



Challenges and Opportunities for Space Research and Education in Florida

**Julie Brisset
Interim Director
Florida Space Institute**



Exciting Times for the Space Sector

- “Space is existential, from the future of the planet to the future of commerce”

Adam Jonas, Head of the Morgan Stanley Research Space Team, 2021

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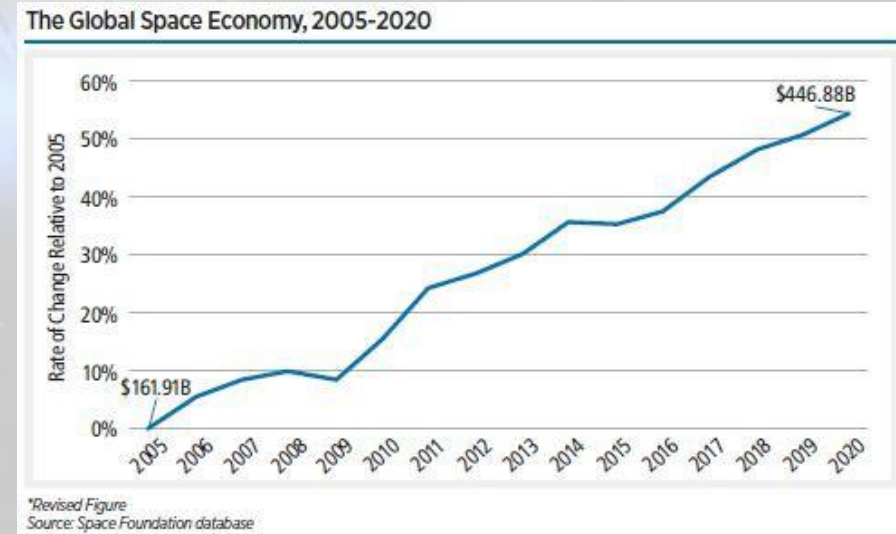


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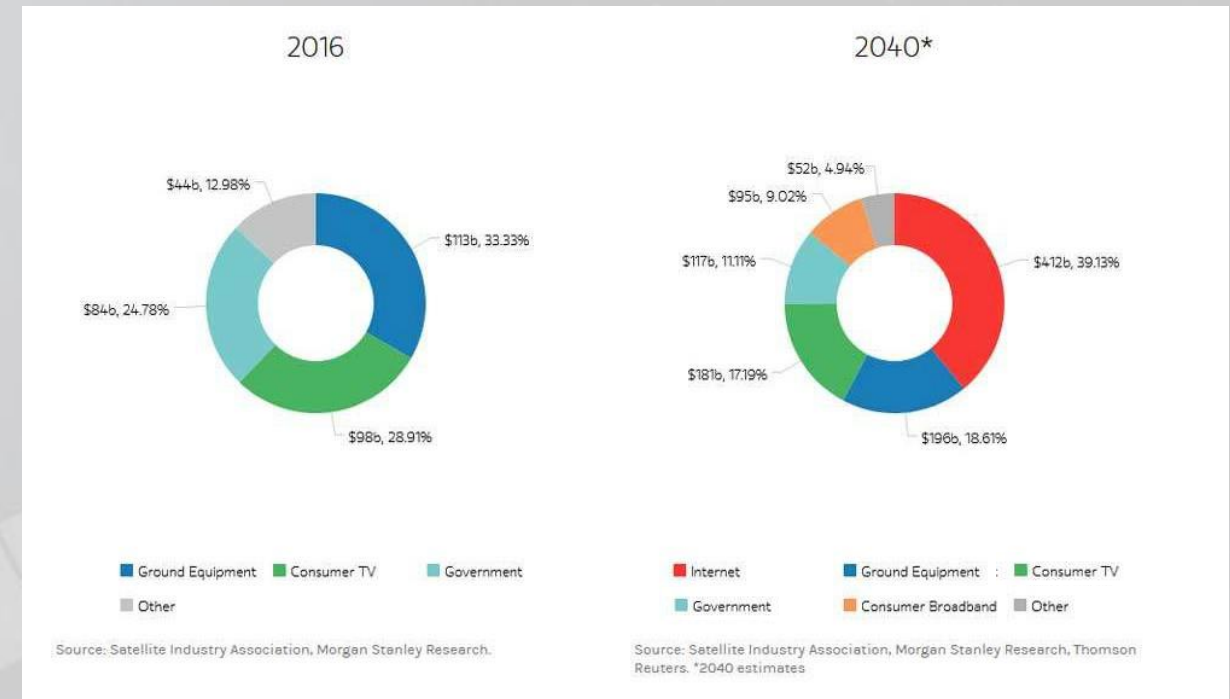
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- The global space economy is to reach \$1 trillion in the 2040s



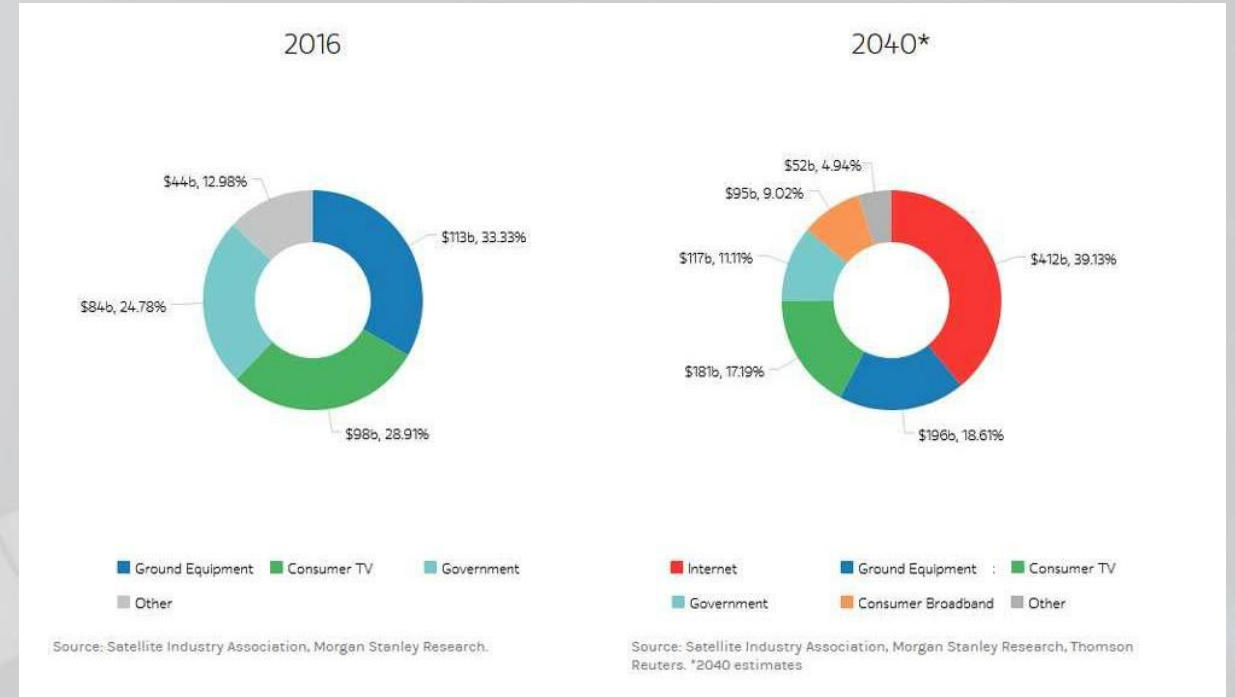
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Exciting Times for the Space Sector

- Sustained public-sector interest:

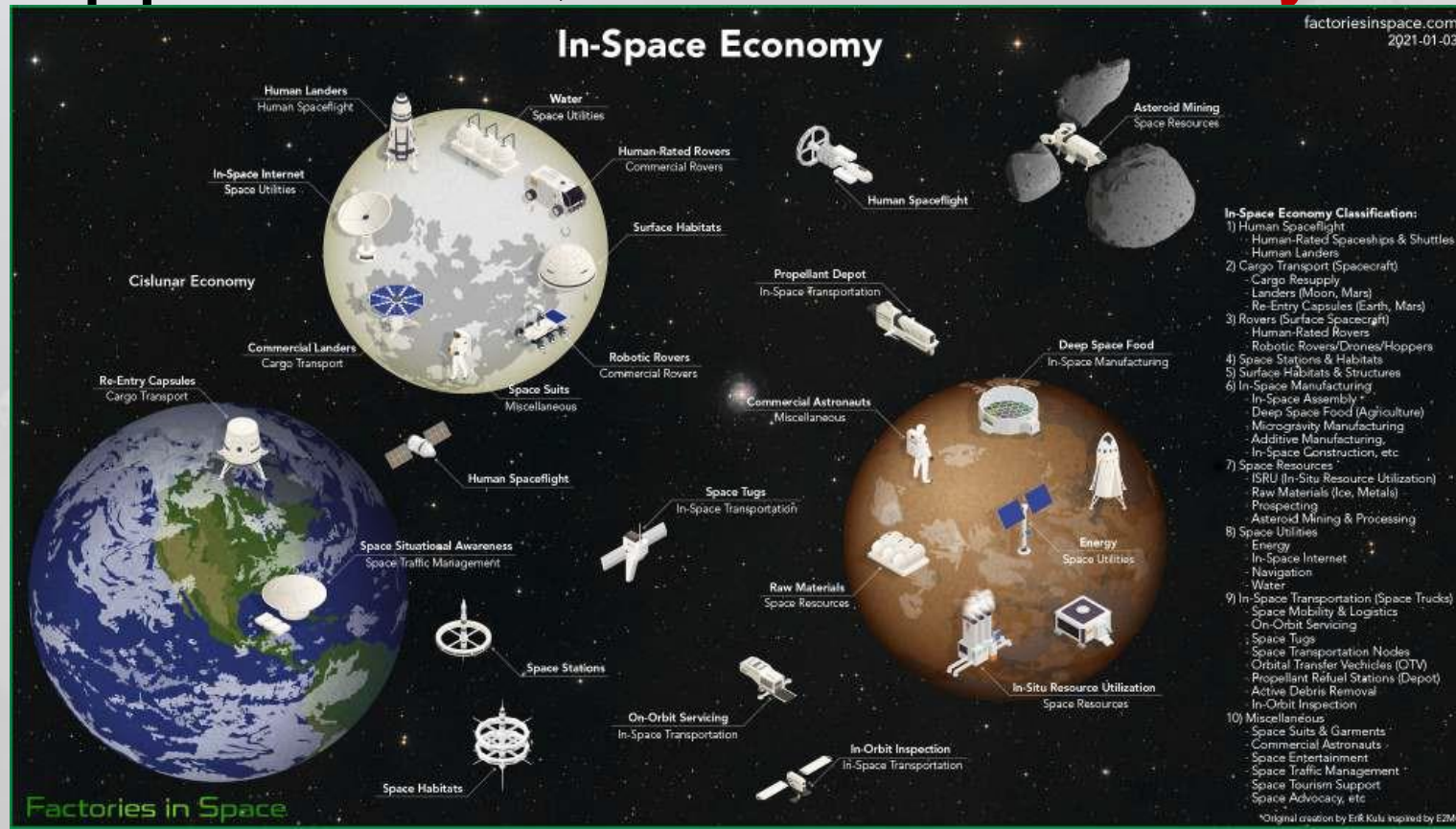


- Creation of the Space Command
- Leasing of government facilities and services (e.g. launching infrastructure)
- Partnering on space traffic control and orbital debris management
- Investment into commercial space stations



Exciting Times for the Space Sector

- 5% of the space economy is in the “space-for-space” applications, which is at a **key turning point**





Exciting Times for the Space Sector

- 5% of the space economy is in the “space-for-space” applications, which is at a key turning point
- Private companies are flying people and equipment to space **sustainably** and **at scale**
SpaceX, Blue Origin, Virgin Galactic → **Reusable** rockets



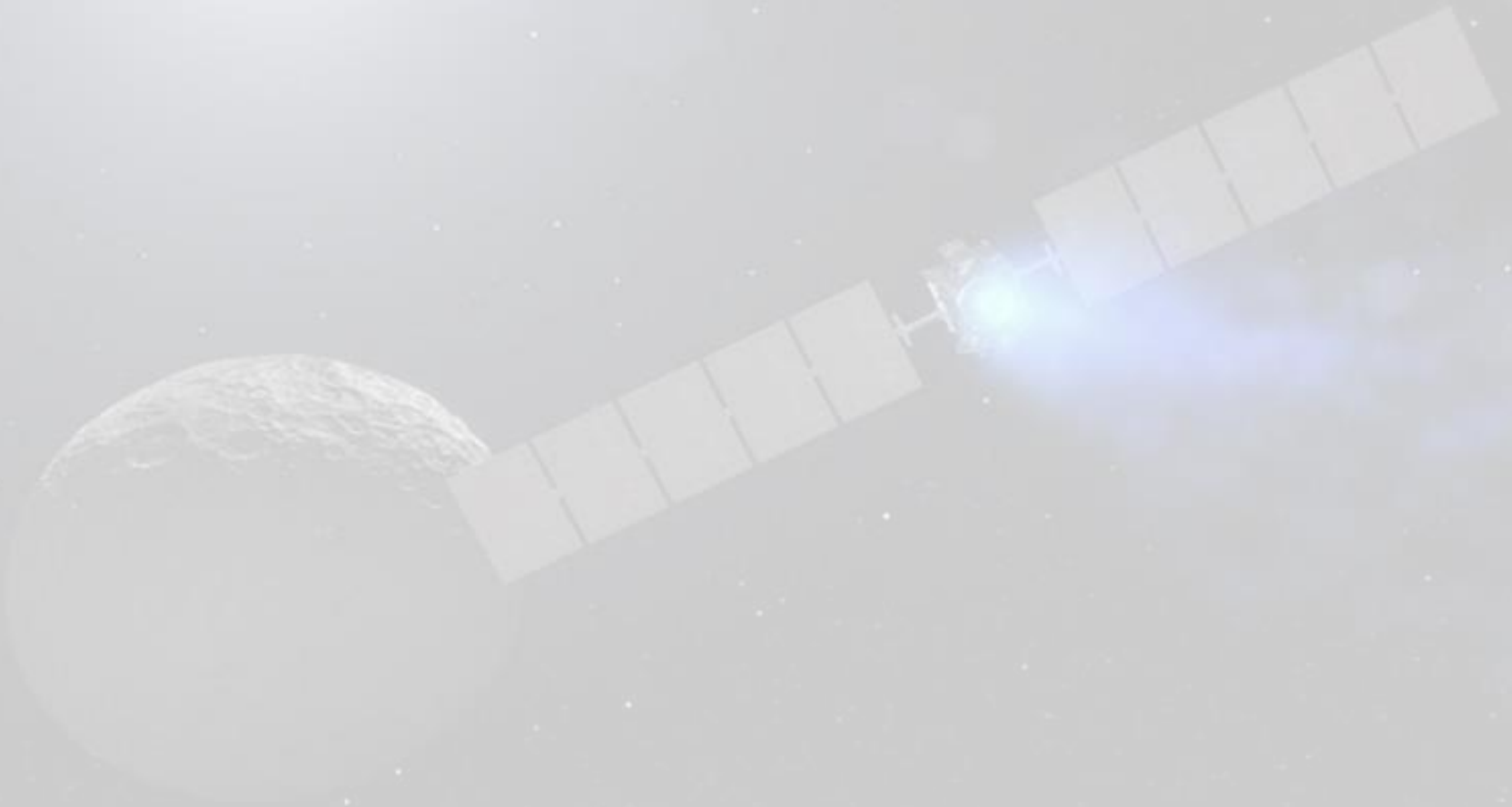


The Time is Right for Florida Universities

- Space-for-Earth: better cater to a growing economy
 - High demand for graduates
 - Consistent funding stream for research
- Space-for-Space: pioneer and establish leadership
 - New educational demands
 - Development of cutting-edge research fields that can be dominated

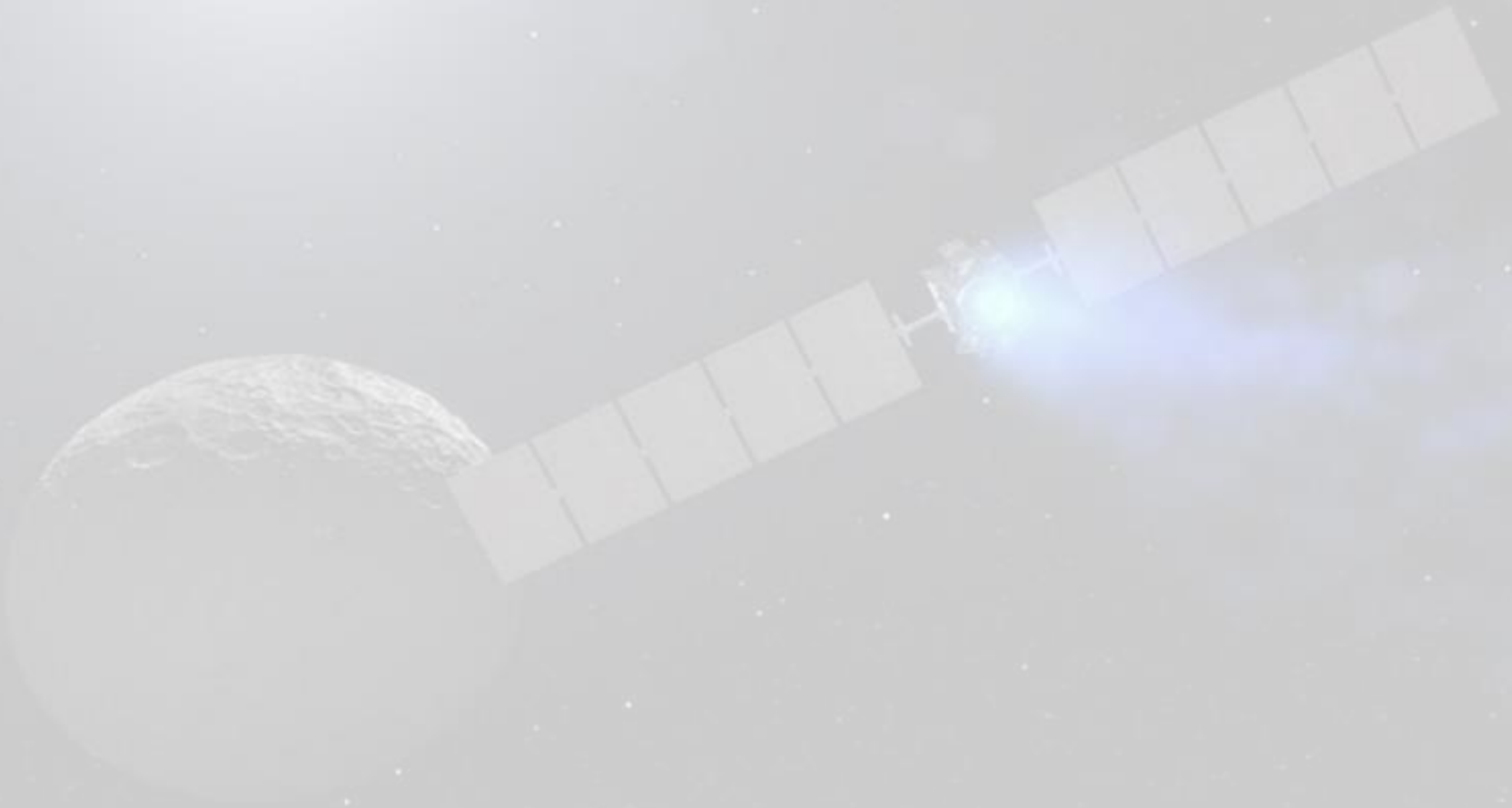


What are Current Challenges?





What are Current Opportunities?



What are Current Opportunities?

- Diversification of:
 - The role of Florida in the space sector
 - The role of universities in supporting the space sector
 - The workforce needed





The Role of Florida in the Space Sector

- Past: “Load and Launch” with KSC/NASA being the strongest space driver in the region



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- Present: Large commercial companies are building rockets and satellites on site
- Future: Diversify the role of Florida by
 - Providing intellectual content to the US space program
 - Becoming a space technology development “engine”

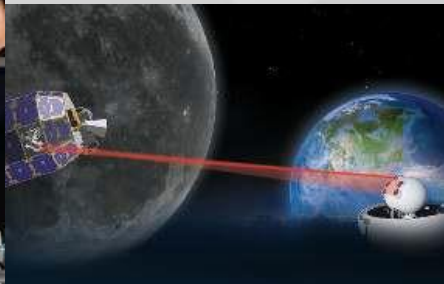
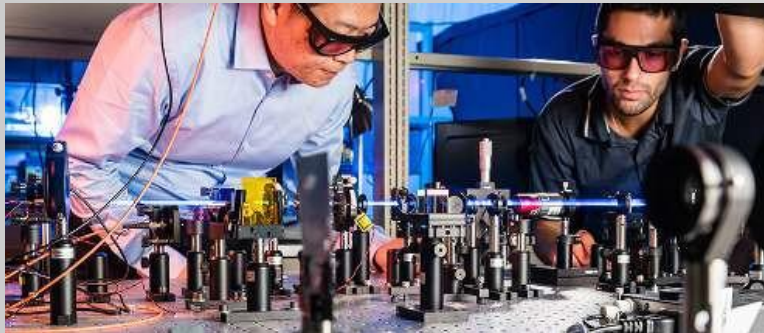


The Role of Florida in the Space Sector

- Intellectual content for the US space program
 - Faculty at Florida universities become Principal Investigators in NASA space missions



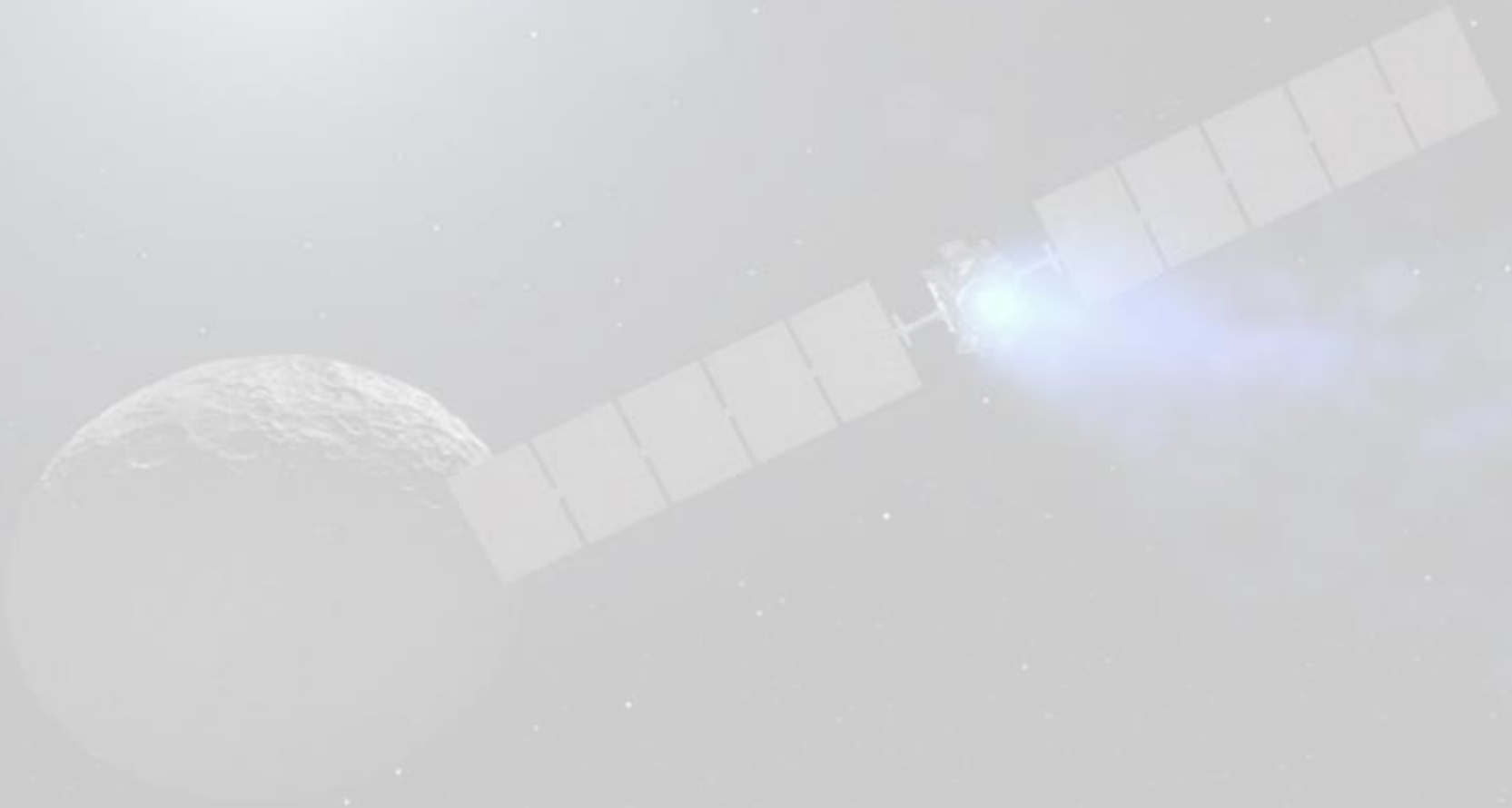
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The Role of Universities

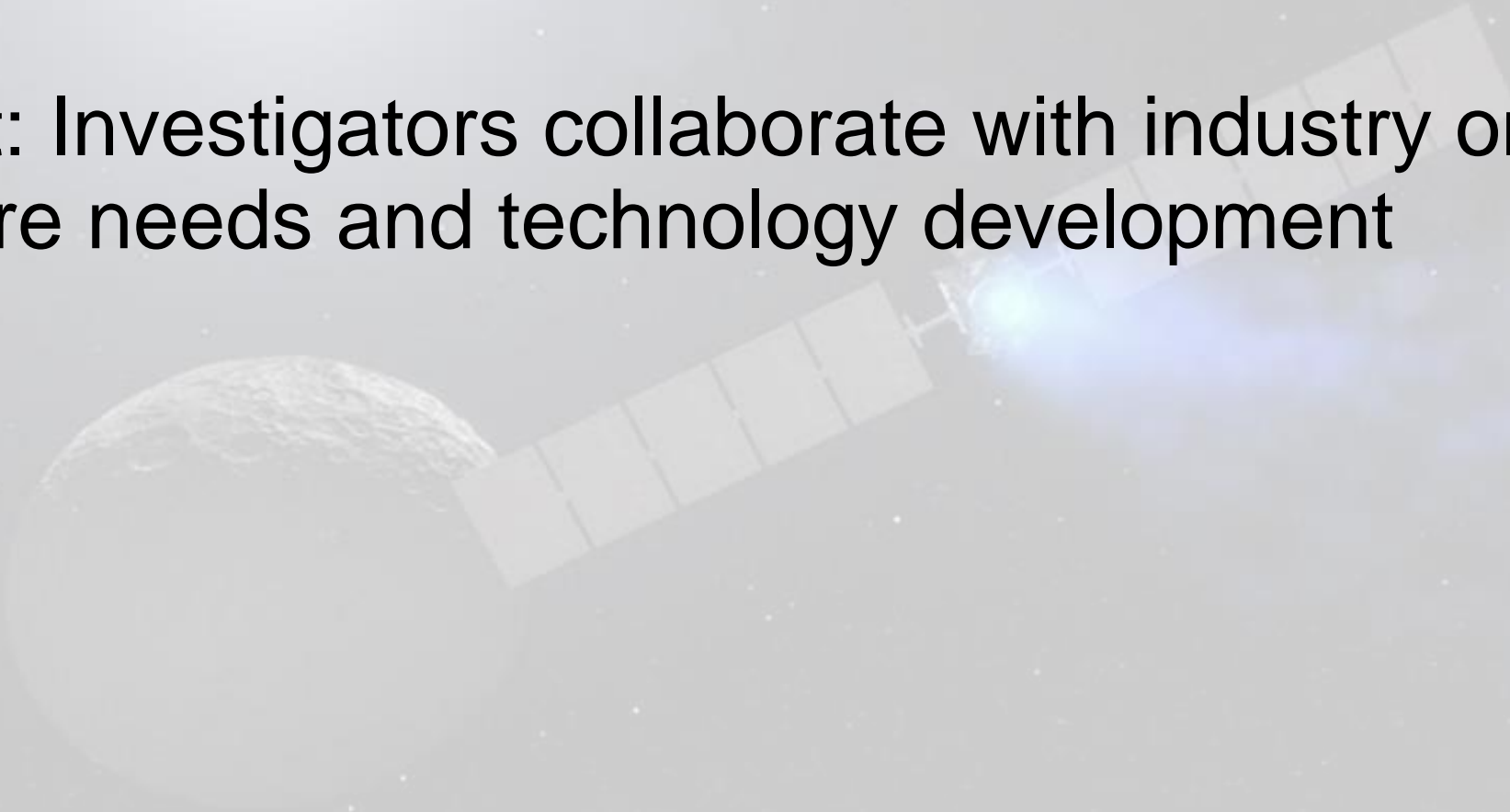
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- Present: Investigators collaborate with industry on their hardware needs and technology development
- Future: Diversify the role of Florida universities by
 - Developing and testing spaceflight-rated hardware in-house
 - Provide next generation hardware services to the local industry

The Role of Universities

- Developing and testing spaceflight-rated hardware in-house
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The Workforce Needed by the Space Sector

• Past: Engineers, technicians, scientists

+

• Present: Managers, investment bankers, accountants

+

• Future: Mining, construction, tourism, pharmacy

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Diverse workforce to represent our society



The Workforce Needed by the Space Sector

- New educational challenges
 - Professional certificates in space electronics, space resources, space photonics, space business
 - New Master degrees in Space Studies (can include electives, such as space pharmacy)
- Following IDEA best practices



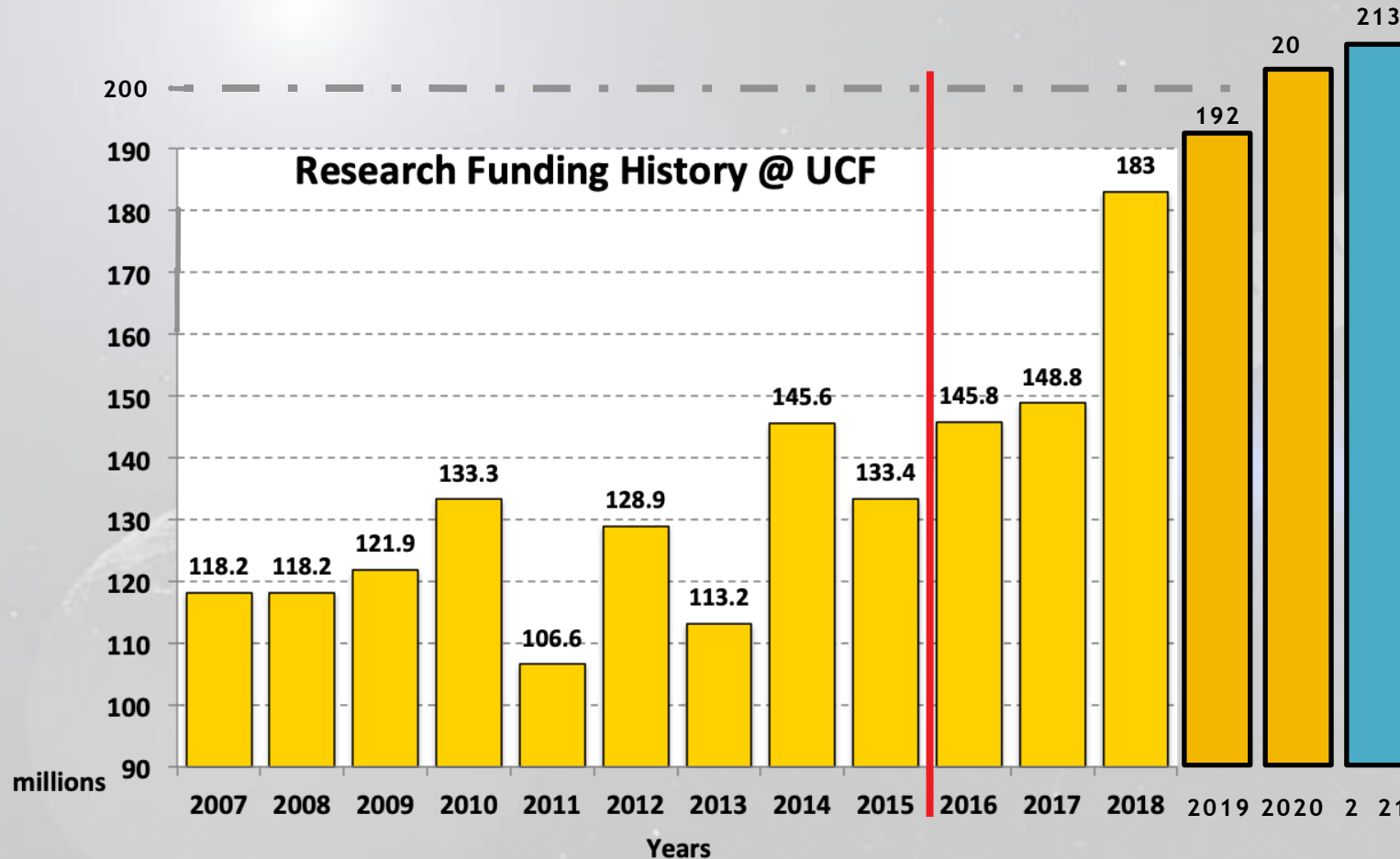
The University of Central Florida

- The University of Central Florida is a thriving preeminent research university located in metropolitan Orlando:
 - 70,060 enrollments in 2021
 - 24% are first generation students
 - 49.1% minorities
 - Hispanic serving institution: 27.8% undergraduates enrollments
 - 31 research doctorates, 3 professional doctorates
- As a research institution:
 - UCF is ranked as a best-value university by The Princeton Review and Kiplinger's, as well as one of the nation's most affordable colleges by Forbes. #16 (out of 1500) for most-Innovative universities. #50 in Undergraduate Research/Creative projects (out of 1500).
 - Carnegie ranking: research University with Very High research activity



The University of Central Florida

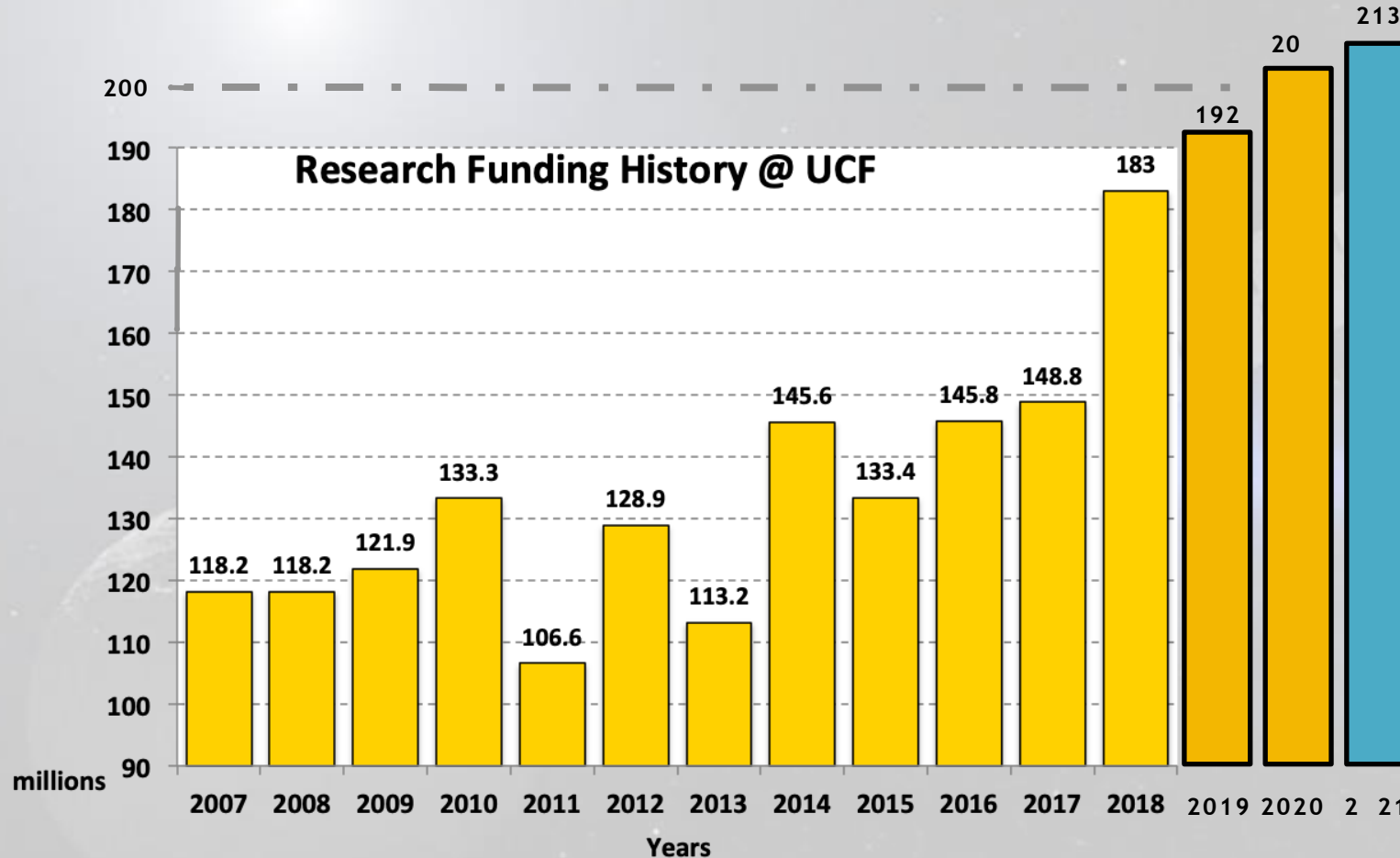
In 2015, UCF launched the new collective strategic plan for the next 20 years





The University of Central Florida

In 2021, President Cartwright launched the Strategic Investment Program (SIP)



UCF's Strategic Investment Plan

AREAS OF FOCUS

During the next five years, we will focus new investments in areas that align with our existing strengths and capitalize on emerging opportunities. These areas of research, teaching, and industry partnership represent pathways for technology, community, and economic development; integrate scholarly activities across the entire campus community; and leverage existing programs, assets, and strengths of our region.

SPACE TECHNOLOGIES AND SYSTEMS



There is significant public and private sector investment in space exploration and the development of a vibrant, low-Earth orbit economy. Our focus on space technologies and systems will capitalize on UCF's distinctive history as the *Space University*; our unique research facilities; and insights from disciplines such as engineering, photonics, physics, chemistry, geology, ethics, philosophy, biology, health, medicine, modeling and simulation, psychology, business, economics, communications, political science, and education.

ENTERTAINMENT AND IMMERSIVE EXPERIENCES



As a premier destination for tourism, entertainment, and the arts, Central Florida provides an unparalleled landscape for immersive experiences that allow people to interact in dynamic ways with real or imagined environments. UCF's focus on entertainment and themed experiences will encourage the development and utilization of dedicated spaces that integrate our expertise in simulation, digital gaming, human computer interface, augmented and virtual reality, hospitality, education, business, and the arts.

HEALTH AND HUMAN PERFORMANCE



Our investments in health and human performance will address prevailing workforce needs in the healthcare sector; encourage distinctive and high-impact research; encourage collaboration between our Academic Health Sciences Center and healthcare providers; and integrate contributions from an eclectic set of disciplines, such as nursing, medicine, population health, biomedical and life sciences, psychology, simulation, engineering, counseling, education, communications, the arts, and humanities.

ENERGY AND SUSTAINABILITY



A new energy future is essential for sustainability of life as we know it. We seek to extend the nearly 250 ongoing energy-related research projects currently funded by government and private industry; continue operating our campuses and facilities with resilience and sustainability; and advance energy research by integrating knowledge from disciplines, including environmental science, public policy, business, optics and photonics, engineering, computer science, modeling and simulation, communications, and education.

TRANSFORMATIVE TECHNOLOGIES AND NATIONAL SECURITY



A focus on transformative technologies and national security will address two related concerns: 1) the prevailing digital transformation of industries and organizations; and 2) the U.S. Department of Defense's demands for new operational concepts, increasingly joint operations, and emerging science and technology trends. We seek to increase research activity in support of national security and technology integration, invest in infrastructure to perform classified and sensitive work, and accelerate technology development.



UCF as a Space University



#1

Supplier of talent to U.S.
aerospace and defense
industries

Aviation Week Network

620

NASA awards
through Feb. 16, 2021

\$204.5 Million

In research funding in
2019-20

\$181.3 Million

NASA funding
Since 1991

100+

Space research articles
published by UCF faculty
in the past five years

30%

Kennedy Space Center
employees are UCF
alumni



The Florida Space Institute

- Mission: Catalyze space research, commercialization, and education both at the university and state level
- Timeline:
 - Established in 1996 on the Space Coast, part of the State University System of Florida
 - 2012: FSI moved to the UCF campus and operates there as a soft-money institute under the Office of Research



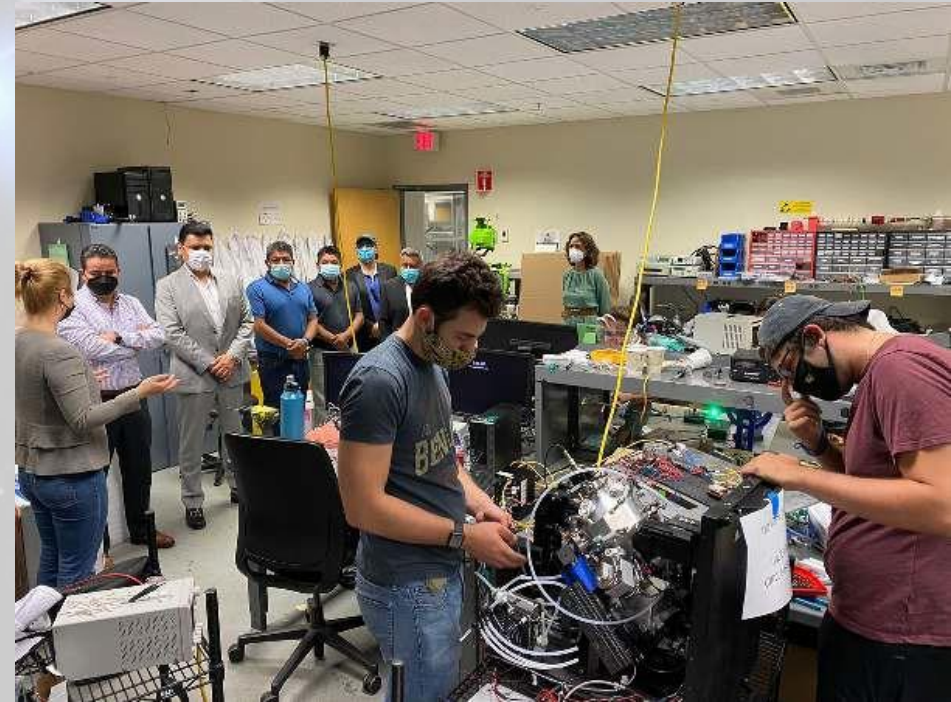
The Florida Space Institute

- People:
 - 25 soft-money researchers
 - Over 20 affiliated faculty
 - 2 postdocs
 - 4 graduate students
 - Over 30 undergraduate students
 - 5 admin (!)



The Florida Space Institute

- Highlights:
 - One space mission: GOLD for NASA Heliophysics
 - Three laboratories for planetary surface and in-situ resource utilization (ISRU)





The Florida Space Institute

- Mission: Catalyze space research, commercialization, and education both at the university and state level
- Strategic position to **initiate and coordinate interdisciplinary, inter-departmental, and inter-university efforts towards supporting the future of Florida in the space sector**
 - Creation of a space hardware development and testing laboratory
 - Initiation of new educational efforts to support the new needs of the sector



Thanks for your attention

Happy to take questions

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