

Lessons Learned from TEAM-UP: The Necessity of Demographic Data

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Making a case for action:

The entire TEAM-UP process,
from the original proposal to the
findings & recommendations,
was driven by data.

→ Social scientists were essential partners.



<https://www.aip.org/statistics>

The AIP Statistical Research Center

The screenshot displays the AIP Statistics website interface. At the top, there is a navigation bar with the following menu items: Programs and Resources (selected), Publications, Career Resources, Member Societies, About AIP, and Giving. A dropdown menu for 'Programs and Resources' is open, listing: Statistical Research (selected), History Programs, Student Programs, Public Policy, Diversity Initiatives, Science News and Media Services, COVID 19, and Future of Convening.

The main content area features a line graph titled 'PhD's Earned in Physics, Classes of 1976-2020'. The y-axis represents the percentage of PhDs earned, ranging from 0% to 25% in 5% increments. The x-axis represents the 'Class of' year, ranging from 1976 to 2020 in 4-year increments. The graph shows a general upward trend, starting at approximately 8% in 1976 and reaching about 23% by 2020, with some fluctuations in the later years.

Below the graph is a 'Browse Data by Topic' section with a grid of blue buttons, each containing an icon and a topic name:

- High School
- Undergraduate Education
- Graduate Education
- Faculty
- PhD Plus 10
- Employment & Careers
- Women
- Underrepresented Groups
- International
- Astronomy
- COVID-19



<https://www.aip.org/statistics/minorities>

AIP | American Institute of Physics

Programs and Resources ▾

Publications ▾

Career Resources ▾

Member Societies

About AIP ▾

Giving



RESOURCE

[Data on People from Underrepresented Groups in the Physical Sciences and Engineering](#)

June 2020



FOCUS ON

[African-American Participation Among Bachelors in the Physical Sciences and Engineering](#)

August 2019



REPORT

[Women in Physics and Astronomy, 2019](#)

March 2019

[SEE ALL REPORTS](#)

Specific figures and tables on Underrepresented Groups



DATA GRAPHIC

[The Proportion of Physics Bachelor's Degrees Awarded to African Americans and Hispanic Americans, Classes 1994 to 2020](#)

October 2021





Programs

Education

Ethics

International Affairs

Public Engagement

Women in Physics

Minorities in Physics

▪ APS Bridge Program

▪ National Mentoring Community

▪ Site Visits

▪ Scholarships & Awards

▪ Speakers List

▪ Minority Physicist Profiles

▪ Resources

LGBT Physicists

Industrial Physics

Innovation

Honors

Minority Physics Statistics

APS and the American Institute of Physics (AIP) Statistical Research Center provide a variety of statistics on minorities in physics in the US.

► [AIP Minorities in Physics Statistics](#)

APS Minorities in Physics Statistics

APS generates statistical reports on minorities in physics. Current reports are shown below. These reports are freely available for your use. You may use our graphs in reports and presentations or you may use the raw data to create new graphs and charts. Credit APS and IPEDS as shown on each graph.

Additional Statistics

[Compare Your Institution](#)

[Top Educators](#)

[All Education Statistics](#)

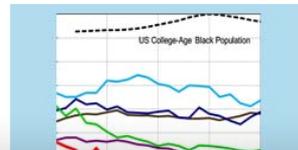
Degrees Earned by Underrepresented Minorities in Physics



Percent of bachelor's, master's, and doctoral degrees awarded to underrepresented minorities (URMs) in physics.

► [Larger Graph and More Information](#)

Bachelor's Degrees Earned by African Americans, by Major

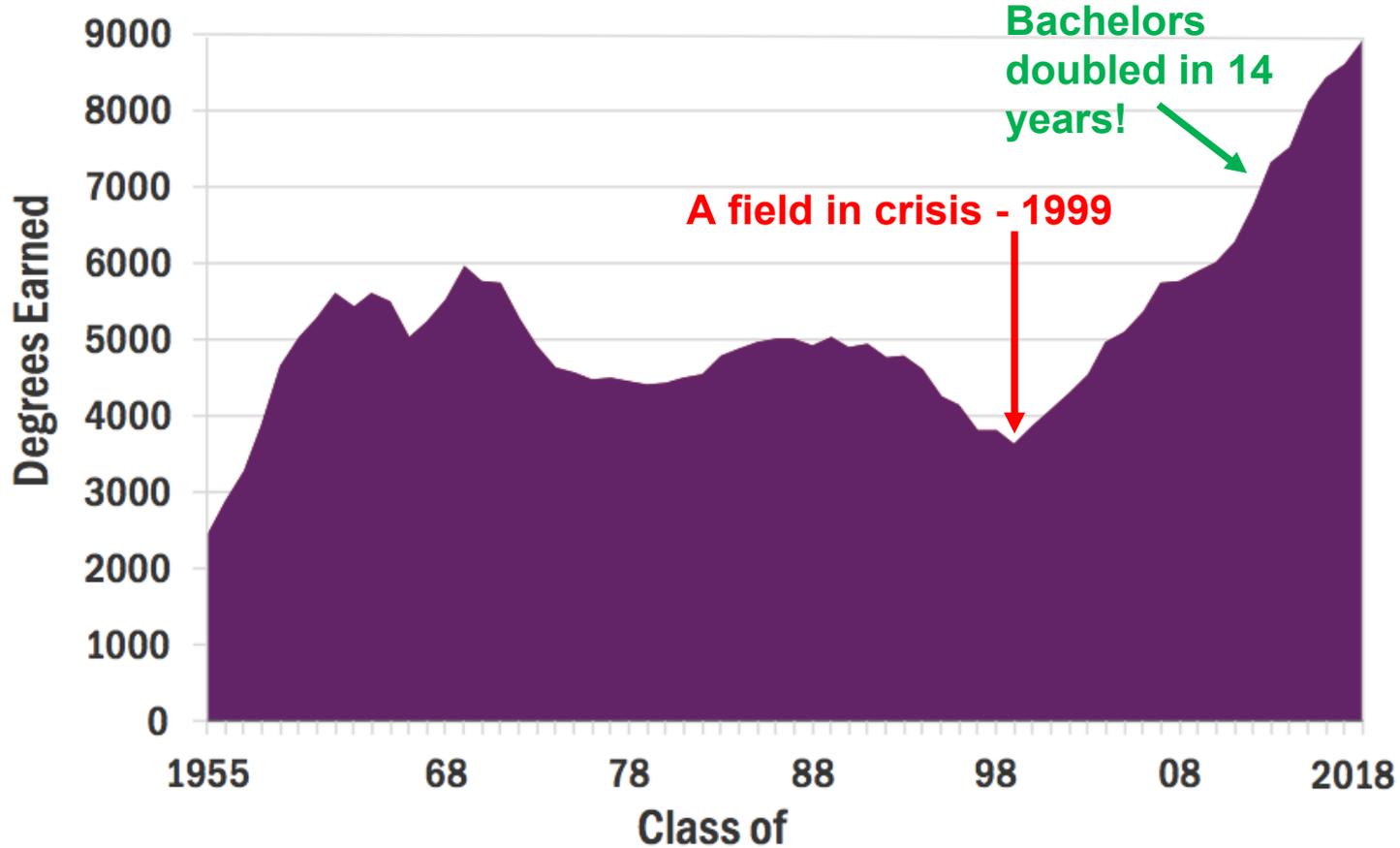


Percent of STEM bachelor's degrees conferred to Black or African American students, by major (Biology, Chemistry, Math & Statistics, Earth Sciences, Physics, and Engineering)

► [Larger Graph and More Information](#)

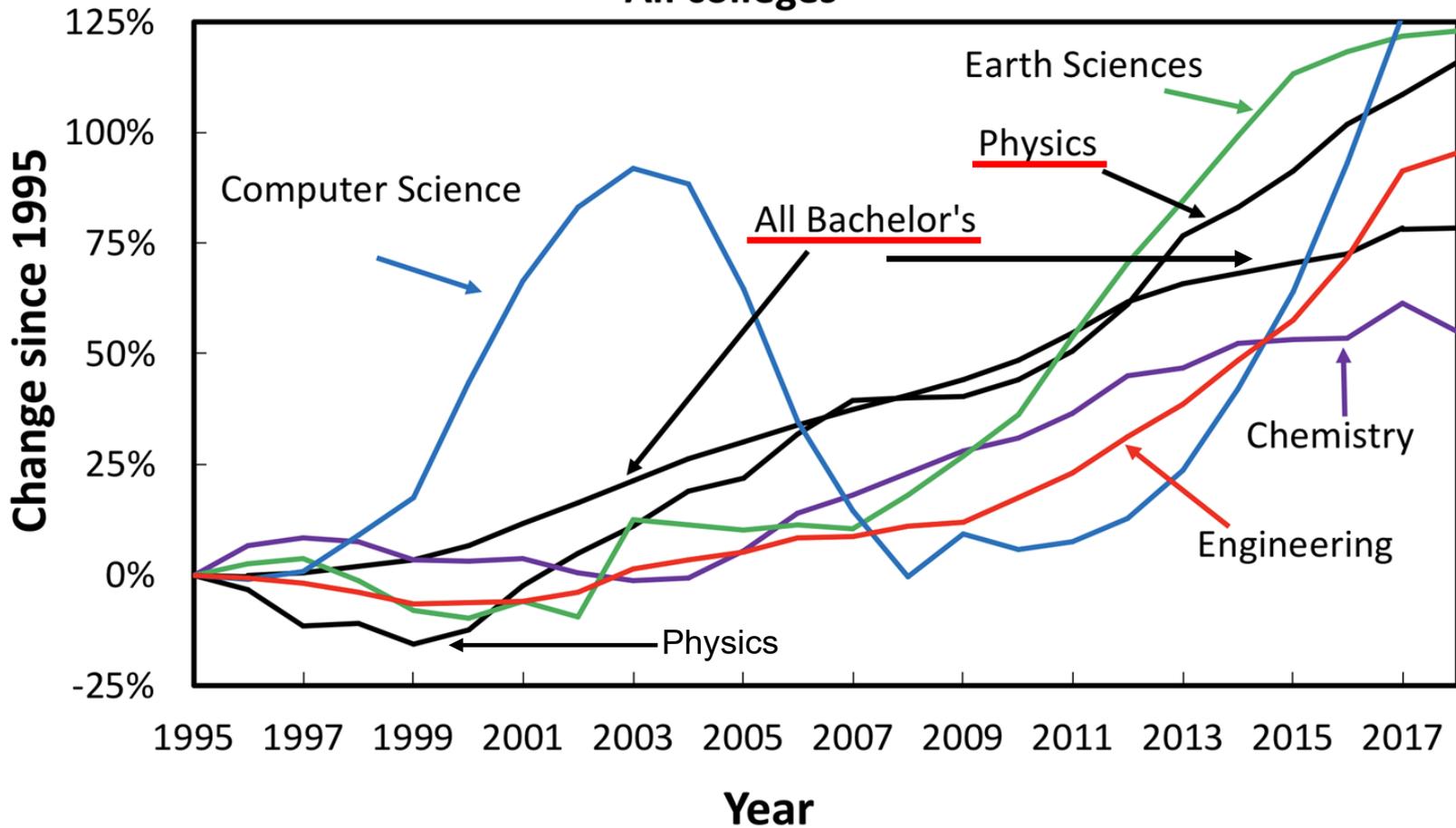


Number of Bachelor's Degrees Earned in Physics 1955 through 2018

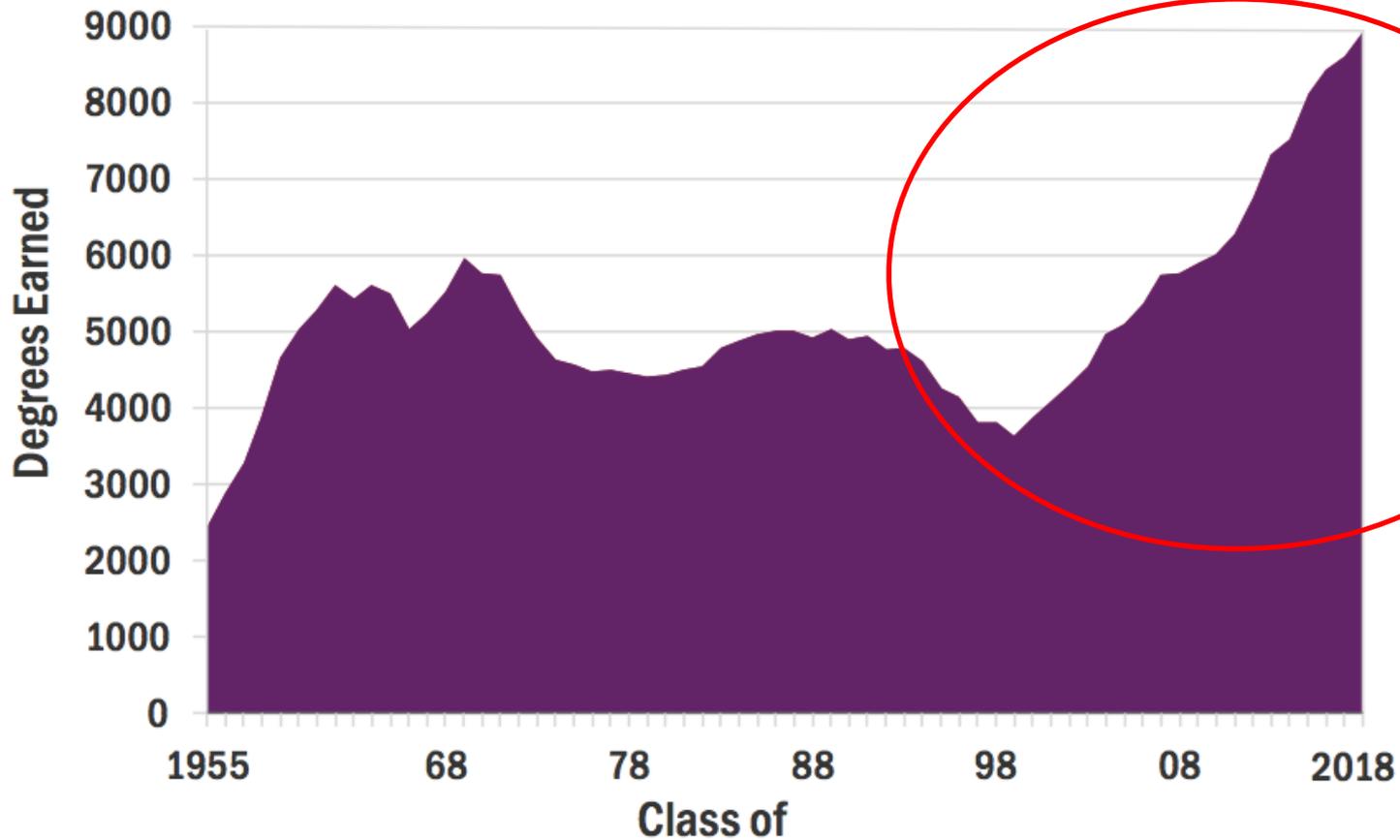


Over this period, physics outperformed most fields (% growth).

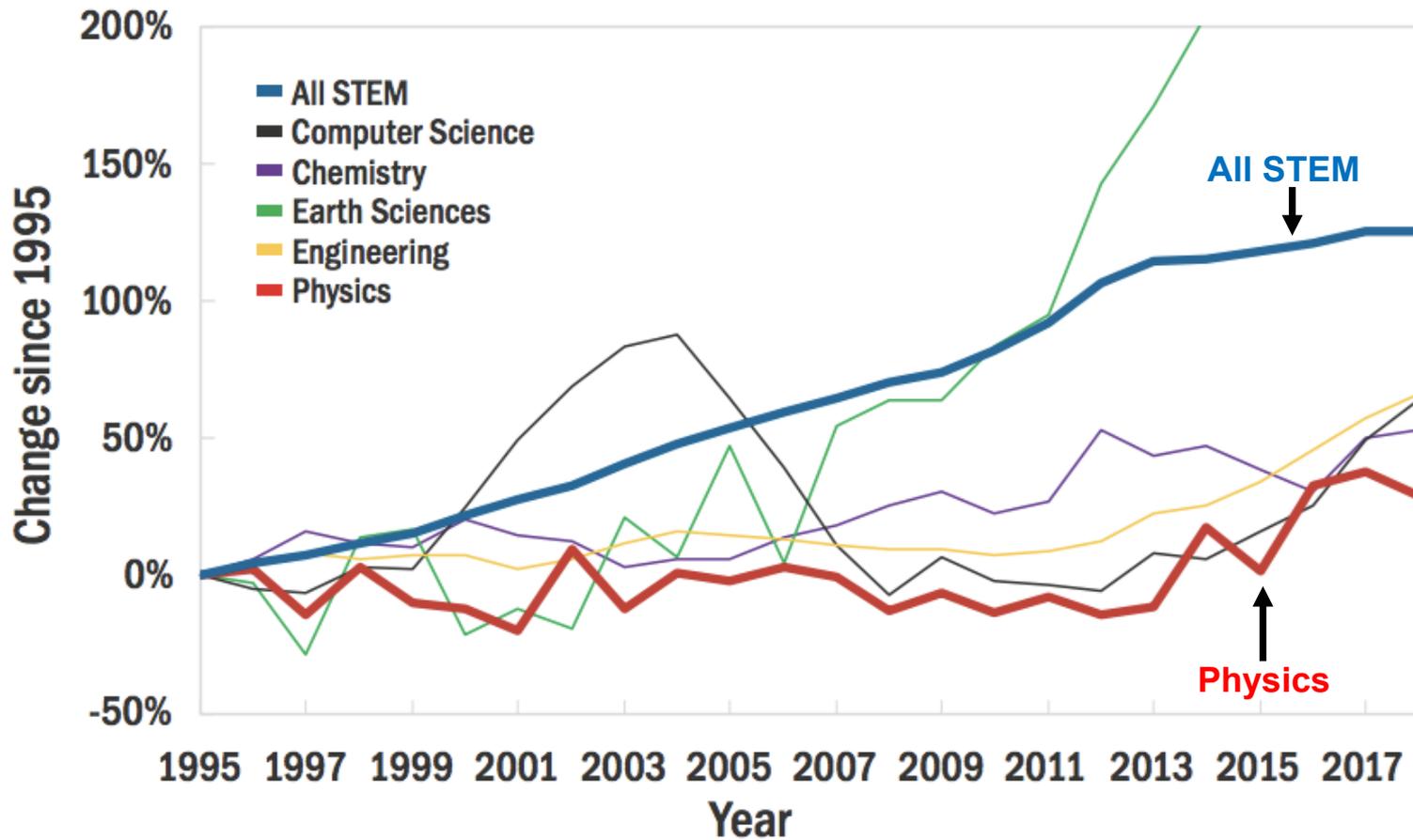
Growth in bachelor's degrees awarded to All students
All colleges



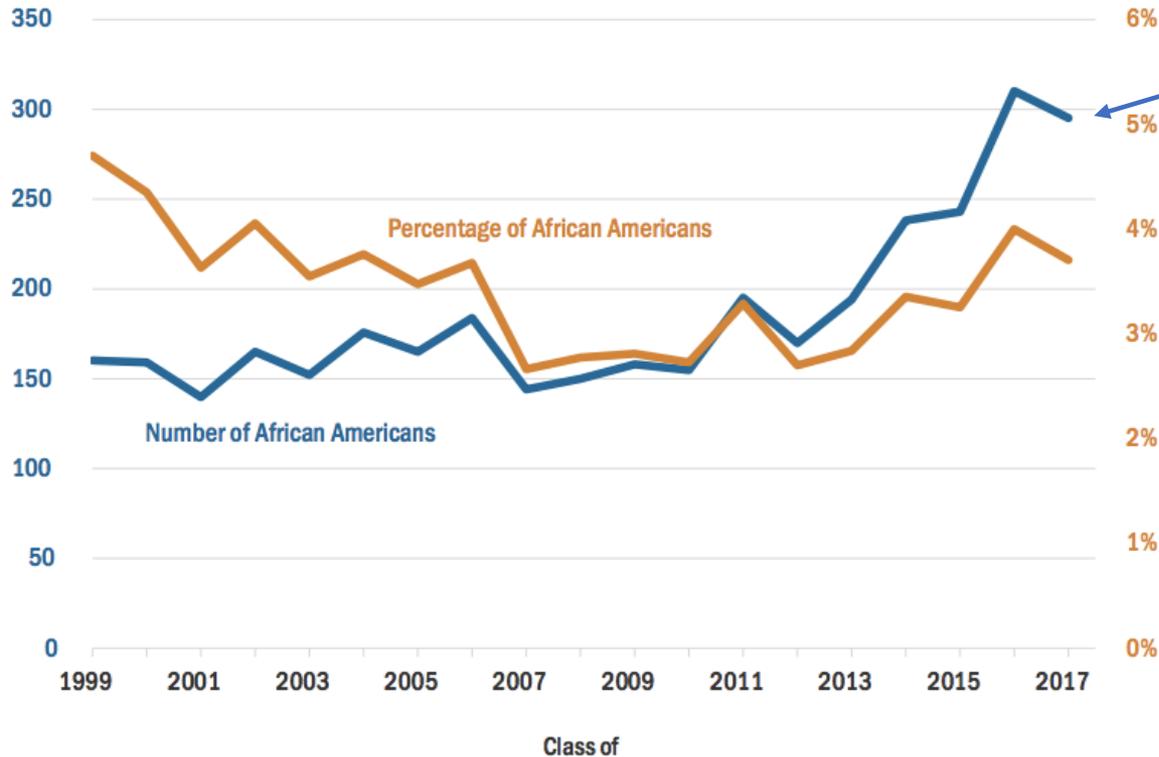
Number of Bachelor's Degrees Earned in Physics 1955 through 2018



Growth in Bachelor's Degrees Awarded to African Americans All Colleges



Number and Percentage of Physics Bachelor's Degrees Earned by African Americans



! Fewer than ~300 out of 9000 bachelor's to African Americans.

! There are ~800 BS granting physics depts in the US.

! << 1 AA physics BS per dept.

The percentage of degrees awarded to African-Americans is based on US citizens only. Typically between 5% and 8% of physics bachelors are awarded to non-US citizens.



2017: Conclusions presented to AIP Board

- In the late '90s, the physics community set out to double the number of bachelor's degrees and succeeded spectacularly, through a deliberate process of culture change and focus on undergrads.
- Over this same period, African American bachelor's *across all majors* increased at a higher rate than the general population.
- African Americans were also succeeding broadly in STEM, including chemistry, earth science, and computer science.
- Yet, over this same period, the percent of African Americans earning bachelor's in physics stagnated or declined, depending on the year.
- The experience of African Americans, nationally and in physics, is different enough relative to other groups that it's worth special focus.



TEAM-UP: Charge from the AIP Board

Examine and assess the reasons for the persistent underrepresentation of African Americans in physics and astronomy at the bachelor's level.

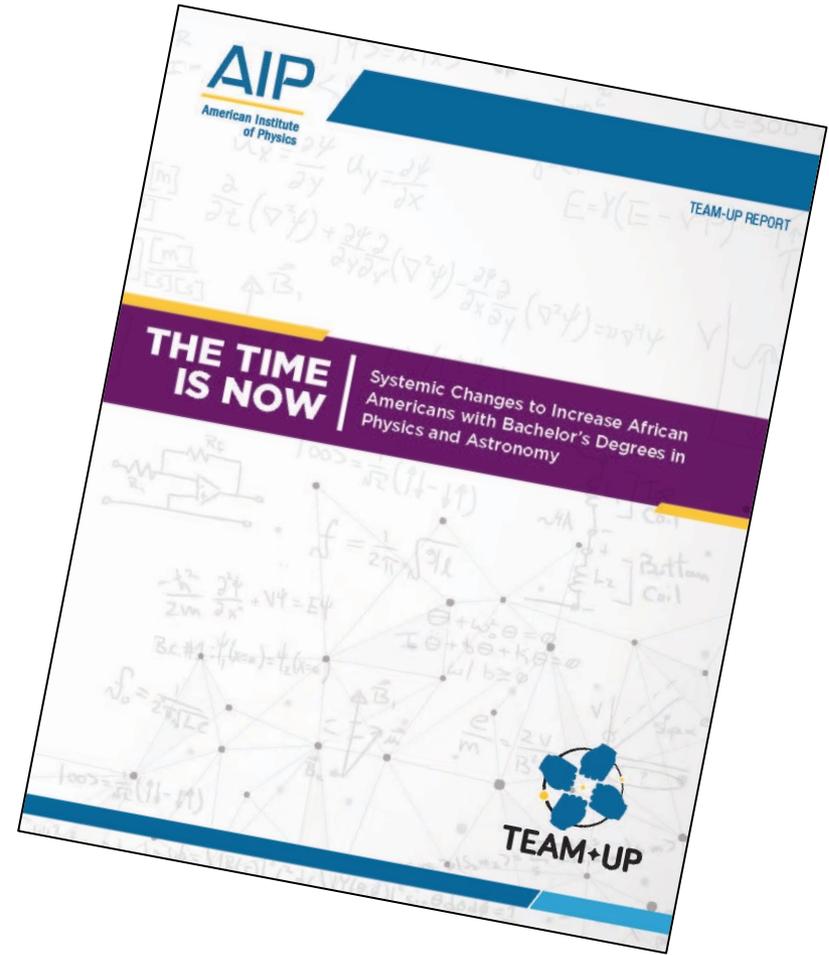
Produce a report with evidence-based recommendations for AIP Member Societies, physics and astronomy departments, and other stakeholders to increase the number and percentage of African American students obtaining bachelor's degrees in physics and astronomy.



AIP TEAM-UP Report

The Time Is Now: Systemic Changes to Increase African Americans with Bachelor's Degrees in Physics and Astronomy

aip.org/teamup



TEAM-UP Summary - January 2020

“The persistent underrepresentation of African Americans in physics and astronomy is due to **the lack of a supportive environment** for these students in many departments, and to **the enormous financial challenges** facing them and the programs that have consistently demonstrated the best practices in supporting their success. Solving these problems requires addressing **systemic and cultural issues** and creating a large-scale **change management framework.**”



TEAM-UP bottom-line goal: 500 in 10

Double the number of physics & astronomy bachelor's degrees earned by African Americans in a decade. →

~500 African American bachelor's degrees in physics *per year* by 2030.



IMPORTANT TAKE-AWAYS

These data and the infrastructure to access them pre-dated any community desire to act on them.

Easily accessible demographic outcomes data, over decades, were essential for quantifying what we “knew” to be true.

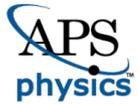
Having these data available from professional societies sends a message of transparency and accountability.

Outcomes data are essential for the community

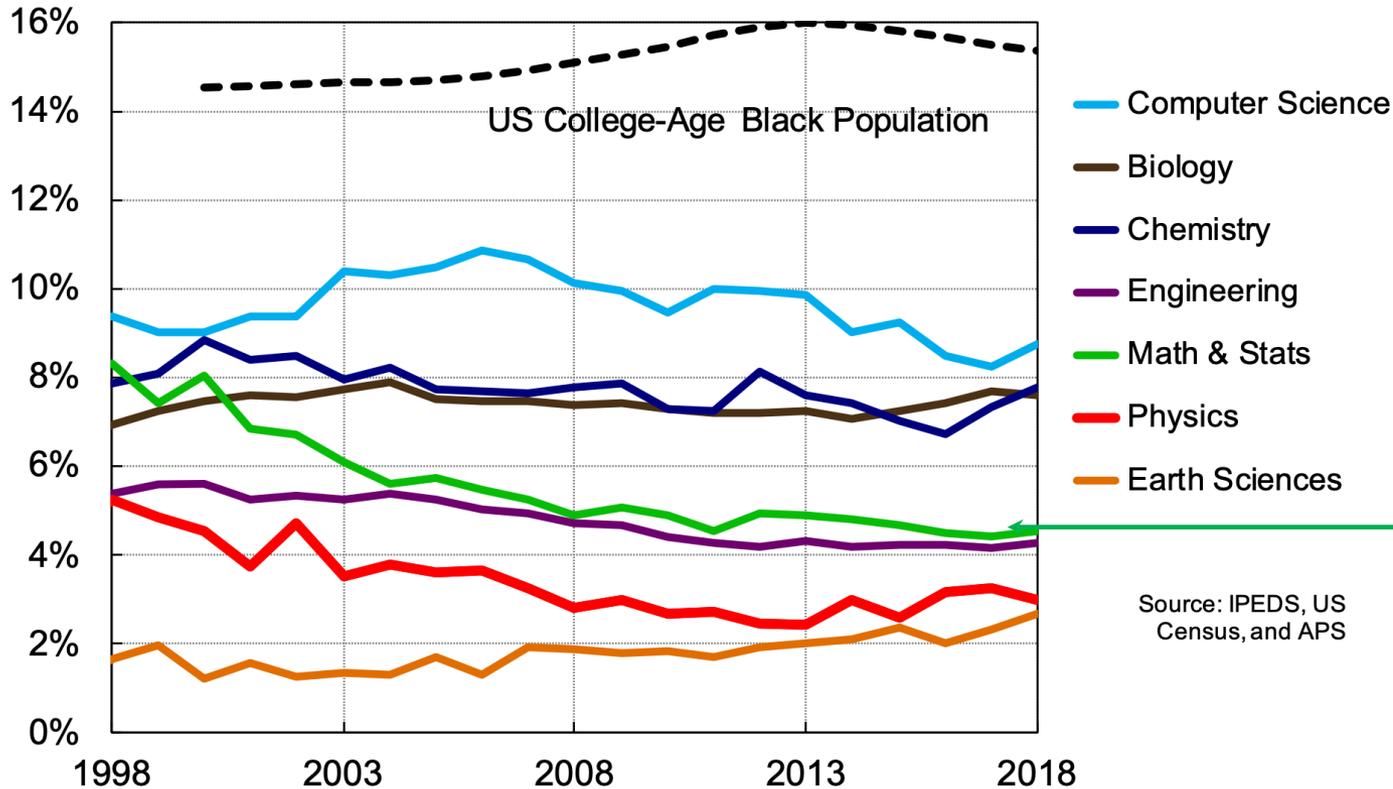
- 1) to understand where it is now,
- 2) to provide a baseline for goal-setting: where do we want to be in the future and by when, and, critically,
- 3) to hold itself accountable for progress with respect to recruiting *and retaining* individuals from historically underrepresented groups.



QUESTION FOR MATH:



Bachelor's Degrees Earned by African Americans



Source: IPEDS, US Census, and APS

What is causing this decline?



A few final thoughts

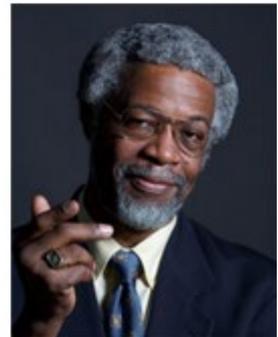
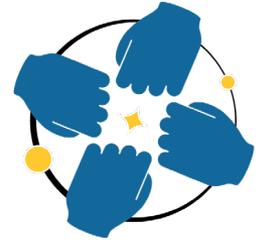
Kimmi Kannankutty's presentation on NCES data for math & statistics was helpful and a very good introduction to NSF's resources through NCES and also what IPEDS (Dept. of Ed) provides.

But the question remains about ease of accessibility, awareness among the math community, and transparency and accountability within the math community.

Perhaps there is a role to be played here by one or more of the math & stats professional societies.



AIP TEAM-UP Members & Staff



TEAM-UP (2017 – 2020)

TEAM-UP Co-Chairs

- Mary James (Reed College)
- Ed Bertschinger (MIT)

- Brian Beckford (Dept. of Energy)
- Tabbetha Dobbins (Rowan University))
- Sharon Fries-Britt (University of Maryland, College Park)
- Jim Gates (Brown University)
- Jedidah Isler (White House Office of Science & Technology Policy)
- Maria Ong (TERC)
- Arlisa Richardson (Chandler-Gilbert Community College)
- Quinton Williams (Howard University)
- Arlene Modeste Knowles (AIP)
- Bo Hammer (UChicago)

