and materials, increasing performance and cost savings by two to five times compared with legacy radar systems. Our Rapid Solutions team is developing and demonstrating a suite of space and airborne radar systems and software mission planning and processing tools for ground, air, and space intelligence that cuts across defense, civilian, and commercial customers.

## Mango One

Jacobs began a new era in space with the successful launch of its Mango One satellite in January 2021 from Cape Canaveral, Florida aboard the Space X Falcon 9 Transporter One Mission. Mango One was developed by Jacobs utilizing Spire's Space as a Service (SpaaS) offerings to qualify radar and intelligence capabilities from space through our novel, innovative X-Band ESA coupled with a Radio Frequency System On Chip (RFSoc) a System-On-Chip (SoC) for communications that contains multiple RF components RFSoc on board processing capability. The on-orbit performance is a milestone towards delivering affordable, space-based active electronically scanned arrays.



## Mango Two

On November 9, 2023, a pair of Jacobs Mango satellites was delivered to its intended orbit aboard a SpaceX Transporter launch. This successful launch demonstrated Jacobs expanding radio frequency payload product line. The Mango Two 2-ball satellite pair lays the pathway for next-generation, affordable space solutions to support critical signal detection, processing, and geo-location. While Mango One was a pathfinder in developing our satellite experience, utilizing Spire's SpaaS offering to demonstrate and qualify radar and intelligence capabilities in space, Mango Two will further validate Jacobs' role as a provider of affordable space ISR solutions.

## Aerospace Manufacturing

Jacobs' Rapid Solutions team maintains an industry-leading manufacturing facility capable of high volume and high yield for aerospace hardware. AS9100D / ISO9001 certified across three locations, Jacobs' team of NASA-certified technicians have the latest Surface Mount Technologies (SMT) pick and place machines, conformal coating, lead forming, electro-mechanical assembly, machining, and a business and quality management system capable of controlling cost and quality. Combined with our trusted supply chain system leveraging the best automation, Jacobs is able to support the full range of manufacturing needs, from minor, quick-reaction prototyping to high volume, high-reliability space payload manufacturing.



Jacobs began a new era in space with the successful launch of its Mango One satellite.

For five years, Jacobs has developed and refined our high-performing, innovative, affordable Electronically Steered Array (ESA) technology. With \$250M of internal and government funding, this technology has quickly matured into a powerful solution to aid commercial SAR providers in driving down cost, increasing ROI, and providing the affordable space-based ESA technology to the commercial industry base - all while working to deliver an initial operating capability in CY27.

Rapid Solutions delivers affordable space-based radar payloads, including all ESA radar panels, ESA electronics, onboard processing sense-making, and the radar payload mission management software integrated with the spacecraft bus, space vehicle integration, and launch service.

Learn more about Jacobs  
Space Exploration and  
Defense work.



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**Jacobs**

Challenging today.  
Reinventing tomorrow.