National Aeronautics and Space Administration

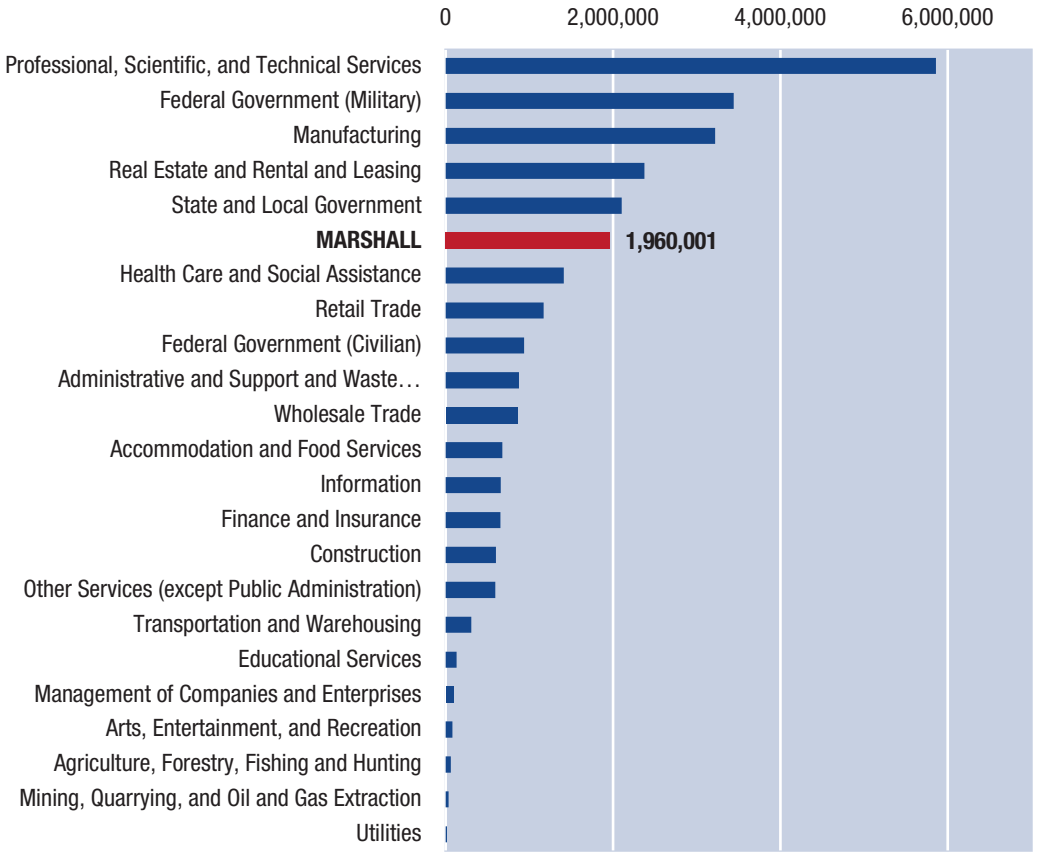
MARSHALL
SPACE FLIGHT CENTER

FY19 Economic Impact Report

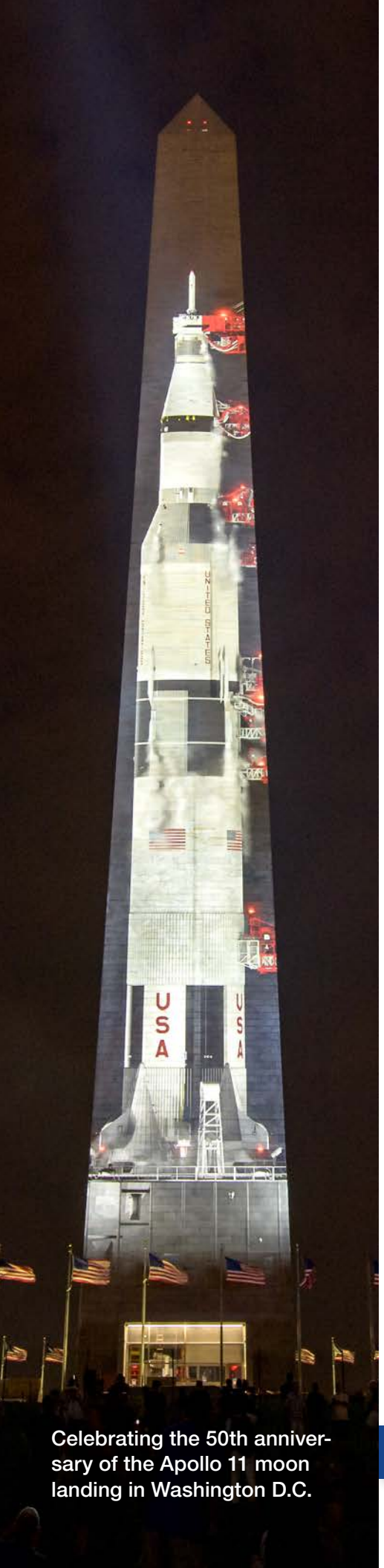
SLS Core Stage being installed in SSC's B2 Test Stand for Green Run

In Huntsville, Alabama, NASA's Marshall Space Flight Center (MSFC) is building America's most powerful rocket, the Space Launch System (SLS), along with developing state-of-the-art engineering technologies, world-class space systems, and cutting-edge science and research. In doing so, Marshall provides valuable contributions to the community, the state, the region, and the nation. Each year, Marshall generates significant economic impact by supporting thousands of jobs and investing millions of dollars in research and development, driving an innovation-based economy in Alabama and throughout the United States.

Marshall Space Flight Center Value Added and Gross Product by Industry, Madison County, Alabama (thousands)*



Credit: The economic impact analysis presented here is based on research conducted by the University of Illinois-Chicago: The Nathalie P. Voorhees Center for Neighborhood and Community Improvement.



Celebrating the 50th anniversary of the Apollo 11 moon landing in Washington D.C.

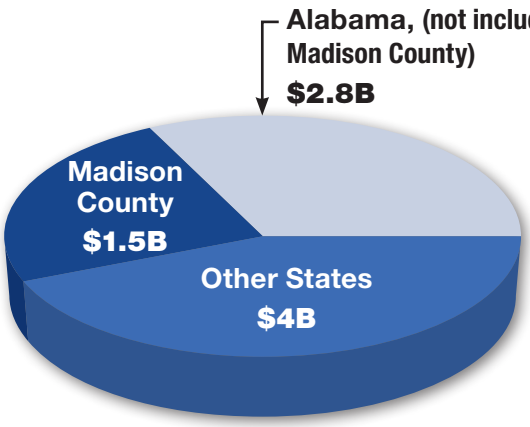
Impacts to our Nation

Marshall Space Flight Center employs thousands of highly paid, skilled professionals and channels millions of dollars in federal spending in the form of contracts throughout the United States.

Marshall directly employs nearly 2,500 civil service workers across the nation. Moreover, for every civil servant employed, approximately 17 additional jobs are supported throughout the economy. These jobs come in the form of government contractors as well as the doctors, dining and leisure workers, school teachers, and others necessary to support the employment base. These employees also spend money in their community generating significant tax revenues for the community. Throughout the United States, Marshall supports more than 43,600 jobs and generates a total economic output of $8.3 billion along with contributing $950 million in federal, state and local tax revenues.

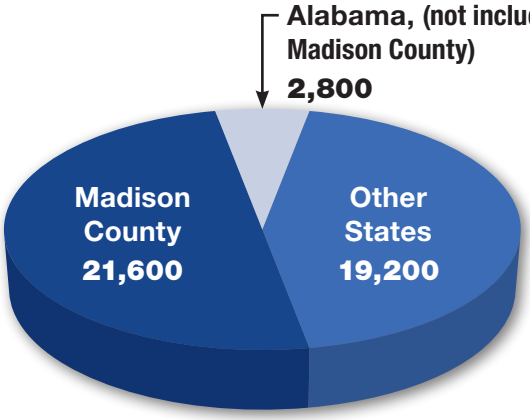
Economic Impact

$8.3 Billion



Jobs

43,600



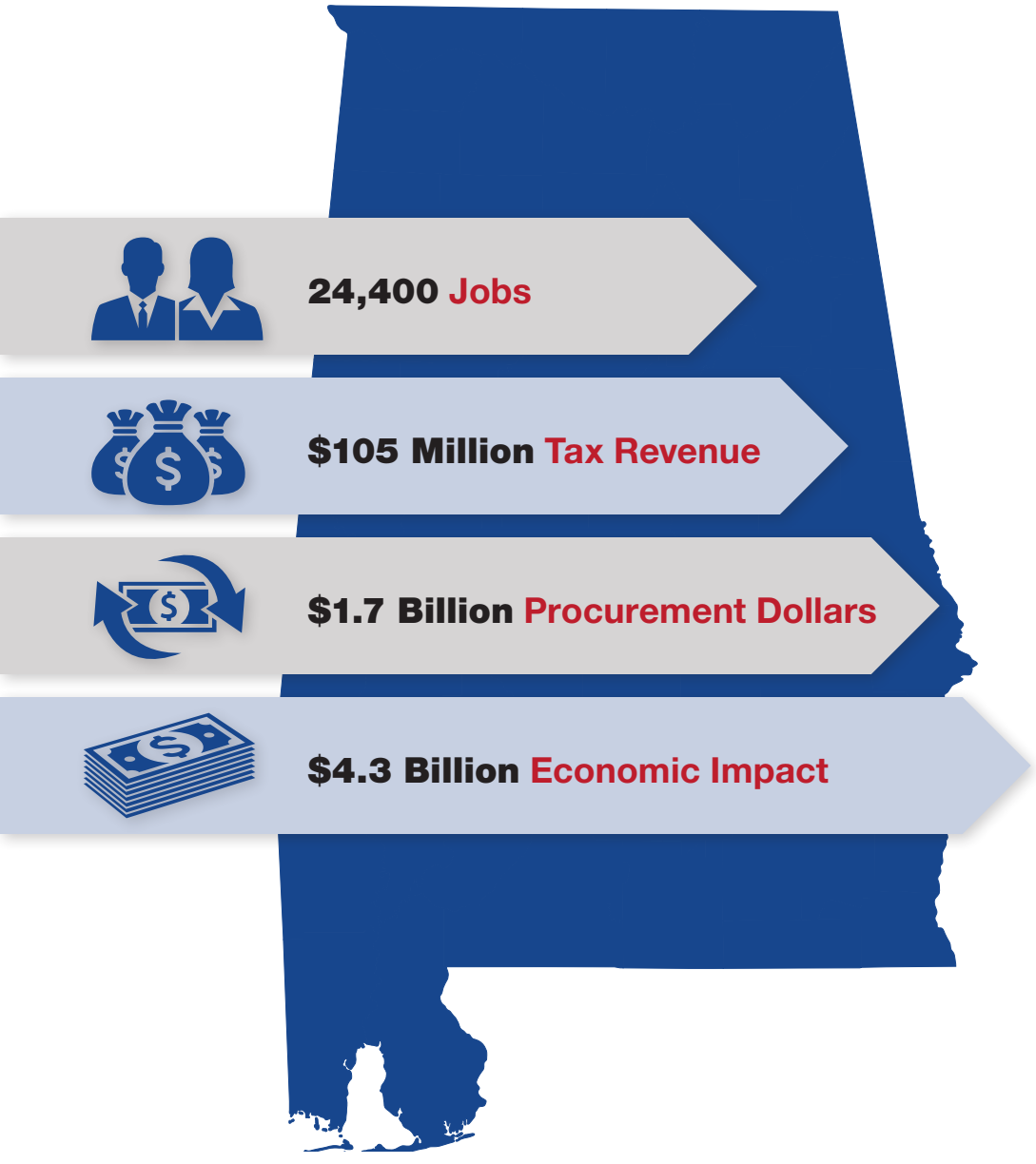
Procurement

$2.6 Billion

Strengthening our State

Marshall Space Flight Center's home state of Alabama reaps the benefits of Marshall's location through economic impact, jobs, and local and state tax revenues. In fact, Marshall generates $4.3 billion annually in economic impact and supports 24,400 jobs within the state of Alabama while also contributing $105 million in local and state tax revenues. Nearly 63% of Marshall's contracts are sourced in Alabama with a total value of $1.7 billion.

To put this in perspective, Marshall Space Flight Center's contributions to the state of Alabama made up approximately 1% of the Gross State Product in Fiscal Year 2019.

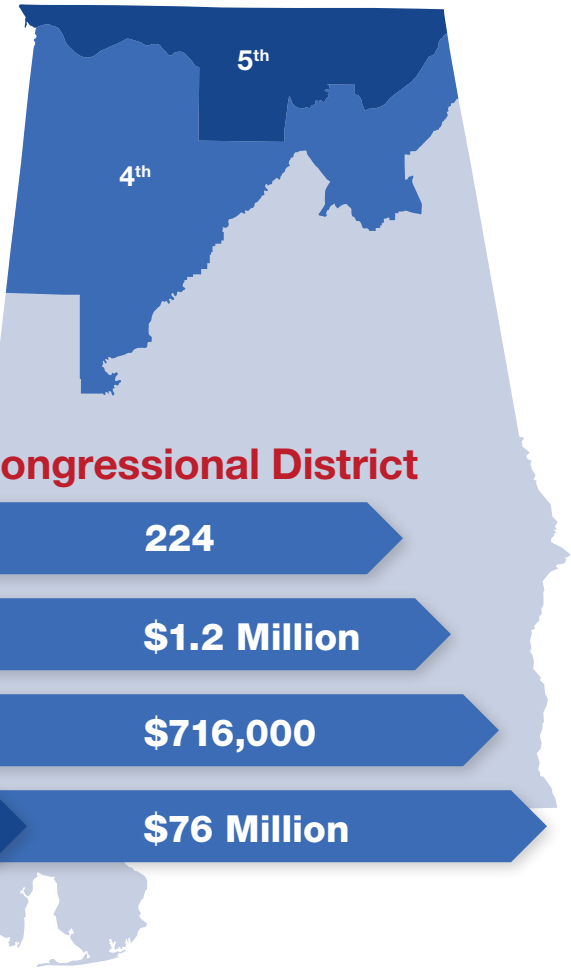


SLS Core Stage structural testing at Marshall Space Flight Center

Across Our Region

Marshall is located within the 5th Congressional District in Alabama. As such, most of the civil servant and contract employees who work on Center live in the 5th Congressional District as well.

Marshall's impact continues into the 4th Congressional District with a smaller, but substantial impact.



	5th Congressional District	4th Congressional District
Jobs	21,300	224
Tax Revenue	$79 Million	$1.2 Million
Procurement	$1.6 Billion	$716,000
Economic Output	$3.7 Billion	$76 Million

Building Our Local Community

Marshall Space Flight Center calls Madison County home. Therefore, it follows that most of the economic impact Marshall generates is concentrated within Madison County. In fact, Marshall's contributions to the local economy account for 7.5% of the county's gross product. Ranking among the top ten sectors, Marshall exceeds the contributions made by many important sectors including health care and retail trade.

Jobs	21,600
Tax Revenue	$75 Million
Procurement	$1.6 Billion
Economic Output	$3.7 Billion

Michoud Assembly Facility

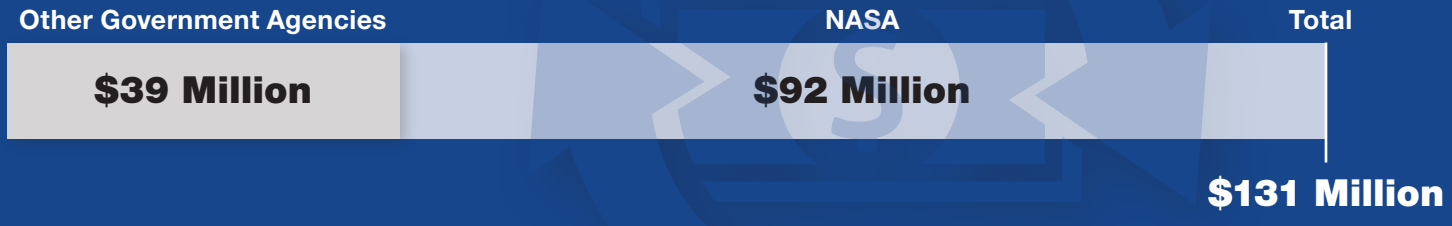
The Michoud Assembly Facility, managed by NASA's Marshall Space Flight Center and located in New Orleans, Louisiana, is essential to NASA's human space exploration program. Michoud Assembly Facility manufactures and assembles critical hardware components for exploration vehicles, such as the Space Launch System core stage, main propulsion system, and large structures and composites for the Orion crew exploration vehicle.

Home to one of the largest indoor manufacturing facilities in the world, Michoud boasts approximately 43 acres (2.2 million square-feet) of climate-controlled space under one roof. This comprehensive facility also hosts a deep water port used for transportation and its own dedicated rail head.

Michoud's importance to Louisiana and the nation extends beyond NASA with a multi-use tenant facility home to numerous government agencies, including the United States Department of Agriculture and the United States Coast Guard, as well as private companies.

	Michoud	Louisiana	Mississippi
Jobs	5,000	3,400	150
Tax Revenue	$110 Million	$18 Million	$735,000
Procurement	$135 Million	$127 Million	–
Economic Output	$875 Million	$527 Million	$25 Million

Michoud Government Procurement



Michoud Assembly Facility does not spend procurement dollars in Mississippi directly. Much of the procurement dollars for Michoud go through Marshall Space Flight Center which manages Michoud.

Building America's Rocket

The Space Launch System (SLS) is the only rocket capable of sending the Orion crew exploration vehicle, astronauts, and cargo to the Moon in a single launch. The SLS rocket, in combination with the Orion spacecraft, Gateway, and Human Landing System together make up the deep space exploration program, Artemis.

NASA's Artemis program is part of America's broader Moon to Mars exploration approach, which aims to put the next man and first woman on the Moon by 2024 and establish a long term presence there by 2028. The experience gained there will enable humanity's next giant leap, sending humans to Mars.

Marshall Space Flight Center has the honor of designing and managing production of the SLS, the backbone of NASA's flagship exploration program, along with the technologies necessary to achieve success. Truly America's rocket, more than 1,100 companies in 45 states have supported the design, development, manufacturing, and building of the Space Launch System.

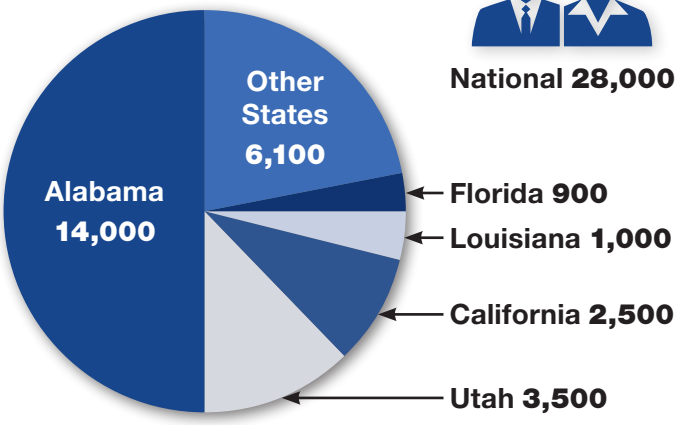
National

Jobs	28,000
Tax Revenue	$600 Million
Procurement	$1.8 Billion
Economic Output	$5.5 Billion

Alabama

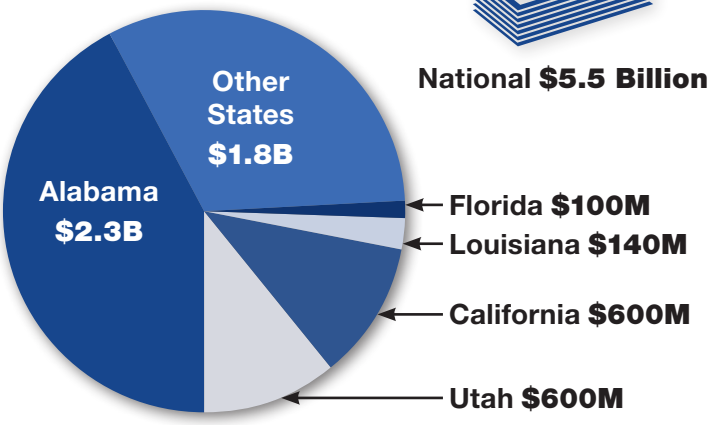
Jobs	14,000
Tax Revenue	$58 Million
Procurement	$1 Billion
Economic Output	$2.3 Billion

Jobs



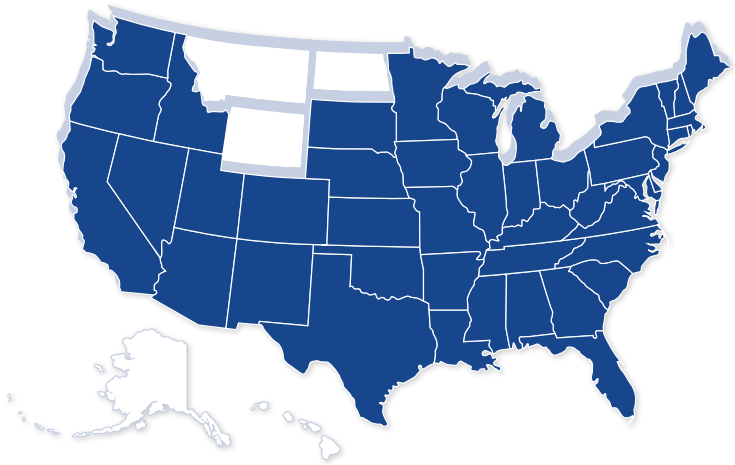
National **28,000**

Economic Output



National **$5.5 Billion**

States Participating in SLS Artemis



Human Landing System

Marshall's newest program office, the Human Lander System (HLS) formed in August 2019 when NASA chose Marshall to work with American companies to rapidly develop, integrate, and demonstrate a human lunar landing system that can launch to the Lunar Gateway, pick up astronauts and ferry them between the Gateway and the surface of the Moon. In April 2020, NASA awarded contracts to Blue Origin, Dynetics (a Leidos company), and SpaceX to design and develop the systems for the agency's Artemis program.

	National	Alabama
Jobs	667	320
Tax Revenue	$11.2 Million	$1.3 Million
Economic Output	$107 Million	$60 Million

A Highly-Skilled Workforce

Redstone Arsenal

Marshall is housed within Redstone Arsenal, a 38,000 acre army base which supports several major commands including the Army Materiel Command and is also home to a number of federal and international organizations. Nearly 44,000 employees enter the gates of Redstone Arsenal daily.

Cummings Research Park

Located just outside the gates of Redstone Arsenal, is Cummings Research Park, the second largest research park in the country.

Established in 1962

4th largest in the world > **300+ companies** > **26,000 Employees** > **826 Patents** > **13,500 Students** > **3,800 Acres**

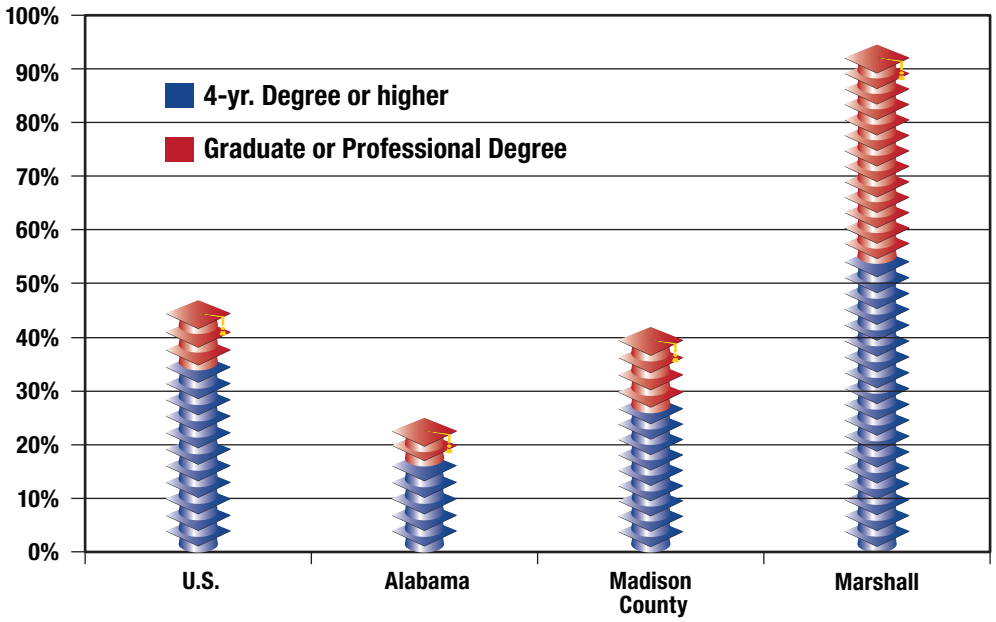
Average Annual Income

Because of the very nature of jobs at Marshall Space Flight Center, the average annual income is higher than the national average. Marshall's workforce is comprised of highly-skilled employees within the STEM fields of Science, Technology, Engineering, and Mathematics, including, rocket scientists, engineers, physicists, chemists, and more. Additionally, Marshall also employs professionals in the fields of accounting, communications, human resources, and IT specialists.

Jobs at Marshall provide an average annual income of $75,346 which is nearly 20% higher than the national average of $62,977 annually.

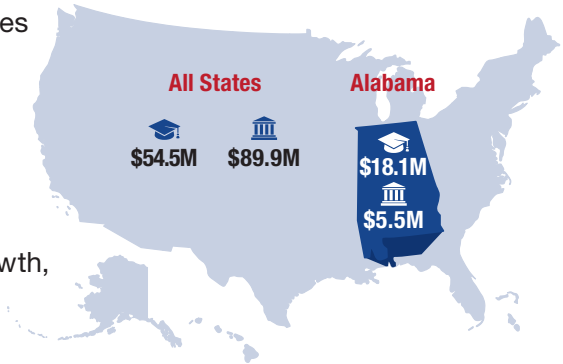
Strong Foundations

NASA and the Marshall Space Flight Center strive to help maintain a strong American education system, nurturing students' interest in the STEM fields of Science, Technology, Engineering, and Mathematics starting in elementary school and continuing on through college. NASA also forges strong ties with the nation's academic centers of excellence and the educators who are shaping the minds of tomorrow's work force. The agency's main goals are to build a diverse future STEM workforce by inspiring and motivating students to pursue careers in STEM related areas, and to strengthen public understanding by enabling powerful connections to NASA's mission and work. The intended outcome is a generation prepared to code, calculate, design, and discover its way to a new era of American innovation.



MSFC Investments in Research Grants

Marshall, like all NASA centers, relies on a highly educated workforce to accomplish their goals. This enhances the economic growth and development throughout the local community. To foster this growth, Marshall provides grants to both educational as well as nonprofit institutions for research that supports different aspects of the agency's mission.



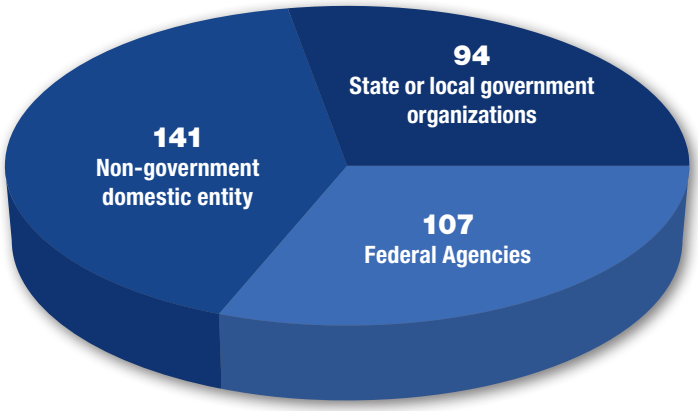

Student Launch Initiative

Space Act Agreements Benefit Everyone

Space Act Agreements

Marshall offers the use of laboratories, test sites, and other cutting-edge facilities, along with the expertise of scientists, engineers and subject matter experts to commercial industry, universities and other government agencies through Space Act Agreements. The goal is to foster development of innovative commercial resources, capabilities and spinoff technologies that benefit everyone.

Marshall currently has 342 Space Act Agreements in place.

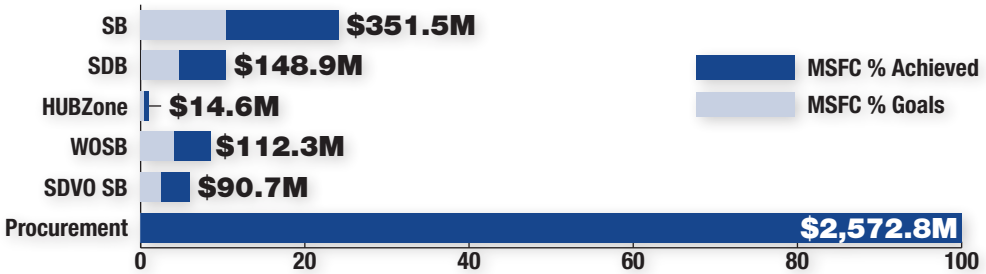


Supporting Small Business

Small Business

Nationally, Marshall supports a variety of small businesses including Small Disadvantaged Businesses, HUBZone Small Businesses, Women Owned Small Businesses, Service Disabled Veteran-Owned Small Businesses, and Veteran-Owned Small Businesses with business opportunities, marketing tools, and special programs such as the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs.

FY19 Small Business Contract Distribution



SBIR/STTR

The NASA Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs fund the research, development, and demonstration of innovative technologies that fulfill NASA needs and have significant potential for successful commercialization.

Goals for the SBIR/STTR programs

- Stimulate technological innovation
- Increase private sector commercialization of innovations derived from Federal Research and Development funding
- Foster and encourage participation in innovation and entrepreneurship by socially and economically disadvantaged small businesses
- Use small businesses to meet Federal research and development needs

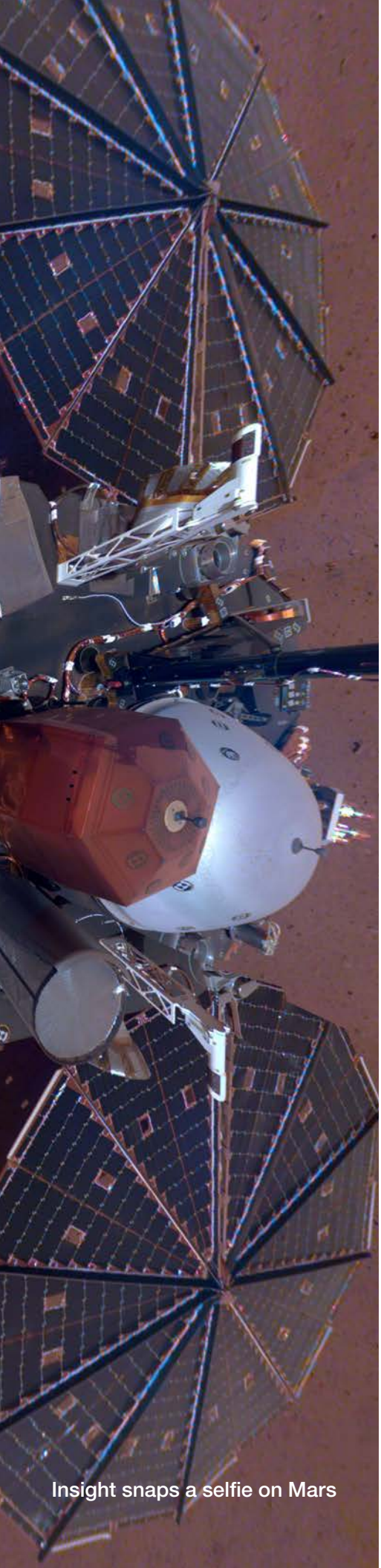
National Impact of NASA Investments

$185 Million Invested >  **2,081 Jobs Supported** >  **$500 Million Economic Output**

Spin Off Technology

Rocket Design Leads to Turbo-Charged Air Purifier

The founders of Wynd, a start-up that makes personal air purifiers, didn't particularly have space exploration on the brain when they built their prototype. But the experience the engineers had calibrating sensors for launch pads and designing turbines for rockets proved crucial when designing their smart, portable device that not only cleans the air you breathe but also tells you just what was in the air in the first place. They built a portable device, about the size of a water bottle, which was rechargeable and is able to conserve energy when the air quality is good and then ramp up the purifier when the air gets worse. The Redwood City, California-based company now sells the air purifier and air quality sensor online.



Insight snaps a selfie on Mars

Explore Marshall

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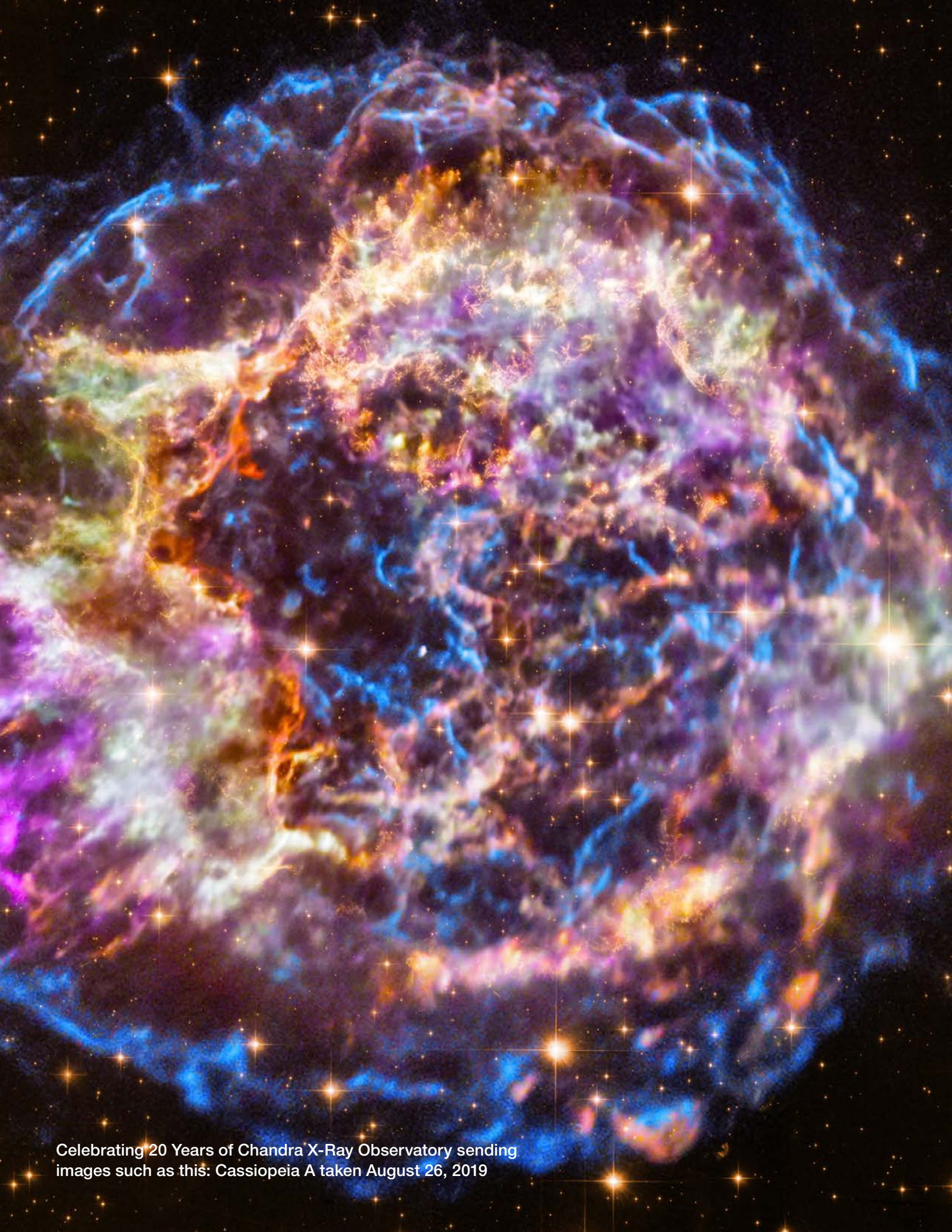

Celebrating 20 Years of Chandra X-Ray Observatory sending images such as this: Cassiopeia A taken August 26, 2019

National Aeronautics and Space Administration

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