

A MILE CLOSER TO SPACE



COLORADO SPACE COALITION



COLORADO AEROSPACE 2011-2012



AEROSPACE

[www.spacecolorado.org](http://www.spacecolorado.org)

# THE PERFECT ATMOSPHERE FOR SPACE



## The fact that Colorado is a mile closer to space is just part of the story

With the nation's third-largest aerospace economy, Colorado offers aerospace companies one of the country's most educated workforces, a dynamic atmosphere for business growth, and a hub of high-tech innovation.

Eight of the nation's top aerospace contractors have significant operations in the state. Along with major U.S. Department of Defense (DoD) facilities and the National Aeronautics and Space Administration (NASA) research and development activities, the state's universities are among the world's best for aerospace engineering.

Colorado's strategic location in the center of the country provides one-bounce satellite communications to Europe and Asia in the same business day.

In addition, Colorado has an abundance of high-tech companies developing viable, cutting-edge technologies in fields such as renewable energy and cyber, providing a fertile environment for innovation opportunities with these cross-supporting sectors.

In Colorado, you'll be part of a high-powered, established space industry in a location that also happens to be a great place to live. In an atmosphere like this, it's no wonder that aerospace companies thrive and prosper at 5,280 feet.

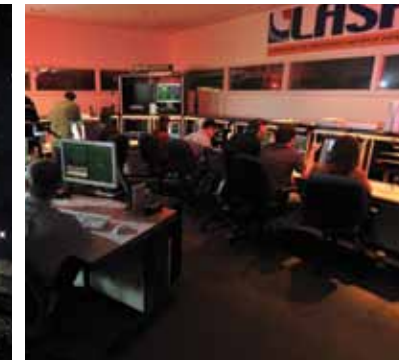
## CLOSER TO SPACE, AS WELL AS CONTRACTORS AND SUPPLIERS

Eight of the country's major space contractors have a significant presence in Colorado, helping the DoD procure, place, and manage national space assets to protect our country and increase its military and homeland security capabilities. Colorado's aerospace companies develop manned and unmanned spacecraft, instrumentation, remote sensing, ground control and navigation services, and launch vehicles for NASA and other agencies. More than 400 companies and suppliers provide space-related products and services in the state.

### Major Aerospace Contractors



Colorado ranked 4th in the nation for NASA prime contract awards in 2009  
— NASA, 2010



## LEADING THE NATION'S MOST NOTABLE AEROSPACE PROJECTS

**Dream Chaser** – Sierra Nevada Corporation, located in Louisville, is developing Dream Chaser, a space transportation system to carry passengers and cargo in sub-orbital and orbital flights, including trips to and from the International Space Station. The company received \$20 million of the \$50 million provided by NASA's Commercial Crew Development (CCDev) initiative.

**GPS OCX** – The U.S. Air Force Space and Missile Systems Center awarded Raytheon, located in Aurora, an \$886 million contract to deliver the Global Positioning System (GPS) Advanced Control Segment (OCX), which will enhance net-centric and navigation warfare capabilities, and control over GPS II and GPS III satellites.

**Joint Polar Satellite System** – NASA, on behalf of the National Oceanic and Atmospheric Administration (NOAA), awarded Aurora-based Raytheon a \$1.7 billion contract for the Joint Polar Satellite System (JPSS), a successor to the National Polar-orbiting Operational Environmental Satellite System program. JPSS includes satellites and sensors supporting next-generation civil weather and climate measurements. NASA also awarded Boulder-based Ball Aerospace a \$248 million contract to design, build, and test the JPSS-1 spacecraft.

**Juno** – NASA chose Jefferson County-based Lockheed Martin Space Systems to build the Juno spacecraft, whose mission will improve our understanding of our solar system's beginnings by revealing the origin and evolution of Jupiter. Set to launch in 2011, the spacecraft will reach Jupiter in 2016.

**Kepler** – Boulder-based Ball Aerospace & Technologies Corp. is the prime contractor for NASA's Kepler Mission to search for Earth-sized planets capable of supporting life. Launched in 2009, Kepler's mission operations are supported by Ball and CU-Boulder's Laboratory for Atmospheric and Space Physics (LASP). In early 2011, Kepler discovered its first Earth-size planet candidates and its first candidates in the habitable zone.

**MAVEN** – The University of Colorado's (CU-Boulder) Laboratory for Atmospheric and Space Physics (LASP) is leading NASA's Mars Atmosphere and Volatile Evolution (MAVEN) mission, set to launch in 2013. Lockheed Martin Space Systems will design, build, and operate the \$485 million spacecraft which will explore the past climate of Mars, including its potential for harboring life over the ages.

**Orion** – Lockheed Martin Space Systems is the prime contractor to NASA for Orion, an advanced crew capsule to transport the nation's next generation of human explorers to and from low Earth orbit, to the Moon, and beyond. The spacecraft comprises a module for crew and cargo transport, a service module for propulsion, electrical power and fluids storage, a spacecraft adapter for securing it to a launch vehicle, and a launch abort system that will significantly improve crew safety.

**United Launch Alliance** – United Launch Alliance (ULA), headquartered in Centennial, celebrated its fourth anniversary in 2010 with 45 successful launches. ULA received a \$6.7 million contract from NASA to participate in the CCDev initiative for the development of an Emergency Detection System for a safe and highly reliable human-rated launch vehicle.

**Worldview-3** – Commercial remote-sensing firm DigitalGlobe, headquartered in Longmont, announced its next satellite, WorldView-3, will be built by Ball Aerospace & Technologies Corp. in Boulder. The fourth-generation WorldView-3 satellite is capable of capturing 8-band multispectral high-resolution satellite imagery and a high-resolution panchromatic band and is expected to launch in 2014.

# THE NATION'S 3RD-LARGEST SPACE ECONOMY



## A DYNAMIC INDUSTRY WITH SIGNIFICANT ECONOMIC IMPACT

The aerospace industry is a crucial driver of Colorado's economic growth, with the state ranking first in the United States for its high concentration of private aerospace jobs, with more than 163,230 workers and a \$2.8 billion annual payroll. Colorado's unique convergence of aerospace and other high-tech industries such as clean energy, provides further opportunities for innovation, collaboration, and growth.

## LEADING-EDGE GEOSPATIAL TECHNOLOGY

Colorado is a strategic hub for geospatial technologies, remote sensing, imaging, and related industries. Two of the country's leading geospatial companies – DigitalGlobe and GeoEye – monitor the planet from their Colorado facilities.

## LARGE AND DIVERSE MIX OF MILITARY INSTALLATIONS

Colorado is the U.S. center for military space. The state's military commands – the primary customers for space-based research, development, acquisition, and operations – advance future aerospace industry growth in Colorado.

### Military Commands:

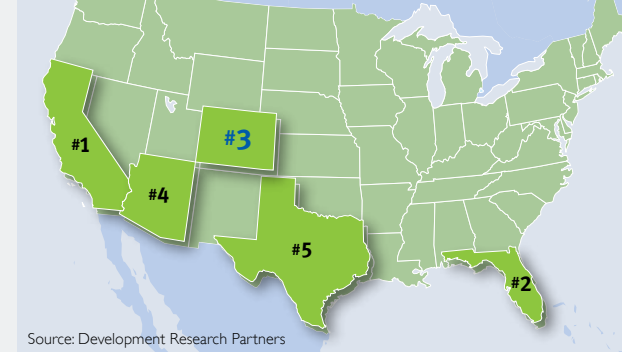
- Air Force Space Command (AFSPC)
- U.S. Army Space and Missile Defense Command/U.S. Army Forces Strategic Command (SMDC/ARSTRAT)
- North American Aerospace Defense Command (NORAD)
- U.S. Northern Command (USNORTHCOM)

### Military Bases:

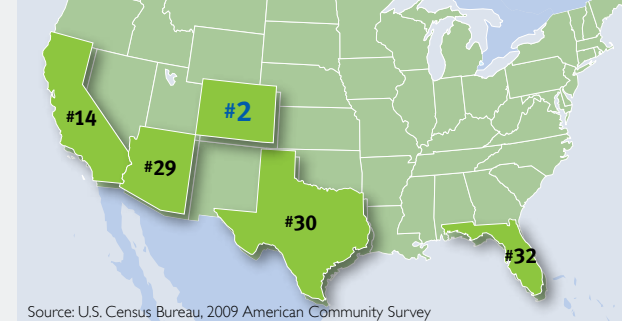
- Buckley Air Force Base
- Peterson Air Force Base
- Schriever Air Force Base

Colorado has three space-oriented Air Force bases

## 2010 total private aerospace employment



## Education of workforce among top five aerospace states



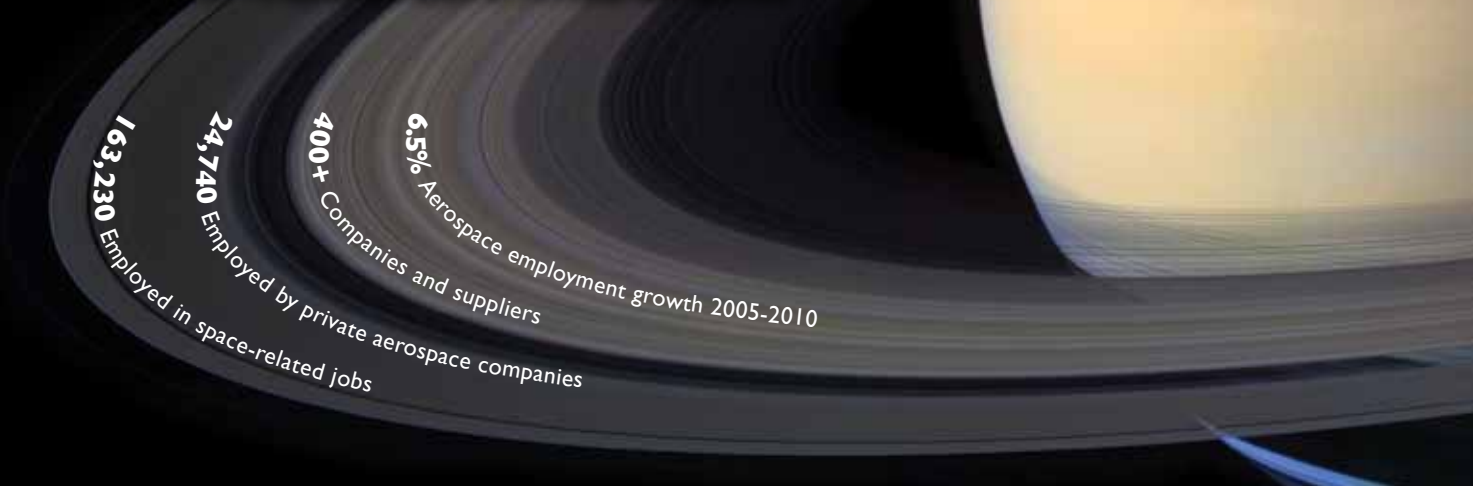
## DEDICATED TO DEVELOPING A 21ST CENTURY AEROSPACE WORKFORCE

Colorado's universities and research centers are leading the charge to educate the next generation of aerospace workers.

- The University of Colorado at Boulder (CU-Boulder) is a leading university for training astronauts.
- Air Force Space Command (AFSPC) designated the University of Colorado at Colorado Springs as the Space Education Consortium's lead university to educate the nation's future aerospace workforce.
- Three Colorado universities are members of the Universities Space Research Association, with graduate programs in space sciences or engineering: CU-Boulder, Colorado School of Mines, and the University of Denver.
- The U.S. Air Force Academy in Colorado Springs offers the country's No. 2 undergraduate program in aerospace engineering.
- Metropolitan State College of Denver's Advanced Aviation and Aerospace Flight Simulation and Training Lab simulates space mission analysis and orbital dynamics.
- As co-chair of the Colorado Space Coalition, Lt. Governor Joe Garcia actively promotes science, technology, engineering, and math education to prepare Colorado's next generation of aerospace workers.

Colorado ranks first in the nation for its concentration of aerospace employees  
– Development Research Partners, 2010

## COLORADO – AEROSPACE AT A HIGHER LEVEL



# OUR WORLD REVOLVES AROUND SPACE

## COLORADO – THE PERFECT ATMOSPHERE FOR AEROSPACE

- 1st** in the United States for private aerospace employment concentration
- 2nd** highest for residents with bachelor's degree or higher
- 2nd** for Small Business Innovation Research Grants
- 3rd** for per capita venture capital investment
- 3rd** highest in state science and technology index
- 4th** best state for business
- 4th** in NASA prime contracts
- 4** military commands
- 4th** for number of new companies per 1,000 employees
- 4th** lowest tax burden



## WORLD-CLASS RESEARCH INSTITUTIONS AND LABORATORIES

Extensive federal funding contributes to leading research at Colorado's research institutes and federal laboratories.

- The National Oceanic and Atmospheric Administration (NOAA), the University Corporation for Atmospheric Research (UCAR), and the National Center for Atmospheric Research (NCAR), located in Boulder, conduct research in atmospheric and related sciences, including exploring and monitoring worldwide weather, climate, the space environment, and ocean resources.
- A proven training ground for future space scientists and engineers, the Laboratory for Atmospheric and Space Physics (LASP) at CU-Boulder is the only university-based institution in the world to have designed and built space instruments for NASA that have been launched to every planet in the solar system.
- Colorado State University's Cooperative Institute for Research in the Atmosphere (CIRA) partners with NOAA to provide global climate research, satellite observations, and air quality measurements.

## PROGRESSIVE, BUSINESS-FRIENDLY STATE

Colorado is a forward-thinking state with an entrepreneurial business climate.

- Along with few regulatory barriers, Colorado has one of the nation's lowest corporate income tax rates – a flat 4.63 percent.
- Colorado offers single-factor tax apportionment, which assesses taxes on a company's sales in the state only.
- The state offers incentives for new job creation as well as training grants.
- Colorado has Procurement Technical Assistance Centers in Colorado Springs and Jefferson County to help businesses compete for military and other funding.
- Key collaborations with the public and private sectors help aerospace companies prosper.
- Colorado's Congressional Delegation is actively engaged with the Colorado Space Coalition to assure continued investment in the state's academic, military, and commercial aerospace infrastructure.

## A HUB FOR ENTREPRENEURISM AND COMMERCIAL SPACE ACTIVITIES

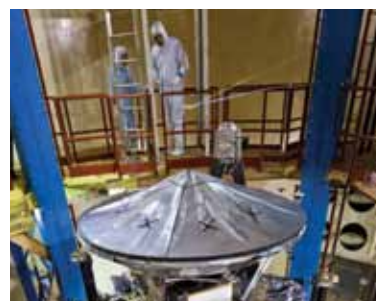
- In late 2010, the Colorado Association for Manufacturing and Technology and NASA signed the **Space Act Agreement**, creating the Technology Acceleration Program (TAP) to shorten the time between development and production of aerospace and clean energy technologies by allowing established companies and startups to leverage existing NASA and National Renewable Energy Laboratory (NREL) resources, engage in joint development projects, and help grow the region's workforce in these industries.
- To address the current and future challenges of commercial space transportation, in 2010 the Federal Aviation Administration established a **Center of Excellence for Commercial Space Transportation**, of which CU-Boulder is a core member. The Center brings together government, industry, and academic institutions to focus on commercial human space flight, space commerce, space launch operations and traffic management, and launch vehicle systems.
- **eSpace: The Center for Space Entrepreneurship** is a not-for-profit organization based in Louisville that supports the creation and development of entrepreneurial space companies, the commercialization of the technologies they create, and the workforce to fuel their growth.
- **The 8th Continent Project**, housed at the Colorado School of Mines' Center for Space Resources, includes a chamber of commerce, business incubator, funding network, and research center. The Project is organizing "Space 2.0" – the emerging generation of entrepreneurial space-related business ventures.

## AN EXCEPTIONAL ENVIRONMENT THAT ATTRACTS AND RETAINS QUALITY WORKERS

Colorado has all of the amenities that both attract and retain a highly educated, productive workforce, including 300 days of sunshine annually and unparalleled access to outdoor recreation. Other vital statistics include having among the country's highest percentages of physical activity and wellbeing and the lowest obesity rate.

Colorado is second in the U.S. for residents with a bachelor's degree or higher  
– U.S. Census Bureau, 2010

**About the Colorado Space Coalition**  
The Colorado Space Coalition (CSC), a group of industry stakeholders, works to make Colorado a center of excellence for space. Coalition members – including aerospace companies, military leaders, academic organizations, and economic development groups – promote Colorado's significant aerospace assets nationally, as well as advance legislation vital to industry growth and success. The CSC is staffed by and housed at the Denver Metro Chamber of Commerce and the Metro Denver Economic Development Corporation.



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Colorado ranks among the top-five states  
where U.S. adults most want to live  
– Harris Interactive, 2010



If you're looking for highly educated aerospace workers and close proximity to major contractors and suppliers, world-class research facilities, and the U.S. center for military space, you really should discover Colorado. Our space-friendly atmosphere offers a wealth of assets to make your company thrive.



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