

## Union Calendar No.

116<sup>TH</sup> CONGRESS  
1<sup>ST</sup> SESSION

# H. R. 4372

[Report No. 116-]

To direct Federal science agencies and the Office of Science and Technology Policy to undertake activities to improve the quality of undergraduate STEM education and enhance the research capacity at the Nation's HBCUs, TCUs, and MSIs, and for other purposes.

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### IN THE HOUSE OF REPRESENTATIVES

SEPTEMBER 18, 2019

Ms. JOHNSON of Texas (for herself and Mr. WALTZ) introduced the following bill; which was referred to the Committee on Science, Space, and Technology

OCTOBER --, 2019

Reported with an amendment, committed to the Committee of the Whole House on the State of the Union, and ordered to be printed

[Strike out all after the enacting clause and insert the part printed in italics]

[For text of introduced bill, see copy of bill as introduced on September 18, 2019]

# **A BILL**

To direct Federal science agencies and the Office of Science and Technology Policy to undertake activities to improve the quality of undergraduate STEM education and enhance the research capacity at the Nation's HBCUs, TCUs, and MSIs, and for other purposes.

1 *Be it enacted by the Senate and House of Representa-*  
2 *tives of the United States of America in Congress assembled,*

3 **SECTION 1. SHORT TITLE.**

4 *This Act may be cited as the “MSI STEM Achievement*  
5 *Act”.*

6 **SEC. 2. FINDINGS.**

7 *Congress makes the following findings:*

8 *(1) Evidence suggests that the supply of STEM*  
9 *workers is not keeping pace with the rapidly evolving*  
10 *needs of the public and private sector, resulting in a*  
11 *deficit often referred to as a STEM skills shortage.*

12 *(2) According to the Bureau of Labor Statistics,*  
13 *the United States will need one million additional*  
14 *STEM professionals than it is on track to produce in*  
15 *the coming decade.*

16 *(3) STEM occupations offer higher wages, more*  
17 *opportunities for advancement, and a higher degree of*  
18 *job security than non-STEM occupations.*

19 *(4) The composition of the STEM workforce does*  
20 *not reflect the current or projected diversity of the Na-*  
21 *tion, with Hispanics, African Americans, and other*  
22 *racial and ethnic minorities, significantly underrep-*  
23 *resented in the STEM workforce compared to their*  
24 *presence in the workforce more generally.*

1           (5) *A stronger national commitment to increas-*  
2           *ing the diversity of the STEM workforce is needed to*  
3           *help address the STEM skills shortage.*

4           (6) *According to a 2019 National Academies of*  
5           *Sciences, Engineering, and Medicine report entitled*  
6           *“Minority Serving Institutions: America’s Underuti-*  
7           *lized Resource for Strengthening the STEM Work-*  
8           *force”, two- and four-year minority serving institu-*  
9           *tions enroll nearly 30 percent of all undergraduate*  
10          *students—a percentage that is expected to grow in the*  
11          *coming years—in the United States higher education*  
12          *system and play a critical role in providing impor-*  
13          *tant pathways to STEM-related education, training,*  
14          *and careers for students of color.*

15          (7) *HBCUs, TCUs, and MSIs are highly success-*  
16          *ful at educating underrepresented minority students*  
17          *in STEM fields and can serve as best practice models*  
18          *for other colleges and universities to further expand*  
19          *participation of underrepresented minorities in the*  
20          *STEM workforce.*

21          (8) *Increased investment in STEM infrastruc-*  
22          *ture at HBCUs, TCUs, and MSIs has the potential*  
23          *to increase these institutions’ ability to educate even*  
24          *more students in the STEM disciplines.*

1           (9) *With the demand for STEM skills exceeding*  
2           *the supply of STEM graduates, success of HBCUs,*  
3           *TCUs, and MSIs in educating and training science*  
4           *and engineering leaders is increasingly important for*  
5           *United States economic growth and competitiveness.*

6 **SEC. 3. GOVERNMENT ACCOUNTABILITY OFFICE REVIEW.**

7           *Not later than 3 years after the date of enactment of*  
8           *this Act, the Comptroller General of the United States shall*  
9           *report to Congress—*

10           (1) *an inventory of competitive funding pro-*  
11           *grams and initiatives carried out by Federal science*  
12           *agencies that are targeted to HBCUs, TCUs, and*  
13           *MSIs or partnerships with HBCUs, TCUs, and MSIs;*

14           (2) *an assessment of Federal science agency out-*  
15           *reach activities to increase the participation and*  
16           *competitiveness of HBCUs, TCUs, and MSIs in the*  
17           *funding programs and initiatives identified in para-*  
18           *graph (1); and*

19           (3) *recommendations of the Comptroller General*  
20           *to increase the participation of and the rate of success*  
21           *of HBCUs, TCUs, and MSIs in competitive funding*  
22           *programs offered by Federal science agencies.*

23 **SEC. 4. RESEARCH AND CAPACITY BUILDING.**

24           (a) *IN GENERAL.—The Director of the National*  
25           *Science Foundation shall award grants, on a competitive*

1 *basis, to institutions of higher education or nonprofit orga-*  
2 *nizations (or consortia thereof) to—*

3 *(1) conduct research described in subsection (b)*  
4 *with respect to HBCUs, TCUs, and MSIs;*

5 *(2) conduct activities described in subsection (c)*  
6 *to build the capacity of HBCUs, TCUs, and MSIs to*  
7 *graduate students who are competitive in attaining*  
8 *and advancing in the STEM workforce;*

9 *(3) build the research capacity and competitive-*  
10 *ness of HBCUs, TCUs, and MSIs in STEM dis-*  
11 *ciplines; and*

12 *(4) identify and broadly disseminate effective*  
13 *models for programs and practices at HBCUs, TCUs,*  
14 *and MSIs that promote the education and workforce*  
15 *preparation of minority students pursuing STEM*  
16 *studies and careers in which such students are under-*  
17 *represented.*

18 *(b) RESEARCH.—Research described in this subsection*  
19 *is research on the contribution of HBCUs, TCUs, and MSIs*  
20 *to the education and training of underrepresented minority*  
21 *students in STEM fields and to the meeting of national*  
22 *STEM workforce needs, including—*

23 *(1) the diversity with respect to local context,*  
24 *cultural differences, and institutional structure*

1        *among HBCUs, TCUs, and MSIs and any associated*  
2        *impact on education and research endeavors;*

3            *(2) effective practices at HBCUs, TCUs, and*  
4        *MSIs and associated outcomes on student recruit-*  
5        *ment, retention, and advancement in STEM fields,*  
6        *including the ability for students to compete for fel-*  
7        *lowships, employment, and advancement in the work-*  
8        *force;*

9            *(3) contributions made by HBCUs, TCUs, and*  
10       *MSIs to local, regional, and national workforces;*

11           *(4) the unique challenges and opportunities for*  
12       *HBCUs, TCUs, and MSIs in attaining the resources*  
13       *needed for integrating effective practices in STEM*  
14       *education, including providing research experiences*  
15       *for underrepresented minority students;*

16           *(5) the access of students at HBCUs, TCUs, and*  
17       *MSIs to STEM infrastructure and any associated*  
18       *outcomes for STEM competency;*

19           *(6) models of STEM curriculum, learning, and*  
20       *teaching successful at HBCUs, TCUs, and MSIs for*  
21       *increasing participation, retention, and success of*  
22       *underrepresented minority students; and*

23           *(7) successful or promising partnerships between*  
24       *HBCUs, TCUs, and MSIs and other institutions of*  
25       *higher education, private sector and non-profit orga-*

1        *nizations, Federal laboratories, and international re-*  
2        *search institutions.*

3        *(c) CAPACITY BUILDING.—Activities described in this*  
4        *subsection include the design, development, implementation,*  
5        *expansion, and assessment of—*

6            *(1) metrics of success to best capture the achieve-*  
7            *ments of HBCUs, TCUs, and MSIs and students of*  
8            *such institutions to account for institutional context*  
9            *and missions, faculty investment, student popu-*  
10           *lations, student needs, and institutional resource con-*  
11           *straints;*

12           *(2) enhancements to undergraduate STEM cur-*  
13           *riculum at HBCUs, TCUs, and MSIs to increase the*  
14           *participation, retention, degree completion, and suc-*  
15           *cess of underrepresented students;*

16           *(3) professional development programs to in-*  
17           *crease the numbers and the high-quality preparation*  
18           *of STEM faculty at HBCUs, TCUs, and MSIs, in-*  
19           *cluding programs to encourage STEM doctoral stu-*  
20           *dents to teach at HBCUs, TCUs, and MSIs; and*

21           *(4) mechanisms for institutions of higher edu-*  
22           *cation that are not HBCUs, TCUs, or MSIs to part-*  
23           *ner with HBCUs, TCUs, and MSIs on STEM edu-*  
24           *cation, including the facilitation of student transfer,*  
25           *mentoring programs for students and junior faculty,*



1        *joint research projects, and student access to graduate*  
2        *education.*

3        *(d) RESEARCH EXPERIENCES.—Grants under this sec-*  
4        *tion may fund the development or expansion of opportuni-*  
5        *ties for the exchange of students and faculty to conduct re-*  
6        *search, including through partnerships with institutions of*  
7        *higher education that are not HBCUs, TCUs, or MSIs, pri-*  
8        *vate sector and non-profit organizations, Federal labora-*  
9        *tories, and international research institutions.*

10       *(e) PARTNERSHIPS.—In awarding grants under this*  
11       *section, the Director of the National Science Foundation*  
12       *shall—*

13            *(1) encourage HBCUs, TCUs, and MSIs and*  
14            *consortia thereof and partnerships with one or more*  
15            *HBCU, TCU, or MSI, to submit proposals;*

16            *(2) require proposals submitted in partnership*  
17            *with one or more HBCU, TCU, or MSI include a*  
18            *plan for establishing a sustained partnership that is*  
19            *jointly developed and managed, draws from the ca-*  
20            *pacities of each institution, and is mutually bene-*  
21            *ficial; and*

22            *(3) encourage proposals submitted in partner-*  
23            *ship with the private sector, non-profit organizations,*  
24            *Federal laboratories, and international research insti-*  
25            *tutions, as appropriate.*

1           (f) *MSI CENTERS OF INNOVATION.*—Grants under this  
2 section may fund the establishment of no more than five  
3 MSI Centers of Innovation to leverage successes of HBCUs,  
4 TCUs, and MSIs in STEM education and research training  
5 of underrepresented minority students as models for other  
6 institutions, including both HBCUs, TCUs, and MSIs and  
7 institutions of higher education that are not HBCUs, TCUs,  
8 or MSIs. Such centers will be located on campuses of se-  
9 lected institutions of higher education and serve as incuba-  
10 tors to allow institutions of higher education to experiment,  
11 pilot, evaluate, and scale up promising practices.

12           (g) *AUTHORIZATION OF APPROPRIATIONS.*—There are  
13 authorized to be appropriated to the Director of the Na-  
14 tional Science Foundation \$170,000,000 for fiscal year  
15 2020, \$175,000,000 for fiscal year 2021, \$180,000,000 for  
16 fiscal year FY 2022, \$185,000,000 for fiscal year 2023, and  
17 \$190,000,000 fiscal year 2024 to carry out this section.

18 **SEC. 5. AGENCY RESPONSIBILITIES.**

19           (a) *IN GENERAL.*—In consultation with outside stake-  
20 holders and the heads of the Federal science agencies, the  
21 Director shall develop a uniform set of policy guidelines for  
22 Federal science agencies to carry out a sustained program  
23 of outreach activities to increase clarity, transparency, and  
24 accountability for Federal science agency investments in

1 *STEM education and research activities at HBCUs, TCUs,*  
2 *and MSIs.*

3 (b) *OUTREACH ACTIVITIES.*—*In developing policy*  
4 *guidelines under subsection (a) the Director shall include*  
5 *guidelines that require each Federal science agency—*

6 (1) *to designate a liaison for HBCUs, TCUs,*  
7 *and MSIs responsible for—*

8 (A) *enhancing direct communication with*  
9 *HBCUs, TCUs, and MSIs to increase the Fed-*  
10 *eral science agency's understanding of the capac-*  
11 *ity and needs of such institutions and to raise*  
12 *awareness of available Federal funding opportu-*  
13 *nities at such institutions;*

14 (B) *coordinating programs, activities, and*  
15 *initiatives while accounting for the capacity and*  
16 *needs of HBCUs, TCUs, and MSIs;*

17 (C) *tracking Federal science agency invest-*  
18 *ments in and engagement with HBCUs, TCUs,*  
19 *and MSIs; and*

20 (D) *reporting progress toward increasing*  
21 *participation of HBCUs, TCUs, and MSIs in*  
22 *grant programs;*

23 (2) *to publish annual forecasts of funding oppor-*  
24 *tunities and proposal deadlines, including for grants,*  
25 *contracts, subcontracts, and cooperative agreements;*

1           (3) to conduct on-site reviews of research facili-  
2           ties at HBCUs, TCUs, and MSIs, as practicable, and  
3           make recommendations regarding strategies for be-  
4           coming more competitive in research;

5           (4) to hold geographically accessible or virtual  
6           workshops on research priorities of the Federal science  
7           agency and on how to write competitive grant pro-  
8           posals;

9           (5) to ensure opportunities for HBCUs, TCUs,  
10          and MSIs to directly communicate with Federal  
11          science agency officials responsible for managing com-  
12          petitive grant programs in order to receive feedback  
13          on research ideas and proposals, including guidance  
14          on the Federal science agency's peer review process;

15          (6) to foster mutually beneficial public-private  
16          collaboration among Federal science agencies, indus-  
17          try, Federal laboratories, academia, and nonprofit or-  
18          ganizations to—

19                 (A) identify alternative sources of funding  
20                 for STEM education and research at HBCUs,  
21                 TCUs, and MSIs;

22                 (B) provide access to high-quality, relevant  
23                 research experiences for students and faculty of  
24                 HBCUs, TCUs, and MSIs;

1           (C) expand the professional networks of stu-  
2           dents and faculty of HBCUs, TCUs, and MSIs;

3           (D) broaden STEM educational opportuni-  
4           ties for students and faculty of HBCUs, TCUs,  
5           and MSIs; and

6           (E) support the transition of students of  
7           HBCUs, TCUs, and MSIs into the STEM work-  
8           force; and

9           (7) to publish an annual report that provides an  
10          account of Federal science agency investments in  
11          HBCUs, TCUs, and MSIs, including data on the level  
12          of participation of HBCUs, TCUs, and MSIs as  
13          prime recipients/contractors or subrecipients/sub-  
14          contractors.

15         (c) STRATEGIC PLAN.—

16           (1) IN GENERAL.—Not later than 1 year after  
17          the date of enactment of this Act, the Director, in col-  
18          laboration with the head of each Federal science agen-  
19          cy, shall submit to Congress a report containing a  
20          strategic plan for each Federal science agency to in-  
21          crease the capacity of HBCUs, TCUs, and MSIs to  
22          compete effectively for grants, contracts, or coopera-  
23          tive agreements and to encourage HBCUs, TCUs, and  
24          MSIs to participate in Federal programs.

1           (2) *CONSIDERATIONS.*—*In developing a strategic*  
2           *plan under paragraph (1), the Director and each*  
3           *head of each Federal science agency shall consider—*

4                   (A) *issuing new or expanding existing fund-*  
5                   *ing opportunities targeted to HBCUs, TCUs,*  
6                   *and MSIs;*

7                   (B) *modifying existing research and devel-*  
8                   *opment program solicitations to incentivize effec-*  
9                   *tive partnerships with HBCUs, TCUs, and*  
10                  *MSIs;*

11                  (C) *offering planning grants for HBCUs,*  
12                  *TCUs, and MSIs to develop or equip grant of-*  
13                  *fices with the requisite depth of knowledge to sub-*  
14                  *mit competitive grant proposals and manage*  
15                  *awarded grants;*

16                  (D) *offering additional training programs*  
17                  *and individualized and timely guidance to grant*  
18                  *officers and faculty researchers at HBCUs,*  
19                  *TCUs, and MSIs to ensure they understand the*  
20                  *requirements for an effective grant proposal; and*

21                  (E) *other approaches for making current*  
22                  *competitive funding models more accessible for*  
23                  *under-resourced HBCUs, TCUs, and MSIs.*

24           (d) *REPORT TO CONGRESS.*—*Not later than 2 years*  
25           *after the date of enactment of this Act, and every 5 years*

1 *thereafter, the Director shall report to Congress on the im-*  
2 *plementation by Federal science agencies of the policy*  
3 *guidelines developed under this section.*

4 **SEC. 6. DEFINITIONS.**

5 *In this Act:*

6 (1) *DIRECTOR.*—*The term “Director” means the*  
7 *Director of the Office of Science and Technology Pol-*  
8 *icy.*

9 (2) *FEDERAL LABORATORY.*—*The term “Federal*  
10 *laboratory” has the meaning given such term in sec-*  
11 *tion 4 of the Stevenson-Wydler Technology Innovation*  
12 *Act of 1980 (15 U.S.C. 3703).*

13 (3) *FEDERAL SCIENCE AGENCY.*—*The term “Fed-*  
14 *eral science agency” means any Federal agency with*  
15 *an annual extramural research expenditure of over*  
16 *\$100,000,000.*

17 (4) *HBCU.*—*The term “HBCU” has the mean-*  
18 *ing given the term “part B institution” in section*  
19 *322 of the Higher Education Act of 1965 (20 U.S.C.*  
20 *1061).*

21 (5) *INSTITUTION OF HIGHER EDUCATION.*—*The*  
22 *term “institution of higher education” has the mean-*  
23 *ing given such term in section 101 of the Higher Edu-*  
24 *cation Act of 1965 (20 U.S.C. 1001).*

1           (6) *MINORITY SERVING INSTITUTION.*—*The term*  
2           *“minority serving institution” or “MSI” means His-*  
3           *panic-Serving Institutions as defined in section 502*  
4           *of the Higher Education Act of 1965 (20 U.S.C*  
5           *1101a); Alaska Native Serving Institutions and Na-*  
6           *tive Hawaiian-Serving Institutions as defined in sec-*  
7           *tion 317 of the Higher Education Act of 1965 (20*  
8           *U.S.C. 1059d); and Predominantly Black Institu-*  
9           *tions, Asian American and Native American Pacific*  
10           *Islander-Serving Institutions, and Native American-*  
11           *Serving Nontribal Institutions as defined in section*  
12           *371 of the Higher Education Act of 1965 (20 U.S.C.*  
13           *1067q(c)).*

14           (7) *STEM.*—*The term “STEM” has the meaning*  
15           *given the term in the STEM Education Act of 2015*  
16           *(42 U.S.C. 1861 et seq.).*

17           (8) *TCU.*—*The term “TCU” has the meaning*  
18           *given the term “Tribal College or University” in sec-*  
19           *tion 316 of the Higher Education Act of 1965 (20*  
20           *U.S.C. 1059c).*