

HBCU/MI Research Collaborations w/ UARCS

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Trends in Federal Sources of R&D Expenditures

NSF Higher Education R&D (HERD) Data R&D Expenditures from Federal Sources				
	2010	2019	Difference	Change
All Institutions	\$37.5B	\$44.5B	\$7.0B	19%
HBCUs	\$475.0M	\$371.1M	-\$104M	-22%
HBCU % of total	1.27%	0.83%	-0.43%	-34%

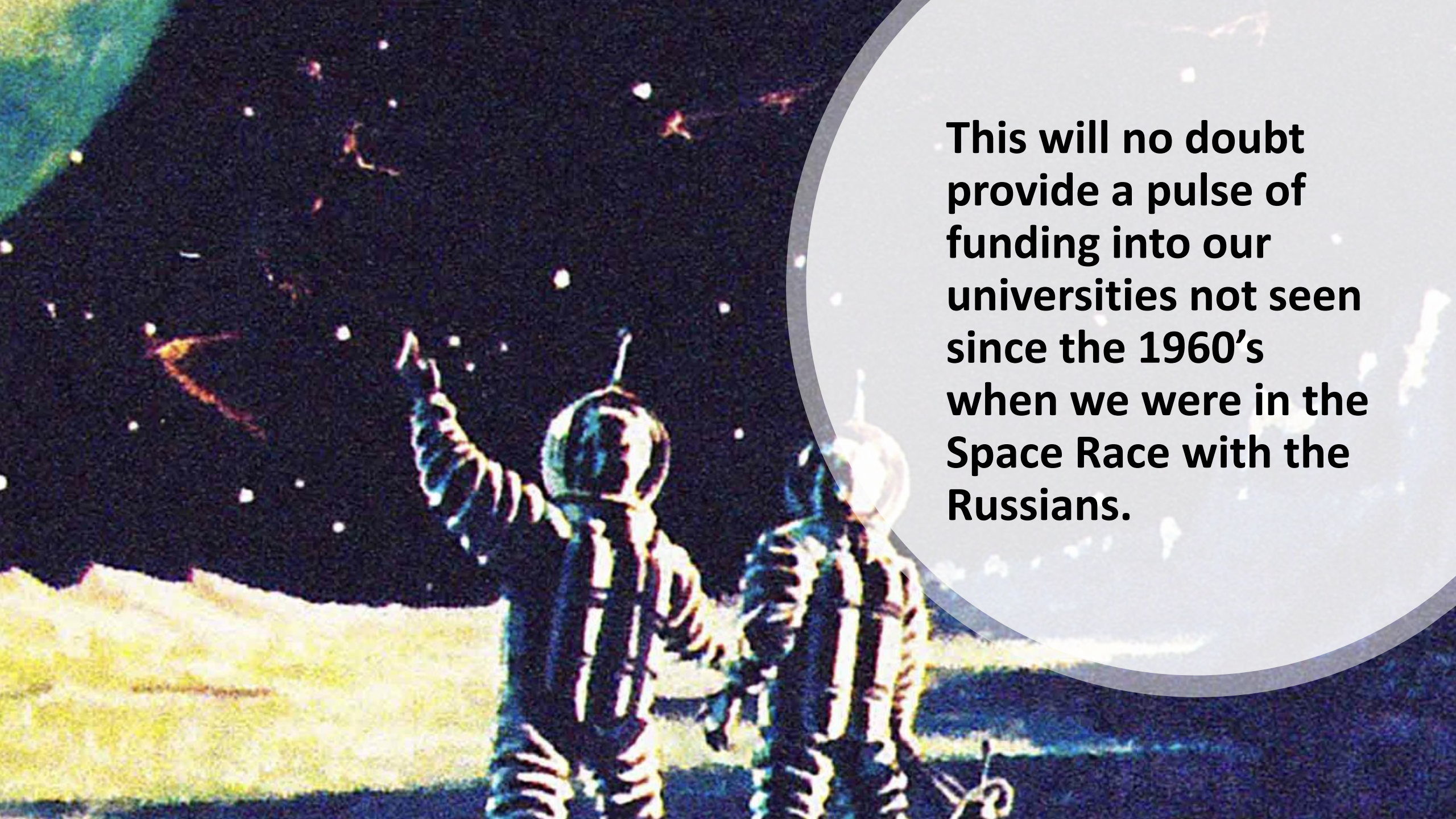
- An unfavorable trend for HBCU receiving Federal Research Funding continues
- Science & Engineering represents 94% of total R&D expenditures

There has been recent legislation that will enable and provide significant resources for universities to partner with industry and prepare students for careers in the technology areas that are going to underpin the careers of the future.

Fields such as:

- ❖ artificial intelligence, quantum computing, advanced communications, advanced manufacturing, Systems, Synthetic and Engineering Biology etc.

- **Leaders in this race will be the superpowers of the future.**

A photograph of two astronauts on the lunar surface. The astronaut in the foreground is wearing a white spacesuit and is pointing their right hand towards the dark sky. The second astronaut is partially visible behind them. The ground is a light-colored, dusty surface, and the background is the black void of space filled with stars and some faint, colorful streaks.

**This will no doubt
provide a pulse of
funding into our
universities not seen
since the 1960's
when we were in the
Space Race with the
Russians.**

Business Case



**“HBCUs are underutilized
national resources”**

***to maintain US global
competitiveness, it is in our best
interest for HBCUs to receive a
greater share of federal
research dollars***

HBCU Value Proposition



According to the United Negro College Fund, HBCUs make up less than **5%** of U.S. colleges & universities

- Yet HBCUs award more than **25%** of the bachelor's degrees to black students in STEM fields

Source: <https://uncf.org/the-latest/the-numbers-dont-lie-hbcus-are-changing-the-college-landscape>

According to the American Institute for Research, more than **1/3** of Blacks who received a STEM PhD earned their undergraduate degrees at an HBCU.

- However, most of these students went on to earn their graduate degrees from PWIs

Source: <https://www.air.org>

University Affiliated Research Center (UARC)

- Defined as a strategic United States Department of Defense (DoD) research center associated with a university.
- UARCs are formally established by the Under Secretary of Defense for Research and Engineering .
- **UARCs were developed to ensure that essential engineering and technology capabilities of particular importance to the DoD are maintained.**
- They have many similarities with Federally Funded Research and Development Centers, including sole source funding under the authority of 10 U.S.C. § 2304(c)(3)(B). However, **UARCs are allowed to compete for other science and technology work, except when it is prohibited by their contracts.**

Source:

https://en.wikipedia.org/wiki/University_Affiliated_Research_Center

University Affiliated Research Centers (UARC's)

Gifts that keep on Giving

Introduction

There are Fourteen (14) UARC's throughout the United States that meet special long-term engineering, research, and development needs for the DoD that cannot be met as effectively by government or other private sector sources.

There is over \$2B/yr awarded to each

Benefits to Morgan

- Facilitate involvement in the work of DoD
- Increase involvement in Cutting Edge Applied Research and Development
- Access to unique research facilities via strategic collaborations
- Assistance in improving MSU's internal business processes
- Strategic Collaborations with R1 Institutions in providing critical services to DoD

University Affiliated Research Centers

MSU Targeted UARC's

- Applied Research Laboratory for Intelligence & Security (**ARLIS**) at UMCP
- Georgia Technology Research Institute (**GTRI**)
- Johns Hopkins University Applied Physics Lab (**JHUAPL**)
- Pennsylvania State University Applied Physics Laboratory (**PSUAPL**)
- HBCUs Research Institute (**HRI/NSA**)

Applied Research Laboratory for Intelligence and Security (ARLIS)

Intelligence and Security University Research Enterprise (INSURE)

- University of Maryland College Park
- George Mason University
- Howard University
- **Morgan State University**
- Texas A&M University
- University of the District of Columbia
- University of Wisconsin
- University of Missouri
- University of Southern California
- Arizona State University
- New Mexico Tech
- University of South Carolina
- St. Louis University
- University of Illinois

6 discrete Projects ~ \$3.6M focused on 5G, AI/ML, Data Analytics

- Create a suite of testing tools for analysis of hardware performance, cyber-security, wireless security, and user access related to 5G technologies.
- Develop an AI/ML Systems Engineering Workbench to develop a common framework for the user community in support of the ARLIS deployment of cyber-infrastructure at scale.
- Develop advanced statistical analytic techniques in a parallel processing high-performance computing environment against very large and diverse data sets that include different types of data will be a requirement for successful operational testing of Department of Defense (DoD) Warfighter systems in the future.

Georgia Tech Research Institute

GTRI is a highly regarded applied research and development organization that is part of the Georgia Institute of Technology, one of the world's top-ranked research universities.

Has more than 2,000 full-time engineers and scientists, plus faculty members, part-time students, consultants and support personnel

GTRI is also the largest employer of Georgia Tech graduate and undergraduate students.

These next generation scientists and engineers work alongside world-class researchers to solve real problems for real customers.

5 discrete Projects ~ \$1.2M focused on Hardware/Software Vulnerabilities, Rf Engineering, Autonomy and AI

- Vulnerabilities assessment and analysis of Cyber Physical Hardware Systems
- Training ROTC Cadets in Rf Engineering
- Software Assurance and Supply Chain Vulnerabilities
- Explainable AI in respect to Autonomous Vehicles
- Vulnerability assessment related to CAN Communication protocols

Business Case



**“HBCUs are underutilized
national resources”**

**We too wish to contribute to the
Our National Defense
and Competitiveness**