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Union Calendar No. 603

116th Congress, 2d Session – – – – – – – – – – – – House Report 116–719

REPORT OF ACTIVITIES

OF THE

COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY

HOUSE OF REPRESENTATIVES

FOR THE

ONE HUNDRED SIXTEENTH CONGRESS

JANUARY 2, 2021.—Committed to the Committee of the Whole House on the State of the Union and ordered to be printed

U.S. GOVERNMENT PUBLISHING OFFICE

42–839 WASHINGTON : 2021

LETTER OF TRANSMITTAL

COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY,
Washington, DC, January 2, 2021.

Hon. NANCY PELOSI,
Speaker, House of Representatives,
Washington, DC.

DEAR SPEAKER PELOSI: Pursuant to House Rule XI(l)(d)(l), I respectfully submit the activities report for the Committee on Science, Space, and Technology for the 116th Congress.

Thank you for your attention to this matter.

Sincerely,

EDDIE BERNICE JOHNSON,
Chairwoman.

COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY

One Hundred Sixteenth Congress

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Report on Activities of the Committee on Science, Space, and Technology 116th Congress

Union Calendar No. 603

116TH CONGRESS *2d Session* | HOUSE OF REPRESENTATIVES | REPORT 116–719

REPORT OF ACTIVITIES OF THE COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY

JANUARY 2, 2021.—Committed to the Committee of the Whole House on the State of the Union and ordered to be printed

Mr. JOHNSON, from the Committee on Science, Space, and Technology, submitted the following

R E P O R T

Chapter I: Legislation Enacted into Law

1.1. P.L. 116–92, National Defense Authorization Act for Fiscal Year 2020 (including: H.R. 2397, American Manufacturing Leadership Act; H.R. 3038, Securing American Science and Technology Act of 2019)

Purpose

The purpose of P.L. 116–92 is to authorize the activities of the Department of Defense and the defense capabilities of the Department of Energy. Significant to the Committee on Science, Space, and Technology's interests, this law contains the texts of H.R. 2397 and H.R. 3038.

The purpose of H.R. 2397 is to amend the National Institute of Standards and Technology Act to reauthorize the network for manufacturing innovation and make changes to the implementation of the network. These changes include an increase in activities in workforce development and outreach to small manufacturers, and the development of network-wide performance metrics.

The purpose of H.R. 3038 is to establish an interagency working group to coordinate activities and develop policy guidance to protect federally funded research and development from foreign interference, and for other purposes.

Legislative History

S. 1790, National Defense Authorization Act for Fiscal Year 2020, was introduced by Senator James M. Inhofe on June 11,

2019. The bill was reported to the Senate on June 11, 2019. On June 27, 2019, the Senate considered S. 1790, and the bill passed the amendment by a record vote of 86–8.

On May 2, 2019, Adam Smith introduced H.R. 2500, National Defense Authorization Act for Fiscal Year 2019. On June 19, 2019, H.R. 2500 was reported to the full House. On July 12, 2019, H.R. 2500 passed the House by a record vote of 220–197.

On September 19, 2019, S. 1790 was passed in the House by Unanimous Consent and a conference was requested. On December 9, 2019, the conference committee filed a conference report. That conference agreement was approved by the House on December 11, 2019, by a record vote of 377–48. On December 17, 2019, the conference agreement was approved by the Senate by a record vote of 86–8.

On December 20, 2019 S. 1790 was signed by the President and became Public Law 116–92.

1.2. P.L. 116–94, Further Consolidated Appropriations Act, 2020 (including: H.R. 5213, NASA Enhanced Use Leasing Extension Act of 2019)

Purpose

The purpose of P.L. 116–94 is to fund certain activities of the federal government for fiscal year 2020, and other purposes. Significant to the Committee on Science, Space, and Technology's interests, this law contains the text of H.R. 5213 in Division I, Title VI. The purpose of H.R. 5213 is to extend the enhanced use leasing authority for NASA through December 31, 2021.

Also of note, is that Division I, Title VII contains an extension of NASA's exemption to the Iran, North Korea, and Syria Nonproliferation Act through December 31, 2025.

Legislative History

On November 21, 2019, Kendra S. Horn introduced H.R. 5213, which was referred to the Committee on Science, Space, and Technology.

H.R. 1865 was introduced in the House by Bill Pascrell Jr. on March 25, 2019. At that time, the bill was titled: "National Law Enforcement Museum Commemorative Coin Act." It was considered in the House on October 28, 2019, under suspension of the rules and passed by voice vote. On November 12, 2019, the Senate considered the bill and it passed by unanimous consent.

On December 17, 2019, the House passed the bill again, this time amending it to include consolidated appropriations (including the provisions related to NASA). It passed by a roll call vote of 297–120. On December 19, 2019, the Senate passed the bill by a vote of 71–23.

On December 20, 2019, the President signed H.R. 1865, and it became Public Law 116–94.

1.3. P.L. 116–97, Vera C. Rubin Observatory Designation Act (H.R. 3196)

Purpose

The purpose of the bill is to designate the Large Synoptic Survey Telescope (LSST) as the "Vera C. Rubin Observatory".

Legislative History

On June 11, 2019, Chairwoman Eddie Bernice Johnson introduced H.R. 3196, which was referred to the Committee on Science, Space, and Technology. The Committee on Science, Space, and Technology met to consider H.R. 3196 on Thursday, June 20, 2019 and the bill was ordered reported by voice vote. H.R. 3196 was reported to the House on June 27, 2019.

On July 23, 2019, H.R. 3196 was considered in the House under suspension of the rules and passed by voice vote.

On December 18, 2019, H.R. 3196 was passed by the Senate by unanimous consent.

On December 20, 2019, H.R. 3196 was signed by the President and became Public Law 116–97.

1.4. P.L. 116–102, Building Blocks of STEM Act (H.R. 1665/S. 737)

Purpose

The purpose of H.R. 1665 is to direct the National Science Foundation (NSF) to more equitably allocate funding for research in the Discovery Research Pre-K–12 (DRK–12) program to studies that include a focus on early childhood (birth through age 10). In addition, the bill authorizes two NSF grant programs.

Legislative History

On March 11, 2019, Haley Stevens introduced H.R. 1665, which was referred to the Committee on Science, Space, and Technology. On July 23, 2019, H.R. 1665 was considered by the House under suspension of the rules and passed by voice vote.

On March 11, 2019, Senator Jacky Rosen introduced S. 737, the Senate companion to H.R. 1665. On August 16, 2019, S. 737 was reported from the Committee on Commerce, Science, and Transportation to the Senate.

On September 26, 2019, the Senate passed S. 737 by voice vote.

On December 9, 2019, the House considered S. 737 under suspension of the rules and the bill passed by voice vote.

On December 24, 2019, S. 737 was signed by the President and became P.L. 116–102.

1.5. P.L. 116–115, Supporting Veterans in STEM Careers Act (H.R. 425/S. 153)

Purpose

The purpose of H.R. 425 is to promote veteran involvement in Science, Technology, Engineering, and Mathematics (STEM) education and careers, computer science, and scientific research.

Legislative History

On January 10, 2019, Neal P. Dunn introduced H.R. 425, which was referred to the Committee on Science, Space, and Technology. On February 25, 2019, H.R. 425 was considered under suspension of the rules, and the bill passed the House by voice vote.

On January 16, 2019, Senator Marco Rubio introduced S. 153, the Senate companion to H.R. 425. On December 5, 2019, S. 153 was reported from the Committee on Commerce, Science, and Transportation to the Senate.

On December 18, 2019, the Senate passed S. 153 by unanimous consent.

On January 27, 2020, S. 153 was considered in the House under suspension of the rules and passed by voice vote.

On February 11, 2020, S. 153 was signed by the President and became P.L. 116–115.

1.6. P.L. 116–181, PROSWIFT Act (H.R. 5260/S. 881)

Purpose

The PROSWIFT Act provides for the continued advancement of heliophysics research, collection of new data and observations, and improvements to our modeling and forecasting of space weather. This bill also clearly delineates the roles and responsibilities of the key federal agencies involved in space weather, including the National Oceanic and Atmospheric Administration, the National Aeronautics and Space Administration, the National Science Foundation, the Department of Defense, the Federal Aviation Administration, the US Geological Survey, and the Office of Science and Technology Policy.

Legislative History

On November 22, 2019, Ed Perlmutter introduced H.R. 5260, which was referred to the Committee on Science, Space, and Technology, and in addition to the Committees on Armed Services and Natural Resources. On October 23, 2019, The Subcommittee on Environment and the Subcommittee on Space and Aeronautics held a joint hearing entitled, "Space Weather: Advancing Research, Monitoring, and Forecasting Capabilities." On January 9, 2020, the Committee on Science, Space, and Technology met to consider H.R. 5260, and the bill was ordered reported by the Committee by voice vote.

On March 26, 2019, Senator Gary C. Peters introduced S. 881, the Senate companion to H.R. 5260. The Senate Committee on Commerce, Science, and Transportation reported S. 881 to the Senate. House and Senate committees pre-conferenced S. 881 and H.R. 5260.

On July 27, 2020, S. 881 was considered by the Senate and passed by unanimous consent.

On September 16, 2020, S. 881 was considered in the House under suspension of the rules and passed by voice vote.

On October 21, 2020, S. 881 was signed by the President and became Public Law 116–181.

1.7. P.L. 116–207, Internet of Things Cybersecurity Improvement Act of 2019 (H.R. 1668)

Purpose

The Internet of Things Cybersecurity Improvement Act of 2019 would require enhanced levels of cybersecurity for federally procured Internet of Things (IoT) devices.

Specifically, the bill tasks NIST with creating recommendations for the appropriate use and management of IoT devices, including information security requirements. The bill tasks OMB with issuing guidelines for federal agencies consistent with NIST's recommendations. Finally, H.R. 1668 requires NIST and OMB to publish guidance on IoT security vulnerabilities.

Legislative History

On March 11, 2019, Robin L. Kelly introduced H.R. 1668, which was referred to the Committee on Oversight and Reform, and in addition to the Committee on Science, Space, and Technology. On September 14, 2020, the Committee on Oversight and Reform reported H.R. 1668 to the House and the Committee on Science, Space, and Technology was discharged from further consideration. On September 21, 2020, H.R. 1668 was considered in the House under suspension of the rules and passed by voice vote.

On November 17, 2020, H.R. 1668 was passed by the Senate by unanimous consent.

On December 4, 2020, H.R. 1668 was signed by the President and became Public Law 116–207.

1.8. P.L. 116–224, Save Our Seas 2.0 Act (S. 1982)

Purpose

The SOS 2.0 Act seeks to improve the domestic response to marine debris, incentivize international engagement on marine debris, and strengthen domestic waste management infrastructure to prevent the creation of new marine debris.

Legislative History

On June 26, 2019, Senator Dan Sullivan introduced S. 1982, which was referred to the Committee on Commerce, Science, and Transportation. On November 13, 2019 the Committee ordered the bill to be reported favorably with an amendment and on January 9, 2020 the Senate passed S. 1982 by voice vote.

In the House, S. 1982 was referred to the Committee on Transportation and Infrastructure, and in addition to the Committees on Natural Resources, Foreign Affairs, Energy and Commerce, Science, Space, and Technology, and Agriculture. The Committee on Science, Space, and Technology was discharged from further consideration on September 28, 2020. On October 1, 2020, an amended S. 1982 was considered under suspension of the rules by the House, and the bill was passed by voice vote. On October 19, 2020 the bill was received with the House amendment by the Senate. Then the Senate agreed to the House amendment to the bill by Unanimous Consent on December 1, 2020.

On December 18, 2020, S. 1982 was signed by the President and became Public Law 116–224.

1.9. P.L. 116–221, National Sea Grant College Program Amendments Act of 2020 (S. 910)

Purpose

The purpose of the National Sea Grant College Program Amendments Act is to amend the National Sea Grant College Program Act to reauthorize the National Sea Grant College Program through 2024 and to improve Sea Grant's ability to enhance the practical use and conservation of coastal, marine, and Great Lakes resources through research, extension, and education activities.

Legislative History

S. 910 was introduced on March 27, 2019, by Senator Wicker and was referred to the Committee on Commerce, Science, and Transportation of the Senate. On April 3, 2019, the Committee met in open Executive Session and, by voice vote, ordered S. 910 reported favorably with an amendment.

On December 6, 2019 the Committee on Science, Space, and Technology exchanged jurisdictional correspondence on H.R. 2405, the Corresponding House bill to S. 910.

On September 30, 2020 S. 910 Passed the Senate with an amendment by voice vote. October 1, 2020, the bill was held at the desk in the House. On November 6, 2020 the Bill was considered in the House under suspension of the rules as amended and passed by voice vote. On December 2, 2020 the Senate agreed to the House amendment to the Bill by Voice Vote.

On December 18, 2020, S. 910 was signed by the President and became Public Law 116–216.

1.10. P.L. 116–XXX, Coordinated Ocean Observations and Research Act of 2020 (S. 914)

Purpose

The purpose of this bill is to reauthorize the Integrated Coastal and Ocean Observation System Act of 2009, to clarify the authority of the Administrator of the National Oceanic and Atmospheric Administration with respect to post-storm assessments, and to require the establishment of a National Water Center, and for other purposes.

Legislative History

On March 27, 2019, Senator Roger F. Wicker introduced S. 914. On December 5, 2019, the Committee on Commerce, Science, and Transportation reported S. 914 to the Senate. On July 30, 2020, the Senate considered and passed S. 914 by Unanimous Consent.

On December 3, 2020, S. 914, as amended, was considered in the House under suspension of the rules and passed by voice vote.

On December 16, 2020, the Senate considered S. 914, as amended by the House, and passed the bill by Unanimous Consent.

On December 21, 2020, S. 914 was submitted to the President.

At the time of filing of this report, no further action had been reported.

1.11. P.L. 116–XXX, IOGAN Act (H.R. 4355/S. 2904)

Purpose

The purpose of the bill is to provide for research on manipulated or synthesized content and information authenticity, including output of generative adversarial networks, otherwise known as deepfakes and to encourage public-private partnerships to develop standards for detecting and identifying such content.

Legislative History

On September 17, 2019, Representative Anthony Gonzalez introduced H.R. 4355, Identifying Outputs of Generative Adversarial Networks Act ("IOGAN Act"). The bill was referred solely to the Committee on Science, Space, and Technology.

On September 25, 2019, the Committee favorably reported the bill, H.R. 4355, as amended, to the House with the recommendation that the bill be approved. On December 9, 2019, H.R. 4355 was considered under suspension of the rules and was agreed to by voice vote.

On November 20, 2019, Senator Catherine Masto Cortez introduced S. 2904, the Senate companion to H.R. 4355. On November 9, 2020, the Committee on Commerce, Science, and Transportation reported S. 2904 to the Senate. On November 18, 2020, the Senate considered and passed S. 2904 by Unanimous Consent.

On December 8, 2020, the House considered and passed S. 2904 by Unanimous Consent.

On December 23, 2020, S. 2904 was signed by the President.

At the time of filing of this report, a Public Law number had not been issued.

1.12. P.L. 116–XXX, One Small Step to Protect Human Heritage in Space Act (S. 1694)

Purpose

The purpose of the "One Small Step to Protect Human Heritage in Space Act" is to require NASA to add recommendations and inform other relevant agencies of information relating to the principle of due regard and the limitation of harmful interference with Apollo landing site artifacts, and for other purposes.

Legislative History

S. 1694 was introduced on May 23, 2019, by Gary Peters and was referred to the Committee on Commerce, Science, and Transportation. On July 10, 2019 the Committee ordered the bill to be reported favorably with an amendment and on July 18, 2019 the Senate passed S. 1982 by voice vote.

On July 16, 2019, Chairwoman Eddie Bernice Johnson introduced H.R. 3766, One Small Step to Protect Human Heritage in Space Act.

In the House, S. 1694 was referred to the Committee on Science, Space, and Technology, and then to the Committee on Foreign Affairs. On December 17, 2020, an amended S. 1694 was considered under suspension of the rules by the House, and the bill was passed by voice vote.

On December 19, 2020, the Senate passed S. 1694 by voice vote.

On December 21, 2020, S. 1694 was presented to the President.

At the time of filing of this report, no further action had been reported.

1.13. P.L. 116–XXX, Consolidated Appropriations Act, 2021 (H.R. 133, including the text of the Energy Act of 2020)

Purpose

The purpose of this law is to fund the activities of the Federal Government for fiscal year 2021, and other purposes. Of note is that this law contains a number of energy and environment provisions in the Committee's jurisdiction. Division S of the bill contains a number of environmental research programs in the Committee's jurisdiction including the text of H.R. 1166, USE IT Act.

Division Z consists of the Energy Act of 2020. This bill is the final product of negotiations related to the House passed H.R. 4447, the Clean Economy Jobs and Innovation Act. Included in Division Z are the following bills which were led by the Committee on Science, Space, and Technology: H.R. 34, the Energy and Water Research Integration Act (E.B. Johnson); H.R. 617, the Department of Energy Veterans' Health Initiative Act (Norman); H.R. 2986, the Better Energy Storage Technologies Act (Foster); H.R. 3597, the Solar Energy Research and Development Act (McAdams); H.R. 3607, the Fossil Energy Research and Development Act (Veasey); H.R. 3609, the Wind Energy Research and Development Act (Tonko); H.R. 4091, the ARPA–E Reauthorization Act (E.B. Johnson); H.R. 4230, the Clean Industrial Technology Act (CITA) (Casten); H.R. 4481, the Securing Energy Critical Elements and American Jobs Act (Swalwell); H.R. 4733, the Low-Dose Radiation Research Act (Posey); H.R. 5428, the Grid Modernization Research and Development Act (Lamb); H.R. 5374, the Advanced Geothermal Research and Development Act (Lucas); H.R. 6084, the Water Power Research and Development Act (Bonamici); H.R. 6097, the Nuclear Energy Research and Development Act (Lamb); and H.R. 8273, the Energizing Technology Transfer Act (E.B. Johnson). The division also includes programs on produced water research development and fusion energy research and development.

Legislative History

For further information about the legislative history of the constituent bills in Division Z, please see Chapter 2 generally.

On January 3, 2019, Henry Cuellar introduced H.R. 133, United States-Mexico Economic Partnership Act. On January 10, 2019, H.R. 133 was considered by the House under suspension of the rules and passed by voice vote. On January 15, 2020, H.R. 133 was considered by the Senate and passed by Unanimous Consent.

On December 21, 2020, H.R. 133 was considered in the House pursuant to a rule (H. Res. 1271). Pursuant to the rule, the text of H.R. 133 was replaced with the Consolidated Appropriations Act, 2021. H.R. 133 passed the House by a record vote of 359–53.

On December 22, 2020, the Senate considered H.R. 133, and the bill passed by a record vote of 92–6.

On December 27, 2020, H.R. 133 was signed by the President.

At the time of filing of this report, a Public Law number had not been issued.

1.14. P.L. 116–XXX, "The William M. (Mac) Thornberry" National Defense Authorization Act for Fiscal Year 2021 (H.R. 6395/S. 4049)

Purpose

The purpose of "The William M. (Mac) Thornberry" National Defense Authorization Act for Fiscal Year 2021 ("NDAA") is to authorize appropriations for fiscal year 2021 for military activities of the Department of Defense and for military construction, to prescribe military personnel strengths for such fiscal year, and for other purposes. It also authorizes appropriations for fiscal year 2021 for military activities of the Department of Defense, for military construction, and for defense activities of the Department of Energy, to prescribe military personnel strengths for such fiscal year, and for other purposes.

Legislative History

On March 26, 2020, Representative Adam Smith introduced H.R. 6395, which was referred to the House Committee on Armed Services and then to its Subcommittees. By June 23, 2020 all Subcommittees had held their markups and forwarded the Bill to the Full Committee by voice vote. On July 1, 2020 the Full Committee marked up the Bill and ordered to be reported amended by record vote, 56–0.

On July 20, 2020, H.R. 6395 was considered under the provisions of rule H. Res. 1053 and on July 21, 2020 the amended bill passed the House by a record vote of 295–125.

On June 23, 2020, Senator James Inhofe introduced S. 4049, National Defense Authorization Act for Fiscal Year 2021, which was referred to the Senate Committee on Armed Services. S. 4049 was moved for consideration before the Senate on June 29, 2020 by record vote of 89–4. Then on July 23, 2020 an amended S. 4049 passed the Senate by record vote of 86–14.

On September 16, 2020, the House Committee on Science, Space, and Technology transmitted a letter to the Speaker of the House requesting the appointment of conferees from the Committee to the anticipated House-Senate conference on the NDAA to certain provisions of H.R. 6395

On November 16, 2020 H.R. 6395 passed the Senate with an amendment by voice vote. Rep. Smith asked for unanimous consent that the House disagree to the Senate's amendment and request a conference, which was agreed to without objection.

On November 18, 2020 the Speaker of the House appointed conferees from the Committee on Science, Space, and Technology for consideration of the following provisions of the House NDAA Bill H.R. 6395 section 229, subtitle D of title II of division A, sections 327, 333, 341, 1744, 1771, 1806, 1807, 1821, 1824, 1825, division E, sections 5502 and 10104. Furthermore, conferees were appointed for sections 318, 1098, 1099, subtitle C of title LII of division E, secs. 5231–38, and 6087 of the Senate NDAA Bill for FY 2021, S. 4049.

Several provisions that the Committee had clear jurisdictional interest and had requested appointed conferees for were denied conferees by the Parliamentarians according to their protocol of which did not respect the similarity to corresponding bills referred to the Committee and the substantial policy implications of these provi-

sions in the House NDAA Bill H.R. 6395, theses sections were 229, 233, 247, 272, 328, 330, 341, 1633, 1705, 1721–1723, 1754, 5107, 5231–5238, and 9412. In S. 4049 bill the provisions included Subtitle H of title LX of Division E.

Of the provisions that the Committee on Science, Space, and Technology had conferees appointed to, the following sections ultimately made it into the final conference report and Public Law, (please note that by including these provisions into the conference report conforming changes were made to their locations in the bill therefore these are references to the location of provisions in the final Public Law) sections 223, 261–267 (Subtitle E of title II of division A), 334, 338, 1055, 9413, 9401–9407, 9411, 9415, 9902, 9906, 9907, 5001–5501, and 8304.

For further information about the legislative history of the constituent bills (H.R. 2051, H.R. 6208, H.R. 6216, H.R. 7139, H.R. 7560, H.R. 7713, H.R. 7931, H.R. 8634) located in sections 261–267 (Subtitle E of title II of division A), 332, 338, 1055, 1613, 5001–5501, 9401–9407, 9414 (respectively) of Public Law 116–XXX please see Chapter 2 generally.

On December 3, 2020 the Conferees agreed to file a Conference Report on H.R. 6395. On December 8, 2020 the Conference Report on H.R. 6395 was agreed to in the House by a record vote of 335–78–1. And then on December 11, 2020 the conference report on H.R. 6395 was agreed to in the Senate by a record vote of 84–13.

On December 23, 2020, H.R. 6395 was vetoed by the President.

On December 28, 2020, the House voted to override the President's veto of H.R. 6395 by a vote of 322–Y and 87–N.

On January 1, 2021, the Senate voted to override the President's veto of H.R. 6395 by a vote of 81–Y and 13–N.

At the time of filing of this report, a Public Law number had not been issued.

1.15. P.L. 116–XXX, National Landslide Preparedness Act (H.R. 8810)

Purpose

The purpose of H.R. 1261 is to establish a national program to identify and reduce losses from landslide hazards, authorize the existing national 3D Elevation Program, and authorize studying, mitigating, and restoring instances of ground subsidence.

Legislative History

On February 14, 2019, Suzan K. DelBene introduced H.R. 1261, which was referred to the Committee on Natural Resources, and in addition to the Committee on Science, Space, and Technology. On June 3, 2019, the Committee on Natural Resources reported H.R. 1261 to the House and the Committee on Science, Space, and Technology was discharged from further consideration. On June 3, 2019, H.R. 1261 was considered in the House under suspension of the rules and passed by voice vote.

On July 30, 2020, the Senate passed S. 529, the Senate companion to H.R. 1261, by unanimous consent.

On November 24, 2020, Suzan K. DelBene introduced H.R. 8810, which was a reintroduction of H.R. 1261. The bill was reintroduced due to difficulties in negotiations with the Senate. On December 3,

2020, the House considered H.R. 8810 under suspension of the rules and the bill passed by voice vote.

On December 16, 2020, the Senate considered H.R. 8810 and the bill passed by Unanimous Consent.

On December 24, 2020, H.R. 8810 was presented to the President.

At the time of filing of this report, no further action had been reported.

1.16. P.L. 116–XXX, Neil A. Armstrong Test Facility Act (S. 2472)

Purpose

The purpose of this bill is to rename the NASA John H. Glenn Research Center at Plum Brook Station in Ohio as the "NASA John H. Glenn Research Center at the Neil A. Armstrong Test Facility."

Legislative History

On September 12, 2019, Senator Rob Portman introduced S. 2472. On February 27, 2020, the Committee on Commerce, Science, and Transportation reported S. 2472 to the Senate. On June 24, 2020, the Senate considered S. 2472 and the bill passed by Unanimous Consent.

On December 16, 2020, the House considered S. 2472 under suspension of the rules and the bill passed by voice vote.

On December 30, 2020, S. 2472 was signed by the President.

At the time of filing of this report, a Public Law number had not been issued.

1.17. P.L. 116–XXX, Advancing Research to Prevent Suicide Act (H.R. 4704)

Purpose

The purpose of the bill is to provide for multidisciplinary research on the science of suicide, and to advance the knowledge and understanding of issues that may be associated with several aspects of suicide including intrinsic and extrinsic factors related to areas such as wellbeing, resilience, and vulnerability.

Legislative History

On October 16, 2019, Representative Ben McAdams introduced H.R. 4704, the Advancing Research to Prevent Suicide Act. The bill was referred to the Committee on Science, Space, and Technology. On November 14, 2019, the Committee on Science, Space, and Technology favorably reported the bill, H.R. 4704, as amended, to the House with the recommendation that the bill be approved.

On January 27, 2020, H.R. 4704 was considered under suspension of the rules, and upon demand of yeas and nays, was agreed to, 385–8.

On December 14, 2020, the Senate agreed to pass an amended H.R. 4704 by unanimous consent.

On December 31, 2020, the House passed H.R. 4704 by unanimous consent.

At the time of filing of this report, no further action had been reported.

1.18. P.L. 116–XXX, EFFORT Act (H.R. 3153)

Purpose

The purpose of H.R. 3153 is to direct the National Science Foundation (NSF) to support research related to opioid addiction.

Legislative History

On June 6, 2019, Representative Jennifer Wexton, introduced H.R. 3153, the Expanding Findings for Federal Opioid Research and Treatment Act or the EFFORT Act. The bill was referred solely to the Committee on Science, Space, and Technology.

On June 20, 2019, the Committee favorably reported the bill, H.R. 3153, to the House with the recommendation that the bill be approved. The motion was agreed to by a voice vote. On July 23, 2019, H.R. 3153 was considered under suspension of the rules and was agreed to by voice vote.

On December 22, 2020, the Senate passed H.R. 3153 by voice vote.

On December 31, 2020, the House passed H.R. 3153 by Unanimous Consent.

At the time of filing of this report, no further action had been reported.

Chapter II: Other Committee Legislation (bold indicates bills primarily referred to the Committee on Science space and Technology)

2.1. H.R. 1, For the People Act of 2019

Purpose

The purpose of H.R. 1 is to expand voter access, ensure election integrity, and increase election security for federal elections. The bill also reforms campaign finance laws and ethics laws for the three branches of government.

Elements of H.R. 1 address and update NIST's role under the Help America Vote Act.

Legislative History

H.R. 1 was introduced by John Sarbanes on January 3, 2019. The bill was referred to the Committee on House Administration, and in addition to the Committees on Intelligence (Permanent Select); Judiciary; Oversight and Reform; Science, Space, and Technology; Education and Labor; Ways and Means; Financial Services; Ethics; and, Homeland Security. H.R. 1 was reported from the Committee on House Administration on March 4, 2019, and all other committees were discharged of consideration of the bill. The House considered H.R. 1 from March 6–8, 2019, and the bill passed the House by record vote of 234–193 on March 8, 2019.

2.2. **H.R. 34, Energy and Water Research Integration Act of 2019**

Purpose

The purpose of H.R. 34 is to ensure the intensity of energy and water is considered in the Department of Energy's energy research,

development, and demonstration programs to help guarantee efficient, reliable, and sustainable delivery of energy and clean water resources.

Legislative History

H.R. 34 was introduced by Chairwoman Eddie Bernice Johnson on January 3, 2019, and the bill was referred solely to the Committee on Science, Space, and Technology. The Energy Subcommittee held a hearing on March 7, 2019 to examine energy and water nexus issues in support of H.R. 34. The Subcommittee on Energy met to consider H.R. 34 on March 27, 2019. The bill was forwarded to the Full Committee by voice vote. The Full Committee met to consider H.R. 34 on May 1, 2019. The bill was ordered reported by voice vote.

On July 23, 2019, H.R. 34 was considered under suspension of the rules and the bill was passed by voice vote.

On September 23–24, 2020, the House considered H.R. 4447, the Clean Economy Jobs and Innovation Act, which contained the text of H.R. 34. H.R. 4447 was considered under the provisions of rule H. Res. 1129 and on September 24, 2020 the bill passed the House by a record vote of 220–185.

For further information on H.R. 34, please refer to entry 1.13 from Chapter 1.

2.3 **H.R. 36, Combating Sexual Harassment in Science Act of 2019**

Purpose

The purpose of the bill is to provide for research on the causes, consequences and prevalence of, as well as interventions for preventing, sexual harassment in the STEM workforce. The bill also directs coordination among federal science agencies efforts to address sexual harassment involving federally funded researchers.

Legislative History

H.R. 36 was introduced by Chairwoman Eddie Bernice Johnson on January 3, 2019, and the bill was referred solely to the Committee on Science, Space, and Technology. On Wednesday, June 12, 2019, the Committee on Science, Space, and Technology held a hearing entitled *Combating Sexual Harassment in Science*. On June 20, 2019, the Committee on Science, Space, and Technology met to consider H.R. 36. The bill was ordered reported by voice vote. The Committee reported the bill to the House on July 12, 2019.

On July 23, 2019, H.R. 36 was considered under suspension of the rules and passed the House by voice vote.

2.4. H.R. 206, Encouraging Small Business Innovation Act

Purpose

The purpose of H.R. 206 is to revise certain requirements for the Small Business Innovation Research and Small Business Technology Transfer Programs, in part, by including small business investment companies in the programs.

Legislative History

H.R. 206 was introduced on January 3, 2019, by Harley Rouda, and the bill was referred to the Committee on Small Business and in addition to the Committee on Science, Space, and Technology. On January 14, 2019, H.R. 206 was considered under suspension of the rules, and the bill passed the House by voice vote.

2.5. H.R. 246, Stimulating Innovation through Procurement Act of 2019

Purpose

The purpose of H.R. 246 is to increase assistance to participants in the Small Business Innovation Research and Small Business Technology Transfer Programs, in part by including procurement executives from participating agencies in the SBIR and STTR programs.

Legislative History

On January 4, 2019, Abby Finkenauer introduced H.R. 246, which was referred to the Committee on Small Business, and in addition to the Committee on Science, Space, and Technology. On January 14, 2019, H.R. 246 was considered under suspension of the rules, and the bill passed the House by voice vote.

2.6. **H.R. 335, South Florida Clean Coastal Waters Act of 2019**

Purpose

H.R. 335 amends the Harmful Algal Bloom and Hypoxia Research and Control Act of 1998 to require the Interagency Task Force on Harmful Algal Blooms (HABs) and Hypoxia to produce an integrated assessment on the causes, consequences, and mitigation options for HABs and hypoxia in South Florida, and to identify gaps in research, monitoring and management.

It also requires the Task Force to develop an action plan, in consultation with local stakeholders, in response to the integrated assessment that details methods for reducing and mitigating HABs and hypoxia in South Florida, and to provide progress reports on the implementation of the plan biennially.

Legislative History

On January 8, 2019, Brian J. Mast introduced H.R. 335, which was referred to the Committee on Science, Space, and Technology, and in addition to the Committee on Natural Resources. On March 7, 2019, the Environment Subcommittee held a hearing focused on climate change impacts on our nation's oceans and coasts, where harmful algal blooms were discussed as a major associated impact. On July 23, 2019, the Full Committee met to consider H.R. 335, and it was ordered reported from the Committee by voice vote. The bill was reported to the House on September 11, 2019, and the Committee on Natural Resources was discharged of consideration of the bill.

On September 26, 2019, H.R. 335 was considered under suspension of the rules, and the bill passed the House by voice vote.

2.7. **H.R. 425, Supporting Veterans in STEM Careers Act**

Purpose

The purpose of H.R. 425 is to promote veteran involvement in Science, Technology, Engineering, and Mathematics (STEM) education and careers, computer science, and scientific research.

Legislative History

On January 10, 2019, Neal P. Dunn introduced H.R. 425, which was referred to the Committee on Science, Space, and Technology. On February 25, 2019, H.R. 425 was considered under suspension of the rules, and the bill passed the House by voice vote.

For further information on the legislative history of H.R. 425 (S. 153), see Chapter I.

2.8. **H.R. 539, Innovators to Entrepreneurs Act of 2019**

Purpose

H.R. 539 expands participation in the National Science Foundation's Innovation Corps Program to Small Business Innovation Program grantees and makes available specialized I-Corps courses in all aspects of preparing a product to go to market.

Legislative History

On January 14, 2019, Daniel Lipinski introduced H.R. 539, which was referred to the Committee on Science, Space, and Technology, and in addition to the Committee on Small Business. On February 25, 2019, H.R. 539 was considered under suspension of the rules, and the bill passed the House by a record vote of 385–18.

2.9. H.R. 542, Supporting Research and Development for First Responders Act

Purpose

H.R. 542 amends the Homeland Security Act of 2002 to authorize the National Urban Security Technology Laboratory (NUSTL) within the Department of Homeland Security's Science and Technology Directorate (S&T).

Legislative History

On January 14, 2019, Kathleen M. Rice introduced H.R. 542, which was referred to the Committee on Homeland Security. On May 15, 2019, the Committee on Homeland Security met to consider H.R. 542, and it was ordered reported from the Committee by voice vote. On June 10, 2019, the Committee on Science, Space, and Technology exchanged jurisdictional correspondence on H.R. 542.

On June 10, 2019, H.R. 542 was considered under suspension of the rules, and the bill passed the House by a record vote of 395–3.

On November 9, 2020, the Senate Committee on Homeland Security and Government Affairs favorably reported H.R. 542 to the Senate.

2.10. **H.R. 617, Department of Energy Veterans' Health Initiative Act**

Purpose

The purpose of H.R. 617 is to require the Department of Energy to collaborate with the Department of Veterans Affairs to conduct research to improve veterans' healthcare.

Legislative History

On January 16, 2019, Ralph Norman introduced H.R. 617, which was referred to the Committee on Science, Space, and Technology, and in addition to the Committee on Veterans Affairs.

On July 23, 2019, H.R. 617 was considered under suspension of the rules, and the bill passed the House by voice vote.

On December 12, 2019, the Senate Committee on Energy and Natural Resources reported H.R. 617 to the Senate.

The text of H.R. 617 was also included in Section 5502 in H.R. 6395, the National Defense Authorization Act for Fiscal Year 2021. On July 20, 2020, H.R. 6395 was considered under the provisions of the rule H. Res. 1053 and on July 21, 2020 the bill passed the House by a record vote of 295–125. On November 18, 2020 the Speaker appointed conferees from the Committee on Science, Space, and Technology and included Committee members for consideration of Section 5502. This language was taken out of the conference report and added to P.L. 116–XXX, the Consolidated Appropriations Act 2021.

For further information regarding the legislative history of H.R. 617, please refer to entry 1.13 in Chapter 1.

2.11. **H.R. 988, NEAR Act of 2019**

Purpose

The purpose of H.R. 988 is to direct the Secretary of Commerce to work with the National Academies of Sciences, Engineering, and Medicine to produce a study on the impacts of ocean acidification and other environmental stressors on estuarine environments to improve our understanding of these impacts and inform management and mitigation decisions.

Legislative History

On February 6, 2019, Bill Posey introduced H.R. 988, which was referred to the Committee on Science, Space, and Technology, and in addition to the Committee on Natural Resources. On March 7, 2019, the Environment Subcommittee of the Committee on Science, Space, and Technology held a hearing focused on climate change impacts on our nation's oceans and coasts, where ocean acidification was discussed as a major associated impact.

On April 9, 2019, the Subcommittee on Environment met to consider H.R. 988 and three other ocean acidification bills, and H.R. 988 was reported to the Full Committee by voice vote. The Full Committee on Science, Space, and Technology met to consider H.R. 988 on Wednesday, May 1, 2019, and the bill was reported to the House by voice vote. On May 23, 2019, H.R. 988 was reported to the House.

On June 5, 2019, H.R. 988 was considered under suspension of the rules, and the bill passed the House by voice vote.

2.12. **H.R. 1237, COAST Research Act of 2019**

Purpose

The purpose of the bill is to reauthorize and update the Federal Ocean Acidification Research and Monitoring Act of 2009 by expanding the scope of federal ocean acidification and coastal acidification research, establishing an independent Ocean Acidification Advisory Board, establishing and maintaining a data archive system for ocean and coastal acidification data, and for other purposes.

Legislative History

On February 14, 2019, Suzanne Bonamici introduced H.R. 1237, which was referred soley to the Committee on Science, Space, and Technology. On March 7, 2019, the Environment Subcommittee held a hearing focused on climate change impacts on our nation's oceans and coasts, where ocean acidification was discussed as a major associated impact.

On April 9, 2019, the Subcommittee on Environment met to consider H.R. 1237 and three other ocean acidification bills, and H.R. 1237 was reported to the Full Committee by voice vote. The Full Committee met to consider H.R. 1237 on Wednesday, May 1, 2019, and the bill was reported favorably to the House by voice vote. On May 28, 2019, H.R. 1237 was reported to the House.

On June 5, 2019, H.R. 1237 was considered under suspension of the rules, and the bill passed the House by voice vote.

2.13. H.R. 1261 (S. 529, H.R. 8810), National Landslide Preparedness Act

Purpose

The purpose of H.R. 1261 is to establish a national program to identify and reduce losses from landslide hazards, authorize the existing national 3D Elevation Program, and authorize studying, mitigating, and restoring instances of ground subsidence.

Legislative History

On February 14, 2019, Suzan K. DelBene introduced H.R. 1261, which was referred to the Committee on Natural Resources, and in addition to the Committee on Science, Space, and Technology. On June 3, 2019, the Committee on Natural Resources reported H.R. 1261 to the House and the Committee on Science, Space, and Technology was discharged from further consideration. On June 3, 2019, H.R. 1261 was considered in the House under suspension of the rules and passed by voice vote.

On July 30, 2020, the Senate passed S. 529, the Senate companion to H.R. 1261, by unanimous consent.

On November 24, 2020, Suzan K. DelBene introduced H.R. 8810, which was a reintroduction of H.R. 1261. The bill was reintroduced due to difficulties in negotiations with the Senate. For further information regarding this bill, see entry 1.15 in Chapter 1.

2.14. H.R. 1314 (S. 914), Integrated Coastal and Ocean Observation System Act Amendments of 2019

Purpose

The purpose of H.R. 1314 is to reauthorize the Integrated Coastal and Ocean Observation System Act of 2009, and for other purposes.

Legislative History

On February 19, 2019, H.R. 1314 was introduced by Don Young and referred to the Committee on Natural Resources, and in addition to the Committee on Science, Space, and Technology. H.R. 1314 was reported from the Committee on Natural Resources on October 11, 2019, and the Committee on Science, Space, and Technology was discharged of further consideration.

On July 30, 2020, the Senate companion to H.R. 1314, S. 914, passed the Senate by unanimous consent.

2.15. H.R. 1646, HERO Act

Purpose

H.R. 1646 would require the Secretary of Health and Human Services (the Secretary) to improve the detection, prevention, and treatment of mental health issues among public safety officers.

Legislative History

On March 8, 2019, Ami Bera introduced H.R. 1646, which was referred to the Committee on Energy and Commerce, and in addition to the Committee on Science, Space, and Technology. On September 18, 2019, the Committee on Energy and Commerce reported H.R. 1646 to the House and the Committee on Science, Space, and Technology was discharged from further consideration.

On September 21, 2019, H.R. 1646 was considered in the House under suspension of the rules and passed by voice vote.

2.16. **H.R. 1665 (S. 737), Building Blocks of STEM Act***

Purpose

The purpose of H.R. 1665 is to direct the National Science Foundation (NSF) to more equitably allocate funding for research in the Discovery Research Pre-K–12 (DRK–12) program to studies that include a focus on early childhood (birth through age 10). In addition, the bill authorizes two NSF grant programs.

Legislative History

On March 11, 2019, Haley Stevens introduced H.R. 1665, which was referred to the Committee on Science, Space, and Technology. On July 23, 2019, H.R. 1665 was considered by the House under suspension of the rules and passed by voice vote.

For further information on the legislative history of H.R. 1665 (S. 737), see Public Law 116–102 Chapter I.

2.17. **H.R. 1709, Scientific Integrity Act**

Purpose

H.R. 1709 amends the America COMPETES Act to establish, in law, scientific integrity policies at Federal science agencies, and for other purposes.

Legislative History

On March 13, 2019, Paul Tonko introduced H.R. 1709, which was referred to the Committee on Science, Space, and Technology. On July 17, 2019, the Research and Technology Subcommittee and the Investigations and Oversight Subcommittee held a joint hearing entitled *"Scientific Integrity in Federal Agencies."* The Committee met to consider H.R. 1709 on October 17, 2019, and the bill was ordered reported to the House by a record vote of 25–096.

On May 15, 2020, the substance of H.R. 1709 passed the House as part of H.R. 6800, the HEROES Act. On September 24, 2020, the substance of H.R. 1709 was incorporate into H.R. 4447, the Clean Economy Jobs and Innovation Act, which was considered under the provisions of rule H. Res. 1129 and passed the House by a record vote of 220–185.

2.18. **H.R. 1716, Coastal Communities Ocean Acidification Act of 2019**

Purpose

The purpose of H.R. 1716 is to direct the National Oceanic and Atmospheric Administration (NOAA) to study the socioeconomic impacts of ocean acidification on coastal communities across the United States.

Legislative History

On March 13, 2019, Chellie Pingree introduced H.R. 1716, which was referred to the Committee on Science, Space, and Technology. On March 7, 2019, the Environment Subcommittee of the Committee on Science, Space, and Technology held a hearing focused on climate change impacts on our nation's oceans and coasts, where ocean acidification was discussed as a major associated impact.

On April 9, 2019, the Subcommittee on Environment met to consider H.R. 1716 and three other ocean acidification bills, and H.R. 1716 was reported to the Full Committee by voice vote. The Full Committee met to consider H.R. 1716 on Wednesday, May 1, 2019, and the bill was reported to the House by voice vote. On May 23, 2019, H.R. 1716 was reported to the House.

On June 5, 2019, H.R. 1716 was considered under suspension of the rules, and the bill passed the House by voice vote.

2.19. H.R. 1837, United States-Israel Cooperation Enhancement and Regional Security Act

Purpose

The purpose of H.R. 1837 is to authorize joint research, cooperation, and security assistance programs between the United States and Israel.

Legislative History

On March 21, 2019, Theodore E. Deutch introduced H.R. 1837, which was referred to the Committee on Foreign Affairs, and in addition to the Committees on Armed Services; Science, Space, and Technology; Agriculture; Energy and Commerce; Judiciary; Homeland Security; Transportation and Infrastructure; and, Veterans' Affairs. The Committee on Foreign Affairs considered H.R. 1837 on July 17, 2019, and ordered the bill reported by voice vote.

On July 23, 2019, H.R. 1837 was considered in the House under suspension of the rules and passed by voice vote.

2.20. **H.R. 1921, Ocean Acidification Innovation Act of 2019**

Purpose

The purpose of H.R. 1921 is to create a federal prize competition to spur innovation in understanding ocean acidification or developing management strategies for responding to ocean acidification.

Legislative History

On March 7, 2019, the Environment Subcommittee of the Committee on Science, Space, and Technology held a hearing focused on climate change impacts on our nation's oceans and coasts, where ocean acidification was discussed as a major associated impact.

On March 27, 2019, Representative Derek Kilmer introduced H.R. 1921, the *Ocean Acidification Innovation Act* of 2019. The bill was referred solely to the Committee on Science, Space, and Technology.

On April 9, 2019, the Subcommittee on Environment favorably reported H.R. 1921, as amended, to the Full Committee. The Full Committee met to consider H.R. 1921 on Wednesday, May 1, 2019. There were no amendments offered to H.R. 1921. The Committee favorably reported the bill, H.R. 1921 to the House with the recommendation that the bill be approved.

On June 5, 2019, H.R. 1921 was considered under suspension of the rules, and upon demand of yeas and nays, was agreed to, 395–22.

2.21. H.R. 2044, Smart Building Acceleration Act

Purpose

The purpose of H.R. 2044 is to accelerate smart building development through the establishment of a Department of Energy (DOE) Federal Smart Building Program. Under the program, DOE must implement smart building technology in certain federal buildings and demonstrate the costs and benefits of smart buildings. In addition, DOE must conduct (1) a survey of privately owned smart buildings throughout the United States and evaluate their costs and benefits, and (2) research and development on barriers to the integration of advanced building technologies.

Legislative History

Representative Peter Welch introduced H.R. 2044 on April 3, 2019. The bill was referred primarily to the Committee on Energy and Commerce, in addition to the Committee on Transportation

and Infrastructure and the Committee on Science, Space, and Technology.

The Committee on Energy and Commerce held a subcommittee hearing on April 10, 2019, a subcommittee markup on May 16, 2019 and on July 17, 2019 favorably reported the bill, H.R. 2044, without amendment, to the House with the recommendation that the bill be approved.

2.22. **H.R. 2051, Sustainable Chemistry Research and Development Act of 2019**

Purpose

The purpose of the bill is to provide for federal coordination of activities supporting sustainable chemistry. Rather than focusing on cleanup and control of waste and hazardous materials, sustainable chemistry emphasizes redesigning industrial products and processes to reduce or eliminate hazards at their source by reducing toxicity, quantities of waste, and energy consumption.

Legislative History

On April 3, 2019, Representative Daniel Lipinski introduced H.R. 2051, the *Sustainable Chemistry Research and Development Act of 2019*. The bill was referred to the House Committee on Science, Space, and Technology and the House Committee on the Budget.

On July 25, 2019 the Subcommittee on Research and Technology held a hearing to assess the challenges and opportunities for expanding the use of sustainable chemicals, production processes, and stewardship practices throughout the chemical science and engineering enterprise. The Committee examined the research, technologies, and strategies that are needed to support the adoption of sustainable chemistry innovations. The Committee also received testimony on the *Sustainable Chemistry Research and Development Act of 2019*.

On October 17, 2019, the Committee on Science, Space, and Technology favorably reported H.R. 2051, as amended, to the House with the recommendation that the bill be approved. On October 17, 2019, the Committee on the Budget was discharged of consideration of the bill.

On December 9, 2019, H.R. 2051 was considered under suspension of the rules and the bill was passed by voice vote.

The text of H.R. 2051 was included as Subtitle E of title II of division A in H.R. 6395 (Sections 261–267 or Subtitle E of title II of division A), "The William M. (Mac) Thornberry" National Defense Authorization Act for Fiscal Year 2021, for further information regarding the legislative history of H.R. 2051, please refer to entry 1.14 in Chapter 1.

2.23. **H.R. 2397, American Manufacturing Leadership Act**

Purpose

The purpose of the bill is to amend the National Institute of Standards and Technology Act to reauthorize the network for manufacturing innovation and make changes to the implementation of the network. These changes include an increase in activities in

workforce development and outreach to small manufacturers, and the development of network-wide performance metrics.

Legislative History

On March 26, 2019, the Honorable Haley Stevens presiding, the Research and Technology Subcommittee and the Energy Subcommittee of the Committee on Science, Space, and Technology held a joint hearing to review the successes and further opportunities for the Manufacturing USA Institutes to achieve the goal of improving the competitiveness of U.S. manufacturing. On April 30, 2019, Representative Stevens introduced H.R. 2397, *the American Manufacturing and Leadership Act*, to reauthorize the Manufacturing USA program and make changes to the implementation of the program.

On Tuesday, May 1, 2019, the Committee on Science, Space, and Technology favorably reported the bill, H.R. 2397, as amended, to the House with the recommendation that the bill be approved. On July 23, 2019, H.R. 2397 was considered under suspension of the rules and was agreed to by voice vote.

On December 20, 2019, the National Defense Authorization Act, amended to include the language from H.R. 2397, was enacted after Presidential signature (P.L. 116–92).

2.24. H.R. 2405, National Sea Grant College Program Amendments Act of 2019

Purpose

The purpose of H.R. 2405 is to reauthorize and amend the National Sea Grant College Program Act.

Legislative History

Representative Jared Huffman, on April 30, 2019, introduced H.R. 2405. The bill was referred to the Committee on Natural Resources.

On May 8, 2019, the Committee on Natural Resources' Subcommittee on Water, Oceans, and Wildlife held a hearing on the bill.

On September 18, 2019, the Natural Resources Committee ordered the bill, as amended, favorably reported to the House of Representatives by a roll call vote of 23 yeas and 12 nays. the Natural Resources Committee Reported the bill on December 5, 2020 and on December 6, 2019 the Committee on Science, Space, and Technology exchanged jurisdictional correspondence on H.R. 2405.

On September 30, 2020 S. 910, the Senate companion of H.R. 2405 passed the Senate with an amendment by voice vote. On November 16, 2020 S. 910 was considered in the House under suspension of the rules as amended and passed by voice vote. On December 2, 2020 the Senate agreed to the House amendment to the Bill by Voice Vote.

On December 18, 2020, S. 910 was signed by the President and became Public Law 116–221.

For further information regarding the legislative history of H.R. 2405, please refer to PL 116–221 in Chapter 1.

2.25. **H.R. 2528, STEM Opportunities Act of 2019**

Purpose

The purpose of the bill is to provide for research and evidence-based interventions to address the underrepresentation of women and racial and ethnic minority groups in STEM studies and research careers at institutions of higher education and at federal laboratories.

Legislative History

On May 7, 2019 Chairwoman Eddie Bernice Johnson and Ranking Member Frank Lucas introduced H.R. 2528, the *STEM Opportunities Act of 2019*. The bill was referred to the Committee on Science, Space, and Technology.

On June 20, 2019, the Committee on Science, Space, and Technology favorably reported H.R. 2528, as amended, to the House with the recommendation that the bill be approved. On September 26, 2019, H.R. 2528 was considered under suspension of the rules and was agreed to by voice vote.

2.26. H.R. 2722, SAFE Act

Purpose

H.R. 2722, the "Securing America's Federal Elections Act" or the "SAFE Act," aims to improve the resilience of election infrastructure used in federal elections through providing resources to states and localities to bolster election infrastructure, and implement additional cybersecurity protocols.

Legislative History

Representative Zoe Lofgren introduced the "SAFE Act" on June 14, 2019. It was referred to the Committee on House Administration, and, in addition, the Committee on Science, Space, and Technology.

On June 21, 2019, the Committee on House Administration favorably reported H.R. 2722 by record vote of 6–3. On June 26, 2019, the Committee of Science, Space, and Technology was discharged of consideration of H.R. 2722.

Under the provisions of rule H. Res. 460, on June 27, 2019 H.R. 2722 passed the House by a record vote of 220–184.

2.27. **H.R. 2986, BEST Act**

Purpose

The purpose of the Better Energy Storage Technology Act (BEST Act), H.R. 2986, is to amend the United States Energy Storage Competitiveness Act to authorize a cross-cutting, research, development, and demonstration program to further the development of a variety of energy storage technologies.

Legislative History

Representative Bill Foster introduced H.R. 2986 on May 23, 2019. The bill was referred solely to the Science Committee.

On July 17, 2019 the Honorable Conor Lamb presiding, the Energy Subcommittee of the Committee on Science, Space, and Tech-

nology held a hearing to examine research needs to modernize and secure our nation's electricity grid, including energy storage.

On December 19, 2019 the Energy Subcommittee of the Committee on Science, Space, and Technology favorably reported H.R. 2986, as amended, to the full Committee with the recommendation that the bill be approved. On February 12, 2020, the full committee favorably reported, H.R. 2986, as amended, to the House of Representatives with the recommendation that the bill be approved.

The text of H.R. 2986 was incorporated into the text of H.R. 4447, the Clean Economy Jobs and Innovation Act, which was considered under the provisions of rule H. Res. 1129 and passed the House by a record vote of 220–185 on September 24, 2020.

For further information regarding the legislative history of H.R. 2986, please refer to entry 1.13 in Chapter 1.

2.28. **H.R. 3038, SASTA**

Purpose

The purpose of H.R. 3038 is to establish an interagency working group to coordinate activities and develop policy guidance to protect federally funded research and development from foreign interference.

Legislative History

On May 30, 2019, Representative Mikie Sherrill introduced H.R. 3038, the Securing American Science and Technology Act of 2019 ("SASTA"). The bill was referred to the Committee on Science, Space, and Technology, and in addition to the Committee on Armed Services.

On December 20, 2019, the National Defense Authorization Act, amended to include H.R. 3038, was enacted after Presidential signature (P.L. 116–92).

2.29. **H.R. 3196, Vera C. Rubin Observatory Designation Act***

Purpose

The purpose of the bill is to designate the Large Synoptic Survey Telescope (LSST) in Chile as the "Vera Rubin Survey Telescope."

Legislative History

On June 11, 2019, Representative Eddie Bernice Johnson, for herself and Representative Jenniffer González-Colón of Puerto Rico introduced H.R. 3196, the *Vera Rubin Survey Telescope Designation Act*, to designate the Large Synoptic Survey Telescope as the "Vera Rubin Survey Telescope".

On Thursday, June 20, 2019, the Committee favorably reported H.R. 3196, to the House with the recommendation that the bill be approved. The Senate passed H.R. 3196, by unanimous consent on December 18, 2019 and the bill was enacted after Presidential signature on December 20, 2019 (P.L. 116–97).

2.30. **H.R. 3597, Solar Energy Research and Development Act of 2019**

Purpose

The purpose of H.R. 3597, the *Solar Energy Research and Development Act of 2019* is to provide the Department of Energy (DOE) with effective guidance to carry out a solar energy research, development, and demonstration (RD&D) program that will improve solar energy systems' efficiency, manufacturing, reliability, integration, and affordability, amongst other qualities.

Legislative History

The Subcommittee on Energy held a legislative hearing on May 15, 2019 to examine the RD&D needs for solar energy in support of a draft of H.R. 3597.

On July 10, 2019, the Energy Subcommittee forwarded H.R. 3597, as amended, to the full Committee by record vote of 7–5. On July 24, 2019, the Committee favorably reported H.R. 3597, as amended, to the House by record vote of 21–13.

The text of H.R. 3597 was incorporated into the text of H.R. 4447, the Clean Economy Jobs and Innovation Act, which was considered under the provisions of rule H. Res. 1129 and passed the House by a record vote of 220–185, on September 24, 2020.

For further information regarding the legislative history of H.R. 3597, please refer to entry 1.13 in Chapter 1.

2.31. **H.R. 3607, Fossil Energy Research and Development Act of 2019**

Purpose

The purpose of H.R. 3607, the *Fossil Energy Research and Development Act of 2019,* is to direct federal research in fossil energy and to promote the development and demonstration of environmentally responsible coal and natural gas technologies.

Legislative History

The Energy Subcommittee held a hearing on June 19, 2019 to examine research and development needs to mitigate the environmental impacts of the extraction and use of fossil fuels in support of a draft of H.R. 3607. On July 2, 2019, Representative Veasey introduced H.R. 3607 and the bill was referred solely to the Committee on Science, Space, and Technology.

On July 10, 2019, the Energy Subcommittee forwarded H.R. 3607, as amended, to the full Committee by record vote of 7–5. On July 24, 2019, was by the Committee forwarded H.R. 3607, as amended, to the House by record vote of 22–13.

The text of H.R. 3607 was incorporated into the text of H.R. 4447, the Clean Economy Jobs and Innovation Act, which was considered under the provisions of rule H. Res. 1129 and passed the House on September 24, 2020 by a record vote of 220–185.

For further information regarding the legislative history of H.R. 3607, please refer to entry 1.13 in Chapter 1.

2.32. **H.R. 3609 Wind Energy Research and Development Act of 2019**

Purpose

The purpose of H.R. 3609, the *Wind Energy Research and Development Act of 2019* is to authorize the Department of Energy (DOE) to carry out research, development, and demonstration (RD&D) of wind energy technologies that improve systems' efficiency, manufacturing, reliability, integration, and affordability, amongst other qualities.

Legislative History

The Subcommittee on Energy held a legislative hearing on May 15, 2019 to examine the research, development, and demonstration needs for wind energy in support of a draft of H.R. 3609.

On July 10, 2019, H.R. 3609, as amended, was forwarded by the Energy Subcommittee to the full Committee by record vote of 7–5. On July 24, 2019, H.R. 3609 was forwarded by the full Committee to the House, as amended, by record vote of 21–13.

The text of H.R. 3609 was incorporated into the text of H.R. 4447, the Clean Economy Jobs and Innovation Act, which was considered under the provisions of rule H. Res. 1129 and passed the House by a record vote of 220–185, on September 24, 2020.

For further information regarding the legislative history of H.R. 2986, please refer to entry 1.13 in Chapter 1.

2.33. **H.R. 4230, CIT Act of 2019**

Purpose

The purpose of the bill is to amend the Energy Independence and Security Act of 2007 to establish a research, development, demonstration, and commercial application program for technologies that would reduce emissions from the industrial sector; to establish a federal advisory committee to guide the focus areas of the program and develop roadmaps to achieve emissions reductions in the industrial sector; and to provide technical assistance to promote the commercial application of relevant industrial emissions reduction technologies.

Legislative History

On March 26, 2019, the Honorable Haley Stevens presiding, the Research and Technology Subcommittee and the Energy Subcommittee of the Committee on Science, Space, and Technology held a joint hearing to examine ways to enable decarbonization of the manufacturing sector in an effort to transition to a carbon-free future, and the role of the Manufacturing USA Institutes in achieving this goal.

On June 19, 2019, the Honorable Conor Lamb presiding, the Energy Subcommittee of the Committee on Science, Space, and Technology held a hearing to examine research and development needs to mitigate the environmental impacts of the extraction and use of fossil fuels. This hearing included discussion of the Department of Energy's current work on developing technologies to help decarbonize industrial processes, especially related to carbon capture.

On September 11, 2019, the Energy Subcommittee favorably report the bill, H.R. 4230, as amended, to the Full Committee with the recommendation that the bill be approved. On February 12, 2020, the Committee favorably report the bill, H.R. 4230, as amended, to the House of Representatives with the recommendation that the bill be approved.

The text of H.R. 4230 was incorporated into the text of H.R. 4447, the Clean Economy Jobs and Innovation Act, which was considered under the provisions of rule H. Res. 1129 and passed the House by a record vote of 220–185, on September 24, 2020.

For further information regarding the legislative history of H.R. 4230, please refer to entry 1.13 in Chapter 1.

2.34. **H.R. 4091, ARPA–E Reauthorization Act of 2019**

Purpose

The purpose of H.R. 4091, the *ARPA–E Reauthorization Act of 2019* is to provide the Department of Energy (DOE) with effective guidance, capabilities, and resources to support and expand the mission of the Advanced Research Program Agency—Energy (ARPA–E), which is to overcome long-term and high-risk technology barriers in the development of energy and energy-relevant technologies

Legislative History

The Subcommittee on Energy held a legislative hearing on February 26, 2019 to assess the role that ARPA–E plays in accelerating the development of innovative energy technologies, and to examine ways that Congress and the Administration may be able to improve ARPA–E's capabilities to spur transformational technological advances in pursuit of the agency's energy and environmental missions. Chairwoman Eddie Bernice Johnson introduced H.R. 4091 on July 30, 2019 and the bill was solely referred to the Committee on Science, Space, and Technology.

On September 11, 2019, the Energy Subcommittee favorably reported H.R. 4091 to the full Committee with the recommendation that the bill be approved. On October 17, 2019, the Committee favorably reported H.R. 4091, as amended, to the House of Representatives with the recommendation that the bill be approved.

The text of H.R. 4091 was incorporated into the text of H.R. 4447, the Clean Economy Jobs and Innovation Act, which was considered under the provisions of rule H. Res. 1129 and passed the House by a record vote of 220–185, on September 24, 2020.

For further information regarding the legislative history of H.R. 4091, please refer to entry 1.13 in Chapter 1.

2.35. **H.R. 4355, IOGAN Act**

Purpose

The purpose of the bill is to provide for research on manipulated or synthesized content and information authenticity, including output of generative adversarial networks, otherwise known as deepfakes and to encourage public-private partnerships to develop standards for detecting and identifying such content.

Legislative History

On September 17, 2019, Representative Anthony Gonzalez introduced H.R. 4355, Identifying Outputs of Generative Adversarial Networks Act ("IOGAN Act"). The bill was referred solely to the Committee on Science, Space, and Technology.

On September 25, 2019, the Committee favorably reported the bill, H.R. 4355, as amended, to the House with the recommendation that the bill be approved. On December 9, 2019, H.R. 4355 was considered under suspension of the rules and was agreed to by voice vote.

For further information regarding the legislative history of H.R. 4355, please refer to entry 1.11 in Chapter 1.

2.36. H.R. 4372, MSI STEM Achievement Act

Purpose

The purpose of the bill is 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 Historically Black Colleges and Universities, Tribal Colleges and Universities, and other minority serving institutions.

Legislative History

On September 18, 2019, Chairwoman Eddie Bernice Johnson and Representative Michael Waltz introduced H.R. 4372, the *MSI STEM Achievement Act*. The bill was referred to the House Committee on Science, Space, and Technology.

On September 25, 2019, the Committee favorably reported H.R. 4372, as amended, to the House with the recommendation that the bill be approved. On December 9, 2019, H.R. 4372 was considered under suspension of the rules and the bill was passed by voice vote.

2.37. **H.R. 4373, Engineering Biology Research and Development Act of 2019**

Purpose

The purpose of the bill is to provide for a coordinated federal research initiative to ensure continued United States leadership in engineering biology.

Legislative History

On March 12, 2019, the Subcommittee on Research and Technology of the Committee on Science, Space, and Technology held a hearing to receive testimony on the *Engineering Biology Research and Development Act*.

On September 18, 2019, Chairwoman Eddie Bernice Johnson introduced H.R. 4373, the *Engineering Biology Research and Development Act of 2019*. The bill was referred to the House Committee on Science, Space, and Technology. On September 25, 2019, the Committee favorably reported H.R. 4373, as amended, to the House with the recommendation that the bill be approved.

On December 9, 2019, H.R. 4373 was considered under suspension of the rules and the bill was passed by voice vote.

2.38. **H.R. 4447, Clean Economy Jobs and Innovation Act**

Purpose

The purpose of H.R. 4447

Legislative History

Representative Tom O'Halloran introduced H.R. 4447 on September 20, 2019. The bill, originally titled the Expanding Access to Sustainable Energy Act of 2019, was referred to the Committee on Energy and Commerce and the Committee on Science, Space, and Technology.

The Committee on Energy and Commerce, on September 9, 2020, favorably reported H.R. 4447, as amended, to the House with the recommendation that the bill be approved.

The Committee of Science, Space, and Technology was discharged of consideration on September 15, 2020.

Under the provisions of H. Res. 1129, H.R. 4447 was considered on the House floor September 23–24, 2020. H.R. 4447 was amended to include previously considered Science Committee bills: H.R. 34, H.R. 1709, H.R. 2986, H.R. 3597, H.R. 3607, H.R. 3609, H.R. 4091, H.R. 4230, H.R. 4481, H.R. 4656, H.R. 4733, H.R. 4924, H.R. 5374, H.R. 5428, H.R. 5760, H.R. 6084, H.R. 6097, and H.R. 8273.

On September 24, 2020, under the provisions of rule H. Res. 1129, the Clean Economy Jobs and Innovation Act passed the House by a record vote of 220–185.

For further information regarding the legislative history of H.R. 4447, please refer to entry 1.13 in Chapter 1.

2.39. **H.R. 4481, Securing Energy Critical Elements and American Jobs Act of 2019**

Purpose

The purpose of H.R. 4481 is to authorize a critical materials research, development, demonstration, and commercial application (RDD&CA) program at the Department of Energy (DOE), and amend the National Materials and Minerals Policy, Research and Development Act of 1980, to advance the secure, sustainable supply of critical materials needed for energy and related technologies.

Legislative History

H.R. 4481 was introduced on September 24, 2019 by Rep. Eric Swalwell. The bill was referred solely to the Science Committee. The Subcommittee on Energy held a legislative hearing on December 10, 2019 to examine H.R. 4481.

On March 12, 2020, the Energy Subcommittee favorably reported H.R. 4481 to the full Committee with the recommendation that the bill be approved.

The text of H.R. 4481 was incorporated into H.R. 4447, the Clean Economy Jobs and Innovation Act, which was considered under the provisions of rule H. Res. 1129 and passed the House by a record vote of 220–185, on September 24, 2020.

2.40. **H.R. 4656, Background Ozone Research Act**

Purpose

The Background Ozone Research Act directs the Environmental Protection Agency to work with the National Academies of Sciences, Engineering, and Medicine to conduct a study that will examine the current and future research needs regarding background ozone

Legislative History

The Committee held a hearing on September 19, 2019 with the Environmental Protection Agency Administrator that included the topic of background ozone and the need for further study. H.R. 4656 was introduced on October 11, 2019 by Rep. Ben McAdams. The bill was referred solely to the Science Committee.

On March 4, 2020, the Environment Subcommittee favorably reported H.R. 4656, as amended, to the full Committee with the recommendation that the bill be approved. The text of H.R. 4656 was incorporated into the text of H.R. 4447, The Clean Economy Jobs and Innovation Act.

On September 23, 2020, H.R. 4447 was considered under the provisions of rule H. Res. 1129 and on September 24, 2020 the bill passed the House by a record vote of 220–185.

2.41. **H.R 4733, Low-Dose Radiation Research Act of 2019**

Purpose

The purpose of H.R. 4733 is to authorize the Secretary of Energy to carry out a research program to improve scientific understanding of the effects of exposure to low-dose radiation. It requires the Secretary to identify barriers to understanding these effects and develop a strategic research agenda to address these challenges.

Legislative History

On October 18, 2019, Representative Posey introduced H.R. 4733. The bill was referred solely to the Committee on Science, Space, and Technology.

On March 12, 2020, the Energy Subcommittee favorably reported H.R. 4733 to the full Committee with the recommendation that the bill be approved.

The text of H.R. 4733 was incorporated into the text of H.R. 4447, the Clean Economy Jobs and Innovation Act, which was considered under the provisions of rule H. Res. 1129 and passed the House by a record vote of 220 185, on September 24, 2020.

For further information regarding the legislative history of H.R. 4733, please refer to entry 1.13 in Chapter 1.

2.42. H.R. 4737, Department of Homeland Security Climate Change Research Act

Purpose

H.R. 4737, the "Department of Homeland Security Climate Change Research Act," would direct the Department of Homeland Security's Science and Technology Directorate to assess current

federal research regarding the connection between climate change and homeland security to identify research gaps and, to the extent practical, conduct additional research to fill identified gaps.

Legislative History

On April 9, 2019, the Committee on Homeland Security held a hearing entitled "Assessing the Homeland Security Impacts of Changing Climate." This hearing was used to develop H.R. 4737.

On October 18, 2019, Representative Yvette Clarke introduced H.R. 4737. The bill was referred to the Committee on Homeland Security. On October 23, 2019, the Committee on Homeland Security ordered H.R. 4737 be reported to the House with a favorable recommendation, with an amendment, by unanimous consent.

On February 10, 2020, H.R. 4737 was considered under suspension of the rules and the bill was passed by voice vote.

2.43. H.R. 4924, Smoke Planning and Research Act of 2019

Purpose

The purpose of H.R. 4924 is to authorize the Administrator of the Environmental Protection Agency to conduct research on wildfire smoke, and for other purposes.

Legislative History

H.R. 4924 was introduced by Representative Anna Eshoo on October 30, 2019. The bill was referred to the Committee on Energy and Commerce and then to the Committee on Science, Space, and Technology. The text of H.R. 4924 was incorporated into the text of H.R. 4447, The Clean Economy Jobs and Innovation Act.

On September 23, 2020, H.R. 4447 was considered under the provisions of rule H. Res. 1129 and on September 24, 2020 the bill passed the House by a record vote of 220–185.

2.44. **H.R. 4979, Rural STEM Education Act**

Purpose

The purpose of H.R. 4979 is to direct the Director of the National Science Foundation to support STEM education and workforce development research focused on rural areas, and for other purposes.

Legislative History

The Subcommittee on Research and Technology held a hearing on May 8, 2019 to review the National Science Foundation's FY2020 Budget Request. On May 9, 2019 the full committee held a hearing entitled, "Achieving the Promise of a Diverse STEM Workforce." H.R. 4979 was introduced by Ranking Member Frank Lucas on November 5, 2019, and the bill was referred solely to the Committee on Science, Space, and Technology. On November 14, 2019, the Full Committee met to consider H.R. 4979. The bill was ordered favorably reported by voice vote. The bill was reported to the House on February 13, 2020.

On September 16, 2020, H.R. 4979 was considered under suspension of the rules, and the bill was passed by voice vote.

2.45. **H.R 4990, Election Technology Research Act of 2020**

Purpose

The purpose of H.R. 4990 is to direct the National Institute of Standards and Technology and the National Science Foundation to carry out research and other activities to promote the security and modernization of voting systems.

Legislative History

The Subcommittees on Research and Technology and the Investigations and Oversight held a joint hearing on June 15, 2018 on election security and voting technology vulnerabilities. H.R. 4990 was introduced on November 8, 2019 by Representative Mikie Sherrill and the bill was referred to the Committee on Science, Space, and Technology and the Committee on House Administration. On November 14, 2019, the Full Committee met to consider H.R. 4990, and the bill was ordered favorably reported by voice vote. The bill was reported to the House on February 13, 2020.

On February 10, 2020, the Committee on House Administration was discharged of consideration of the bill.

On September 16, 2020, H.R. 4990 was considered under suspension of the rules, and the bill was passed by voice vote.

2.46. **H.R. 5213, NASA Enhanced Use Leasing Extension Act of 2019**

Purpose

The purpose of H.R. 5213 is to extend the authority of the National Aeronautics and Space Administration to lease its non-excess real property and related personal property through 2021.

Legislative History

H.R. 5213 was introduced by Representative Kendra Horn on November 21, 2019 and sponsored by Representative Brian Babin, Chairwoman Eddie Bernice Johnson, Ranking Member Frank Lucas, and Representative Steven Palazzo. The text of H.R. 5213 was incorporated into the text of the 2020 Consolidated Appropriations, which was enacted in December 20, 2019 as P.L. 116–93.

2.47. **H.R. 5260, PROSWIFT Act***

Purpose

The purpose of H.R. 5260 is to improve understanding and forecasting of space weather events, and for other purpose.

Legislative History

On October 23, 2019, The Subcommittee on Environment and the Subcommittee on Space and Aeronautics held a joint hearing entitled, "Space Weather: Advancing Research, Monitoring, and Forecasting Capabilities." The purpose of this hearing was to discuss current federal efforts to monitor and predict space weather phenomena and focus on opportunities to improve space weather forecasting and prediction capabilities. H.R. 5260 was introduced on November 22, 2019 by Mr. Perlmutter. The bill was referred to the Committee on Science, Space, and Technology, then to the Com-

mittee on the Armed Services, and then the Committee on Natural Resources. On January 9th the Full committee met to consider the H.R. 5260, and the bill was ordered to be reported favorably by voice vote. A bill, identical in text to H.R. 5260, S. 881 passed the Senate on July 27, 2020. Mr. Perlmutter took up the Senate bill, and on September 16, 2020 the bill was considered under suspension of the rules and passed by voice vote.

For further information regarding the legislative history of H.R. 5260, please refer to PL 116–181 in Chapter 1.

2.48. **H.R. 5374, Advanced Geothermal Research and Development Act of 2019**

Purpose

The purpose H.R. 5374 is to amend the Energy Independence and Security Act of 2007 to establish and support advanced geothermal research, development, demonstration, and commercial application programs at the Department of Energy.

Legislative History

On November 14, 2019, the Energy Subcommittee held a hearing to examine research, development, demonstration, and commercial application needs in the geothermal energy and water power industries. Then on December 10, 2019, H.R. 5374 was introduced by Ranking Member Frank Lucas. The bill was referred to the Committee on Science, Space, and Technology and then to the Committee on Education and Labor. The Energy Subcommittee met to consider H.R. 5374 on December 19, 2019 and the Subcommittee agreed to forward the bill to the full committee by voice vote. The Full Committee met to consider H.R. 5374 on February 12, 2020 and they agreed favorably report the bill out of committee by a voice vote. The bill was reported to the House on September 11, 2020, and he Committee on Education and Labor was discharged of consideration of the bill.

The text of H.R. 5374 was incorporated into the text of H.R. 4447, The Clean Economy Jobs and Innovation Act. On September 23, 2020, H.R. 4447 was considered under the provisions of rule H. Res. 1129 and on September 24, 2020 the bill passed the House by a record vote of 220–185.

For further information regarding the legislative history of H.R. 5374, please refer to entry 1.13 in Chapter 1.

2.49. **H.R. 5428, Grid Modernization Research and Development Act of 2019**

Purpose

The purpose of the H.R. 5428 is to amend the Energy Independence and Security Act of 2007 and the Energy Policy Act of 2005 to direct federal research on grid modernization and resilience.

Legislative History

On July 17, 2019 the Energy Subcommittee held a hearing to examine research needs to modernize and secure our nation's electricity grid. Witnesses and Members discussed the extensive work done at the Department of Energy to develop technologies that im-

prove the flexibility, resilience, and security of the electric grid, including energy storage, and the need for continued and additional investments in grid operation technology to keep up with a rapidly evolving grid system. On December 13, 2019 Representative Conor Lamb introduced H.R. 5428 and the bill was referred solely to the Committee on Science, Space, and Technology. The Energy Subcommittee met to consider H.R. 5428 on December 19, 2019 and the Subcommittee agreed to forward the bill to the full committee by voice vote. The Full Committee met to consider H.R. 5428 on February 12, 2020 and they agreed to favorably report the bill out of committee by a voice vote. The bill was reported to the House on August 11, 2020.

The text of H.R. 5428 was incorporated into the text of H.R. 4447, the Clean Economy Jobs and Innovation Act. On September 23, 2020, H.R. 4447 was considered under the provisions of rule H. Res. 1129 and on September 24, 2020 the bill passed the House by a record vote of 220–185.

For further information regarding the legislative history of H.R. 5428, please refer to entry 1.13 in Chapter 1.

2.50. **H.R. 5519, Atmospheric Climate Intervention Research Act**

Purpose

The purpose of H.R. 5519 is to amend the America COMPETES Act to improve measurement and assessment capabilities for understanding proposed atmospheric interventions in Earth's climate, including, as a priority, the effects of proposed interventions in the stratosphere and in cloud-aerosol processes.

Legislative History

H.R. 5519 was introduced in the House on December 19th, 2019 by Representative Jerry McNerney, and the bill was referred solely to the Committee on Science, Space, and Technology. On January 15, 2020, the Full committee held a hearing titled "An Update on the Climate Crisis: From Science to Solutions." The purpose of this hearing was to provide an update on the state of climate science and receive testimony on the climate reports published in 2019. On February 4, 2020 the Subcommittee on Environment met to consider H.R. 5519 and agreed to forward the bill to the full committee by voice vote.

2.51. **H.R. 5666, NASA Authorization Act of 2020**

Purpose

The purpose of H.R. 5666 is to authorize the programs of the National Aeronautics and Space Administration, and for other purposes.

Legislative History

H.R. 5666 was introduced in the House on the January 24, 2020 by Representative Kendra Horn and the bill was referred solely to the Committee on Science, Space, and Technology On January 29, 2020 the Subcommittee on Space and Aeronautics met to consider

H.R. 5666 and agreed to forward the bill favorably to the Full committee by voice vote.

2.52. **H.R. 5760, Grid Security Research and Development Act**

Purpose

The purpose of H.R. 5760 is to authorize a comprehensive interdisciplinary research, development, and demonstration initiative to strengthen the capacity of the energy sector to prepare for and withstand cyber and physical attacks and improve the security of the energy sector.

Legislative History

On July 17, 2019 the Subcommittee on Energy held a hearing to examine research needs to modernize and secure our nation's electricity grid. The hearing was entitled "The Future of Electricity Delivery: Modernizing and Securing our Nation's Electricity Grid." Witnesses and Members discussed the extensive work done at DOE to develop technologies that improve the flexibility, resilience, and security of the electric grid and the need for continued and additional investments in our nation's cybersecurity and emergency response workforce. On February 5, 2020 Representative Ami Bera introduced H.R. 5760 H.R. 5760 was referred to the Committee on Science, Space, and Technology and then to the Committee on Homeland Security. The Full committee met to consider H.R. 5760 on February 12, 2020 and they agreed to favorably report the bill out of committee by a voice vote.

On September 2, 2020 the Committee on Homeland Security was discharged of consideration of H.R. 5760. The text of the bill was incorporated into the text of H.R. 4447, the Clean Economy Jobs and Innovation Act. On September 23, 2020, H.R. 4447 was considered under the provisions of rule H. Res. 1129 and on September 24, 2020 the bill passed the House by a record vote of 220–185. On September 29, 2020, H.R. 5760 was considered as a standalone bill under suspension of the rules, and the bill was passed by voice vote.

2.53. **H.R. 6084, Water Power Research and Development Act**

Purpose

The purpose of H.R. 6084 is to provide for a program of hydropower, pumped storage, and marine energy research, development, demonstration, and commercial application, and for other purposes.

Legislative History

On November 14, 2019 the Subcommittee on Energy held a hearing entitled, "Water and Geothermal Power: Unearthing the Next Wave of Energy Innovation," the purpose of which was to examine research and development needs in the geothermal energy and water power industries and focused on the draft Water Power Research and Development Act of 2019. Representative Suzanne Bonamici introduced H.R. 6084 on March 4 and the bill was referred solely to the Committee on Science, Space, and Technology. On March 12, 2020 the Subcommittee on Energy met to consider

H.R. 6084 and agreed to forward the bill to the Full committee by voice vote.

The text of H.R. 6084 was incorporated into the text of H.R. 4447, the Clean Economy Jobs and Innovation Act. On September 23, 2020, H.R. 4447 was considered under the provisions of rule H. Res. 1129 and on September 24, 2020 the bill passed the House by a record vote of 220–185.

For further information regarding the legislative history of H.R. 6084, please refer to entry 1.13 in Chapter 1.

2.54. **H.R. 6097, Nuclear Energy Research and Development Act**

Purpose

The purpose of H.R. 6097 is to provide for a program of nuclear energy research, development, demonstration, and commercialization, and for other purposes.

Legislative History

On May 3, 2019 the Subcommittee on Energy held a Field Hearing, entitled "How the Domestic Nuclear Industry Boosts Local Economies, Curbs Emissions, and Strengthens National Security" at the Shippingport Community Building, 163 State Route 3016, Shippingport, PA 15077. The purpose of this hearing was to examine nuclear energy broadly, including its role as an emissions-free energy source and as a national security asset, as well as examining the impact that nuclear plants have on local economies. Representative Conor Lamb introduced H.R. 6097 on March 5, 2020 and the bill was referred solely to the Committee on Science, Space, and Technology. On March 12, 2020 the Subcommittee on Energy met to consider H.R. 6097 and agreed to forward the bill to the Full committee by voice vote.

The text of H.R. 6097 was incorporated into the text of H.R. 4447, the Clean Economy Jobs and Innovation Act. On September 23, 2020, H.R. 4447 was considered under the provisions of rule H. Res. 1129 and on September 24, 2020 the bill passed the House by a record vote of 220–185.

For further information regarding the legislative history of H.R. 6097, please refer to entry 1.13 in Chapter 1.

2.55. **H.R. 6208, Protecting American Space Assets Act**

Purpose

The purpose of H.R. 6208 is to direct the President to develop a strategy to protect the space assets of the United State, and for other purposes.

Legislative History

On March 11, 2020 Representative Adam Kinzinger introduced H.R. 6208 and the bill was referred to the Committees on Science, Space, and Technology, then on to Armed Services and then Foreign Affairs. The text of H.R. 6208 was incorporated in part into H.R. 6395, the National Defense Authorization Act for Fiscal Year 2021 as Section 1754. On July 20, 2020, H.R. 6395 was considered under the provisions of the rule H. Res. 1053 and on July 21, 2020

the bill passed the House by a record vote of 295–125. On November 18, 2020 the Speaker appointed conferees from the Committee on Science, Space, and Technology but Committee Members were not included for consideration of section 1754 containing the text from H.R. 6208 (Section 1613 in entry 1.14 from Chapter 1).

2.56. **H.R. 6216, National Artificial Intelligence Initiative Act of 2020**

Purpose

The purpose of H.R. 6216 is to establish the National Artificial Intelligence Initiative.

Legislative History

On June 26, 2019 the Full committee held a hearing entitled, "Artificial Intelligence: Societal and Ethical Implications," the purpose of which was to discuss the impact of artificial intelligence (AI) on society and the ethical implications in the design and use of this technology. Then on September 24, 2019 the Research and Technology Subcommittee held a hearing entitled, "Artificial Intelligence and the Future of Work," the purpose of which was to examine the impact of machine learning and artificial intelligence on the workforce, including issues related to worker displacement, retraining of the current workforce, and developing a skilled technical workforce of the future that can thrive in an economy in which artificial intelligence increasingly plays a role. Chairwoman Eddie Bernice Johnson introduced H.R. 6216 on March 12, 2020 and the bill was referred solely to the Committee on Science, Space, and Technology.

The text of H.R. 6216 was incorporated into H.R. 6395, the National Defense Authorization Act for Fiscal Year 2021 as Division E. On July 20, 2020, H.R. 6395 was considered under the provisions of the rule H. Res. 1053 and on July 21, 2020 the bill passed the House by a record vote of 295–125. On November 18, 2020 the Speaker appointed conferees from the Committee on Science, Space, and Technology and included Committee members for consideration of Division E (Sections 5001–5501 in the Public Law).

For further information regarding the legislative history of H.R. 6216, please refer to entry 1.14 in Chapter 1.

2.57. **H.R. 6388, Space Technology Advancement Report Act of 2020**

Purpose

The purpose of H.R. 6388 is to require the National Space Council to submit annual reports to Congress on the ability of the United States to effectively compete with foreign space programs and in the emerging commercial space economy. Furthermore, the President would develop and submit to Congress a strategy to ensure that the United States can effectively compete with other national space programs, maintain dominance in the emerging commercial space economy, and has market, regulatory, and other means available to address unfair competition from China based on the findings in the report.

Legislative History

On March 25, 2020 Representative Chrissy Houlahan introduced H.R. 6388 and the bill was referred solely to the Committee on Science, Space, and Technology. The text of H.R. 6388 was incorporated in part into H.R. 6395, the National Defense Authorization Act for Fiscal Year 2021 as Sections 1721–1723. On July 20, 2020, H.R. 6395 was considered under the provisions of the rule H. Res. 1053 and on July 21, 2020 the bill passed the House by a record vote of 295–125. On November 18, 2020 the Speaker appointed conferees from the Committee on Science, Space, and Technology but Committee Members were not included for consideration of sections 1721–1723 containing the text from H.R. 6388. This language was taken out of the conference report.

2.58. **H.R. 7139, Ensuring American Leadership over International Standards Act of 2019**

Purpose

The purpose of H.R. 7139 is to direct the National Institute of Standards and Technology to enter into an agreement with the National Academies of Sciences, Engineering, and Medicine to conduct a study on the impact of Chinese government policies and standards development on international bodies engaged in developing and setting international standards for emerging technologies.

Legislative History

On March 11, 2020 the Subcommittee on Research and Technology held a hearing entitled, "Reauthorization of the National Institute of Standards and Technology," in that hearing the Subcommittee explored the major areas of research under the National Institute of Standards and Technology (NIST) laboratory programs, the agency's role in working with industry to advance U.S. competitiveness, and key facilities construction and maintenance issues on the NIST campuses in Maryland and Colorado. On July 8, 2020 Representative David Schweikert introduced H.R. 7139 and the bill was referred solely to the Committee on Science, Space, and Technology. The text of H.R. 7139 was incorporated in part into H.R. 6395, the National Defense Authorization Act for Fiscal Year 2021 as Section 1705.

On July 20, 2020, H.R. 6395 was considered under the provisions of the rule H. Res. 1053 and on July 21, 2020 the bill passed the House by a record vote of 295–125.

On November 18, 2020 the Speaker appointed conferees from the Committee on Science, Space, and Technology but Committee Members were not included for consideration of section 1705 (Section 9414 in the Public Law).

For further information regarding the legislative history of H.R. 7139, please refer to entry 1.14 in Chapter 1.

2.59. **H.R. 7214, Surface Transportation Research and Development Act of 2020**

Purpose

The purpose of H.R. 7214 is to authorize appropriations to the Department of Transportation for surface transportation research, development, and deployment, and for other purposes.

Legislative History

On May 21, 2019 the Investigations and Oversight Subcommittee held a hearing entitled, "The Need for Resilience: Preparing America's Transportation Infrastructure for Climate Change" that examined the threat to transportation assets posed by climate change, assessed the current state of federal research on transportation infrastructure climate resilience, and explored strategies by which the federal research enterprise can complement state and local efforts on transportation climate resilience more effectively. Then on July 11, 2019, the Research and Technology Subcommittee held a hearing entitled, "Bumper to Bumper: The Need for a National Surface Transportation Research Agenda" that reviewed the Department of Transportation's surface transportation research, development, and demonstration and technology transfer activities. And lastly, on September 18, 2019 the Energy Subcommittee held a hearing entitled, "The Next Mile: Technology Pathways to Accelerate Sustainability within the Transportation Sector" which examined the range of research, development, and demonstration activities necessary to advance sustainable transportation. Chairwoman Eddie Bernice Johnson introduced H.R. 7214 on June 15, 2020 and the bill was referred to the Committee on Science, Space, and Technology, and in addition to the Committee on Transportation and Infrastructure.

The text of H.R. 7214 was incorporated in part into H.R. 2, the Moving Forward Act. On July 20, 2020, H.R. 2 was considered under the provisions of the rule H. Res. 1028 and the bill passed the House by a record vote of 233–188.

2.60. **H.R. 7560, Guaranteeing Equipment Safety for Firefighters Act of 2020**

Purpose

The purpose of H.R. 7560 is to require the Director of the National Institute of Standards and Technology to conduct a study of personal protective equipment worn by firefighters to determine the prevalence and concentration of per- and polyfluoroalkyl substances, and for other purposes.

Legislative History

Representative Ed Perlmutter introduced H.R. 7560 with Representative Bill Posey on July 9, 2020 and the bill was referred solely to the Committee on Science, Space, and Technology. The text of H.R. 7560 was incorporated in part into H.R. 6395, the National Defense Authorization Act for Fiscal Year 2021 as Section 341. On July 20, 2020, H.R. 6395 was considered under the provisions of the rule H. Res. 1053 and on July 21, 2020 the bill passed the House by a record vote of 295–125. On November 18, 2020 the

Speaker appointed conferees from the Committee on Science, Space, and Technology and included Committee members for consideration of Section 341 (Section 338 in the Public Law).

For further information regarding the legislative history of H.R. 7560, please refer to entry 1.14 in Chapter 1.

2.61. H.R. 7713, NOPP Revitalization Act

Purpose

The purpose of H.R. 7713 is to reauthorize the National Oceanographic Partnership Program, and for other purposes.

Legislative History

Representative Jimmy Panetta introduced H.R. 7713 on July 21, 2020. The bill was referred to the Committee on Natural Resources and then to the Committees on Armed Services and then Science, Space, and Technology. The text of H.R. 7713 was incorporated in part into H.R. 6395, the National Defense Authorization Act for Fiscal Year 2021 as Section 1744. On July 20, 2020, H.R. 6395 was considered under the provisions of the rule H. Res. 1053 and on July 21, 2020 the bill passed the House by a record vote of 295–125. On November 18, 2020 the Speaker appointed conferees from the Committee on Science, Space, and Technology and included Committee members for consideration of Section 1744 (Section 1055 in the Public Law).

For further information regarding the legislative history of H.R. 7713, please refer to entry 1.14 in Chapter 1.

2.62. **H.R. 7931, PIRCS Act**

Purpose

The purpose of H.R. 7931 is to direct the National Science and Technology Council to establish an interagency working group to coordinate federal activities to advance research and development needed to address perfluoroalkyl and polyfluoroalkyl substances, commonly referred to as PFAS.

Legislative History

Representative Chrissy Houlahan introduced H.R. 7931 on August 4, 2020 and the bill was referred solely to the Committee on Science, Space, and Technology. The text of H.R. 7931 was incorporated into H.R. 6395, the National Defense Authorization Act for Fiscal Year 2021 as Section 330. On July 20, 2020, H.R. 6395 was considered under the provisions of the rule H. Res. 1053 and on July 21, 2020 the bill passed the House by a record vote of 295–125. On November 18, 2020 the Speaker appointed conferees from the Committee on Science, Space, and Technology but Committee Members were not included for consideration of section 330 (Section 332 in the Public Law).

For further information regarding the legislative history of H.R. 7931, please refer to entry 1.14 in Chapter 1.

2.63. **H.R. 8132, American COMPETE Act**

Purpose

The purpose of H.R. 8132 is to require the Federal Trade Commission and the Secretary of Commerce to conduct studies and submit reports on the impact of artificial intelligence and other technologies on United States businesses conducting interstate commerce, and for other purposes.

Legislative History

Representative Cathy McMorris introduced H.R. 8132 on August 28, 2020. The bill was solely referred to the Committee on Energy and Commerce. On September 10, 2020 Chairwoman Eddie Bernice Johnson delivered a jurisdictional claim on the bill on behalf of the Committee on Science, Space, and Technology. After assurances were made to consult the Committee on the bill, on September 25, 2020 the claim for consideration of the bill was waived. On September 29, 2020, H.R. 8132 was considered under suspension of the rules, and the bill was passed by voice vote.

2.64. **H.R. 8273, Energizing Technology Transfer Act**

Purpose

The purpose of H.R. 8273 is to establish programs and authorities to facilitate the commercial application of clean energy and related technologies in the United States.

Legislative History

On July 17, 2020 the Energy Subcommittee held a hearing entitled, "From Lab to Market: Accelerating our Progress toward Economic Recovery and a Clean Energy Future." The hearing examined technology transfer activities at the Department of Energy (DOE) and their potential contributions to economic recovery from the current COVID–19 pandemic. Chairwoman Eddie Bernice Johnson introduced H.R. 8273 on September 16, 2020 and the bill was referred solely to the Committee on Science, Space, and Technology. The text of H.R. 8273 was incorporated into the text of H.R. 4447, the Clean Economy Jobs and Innovation Act. On September 23, 2020, H.R. 4447 was considered under the provisions of rule H. Res. 1129 and on September 24, 2020 the bill passed the House by a record vote of 220–185.

For further information regarding the legislative history of H.R. 8273, please refer to entry 1.13 in Chapter 1.

2.65. **H.R. 8395, COVID–19 Disinformation Research and Reporting Act of 2020**

Purpose

The purpose of H.R. 8395 is to direct the Director of the National Science Foundation to enter into an arrangement with the National Academies of Sciences, Engineering, and Medicine to conduct a study on the spread of COVID–19-related disinformation and misinformation on the internet and social media platforms.

Legislative History

On March 5, 2020 the Full committee met to hold a hearing entitled, "Coronaviruses: Understanding the Spread of Infectious Diseases and Mobilizing Innovative Solutions." In the hearing the Subcommittee discussed emerging infectious diseases in light of the recent coronavirus outbreak, and the modeling tools used to detect, predict and understand the spread of such diseases. The Committee discussed how some infectious agents spread from animals to humans, and how predictive modeling can help control and mitigate the effects of emerging diseases. Representative Jennifer Wexton introduced H.R. 8395 on September 24, 2020 and the bill was referred solely to the Committee on Science, Space, and Technology. The text of H.R. 8395 was incorporated into the text of H.R. 6800. On May 15, 2020, H.R. 6800 was considered under the provisions of rule H. Res. 967 and passed by a record vote of 208–199.

2.66. **H.R. 8634, HACKED Act**

Purpose

The purpose of H.R. 8634 is to improve United States cybersecurity through STEM scholarships, prize competitions, and other STEM activities, and for other purposes.

Legislative History

On February 11, 2020 the Research and Technology Subcommittee held a hearing entitled, "More Hires, Fewer Hacks: Developing the U.S. Cybersecurity Workforce." The purpose of this hearing was to explore the challenges faced by organizations in both the public and private sectors in recruiting and training skilled cybersecurity professionals and discuss strategies to expand and diversify the cybersecurity workforce pipeline to meet the demand. On September 20, 2020, Representative Kendra Horn introduced H.R. 8634, which was referred to the Committee on Science, Space, and Technology and then onto the Committee on Education and Labor.

The text of H.R. 8634 was incorporated in part into S. 4049, the National Defense Authorization Act for Fiscal Year 2021 as Sections 5231 through 5238. On July 23, 2020 the bill passed the Senate by a record vote of 86–14.

On November 18, 2020 the Speaker appointed conferees from the Committee on Science, Space, and Technology and included Committee members for consideration of Sections 5231 through 5238 (Section 9401–9407 in the Public Law).

For further information regarding the legislative history of H.R. 8634, please refer to entry 1.14 in Chapter 1.

2.67. H. Res. 246, Opposing efforts to delegitimize the State of Israel and the Global Boycott, Divestment, and Sanctions Movement targeting Israel

Purpose

The purpose of H. Res. 246 is to oppose the Global Boycott, Divestment, and Sanctions Movement and other efforts targeting Israel. The resolution urged both sides to return to direct negotiations and expresses support for a solution resulting in the state of

Israel existing alongside a democratic Palestinian state. It also affirmed the right of U.S. citizens to free speech, including the right to protest or criticize U.S. or foreign government policies.

Legislative History

Representative Bradley Schneider introduced H. Res. 246 on March 21, 2019. The resolution was referred to the Committee on Foreign Affairs, and in addition to the Committees on Financial Services, Science, Space, and Technology, and the Judiciary. On July 17, 2019 the bill was marked up and ordered to be reported by unanimous consent, the Committee on Science, Space, and Technology was discharged from further consideration. On July 23, 2020 H. Res. 246 was considered under suspension of the rules, and upon a demand of record vote was agreed to, 398–17, 5 present.

3.1. Hearings Before the Full Committee

3.1(a). HEARING VOLUME NO. 116–1

February 13, 2019

FULL COMMITTEE HEARING: THE STATE OF CLIMATE SCIENCE AND WHY IT MATTERS

The purpose of this hearing was to provide a big-picture assessment of the current state of climate science. The Committee received expert testimony on recently published significant climate reports and discussed report findings that include the physical mechanisms of climate change, risks to human society at different levels of warming, and the need for adaptation and mitigation.

Witnesses:

- Dr. Natalie M. Mahowald, Irving Porter Church Professor of Engineering, Faculty Director for the Environment, Atkinson Center for a Sustainable Future, Cornell University;
- Dr. Robert Kopp, Director, Rutgers Institute of Earth, Ocean, and Atmospheric Sciences, and Professor, Department of Earth and Planetary Sciences, Rutgers University;
- Dr. Jennifer Francis, Senior Scientist, Woods Hole Research Center;
- Dr. Joseph Majkut, Director of Climate Policy, Niskanen Center; and
- Dr. Kristie Ebi, Rohm & Haas Endowed Professor in Public Health Sciences, Director, Center for Health and the Global Environment (CHanGE), University of Washington.

3.1(b). HEARING VOLUME NO. 116–4

March 6, 2019

FULL COMMITTEE HEARING: MAINTAINING U.S. LEADERSHIP IN SCIENCE AND TECHNOLOGY

The purpose of this hearing was to assess the current state of U.S. science and technology (S&T) in the global context and what is needed to maintain U.S. leadership. The hearing examined the role of federal investments in S&T; partnerships between academia, the government and industry; the future of U.S. research

universities; STEM education and the U.S. STEM workforce; and increasing international competition in areas of emerging technology as well as opportunities for increased international collaboration on pressing global challenges.

Witnesses:

- Dr. Marcia McNutt, President of the National Academy of Sciences;
- Dr. Patrick Gallagher, Chancellor of the University of Pittsburgh; and
- Dr. Mehmood Khan, Vice Chairman and Chief Scientific Officer of PepsiCo, and Chair of the Council on Competitiveness.

3.1(c). HEARING VOLUME NO. 116–7

March 13, 2019

FULL COMMITTEE HEARING: AMERICA IN SPACE: FUTURE VISION, CURRENT ISSUES

The purpose of this hearing was to provide big-picture perspectives on the future of the nation's civil space activities, including the roles of government and commercial entities, and to identify the key issues for the near term.

Witnesses:

- Dr. Ellen Stofan, John and Adrienne Mars Director, Smithsonian National Air and Space Museum, Former NASA Chief Scientist;
- Dr. Peggy A. Whitson, Technical Consultant and Former Astronaut; and
- Mr. Frank A. Rose, Senior Fellow, Security and Strategy, The Brookings Institution, Former Assistant Secretary of State.

3.1(d). HEARING VOLUME NO. 116–10

April 2, 2019

FULL COMMITTEE HEARING: A REVIEW OF THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION (NASA) FY2020 BUDGET REQUEST

The purpose of this hearing was to review the Administration's fiscal year 2020 budget request for NASA.

Witness: The Honorable James F. Bridenstine, NASA Administrator.

3.1(e). HEARING VOLUME NO. 116–17

May 9, 2019

FULL COMMITTEE HEARING: ACHIEVING THE PROMISE OF A DIVERSE STEM WORKFORCE

The purpose of this hearing was to explore the need for a diverse STEM workforce and assess the lessons learned, model programs, enduring challenges, and future opportunities for expanding access to STEM studies and careers. An additional purpose of the hearing was to receive testimony on the *STEM Opportunities Act*.

Witnesses:

- Dr. Mae Jemison, Principal for 100 Year Starship;
- Dr. Shirley Malcom, Senior Advisor and Director of SEA Change at the American Association for the Advancement of Science;
- Dr. Lorelle Espinosa, Vice President for Research at the American Council on Education;
- Dr. James L. Moore III, Vice Provost for Diversity and Inclusion and Chief Diversity Officer at The Ohio State University; and
- Ms. Barbara Whye, Chief Diversity and Inclusion Officer and Vice President of Human Resources at Intel.

3.1(f). HEARING VOLUME NO. 116–19

May 16, 2019

FULL COMMITTEE HEARING: EVENT HORIZON TELESCOPE: THE BLACK HOLE SEEN ROUND THE WORLD

The purpose of this hearing was to review the scientific knowledge gained from the very first image of a black hole; how this new imaging capability may enable yet more scientific discovery; how the image was created, including the domestic and international partnerships that made this result possible; and future plans for the Event Horizon Telescope.

Witnesses:

- Dr. France Córdova, Director of the National Science Foundation;
- Dr. Sheperd Doeleman, Director of the Event Horizon Telescope, at the Harvard-Smithsonian Center for Astrophysics;
- Dr. Colin Lonsdale, Director of the MIT Haystack Observatory; and
- Dr. Katherine (Katie) Bouman, Postdoctoral Fellow, at the Harvard-Smithsonian Center for Astrophysics.

3.1(g). HEARING VOLUME NO. 116–21

May 17, 2019

MEMBER'S DAY HEARING: HOUSE COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY.

3.1(h). HEARING VOLUME NO. 116–24

July 4, 2019

FULL COMMITTEE HEARING: NATURE IN CRISIS: BIODIVERSITY LOSS AND ITS CAUSES

The purpose of this hearing was to discuss the major findings of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) summary for policymakers of their first Global Assessment Report, including the knowledge gaps and solutions for dealing with human-driven biodiversity loss.

Witnesses:

- Sir. Robert (Bob) Watson, Past Chair, Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES);

• Dr. Kate Brauman, Coordinating Lead Author, IPBES Global Assessment; Lead Scientist, Global Water Assessment, University of Minnesota, Institute of the Environment;
• Dr. Steven Monfort, Director of the Smithsonian National Zoo and Smithsonian Conservation Biology Institute;
• Mr. Jeff Goodwin, Conservation Stewardship Lead & Agricultural Consultant, Noble Research Institute; and
• Dr. James Porter, Josiah Meigs Distinguished Professor, Emeritus, University of Georgia; Scientific Advisor, Chasing Coral.

3.1(i). HEARING VOLUME NO. 116–28

June 12, 2019

FULL COMMITTEE HEARING: COMBATING SEXUAL HARASSMENT IN SCIENCE

The purpose of this hearing was to assess federal science agency policies and procedures for addressing sexual harassment involving federally-funded STEM researchers and their trainees. The hearing also explored lessons learned, enduring challenges, and future opportunities for preventing and mitigating the negative impact of sexual harassment in STEM studies and careers. An additional purpose of the hearing was to receive testimony on H.R. 36, the *Combating Sexual Harassment in Science Act*.

Witnesses:

• Mr. John Neumann, Managing Director of the Science, Technology Assessment, and Analytics team at the U.S. Government Accountability Office;
• Dr. Paula A. Johnson, President of Wellesley College;
• Dr. Jean Morrison, University Provost and Chief Academic Officer of Boston University; and
• Dr. Philip Kass, Vice Provost for Academic Affairs and Professor of Analytic Epidemiology at the University of California, Davis.

3.1(j). HEARING VOLUME NO. 116–30

June 25, 2019

FULL COMMITTEE HEARING: OVERSIGHT OF THE DEPARTMENT OF ENERGY'S RESEARCH AND DEVELOPMENT ENTERPRISE

The purpose of the hearing was to examine the Department of Energy's research, development, demonstration, and commercialization activities, including the impact of the President's fiscal year 2020 budget request.

Witness: The Honorable Rick Perry, Secretary of the Department of Energy.

3.1(k). HEARING VOLUME NO. 116–32

June 26, 2019

FULL COMMITTEE HEARING: ARTIFICIAL INTELLIGENCE: SOCIETAL AND ETHICAL IMPLICATIONS

The purpose of this hearing was to discuss the impact of artificial intelligence (AI) on society and the ethical implications in the design and use of this technology. The hearing also examined the extent to which AI is already being deployed across different sectors of our society and economy; how biases, vulnerabilities, and other unintended consequences may manifest in these AI systems; and how federal agencies, as part of their research programs, standards development efforts, and internal adoption of AI, can help ensure more ethical and responsible design and application of AI.

Witnesses:

- Ms. Meredith Whittaker, Co-Founder of the AI Now Institute at New York University;
- Mr. Jack Clark, Policy Director at OpenAI;
- Mx. Joy Buolamwini, Founder of the Algorithmic Justice League; and
- Dr. Georgia Tourassi, Director of the Oak Ridge National Lab Health Data Sciences Institute.

3.1(l). HEARING VOLUME NO. 116–35

July 11, 2019

FULL COMMITTEE HEARING: EARTH'S THERMOMETERS: GLACIAL AND ICE SHEET MELT IN A CHANGING CLIMATE

The purpose of this hearing was to discuss the science of the physical processes and projections of mass loss of ice sheets and glaciers. The Committee received expert testimony on current projections of glacier mass loss due to anthropogenic climate change, and in turn how that will affect sea level. Additionally, the panel discussed research gaps, risks to communities from local glacier melt, as well as global risks from ice sheet instability and sea level rise, and the need for adaptation and mitigation.

Witnesses:

- Dr. Richard B. Alley, Evan Pugh Professor of Geosciences and Associate of the Earth and Environmental Systems Institute, Pennsylvania State University;
- Dr. Robin E. Bell, Lamont Research Professor, Lamont-Doherty Earth Observatory, Columbia University;
- Dr. Twila A. Moon, Research Scientist, National Snow and Ice Data Center's (NSIDC) Cooperative Institute for Research in Environmental Sciences;
- Dr. Gabriel J. Wolkon, Research Scientist and Manager, Climate and Cryosphere Hazards Program, Division of Geological & Geophysical Surveys, Alaska Department of Natural Resources; and
- Dr. W. Tad Pfeffer, Fellow, Institute of Arctic and Alpine Research, University of Colorado Boulder.

3.1(m). HEARING VOLUME NO. 116–37

July 16, 2019

FULL COMMITTEE HEARING: THE LEGACY OF APOLLO

The purpose of this hearing was to commemorate the 50th anniversary of the Apollo 11 Moon landing.

Witnesses:

- Mr. Charles Fishman, author of One Giant Leap: The Impossible Mission That Flew Us to the Moon;
- Dr. David W. Miller, Vice President and Chief Technology Officer, The Aerospace Corporation; and
- Dr. Peter Jakab, Chief Curator, Smithsonian Air and Space Museum.

3.1(n). HEARING VOLUME NO. 116–43

September 10, 2019

FULL COMMITTEE HEARING: RAISING THE BAR: PROGRESS AND FUTURE NEEDS IN FORENSIC SCIENCE

The purpose of this hearing was to assess the progress in forensic science since the 2009 National Academy of Sciences report, *Strengthening Forensic Science in the United States: A Path Forward*, and to examine the role of the National Institute of Standards and Technology in the advancement of forensic science research and standards. An additional purpose of the hearing was to receive testimony on the Forensic Science and Standards Act, last introduced in the 114th Congress (H.R. 5795), including any recommendations for updates to the bill.

Witnesses:

- Ms. Susan Ballou, Program Manager in the Office of Special Programs at the National Institute of Standards and Technology;
- Ms. Lynn Garcia, General Counsel for the Texas Forensic Science Commission;
- Ms. Vicki Zemp Behenna, Executive Director of the Oklahoma Innocence Project;
- Dr. Karen Kafadar, Professor and Chair of the Department of Statistics at the University of Virginia; President of the American Statistical Association; and
- Mr. Matthew Gamette, Crime Lab Director for the Idaho State Police Forensic Services.

3.1(o). HEARING VOLUME NO. 116–46

September 19, 2019

FULL COMMITTEE HEARING: SCIENCE AND TECHNOLOGY AT THE ENVIRONMENTAL PROTECTION AGENCY

The purpose of this hearing was to review the science and technology activities at the Environmental Protection Agency (EPA) including: agency-wide policies and practices related to the development and use of science in regulatory and deregulatory decisions, the role of independent scientific advisory bodies such as the EPA Science Advisory Board and the EPA Clean Air Scientific Advisory

Committee, and the importance of transparency and integrity in the agency's science activities.

Witness: The Honorable Andrew Wheeler, Administrator, Environmental Protection Agency.

3.1(p). HEARING VOLUME NO. 116–49

September 26, 2019

FULL COMMITTEE HEARING: UNDERSTANDING, FORECASTING, AND COMMUNICATING EXTREME WEATHER IN A CHANGING CLIMATE

The purpose of this hearing was to understand the state of the science related to extreme weather events and examine the role of climate change and other factors in causing and exacerbating extreme weather events. The panel discussed economic and other societal impacts of extreme weather, explored the state of forecasting and prediction of extreme weather with a focus on how to communicate uncertainty, and identified gaps in the science.

Witnesses:

- Dr. J. Marshall Shepherd, Georgia Athletic Association Distinguished Professor of Atmospheric Sciences and Geography, Director, Atmospheric Sciences Program, Department of Geography, University of Georgia; 2013 President, American Meteorological Society;
- Dr. James Done, Project Scientist III and Willis Research Fellow, Capacity Center for Climate & Weather Extremes, Mesoscale & Microscale Meteorology Lab, National Center for Atmospheric Research;
- Dr. Adam Sobel, Professor, Lamont-Doherty Earth Observatory and School of Engineering and Applied Sciences, Columbia University; Director and Chief Scientist, Initiative on Extreme Weather and Climate, Columbia University;
- Dr. Berrien Moore, Director, National Weather Center, University of Oklahoma; and
- Dr. Ann Bostrom, Weyerhaeuser Endowed Professor in Environmental Policy, University of Washington.

3.1(q). HEARING VOLUME NO. 116–56

November 13, 2019

FULL COMMITTEE HEARING: STRENGTHENING TRANSPARENCY OR SILENCING SCIENCE? THE FUTURE OF SCIENCE IN EPA RULEMAKING

The purpose of this hearing was to assess the Environmental Protection Agency's (EPA) proposed rule entitled "Strengthening Transparency in Regulatory Science."

Witnesses:

Panel 1:

Witness: Dr. Jennifer Orme-Zavaleta, Principal Deputy Assistant Administrator for Science, Office of Research and Development, EPA; and Science Advisor, EPA.

Panel 2:

- Dr. Linda S. Birnbaum, Former Director, Scientist Emeritus, National Institute of Environmental Health Sciences, 2009 2019;

• Dr. Mary B. Rice, Assistant Professor, Medicine, Harvard Medical School; Pulmonary and Critical Care Physician, Beth Israel Deaconess Medical Center;
• Dr. David Allison, Dean, School of Public Health, Indiana University—Bloomington; Member, "Reproducibility and Replicability in Science" Committee, The National Academies of Sciences, Engineering and Medicine;
• Dr. Brian Nosek, Co-Founder and Executive Director, Center for Open Science; and
• Dr. Todd Sherer, CEO, The Michael J. Fox Foundation for Parkinson's Research.

3.1(r). HEARING VOLUME NO. 116–56.

November 20, 2019

FULL COMMITTEE HEARING: FIGHTING FLU, SAVING LIVES: VACCINE SCIENCE AND INNOVATION

The purpose of this hearing was to highlight the effectiveness and safety of vaccines; review the rationale for continuing to invest in vaccine science and innovation; use influenza as a case study to examine the science, innovation, and data challenges to developing an even more effective vaccine and eventually a universal flu vaccine; and consider the common technology and data platforms that could accelerate progress in vaccine development for many diseases. An additional purpose of the hearing was to examine the public-private partnerships and state-federal partnerships to advance vaccine innovation and deployment, as well as efforts to communicate vaccine safety and effectiveness to the public.

Witnesses:

• Dr. Daniel B. Jernigan, Director of the Influenza Division in the National Center for Immunization and Respiratory Diseases at the Centers for Disease Control and Prevention;
• Dr. Anthony S. Fauci, Director of the National Institute for Allergy and Infectious Disease at the National Institutes of Health;
• Dr. Sharon Watkins, State Epidemiologist and Director of the Bureau of Epidemiology for the Pennsylvania Department of Health; President of the Council of State and Territorial Epidemiologists; and
• Dr. Robin Robinson, Vice-President for Scientific Affairs at RenovaCare; former Director of the Biomedical Advanced Research and Development Authority of the U.S. Department of Health and Human Services.

3.1(s). HEARING VOLUME NO. 116–60

December 5, 2019

FULL COMMITTEE HEARING: EXPERTS NEEDED: OPTIONS FOR IMPROVED SCIENCE AND TECHNOLOGY ADVICE FOR CONGRESS

The purpose of this hearing was to examine Congress's needed for advice to understand and address the growing number of science and technology policy issues facing the nation. An additional purpose was to assess the gaps in accessible science and technology resources and advice, and to explore the opportunities

and challenges for addressing such gaps, including whether a renewed Office of Technology Assessment would meet the needs.

Witnesses:

- The Honorable Michael McCord, Director of Civil-Military Programs at the Stennis Center for Public Service;
- Ms. Laura Manley, Director of the Technology and Public Purpose Project at the Belfer Center for Science and International Affairs at the Harvard Kennedy School of Government;
- Dr. Timothy Persons, Chief Scientist and Managing Director the Science, Technology Assessment, and Analytics team at the U.S. Government Accountability Office; and
- Dr. Peter Blair, Executive Director of the Division on Engineering and Physical Sciences at the National Academies of Sciences, Engineering, and Medicine.

3.1(t). HEARING VOLUME NO. 116–62

January 15, 2020

FULL COMMITTEE HEARING: AN UPDATE ON THE CLIMATE CRISIS: FROM SCIENCE TO SOLUTIONS

The purpose of this hearing was to provide an update on the state of climate science. The Committee received expert testimony on the climate reports published in 2019 and discussed their findings.

Witnesses:

- Dr. Pamela McElwee, Associate Professor of Human Ecology, School of Environmental and Biological Sciences, Rutgers, The State University of New Jersey;
- Dr. Richard Murray, Deputy Director & Vice President for Research, Woods Hole Oceanographic Institution;
- Dr. Heidi Steltzer, Professor of Environment and Sustainability, Fort Lewis College, Colorado;
- Mr. Michael Shellenberger, Founder and President, Environmental Progress; and
- Ms. Taryn Fransen, Senior Fellow, Global Climate Program, World Resources Institute.

3.1(u). HEARING VOLUME NO. 116–64.

January 29, 2020

FULL COMMITTEE HEARING: LOSING GROUND: U.S. COMPETITIVENESS IN CRITICAL TECHNOLOGIES

The purpose of this hearing was to review U.S. competitiveness in critical technologies and federal investments in the research, development and STEM workforce that will be essential to maintaining U.S. leadership. An additional purpose of the hearing was to examine opportunities for increased public-private partnership and the economic and national security implications of leadership—or loss of leadership—in these critical technology areas.

Witnesses:

- Dr. Diane Souvaine, Chair of the National Science Board;

• Dr. Eric Schmidt, Founder of Schmidt Futures; Chairman of the Defense Innovation Board; and Chairman of the National Security Commission on Artificial Intelligence; and
• Dr. Chaouki Abdallah, Executive Vice President for Research at the Georgia Institute of Technology.

3.1(v). HEARING VOLUME NO. 116–69

February 27, 2020

FULL COMMITTEE HEARING: A REVIEW OF THE ADMINISTRATION'S FEDERAL RESEARCH AND DEVELOPMENT BUDGET FOR FISCAL YEAR 2021

The purpose of this hearing was to examine the Administration's proposed Fiscal Year 2021 (FY21) budget for federal research, development, demonstration, and commercial application programs within the Committee's jurisdiction and to discuss related policy issues.

Witness: Dr. Kelvin K. Droegemeier, Director of the White House Office of Science and Technology Policy.

3.1(w). HEARING VOLUME NO. 116–71

March 5, 2020

FULL COMMITTEE HEARING: CORONAVIRUSES: UNDERSTANDING THE SPREAD OF INFECTIOUS DISEASES AND MOBILIZING INNOVATIVE SOLUTIONS

The purpose of this hearing was to discuss emerging infectious diseases, in light of the recent coronavirus outbreak, and the modeling tools used to detect, predict and understand the spread of such diseases. The Committee discussed how some infectious agents spread from animals to humans, and how predictive modeling can help control and mitigate the effects of emerging diseases.

Witnesses:

• Dr. Suzan Murray, Program Director, Smithsonian Global Health Program, Smithsonian's National Zoo & Conservation Biology Institute;
• Dr. John Brownstein, Chief Innovation Officer, Boston Children's Hospital; Professor, Harvard Medical School;
• Dr. Peter Hotez, Professor and Dean, National School of Tropical Medicine, Baylor College of Medicine; Co-Director, Texas Children's Hospital Center for Vaccine Development; and
• Dr. Tara Kirk Sell, Senior Scholar, Johns Hopkins Center for Health Security; Assistant Professor, Johns Hopkins Bloomberg School of Public Health.

3.1(x). HEARING VOLUME NO. 116–73

June 12, 2020

FULL COMMITTEE HEARING: THE ROLE OF AFG AND SAFER GRANTS IN COVID–19 RESPONSE

The purpose of this hearing was to discuss the impact of COVID–19 on the fire service community, to examine implementation of supplemental funding for the Assistance to Firefighters Grants

(AFG) program provided under the *CARES ACT*, and to explore the need for additional funding and temporary administrative changes to the AFG and Staffing for Adequate Fire and Emergency Response (SAFER) grant program in order to expedite assistance to fire departments for personal protective equipment, staffing, and other needs.

Witnesses:

- Chief Gary Ludwig, President and Chairman of the Board of the International Association of Fire Chiefs;
- Mr. Roy L. "Sandy" McGhee III, District 11 Vice President of the International Association of Fire Fighters; and
- Mr. Steve Hirsch, Chair of the National Volunteer Fire Council.

3.1(y). HEARING VOLUME NO. 116–76

July 14, 2020

FULL COMMITTEE HEARING: SWELTERING IN PLACE: COVID–19, EXTREME HEAT, AND ENVIRONMENTAL JUSTICE

The purpose of this hearing was to explore the disproportionate impacts of extreme heat and COVID–19 on vulnerable low-income communities and communities of color, the impacts of the Environmental Protection Agency (EPA)'s deregulatory actions and relaxed enforcement of pollution regulations, the gaps in heat monitoring research, and what federal investments are needed to address these gaps to develop equitable and just policies.

Witnesses:

- Ms. Heather McTeer Toney, National Field Director, Moms Clean Air Force;
- Dr. Mustafa Santiago Ali, Vice President of Environmental Justice, Climate, and Community Revitalization, National Wildlife Federation;
- Mr. Cecil Corbin-Mark, Deputy Director, WE ACT for Environmental Justice; and
- Mr. Hilton Kelley, Founder/Director of the Community In-Power & Development Association Inc.

3.2. Hearings Before the Subcommittee on Energy

3.2(a). HEARING VOLUME NO. 116–2.

February 26, 2019

SUBCOMMITTEE HEARING: THE FUTURE OF ARPA–E

The purpose of this hearing was to assess the value of the role that the Department of Energy's Advanced Research Projects Agency—Energy (ARPA–E) plays in accelerating the development of innovative energy technologies, and to examine ways that Congress and the Administration may be able to improve ARPA–E's capabilities to spur transformational technological advances in pursuit of the agency's energy and environmental missions.

Witnesses:

- Dr. Arun Majumdar, Jay Precourt Provostial Chair Professor at Stanford University;

- Dr. Ellen Williams, Distinguished University Professor at the University of Maryland;
- Dr. John Wall, Retired Chief Technology Officer of Cummins; Member of the Committee on Evaluation for the 2017 National Academies Review of ARPA–E;
- Dr. Saul Griffith, Founder and Chief Executive Officer of Otherlab; and
- Mr. Mark Mills, Senior Fellow at the Manhattan Institute.

3.2(b). HEARING VOLUME NO. 116–5

March 7, 2019

SUBCOMMITTEE HEARING: THE ENERGY WATER NEXUS: DRIER WATTS AND CHEAPER DROPS

The purpose of this hearing was to examine energy and water nexus issues and consider H.R. 34, the Energy and Water Research Integration Act of 2019, as introduced by Chairwoman Eddie Bernice Johnson and Ranking Member Frank Lucas at the beginning of the 116th Congress. This legislation would ensure that the Department of Energy considers water intensity in energy research and development activities and energy intensity in water production and use. The hearing focused on current issues and opportunities for efficiency improvements.

Witnesses:

- Dr. Vincent Tidwell, Distinguished Member of the Technical Staff at Sandia National Laboratories;
- Ms. Kate Zerrenner, Senior Manager at the Environmental Defense Fund;
- Dr. Richard Bonner, Vice President of Research and Development at Advanced Cooling Technologies Inc.;
- Dr. Raman P. Singh, Associate Dean for Engineering at Oklahoma State University—Tulsa; Professor and Head of School of Materials Science and Engineering at Oklahoma State University; and
- Dr. Michael Webber, Chief Science and Technology Officer at ENGIE; Professor at University of Texas—Austin.

3.2(c). HEARING VOLUME NO. 116–14

May 3, 2019

FIELD HEARING: HOW THE DOMESTIC NUCLEAR INDUSTRY BOOSTS LOCAL ECONOMIES, CURBS EMISSIONS, AND STRENGTHENS NATIONAL SECURITY

Held at the Shippingport Community Building, 163 State Route 3016, Shippingport, PA 15077. The purpose of this hearing was to examine nuclear energy broadly, including its role as an emissions-free energy source and as a national security asset, as well as examining the impact that nuclear plants have on local economies. The hearing focused on research and development needs to extend the lifetime of operating nuclear plants.

Witnesses:

- Dr. Pete Lyons, Former Assistant Secretary for the Department of Energy's Office of Nuclear Energy; Commissioner, Nuclear Regulatory Commission;

- Admiral William Fallon, Retired, United States Navy;
- Ms. Tina M. Taylor, Senior Director of Research and Development at the Electric Power Research Institute; and
- Dr. Jay Apt, Professor at the Tepper School of Business and Department of Engineering & Public Policy; Co-Director of the Carnegie Mellon Electricity Industry Center.

3.2(d). HEARING VOLUME NO. 116–18

May 15, 2019

SUBCOMMITTEE HEARING: ADVANCING THE NEXT GENERATION OF SOLAR AND WIND ENERGY TECHNOLOGIES

The purpose of this hearing was to examine the range of existing research, development, and demonstration activities and the next steps required to advance solar and wind energy technologies.

Witnesses:

- Dr. Peter Green, Science and Technology Officer and Deputy Laboratory Director of the National Renewable Energy Laboratory;
- Ms. Abby Hopper, Esq., President and Chief Executive Officer of the Solar Energy Industries Association;
- Mr. Kenny Stein, Esq., Director of Policy for the Institute for Energy Research; and
- Mr. Tom Kiernan, President and Chief Executive Officer of the American Wind Energy Association.

3.2(e). HEARING VOLUME NO. 116–29

June 19, 2019

SUBCOMMITTEE HEARING: FOSSIL ENERGY RESEARCH: ENABLING OUR CLEAN ENERGY FUTURE

The purpose of the hearing was to examine research and development needs to mitigate the environmental impacts of the extraction and use of fossil fuels as well as the decarbonization of industrial processes and long-distance transportation. The hearing focused on two draft bills: H.R. 3607, the Fossil Energy Research and Development Act of 2019, and the Industrial Decarbonization Technology Development Act of 2019—which was the title at the time and is now H.R 4230, the Clean Industrial Act of 2019.

Witnesses:

- Ms. Shannon Angielski, Executive Director of the Carbon Utilization Research Council;
- Mr. Elgie Holstein, Senior Director for Strategic Planning at the Environmental Defense Fund;
- Mr. Jeff Bobeck, Director of Energy Policy Engagement at the Center for Climate and Energy Solutions (C2ES);
- Ms. Erin Burns, Director of Policy at Carbon180; and
- Dr. Erik K. Webb, Senior Manager of Geoscience Research & Applications at Sandia National Laboratories.

3.2(f). HEARING VOLUME NO. 116–40

July 17, 2019

SUBCOMMITTEE HEARING: THE FUTURE OF ELECTRICITY DELIVERY: MODERNIZING AND SECURING OUR NATION'S ELECTRICITY GRID

The purpose of this hearing was to examine research needs to modernize and secure our nation's electricity grid. The hearing focused on two draft bills at the time: H.R. 5428, the Grid Modernization Research and Development Act of 2019 and H.R. 5760, the Grid Cybersecurity Research and Development Act of 2019.

Witnesses:

- The Honorable Karen Evans, Assistant Secretary of the Department of Energy's Office of Cybersecurity, Energy Security, and Emergency Response;
- Mr. Juan J. Torres, Associate Laboratory Director of Energy Systems Integration at the National Renewable Energy Laboratory; Co-Chair of the Grid Modernization Lab Consortium;
- Ms. Kelly Speakes-Backman, Chief Executive Officer of the Energy Storage Association; and
- Ms. Katherine Hamilton, Chair of 38 North Solutions; Executive Director of Advanced Energy Management Alliance.

3.2(g). HEARING VOLUME NO. 116–45

September 18, 2019

SUBCOMMITTEE HEARING: THE NEXT MILE: TECHNOLOGY PATHWAYS TO ACCELERATE SUSTAINABILITY WITHIN THE TRANSPORTATION SECTOR

The purpose of this hearing was to examine the range of research, development, and demonstration activities necessary to advance sustainable transportation. The hearing served to inform the development of legislation that will guide the Department of Energy's activities in these areas.

Witnesses:

- Ms. Ann M. Schlenker, Director of the Center for Transportation Research at Argonne National Laboratory;
- Mr. James Chen, Vice President of Public Policy at Rivian Automotive LLC;
- Mr. Brooke Coleman, Executive Director of the Advanced Biofuels Business Council;
- Dr. Claus Daniel, Director of the Sustainable Transportation Program at Oak Ridge National Laboratory; and
- Mr. Tim Cortes, Vice President of Hydrogen Energy Systems at Plug Power Inc.

3.2(h). HEARING VOLUME NO. 116–55

November 14, 2019

SUBCOMMITTEE HEARING: WATER AND GEOTHERMAL POWER: UNEARTHING THE NEXT WAVE OF ENERGY INNOVATION

The primary purpose of this hearing was to examine research and development needs in the geothermal energy and water power

industries. The hearing focused on two draft bills at the time: H.R. 5374, the Geothermal Energy Research and Development Act of 2019, and H.R. 34, the Water Power Research and Development Act of 2019.

Witnesses:

- Dr. David Solan, Deputy Assistant Secretary for Renewable Power of the Department of Energy's Office of Energy Efficiency and Renewable Energy;
- Dr. Bryson Robertson, Co-Director of the Pacific Marine Energy Center, and Associate Professor of Civil and Construction Engineering at Oregon State University;
- Dr. Joseph Moore, Manager of the Utah Frontier Observatory for Research in Geothermal Energy (FORGE), and Research Professor at the University of Utah;
- Ms. Maria Richards, Director of the Geothermal Laboratory, Roy M. Huffington Department of Earth Sciences at Southern Methodist University; and
- Mr. Sander Cohan, Director of Innovation at Enel Green Power North America, Inc.

3.2(i). HEARING VOLUME NO. 116–58

November 22, 2019

SUBCOMMITTEE FIELD HEARING: THE FUTURE OF ADVANCED CARBON CAPTURE RESEARCH AND DEVELOPMENT

Held at the Hilton University of Houston Waldorf Astoria Ballroom, Houston, TX. The purpose of this hearing was to examine the state of advanced carbon capture, utilization, and storage technologies and practices in the United States and to determine how the federal government can best accelerate this growing area of research in support of U.S. interests in energy security, environmental stewardship, and national security.

Witnesses:

- Dr. Ramanan Krishnamoorti, Chief Energy Officer and Professor of Chemical Engineering at the University of Houston;
- Dr. Jeffrey Long, Faculty Senior Scientist of the Materials Sciences Division at Lawrence Berkeley National Laboratory;
- Mr. Greg Kennedy, Senior Project Director of NRG Energy; Director of Asset Management of the Petra Nova Project;
- Mr. Roger Dewing, Director of Technology CCUS at Air Products and Chemicals Incorporated, Inc.; and
- Mr. Nigel Jenvey, Global Head of Carbon Management at Gaffney, Cline & Associates.

3.2(j). HEARING VOLUME NO. 116–61

December 10, 2019

SUBCOMMITTEE HEARING: RESEARCH AND INNOVATION TO ADDRESS THE CRITICAL MATERIALS CHALLENGE

The purpose of this hearing was to examine research, development, and demonstration (RD&D) needs to support the sustainable supply of critical materials for energy technologies and other applications. The witnesses discussed the importance of a reliable, af-

fordable supply of helium, which is needed as an energy technology input and for various research applications. The hearing focused H.R. 4481, the Securing Energy Critical Elements and American Jobs Act of 2019.

Witnesses:

- Dr. Adam Schwartz, Director of Ames Laboratory;
- Dr. Sophia Hayes, Professor of the Department of Chemistry at Washington University in St. Louis;
- Mr. David Weiss, Vice President of Engineering and Research and Development at Eck Industries, Inc.; and
- Dr. Carol Handwerker, Reinhardt Schuhmann Jr. Professor of Materials Engineering & Environmental and Ecological Engineering at Purdue University.

3.2(k). HEARING VOLUME NO. 116–63

January 15, 2020

SUBCOMMITTEE HEARING: THE DEPARTMENT OF ENERGY'S OFFICE OF SCIENCE: EXPLORING THE NEXT FRONTIERS IN ENERGY RESEARCH AND SCIENTIFIC DISCOVERY

The purpose of this hearing was to examine the research and development activities and facilities supported by the Department of Energy's Office of Science, and to consider potential future directions for its various programs.

Witness: Dr. Chris Fall, Director of the Department of Energy's Office of Science.

3.2(l). HEARING VOLUME NO. 116–77

July 17, 2020

SUBCOMMITTEE HEARING: FROM LAB TO MARKET: ACCELERATING OUR PROGRESS TOWARD ECONOMIC RECOVERY AND A CLEAN ENERGY FUTURE

The purpose of this hearing was to examine technology transfer activities at the Department of Energy (DOE) and their potential contributions to economic recovery from the current COVID–19 pandemic. The hearing focused on two bills: H.R 8273, the Energizing Technology Transfer Act, which was in draft at the time, and H.R. 3575, the Increasing and Mobilizing Partnerships to Achieve Commercialization of Technologies (IMPACT) for Energy Act.

Witnesses:

- Ms. Jetta Wong, President of JLW Advising; Former Director of the Department of Energy's Office of Technology Transitions;
- Ms. Jennifer States, Director for Blue Economy at DNV GL; Project Director of Washington Maritime Blue;
- Ms. Farah Benahmed, Climate and Energy Policy Advisor at Third Way.
- Dr. Emily Reichert, Chief Executive Officer of Greentown Labs; and
- Dr. Lee Cheatham, Director of Technology Deployment and Outreach at Pacific Northwest National Laboratory.

3.2(m). HEARING VOLUME NO. 116–80

September 11, 2020

SUBCOMMITTEE HEARING: BIOLOGICAL RESEARCH AT THE DEPARTMENT OF ENERGY: LEVERAGING DOE'S UNIQUE CAPABILITIES TO RESPOND TO THE COVID–19 PANDEMIC

The purpose of this hearing was to examine the biological research and development activities within the Department of Energy Office of Science's Biological and Environmental Research (BER) program. The hearing examined the historic reasons for why the Department has bioscience research capabilities, how this expertise and BER's advanced research tools are being leveraged to respond to the COVID–19 pandemic, and future directions for the Department's biological research activities.

Witnesses:

- Dr. Mary Maxon, Associate Laboratory Director for Biosciences at Lawrence Berkeley National Laboratory;
- Dr. Debra Mohnen, Professor of the Department of Biochemistry and Molecular Biology at the University of Georgia;
- Dr. Glenn C. Randall, Chair of the Committee on Microbiology at the University of Chicago; and
- Dr. Kelly C. Wrighton, Associate Professor of the Department of Soil and Crop Science at Colorado State University.

3.3 Hearings Before the Subcommittee on Environment

3.3(a). HEARING VOLUME NO. 116–3

February 27, 2019

SUBCOMMITTEE HEARING: SEA CHANGE: IMPACTS OF CLIMATE CHANGE ON OUR OCEANS AND COASTS

The purpose of this hearing was to explore the impacts of anthropogenic carbon dioxide emissions on our oceans and coasts including the state of the science of ocean warming, acidification, deoxygenation, and sea level rise with special attention to findings in recently published climate reports and the impacts of climate change to coastal industry.

Witnesses:

- Dr. Sarah Cooley, Director, Ocean Acidification Program, Ocean Conservancy;
- Dr. Radley Horton, Lamont Associate Research Professor, Lamont-Doherty Earth Observatory, Columbia University Earth Institute;
- Dr. Thomas K. Frazer, Professor and Director, School of Natural Resources and Environment, University of Florida; and
- Ms. Margaret A. Pilaro, Executive Director, Pacific Coast Shellfish Growers Association (PCSGA).

3.3(b). HEARING VOLUME NO. 116–12

April 30, 2019

SUBCOMMITTEE HEARING: A REVIEW OF THE NOAA FISCAL YEAR 2020 BUDGET REQUEST

The purpose of this hearing was to examine the President's Fiscal Year (FY) 2020 budget request for the National Oceanic and Atmospheric Administration (NOAA) and associated issues.

Witness: The Honorable Neil Jacobs, Ph.D., Assistant Secretary of Commerce for Environmental Observation and Prediction, performing the duties of Under Secretary of Commerce for Oceans and Atmosphere, National Oceanic and Atmospheric Administration.

3.3(c). HEARING VOLUME NO. 116–20

May 16, 2019

SUBCOMMITTEE HEARING: THE FUTURE OF FORECASTING: BUILDING A STRONGER U.S. WEATHER ENTERPRISE

The purpose of this hearing was to discuss the state of the U.S. Weather Enterprise and next steps that need to be taken to develop U.S. leadership in weather modeling and forecasting, and the coordination and collaboration between the different sectors to ensure that the U.S. Weather Enterprise can provide the most timely and accurate weather products and services.

Witnesses:

- The Honorable Neil Jacobs, Ph.D., Assistant Secretary of Commerce for Environmental Observation and Prediction, performing the duties of Under Secretary of Commerce for Oceans and Atmosphere, National Oceanic and Atmospheric Administration (NOAA);
- Dr. Louis Uccellini, Assistant Administrator for Weather Services and Director of the National Weather Service, NOAA;
- Dr. Shuyi Chen, Professor, Department of Atmospheric Sciences, University of Washington; and
- Dr. Christopher Fiebrich, Associate Director of the Oklahoma Climatological Survey and Executive Director of the Oklahoma Mesonet; and
- Mr. Rich Sorkin, CEO, Jupiter Intelligence.

3.3(d). HEARING VOLUME NO. 116–25

June 5, 2019

SUBCOMMITTEE HEARING: OCEAN EXPLORATION: DIVING TO NEW DEPTHS AND DISCOVERIES

The purpose of this hearing was to discuss the state of U.S. ocean exploration, ongoing research, scientific discoveries and applications, technological innovations, research gaps, and the future of the field.

Witnesses:

- Dr. Katy Croff Bell, Founding Director, Open Ocean Initiative, MIT Media Lab;
- Dr. Carlie Wiener, Director of Marine Communications, Schmidt Ocean Institute;

- Mr. Steve Barrett, Senior Vice President for Business Development, Oceaneering International; and
- Mr. David Lang, Co-founder, Sofar Ocean Technologies.

3.3(e). HEARING VOLUME NO. 116–26

July 22, 2019

SUBCOMMITTEE FIELD HEARING: WEATHERING THE STORM: IMPROVING HURRICANE RESILIENCY THROUGH RESEARCH

Held at the Houston Community College, West Loop Campus Auditorium, 5601 West Loop South, Houston, TX 77081. The purpose of this hearing was to understand the state of current hurricane and coastal resilience research in the U.S., and to identify knowledge gaps and improvements to current research efforts.

Witnesses:

- Dr. Louis W. Uccellini, Assistant Administrator for Weather Services, National Oceanic and Atmospheric Administration (NOAA); Director, National Weather Service (NWS);
- Dr. Hanadi Rifai, P.E., John and Rebecca Moores Professor; Director, Environmental Engineering Graduate Program; Associate Dean Research and Facilities, Director of Hurricane Resilience Research Institute (HuRRI), University of Houston;
- Ms. Emily Grover-Kopec, Director of Insurance Practice, One Concern, Inc.; and
- Mr. Jim Blackburn, Co-Director, Severe Storm Prediction, Education & Evacuation from Disasters (SSPEED) Center; Professor, Department of Civil and Environmental Engineering, Rice University.

3.3(f). HEARING VOLUME NO. 116–52

October 23, 2019

JOINT-SUBCOMMITTEE HEARING, ENVIRONMENT SUBCOMMITTEE LEAD, WITH SPACE AND AERONAUTICS SUBCOMMITTEE: SPACE WEATHER: ADVANCING RESEARCH, MONITORING, AND FORECASTING CAPABILITIES

The purpose of this hearing was to discuss the current state of space weather research and federal efforts to monitor and predict space weather events with a specific focus on identifying what is needed to improve our space weather forecasting prediction capabilities.

Witnesses:

- Mr. Bill Murtagh, Program Coordinator, National Oceanic and Atmospheric Administration's (NOAA) Space Weather Prediction Center (SWPC);
- Dr. Nicola Fox, Heliophysics Division Director, National Aeronautics and Space Administration (NASA); and
- Dr. Conrad C. Lautenbacher, Jr., VADM USN (ret.), CEO of GeoOptics, Inc; Former Under-Secretary of Commerce for Oceans and Atmosphere and NOAA Administrator (2001–2008).

3.3(g). HEARING VOLUME NO. 116–57

November 20, 2019

SUBCOMMITTEE HEARING: A TASK OF EPIC PROPORTIONS: RECLAIMING U.S. LEADERSHIP IN WEATHER MODELING AND PREDICTION

The purpose of this hearing was to assess the development and implementation of the Earth Prediction Innovation Center (EPIC), which was recently authorized under the National Oceanic and Atmospheric Administration (NOAA) in the National Integrated Drought Information System Reauthorization Act of 2018, P.L. 115–423.

Witnesses:

- Dr. Neil Jacobs, Assistant Secretary of Commerce for Environmental Observation and Prediction, performing the duties of Under Secretary of Commerce for Oceans and Atmosphere, National Oceanic and Atmospheric Administration (NOAA);
- Dr. Cliff Mass, Professor of Atmospheric Sciences, University of Washington;
- Dr. Peter P. Neilley, IBM Distinguished Engineer and Director of Weather Forecasting Sciences and Technologies, The Weather Company, An IBM Business; and
- Dr. Thomas Auligné, Director of the Joint Center for Satellite Data Assimilation, University Corporation for Atmospheric Research (UCAR).

3.3(h). HEARING VOLUME NO. 116–70

February 27, 2020

JOINT-SUBCOMMITTEE HEARING, ENVIRONMENT SUBCOMMITTEE LEAD, WITH INVESTIGATIONS AND OVERSIGHT SUBCOMMITTEE: AN EXAMINATION OF FEDERAL FLOOD MAPS IN A CHANGING CLIMATE

The purpose of this hearing was to discuss how flooding and sea level rise affect American property owners, how the Federal Emergency Management Agency (FEMA) uses science to inform its flood products, how the National Oceanic and Atmospheric Administration (NOAA) researches and communicates flooding and sea level rise, and whether additional federal resources are needed to research and communicate present and future flood risk to the public.

Witnesses:

- Mr. Michael Grimm, Assistant Administrator for Risk Management, Federal Insurance and Mitigation Administration, Federal Emergency Management Agency, U.S. Department of Homeland Security;
- Mr. Mark Osler, Senior Advisor for Coastal Inundation and Resilience, National Oceanic and Atmospheric Administration, Department of Commerce;
- Mr. Ryan R. Branfort, PLS, GISP, Senior Vice President, Wilson & Company, Inc., Engineers and Architects; and
- Mr. Chad Berginnis, CFM, Executive Director, Association of State Floodplain Managers.

3.3(i). HEARING VOLUME NO. 116–83

September 30, 2020

SUBCOMMITTEE HEARING: COPING WITH COMPOUND CRISES: EXTREME WEATHER, SOCIAL INJUSTICE, AND A GLOBAL PANDEMIC

The purpose of this hearing was to discuss the impacts of the twin stressors of climate change and the COVID–19 pandemic to environmental justice communities, the role of social and behavioral sciences in risk communication of science-based messages related to these compound stressors, the gaps in emergency management research to inform preparation and response, and the public and human health impacts of dealing with disasters during a global pandemic.

Witnesses:

- Dr. Roxane Cohen Silver, Professor of Psychological Science, Medicine, and Public Health, University of California, Irvine; and
- Dr. Samantha Montano, Assistant Professor of Emergency Management, Massachusetts Maritime Academy.

3.4. Hearings Before the Subcommittee on Investigations and Oversight

3.4(a). HEARING VOLUME NO. 116–9

March 27, 2019

JOINT SUBCOMMITTEE HEARING, INVESTIGATIONS AND OVERSIGHT SUBCOMMITTEE LEAD, WITH ENVIRONMENT SUBCOMMITTEE: EPA'S IRIS PROGRAM: REVIEWING ITS PROGRESS AND ROADBLOCKS AHEAD

The purpose of this hearing was to assess the current state of the EPA's Integrated Risk Information System (IRIS) program in light of the findings published in the March 4, 2019, Government Accountability Office (GAO) report, "Status of EPA's Efforts to Produce Assessments and Implement the Toxic Substances Control Act." Additionally, witnesses provided their expert perspectives on the EPA's current status on implementing recommendations for the IRIS program provided by the GAO and the National Academies of Science, Engineering, and Medicine (NAS), as well as the unique value of IRIS assessments.

Witnesses:

Panel 1:

- Dr. Jennifer Orme-Zavaleta, Principal Deputy Assistant Administrator for Science for the Office of Research and Development, and Science Advisor, Environmental Protection Agency; and
- Mr. Alfredo Gomez, Director, Natural Resources and Environment, Government Accountability Office.

Panel 2:

- Dr. Bernard D. Goldstein, Professor Emeritus, Dean Emeritus, University of Pittsburgh Graduate School of Public Health;
- Dr. Ivan Rusyn, Professor, Department of Veterinary Integrative Biosciences, Texas A&M University; Chair, Inter-

disciplinary Faculty of Toxicology; Director, Texas A&M Superfund Research Center;

- Dr. Julie E. Goodman, Principal, Gradient; and
- Ms. Wilma Subra, President, Subra Company; Technical Advisor, Louisiana Environmental Action Network.

3.4(b). HEARING VOLUME NO. 116–22

May 21, 2019

SUBCOMMITTEE HEARING: THE NEED FOR RESILIENCE: PREPARING AMERICA'S TRANSPORTATION INFRASTRUCTURE FOR CLIMATE CHANGE

The purpose of this hearing was to examine the threat to transportation assets posed by climate change, assess the current state of federal research on transportation infrastructure climate resilience, and explore strategies by which the federal research enterprise can complement state and local efforts on transportation climate resilience more effectively.

Witnesses:

- Ms. Susanne DesRoches, Deputy Director for Infrastructure and Energy, New York City Mayor's Office of Resiliency and Office of Sustainability;
- Mr. Gregory D. Winfree, Director, Texas A&M Transportation Institute (TTI);
- Mr. Jason Averill, Chief, Materials and Structural Systems Division, Engineering Laboratory, National Institute of Standards and Technology; and
- Mr. Scott Reeve, President, Composite Advantage.

3.4(c). HEARING VOLUME NO. 116–31

June 25, 2019

JOINT SUBCOMMITTEE HEARING, INVESTIGATIONS AND OVERSIGHT SUBCOMMITTEE LEAD, WITH RESEARCH AND TECHNOLOGY SUBCOMMITTEE: ELECTION SECURITY: VOTING TECHNOLOGY VULNERABILITIES

The purpose of this hearing was to review the security of US election system technologies, such as electronic pollbooks, voter registration systems, voting machines, and the maintenance and operations activities that support them.

Witnesses:

- Dr. Charles H. Romine, Director, Information Technology Laboratory, National Institute of Standards and Technology;
- Mr. Neal Kelley, Registrar of Voters, Orange County, California;
- Dr. Latanya Sweeney, Professor of Government and Technology in Residence, Department of Government, Harvard University, Institute for Quantitative Social Science;
- Mr. Paul Ziriax, Secretary, Oklahoma State Election Board; and
- Dr. Josh Benaloh, Senior Cryptographer, Microsoft Research.

3.4(d). HEARING VOLUME NO. 116–38

July 16, 2019

JOINT SUBCOMMITTEE HEARING, INVESTIGATIONS AND OVERSIGHT SUBCOMMITTEE LEAD, WITH ENVIRONMENT SUBCOMMITTEE: EPA ADVISORY COMMITTEES: HOW SCIENCE SHOULD INFORM DECISIONS

The purpose of this hearing was to discuss the state of federal advisory committees at the EPA in light of the findings published in the July 2019 Government Accountability Office report, *EPA's Advisory Committees: Improvements Needed for the Member Appointment Process.*

Witnesses:

- Mr. J. Alfredo Gomez, Director, Natural Resources and Environment, U.S. Government Accountability Office;
- Dr. Thomas A. Burke, PhD, MPH, Jacob I. and Irene B. Fabrikant Professor and Chair in Health Risk and Society, Bloomberg School of Public Health, Johns Hopkins University;
- Dr. Deborah Swackhamer, Professor Emerita, Humphrey School of Public Affairs, University of Minnesota; and
- Dr. Jonathan Samet, MD, MS, Dean, Colorado School of Public Health.

3.4(e). HEARING VOLUME NO. 116–47

September 26, 2019

SUBCOMMITTEE HEARING: ONLINE IMPOSTERS AND DISINFORMATION

The purpose of this hearing was to explore the enabling technologies for disinformation online, including deep fakes, explore trends and emerging technology in the field, and consider research strategies that could help stem the tide of malicious inauthentic behavior.

Witnesses:

- Dr. Siwei Lyu, Professor, Department of Computer Science, Director, Computer Vision and Machine Learning Lab, University at Albany, State University of New York;
- Dr. Hany Farid, Professor, Electrical Engineering & Computer Science and the School of Information, University of California, Berkeley; and
- Ms. Camille Francois, Chief Innovation Officer, Graphika.

3.4(f). HEARING VOLUME NO. 116–50

October 15, 2019

SUBCOMMITTEE FIELD HEARING: ADDRESSING THE LEAD CRISIS THROUGH INNOVATION & TECHNOLOGY

Held at the Livonia City Hall, 33000 Civic Center Drive, Livonia, MI 48154. The purpose of this hearing was to discuss the prevalence and effects of lead in drinking water and the challenges that local leaders face in addressing lead contamination. The Subcommittee considered innovative science-based solutions for anticipating risk and preventing contamination and explored research opportunities to help municipalities reduce lead exposure more quickly and cost-effectively.

Witnesses:
Panel I:
- The Honorable Joe DiVincenzo, Jr., County Executive, Essex County, New Jersey;
- The Honorable Joseph Scarpelli, Mayor of Nutley, New Jersey; and
- The Honorable Michael Venezia, Mayor of Bloomfield, New Jersey.

Panel II:
- Dr. Diane Calello, Executive Medical Director, New Jersey Poison Information and Education System and Associate Professor of Emergency Medicine, Rutgers University;
- Dr. Marc Edwards, University Distinguished Professor, Virginia Polytechnic Institute;
- Mr. Michael Ramos, Chief Engineer, Chicago Public Schools; inventor, the Noah Auto Flushing device; and
- Dr. Eric Roy, Founder, Hydroviv.

3.4(g). HEARING VOLUME NO. 116–66

February 5, 2020

JOINT-SUBCOMMITTEE HEARING, INVESTIGATIONS AND OVERSIGHT SUBCOMMITTEE LEAD, WITH ENERGY SUBCOMMITTEE: MANAGEMENT AND SPENDING CHALLENGES WITHIN THE DEPARTMENT OF ENERGY'S OFFICE OF ENERGY EFFICIENCY AND RENEWABLE ENERGY

The purpose of this hearing was to assess the Department of Energy's (DOE) Office of Energy Efficiency and Renewable Energy (EERE) use of funds to advance clean energy research and development. The Subcommittees discussed EERE's ability to spend its grant funding in a responsible manner and maintain adequate staffing levels.

Witnesses:
Panel 1:
- Mr. Daniel Simmons, Assistant Secretary, Department of Energy's Office of Energy Efficiency and Renewable Energy.

Panel 2:
- Dr. Charles Gay, Member, Sandia National Laboratories Energy and Homeland Security External Advisory Board; former Director of the Solar Energy Technologies Office, Department of Energy's Office of Energy Efficiency and Renewable Energy;
- Mr. Anthony M. Reardon, National President, National Treasury Employees Union; and
- Mr. Arjun Krishnaswami, Policy Analyst, Climate & Clean Energy Program, Natural Resources Defense Council.

3.4(h). HEARING VOLUME NO. 116–74

June 19, 2020

SUBCOMMITTEE HEARING: REPURPOSING THERAPEUTIC DRUGS FOR COVID–19: RESEARCH CHALLENGES AND OPPORTUNITIES

The purpose of this hearing was to explore the scientific foundations behind repurposing existing drugs for the treatment of COVID–19. The Subcommittee discussed how researchers identify

and test approved drugs—developed for other uses—that could lessen the severity of COVID–19 symptoms, as well as the regulatory approval process for the use of these drugs among infected patients.

Witnesses:

- Dr. Peter Lurie, President, Center for Science in the Public Interest;
- Dr. James Finigan, Director of the Respiratory Centers of Excellence, National Jewish Health;
- Dr. Rick Stevens, Associate Laboratory Director for Computing, Environment and Life Sciences, Argonne National Laboratory; and
- Dr. Benjamin Rome, Associate Physician, Brigham and Women's Hospital; Postdoctoral Research Fellow, Harvard Medical School.

3.4(i). HEARING VOLUME NO. 116–78

July 28, 2020

JOINT SUBCOMMITTEE HEARING, INVESTIGATIONS AND OVERSIGHT SUBCOMMITTEE LEAD, WITH RESEARCH AND TECHNOLOGY SUBCOMMITTEE: THE ROLE OF TECHNOLOGY IN COUNTERING TRAFFICKING IN PERSONS

The purpose of this hearing was to examine the role of science and technology in assisting nongovernmental organizations, state, local and federal governments, financial institutions, and others to disrupt domestic and international human trafficking, including trafficking for forced labor and sexual exploitation. An additional purpose was to explore the research, technology development, and coordination needs to strengthen federal anti-trafficking strategies and to discuss the impact of COVID–19 on human trafficking response.

Witnesses:

- Ms. Anjana Rajan, Chief Technology Officer, Polaris;
- Mr. Matthew Daggett, Technical Staff, Humanitarian Assistance and Disaster Relief Systems Group, Lincoln Laboratory, Massachusetts Institute of Technology;
- Ms. Emily Kennedy, President and Co-Founder, Marinus Analytics; and
- Ms. Hannah Darnton, Associate Director of Ethics, Technology, and Human Rights, Business for Social Responsibility.

3.4(j). HEARING VOLUME NO. 116–82

September 23, 2020

SUBCOMMITTEE HEARING: DATA FOR DECISION-MAKING: RESPONSIBLE MANAGEMENT OF DATA DURING COVID–19 AND BEYOND

The purpose of this hearing was to explore COVID–19 data management at the local, state, and federal level, including how relevant stakeholders are collecting, analyzing, and reporting data that informs COVID–19 research and decision making. The Subcommittee discussed how healthcare providers, scientists, and public health agencies can ensure the integrity, accuracy, and transparency of data in the midst of the COVID–19 pandemic.

Witnesses:

- Dr. Lisa M. Lee, PhD, Associate Vice President for Research and Innovation, Virginia Tech;
- Dr. Lisa L. Maragakis, MD, PhD, Senior Director of Infection Prevention, Johns Hopkins Health System;
- Mr. Avik Roy, President, Foundation for Research on Equal Opportunity; and
- Ms. Janet Hamilton, MPH, Executive Director, Council of State and Territorial Epidemiologists.

3.5. Hearings Before the Subcommittee on Research and Technology

3.5(a). HEARING VOLUME NO. 116–8

March 12, 2019

SUBCOMMITTEE HEARING: ENGINEERING OUR WAY TO A SUSTAINABLE BIOECONOMY

The purpose of this hearing was to review the opportunities and challenges with new and emerging bioscience and biotechnologies with application in agriculture, energy and manufacturing; to examine the role of the federal government in research and development (R&D) and oversight of such science and technologies; and to examine the status of U.S. leadership in engineering biology. An additional purpose of this hearing was to receive testimony on the Engineering Biology Research and Development Act, which would establish a federal R&D initiative in engineering biology.

Witnesses:

- Dr. Rob Carlson, Managing Director of Bioeconomy Capital;
- Dr. Kevin Solomon, Assistant Professor of Agricultural & Biological Engineering at Purdue University;
- Dr. Eric Hegg, Professor of Biochemistry and Molecular Biology at Michigan State University and Michigan State University Subcontract Lead at the Great Lakes Bioenergy Research Center;
- Dr. Sean Simpson, Chief Scientific Officer and Co-Founder of LanzaTech; and
- Dr. Laurie Zoloth, Margaret E. Burton Professor of Religion and Ethics and Senior Advisor to the Provost for Programs in Social Ethics at the University of Chicago.

3.5(b). HEARING VOLUME NO. 116–8

March 26, 2019

JOINT-SUBCOMMITTEE HEARING, RESEARCH AND TECHNOLOGY SUBCOMMITTEE LEAD, WITH ENERGY SUBCOMMITTEE: REVITALIZING AMERICAN LEADERSHIP IN ADVANCED MANUFACTURING

The purpose of this hearing was to review the successes and further opportunities for the Manufacturing USA Institutes to achieve the goal of improving the competitiveness of U.S. manufacturing. The hearing also discussed the long-term sustainability of the Institutes and explored how the Institutes are working to accelerate the development of an advanced manufacturing workforce; leverage

the existing national network of small and medium manufacturers; and develop local and regional economic opportunities in advanced manufacturing across America. An additional purpose of this hearing was to examine ways to enable decarbonization of the manufacturing sector in an effort to transition to a carbon-free future, and the role of the Manufacturing USA Institutes in achieving this goal.

Witnesses:

- Mr. Ryan Myers, Director of Business Development, Department of Defense, for Hexagon Manufacturing Intelligence;
- Mr. Mike Molnar, Director of the Office of Advanced Manufacturing at the National Institute of Standards and Technology (NIST);
- Dr. John Hopkins, CEO of the Institute for Advanced Composites Manufacturing Innovation (IACMI);
- Ms. Valri Lightner, Acting Director of the Advanced Manufacturing Office under the Office of Energy Efficiency and Renewable Energy at the U.S. Department of Energy; and
- Dr. Mitchell Dibbs, Associate R&D Director for External Technology—Government Programs at Dow.

3.5(c). HEARING VOLUME NO. 116–11

April 9, 2019

SUBCOMMITTEE HEARING: A REVIEW OF THE NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY FY 2020 BUDGET REQUEST

The purpose of this hearing was to examine the President's Fiscal Year 2020 budget request for the National Institute of Standards and Technology (NIST) and related policy and management issues. The hearing also discussed major areas of research under NIST's laboratory programs, the agency's role in working with industry to advance U.S. competitiveness, and key facilities construction and maintenance issues on both of NIST's campuses.

Witness: The Honorable Walter G. Copan, Under Secretary of Commerce for Standards and Technology and Director of the National Institute of Standards and Technology.

3.5(d). HEARING VOLUME NO. 116–13

April 30, 2019

SUBCOMMITTEE HEARING: CLOSING THE LOOP: EMERGING TECHNOLOGIES IN PLASTICS RECYCLING

The purpose of this hearing was to examine plastics recycling challenges in the United States and discuss new and emerging technologies to reduce the lifecycle impact of plastic.

Witnesses:

- Mr. Paul Sincock, City Manager for the City of Plymouth, Michigan;
- Dr. Govind Menon, Director of the School of Science and Technology and Chair of the Department of Physics and Chemistry at Troy University;
- Dr. Gregg Beckham, Senior Research Fellow at the National Renewable Energy Laboratory; and

• Mr. Tim Boven, Recycling Commercial Director, Packaging and Specialty Plastics at Dow.

3.5(e). HEARING VOLUME NO. 116–15

May 8, 2019

SUBCOMMITTEE HEARING: A REVIEW OF THE NATIONAL SCIENCE FOUNDATION FY 2020 BUDGET REQUEST

The purpose of this hearing was to review the Administration's Fiscal Year 2020 budget request for the National Science Foundation and related policy and management issues.

Witnesses:

• Dr. France Córdova, Director of the National Science Foundation; and

• Dr. Diane Souvaine, Chair of the National Science Board.

3.5(f). HEARING VOLUME NO. 116–36

July 11, 2019

SUBCOMMITTEE HEARING: BUMPER TO BUMPER: THE NEED FOR A NATIONAL SURFACE TRANSPORTATION RESEARCH AGENDA

The purpose of this hearing was to review the Department of Transportation's surface transportation research, development, and demonstration and technology transfer activities; examine implementation of research provisions of the *Fixing America's Surface Transportation Act of 2015 (FAST Act)* and explore the need for a long-term national surface transportation research agenda.

Witnesses:

• Mr. Tim Henkel, Chair of the Research and Technology Coordinating Committee of the Transportation Research Board; Assistant Commissioner of Modal Planning and Program Management at the Minnesota Department of Transportation;

• Mr. Brian Ness, Director of the Idaho Transportation Department; Chair of the American Association of State Highway and Transportation Officials Special Committee on Research and Innovation;

• Dr. Henry Liu, Director of the Center for Connected and Automated Transportation and Professor in the Department of Civil and Environmental Engineering at the University of Michigan, Ann Arbor; and

• Dr. Darcy Bullock, Director of the Joint Transportation Research Program and Lyles Family Professor in the Department of Civil Engineering at Purdue University.

3.5(g). HEARING VOLUME NO. 116–39

July 17, 2019

JOINT-SUBCOMMITTEE HEARING, RESEARCH AND TECHNOLOGY SUBCOMMITTEE LEAD, WITH INVESTIGATIONS AND OVERSIGHT SUBCOMMITTEE: SCIENTIFIC INTEGRITY IN FEDERAL AGENCIES

The purpose of this hearing was to discuss the importance of scientific integrity policies within federal agencies that fund, conduct,

or oversee research and to examine the status of current such policies. An additional purpose of the hearing was the receive testimony on H.R. 1709, the *Scientific Integrity Act*.

Witnesses:

- Mr. Michael Halpern, Deputy Director of the Center for Science and Democracy at the Union of Concerned Scientists;
- Mr. Joel Clement, Arctic Initiative Senior Fellow at the Belfer Center for Science and International Affairs at the John F. Kennedy School of Government at Harvard University;
- Dr. Roger Pielke Jr., Director of the Sports Governance Center and Professor in the Environmental Studies Program at the University of Colorado, Boulder; and
- Mr. John Neumann, Managing Director of the Science, Technology Assessment, and Analytics team at the U.S. Government Accountability Office.

3.5(h). HEARING VOLUME NO. 116–42

July 25, 2019

SUBCOMMITTEE HEARING: BENIGN BY DESIGN: INNOVATIONS IN SUSTAINABLE CHEMISTRY

The purpose of this hearing was to assess the challenges and opportunities for expanding the use of sustainable chemicals, production processes, and stewardship practices throughout the chemical science and engineering enterprise. The hearing also examined what research, technologies, and strategies are needed to support the adoption of sustainable chemistry innovations. An additional purpose of the hearing was to receive testimony on the *Sustainable Chemistry Research and Development Act of 2019*.

Witnesses:

- Dr. Tim Persons, Chief Scientist and Managing Director of the Science, Technology Assessment, and Analytics team at the U.S. Government Accountability Office;
- Dr. John Warner, President and Chief Technology Officer of the Warner Babcock Institute for Green Chemistry;
- Dr. Julie Zimmerman, Professor and Senior Associate Dean in the School of Forestry and Environmental Studies and Deputy Director of the Center for Green Chemistry and Green Engineering at Yale University;
- Ms. Anne Kolton, Executive Vice President of Communications, Sustainability, and Market Outreach at the American Chemistry Council; and
- Mr. Mitchell Toomey, Director of Sustainability at BASF in North America.

3.5(i). HEARING VOLUME NO. 116–48

September 24, 2019

SUBCOMMITTEE HEARING: ARTIFICIAL INTELLIGENCE AND THE FUTURE OF WORK

The purpose of this hearing was to examine the impact of machine learning and artificial intelligence on the workforce, including issues related to worker displacement, retraining of the current workforce, and developing a skilled technical workforce of the fu-

ture that can thrive in an economy in which artificial intelligence increasingly plays a role. An additional purpose of the hearing was also to explore the disparate impacts on different industry sectors and different populations, as well as issues of safety, privacy, and security relevant to the human-technology interface.

Witnesses:

- Dr. Arthur Lupia, Assistant Director of the Directorate for Social, Behavioral and Economic Sciences at the National Science Foundation;
- Dr. Erik Brynjolfsson, Schussel Family Professor of Management Science and Director of The MIT Initiative on the Digital Economy at the Massachusetts Institute of Technology;
- Ms. Rebekah Kowalski, Vice President of Manufacturing Services at ManpowerGroup; and
- Dr. Sue Ellspermann, President of Ivy Tech Community College.

3.5(j). HEARING VOLUME NO. 116–51

October 25, 2019

SUBCOMMITTEE FIELD HEARING: SMART MOBILITY: IT'S A COMMUNITY ISSUE

Held at the Livonia City Hall, 33000 Civic Center Drive, Livonia, MI 48154. The purpose of this hearing was to explore the use of smart technology to improve the ability of small cities and suburban communities to provide safe and efficient mobility solutions, to examine the research and development needs to ensure this technology is accessible to diverse communities, and to consider best practices for integration of community input and consideration of unique community needs, as well as collaboration between public, private, and academic stakeholders.

Witnesses:

- The Honorable David Coulter, Oakland County Executive;
- Mr. Mark Dowd, Executive Director of Smart Cities Lab;
- Dr. Raj Rajkumar, Director of Mobility21 and George Westinghouse Professor of Electrical and Computer Engineering at Carnegie Mellon University;
- Dr. Tierra Bills, Assistant Professor Civil and Environmental Engineering in the College of Engineering at Wayne State University; and
- Mr. Scott Averitt, Technical Expert and Manager of Public/Private Partnerships at Robert Bosch LLC.

3.5(k). HEARING VOLUME NO. 116–59

December 4, 2019

JOINT-SUBCOMMITTEE HEARING, RESEARCH AND TECHNOLOGY SUBCOMMITTEE LEAD, WITH ENVIRONMENT SUBCOMMITTEE: CALM BEFORE THE STORM: REAUTHORIZING THE NATIONAL WINDSTORM IMPACT REDUCTION PROGRAM

The purpose of this hearing was to review the activities of the National Windstorm Impact Reduction Program (NWIRP) and to consider opportunities and challenges to improved wind resilience and priorities for the next NWIRP reauthorization.

Witnesses:

- Dr. Scott Weaver, Director of the National Windstorm Impact Reduction Program at the National Institute of Standards and Technology;
- Major General Lee Tafanelli, Kansas Adjutant General and Director of Kansas Homeland Security and Director of Emergency Management;
- Dr. Delong Zuo, Associate Professor of Civil Engineering at the National Wind Institute at Texas Tech University; and
- Mr. Ryan Colker, Vice President of Innovation and Executive Director of the Alliance for National and Community Resilience at the International Code Council.

3.5(l). HEARING VOLUME NO. 116–65

February 5, 2020

SUBCOMMITTEE HEARING: AMERICA'S SEED FUND: A REVIEW OF SBIR AND STTR

The purpose of this hearing was to hold a review of the role of the Small Business Innovation Research (SBIR) Program and the Small Business Technology Transfer (STTR) Program in helping to move the results of federally funded research into commercial development and generating new economic growth, as well as in assisting federal science agencies in meeting their respective missions. An additional purpose of the hearing was to consider recommendations for improvements to the SBIR and STTR Programs and to receive testimony on *The Small Business Innovation Research and Small Business Technology Transfer Improvements Act of 2019*.

Witnesses:

- Dr. Dawn Tilbury, Assistant Director of the Directorate of Engineering at the National Science Foundation;
- Dr. Maryann Feldman, S.K. Heninger Distinguished Professor of Public Policy in the Department of Public Policy; Adjunct Professor of Finance in the Kenan-Flagler Business School; Faculty Director of CREATE in the Kenan Institute of Private Enterprise at The University of North Carolina at Chapel Hill;
- Mr. Nicholas Cuccinelli, Chief Executive Officer of Endectra; and
- Dr. Johnny Park, Chief Executive Officer of Wabash Heartland Innovation Network.

3.5(m). HEARING VOLUME NO. 116–67

February 11, 2020

SUBCOMMITTEE HEARING: MORE HIRES, FEWER HACKS: DEVELOPING THE U.S. CYBERSECURITY WORKFORCE

The purpose of this hearing was to explore the challenges faced by organizations in both the public and private sectors in recruiting and training skilled cybersecurity professionals and discuss strategies to expand and diversify the cybersecurity workforce pipeline to meet the demand. An additional purpose of the hearing was to as-

sess the federal programs designed to address this workforce shortage.

Witnesses:

- Mr. Rodney Petersen, Director of the National Initiative for Cybersecurity Education at the National Institute of Standards and Technology;
- Dr. Ambareen Siraj, Professor of Computer Science and Director of the Cybersecurity Education Research and Outreach Center at Tennessee Tech University;
- Mr. Joseph Sawasky, President and Chief Executive Officer of Merit Network, Inc.; and
- Ms. Sonya Miller, HR Director at IBM Security and Enterprise & Technology Security.

3.5(n). HEARING VOLUME NO. 116–72

March 11, 2020

SUBCOMMITTEE HEARING: REAUTHORIZATION OF THE NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY

The purpose of this hearing was to explore the major areas of research under the National Institute of Standards and Technology (NIST) laboratory programs, the agency's role in working with industry to advance U.S. competitiveness, and key facilities construction and maintenance issues on the NIST campuses in Maryland and Colorado. An additional purpose of the hearing was to review the President's Fiscal Year 2021 budget proposal for NIST.

Witness: The Honorable Walter G. Copan, Under Secretary of Commerce for Standards and Technology, and Director of the National Institute of Standards and Technology.

3.5(o). HEARING VOLUME NO. 116–79

September 9, 2020

SUBCOMMITTEE HEARING: THE IMPACT OF COVID–19 CRISIS ON UNIVERSITY RESEARCH

The purpose of this hearing was to examine the near- and long-term impacts of the COVID–19 crisis on the U.S. academic research enterprise. The Committee also heard about the steps universities have taken to slow the spread of the virus and the impact such measures have had on the progress of research and the pipeline of STEM talent. The Committee explored what is needed for universities to recover from these setbacks and safely ramp up research programs. An additional purpose of this hearing was to hear testimony on the *Research Investment to Spark the Economy (RISE) Act* and the *Supporting Early Career Researchers Act*.

Witnesses:

- Dr. Joseph Walsh, Interim Vice President for Economic Development and Innovation for the University of Illinois System;
- Dr. David Stone, Vice President of Research at Oakland University;
- Dr. Theresa Mayer, Executive Vice President for Research and Partnerships at Purdue University; and

• Mr. Ryan Muzzio, Physics Ph.D. Student at Carnegie Mellon University.

3.6. Hearings Before the Subcommittee on Space and Aeronautics

3.6(a). HEARING VOLUME NO. 116–16

May 8, 2019

SUBCOMMITTEE HEARING: KEEPING OUR SIGHTS ON MARS: A REVIEW OF NASA'S DEEP SPACE EXPLORATION PROGRAMS AND LUNAR PROPOSAL

The purpose of this hearing was to review NASA's deep space human exploration programs, including proposed lunar activities and the budgetary resource requirements for those activities, in the context of the long-term goal of sending humans to the surface of Mars.

Witnesses:

• Mr. William H. Gerstenmaier, Associate Administrator, Human Exploration and Operations, NASA;

• Mr. Mark Sirangelo, Special Assistant to the Administrator, NASA;

• Dr. Jonathan Lunine, Director, Cornell Center for Astrophysics and Planetary Science; Co- Chair of the Former Committee on Human Spaceflight, National Academies of Sciences, Engineering, and Medicine;

• Dr. Patricia Sanders, Chair, Aerospace Safety Advisory Panel; and

• Mr. Walt Faulconer, President, Faulconer Consulting Group, LLC.

3.6(b). HEARING VOLUME NO. 116–27

June 11, 2019

SUBCOMMITTEE HEARING: DISCOVERY ON THE FRONTIERS OF SPACE: EXPLORING NASA'S SCIENCE MISSION

The purpose of this hearing was to review NASA's activities and plans for its Earth and space science programs, including the Earth Science, Planetary Science, Astrophysics, and Heliophysics divisions of the Science Mission Directorate, and associated issues.

Witnesses:

• Dr. Thomas H. Zurbuchen, Associate Administrator, Science Mission Directorate, NASA;

• Dr. Chelle L. Gentemann, Senior Scientist, Earth and Space Research; Co-chair, Committee on Earth Science and Applications from Space, Space Studies Board, National Academies of Sciences, Engineering, and Medicine;

• Dr. David Spergel, Charles Young Professor of Astronomy, Princeton University; Director, Center for Computational Astrophysics, Flatiron Institute; Former Chair, Space Studies Board, National Academies of Sciences, Engineering, and Medicine; and

• Dr. Mark Sykes, Chief Executive Officer and Director, Planetary Science Institute.

3.6(c). HEARING VOLUME NO. 116–33

June 26, 2019

SUBCOMMITTEE HEARING: EXPLORING NATIONAL AERONAUTICS AND SPACE ADMINISTRATION'S AERONAUTICS MISSION: ENABLING THE TRANSFORMATION OF AVIATION

The purpose of this hearing was to review the programs, activities, and plans of NASA's Aeronautics Research Mission Directorate, and associated issues.

Witnesses:

- Dr. Jaiwon Shin, Associate Administrator, Aeronautics Research Mission Directorate, NASA;
- Dr. Alan H. Epstein, R.C. Maclaurin Professor Emeritus of Aeronautics and Astronautics, Massachusetts Institute of Technology; Chair, Aeronautics and Space Engineering Board, National Academies of Sciences, Engineering, and Medicine;
- Dr. Ilan Kroo, Professor of Aeronautics and Astronautics, Stanford University; and
- Dr. Mark Lewis, Director, IDA Science & Technology Policy Institute; Professor Emeritus of Aerospace Engineering, University of Maryland.

3.6(d). HEARING VOLUME NO. 116–34

July 10, 2019

SUBCOMMITTEE HEARING: A REVIEW OF NATIONAL AERONAUTICS AND SPACE ADMINISTRATION'S PLANS FOR THE INTERNATIONAL SPACE STATION AND FUTURE ACTIVITIES IN LOW EARTH ORBIT

The purpose of this hearing was to examine NASA's plans for the International Space Station and future activities in low Earth orbit, and associated issues.

Witnesses:

- Mr. William H. Gerstenmaier, Associate Administrator, Human Exploration and Operations Mission Directorate, NASA;
- The Honorable Paul K. Martin, Inspector General, NASA;
- Professor Joanne Irene Gabrynowicz, Emerita, University of Mississippi; Editor-in-Chief Emerita, Journal of Space Law; and
- Mr. Eric W. Stallmer, President, Commercial Spaceflight Federation.

3.6(e). HEARING VOLUME NO. 116–42

July 25, 2019

SUBCOMMITTEE HEARING: THE COMMERCIAL SPACE LANDSCAPE: INNOVATION, MARKET, AND POLICY

The purpose of this hearing was to provide an overview of the commercial space industry, including innovative capabilities, the market, policy issues, and associated matters.

Witnesses:

- Dr. Bhavya Lal, Research Staff Member, IDA Science and Technology Policy Institute;

- Ms. Carissa Christensen, Chief Executive Officer, Bryce Space and Technology;
- Mr. Eric Stallmer, President, Commercial Spaceflight Federation;
- Mr. Michael French, Vice President, Space Systems, Aerospace Industries Association; and
- Ms. Laura Montgomery, Proprietor, Ground Based Space Matters; Professor, Catholic University's Columbus School of Law.

3.6(f). HEARING VOLUME NO. 116–44

September 18, 2019

SUBCOMMITTEE HEARING: DEVELOPING CORE CAPABILITIES FOR DEEP SPACE EXPLORATION: AN UPDATE ON NASA'S SLS, ORION, AND EXPLORATION GROUND SYSTEMS

The purpose of this hearing was to assess the status, including the progress, challenges, and other issues, of NASA's Exploration Systems Development programs (the Space Launch System, Orion Multipurpose Crew Vehicle, and Exploration Ground Systems).

Witnesses:

- Mr. Kenneth Bowersox, Associate Administrator (Acting), Human Exploration and Operations, NASA;
- Ms. Cristina Chaplain, Director, Contracting and National Security Acquisitions, U.S. Government Accountability Office; and
- Mr. Doug Cooke, Owner, Cooke Concepts and Solutions; Former Associate Administrator, Exploration Systems, NASA.

3.6(g). HEARING VOLUME NO. 116–54.

November 13, 2019

SUBCOMMITTEE HEARING: KEEPING OUR SIGHTS ON MARS PART 2: STRUCTURING A MOON-MARS PROGRAM FOR SUCCESS

The purpose of this hearing was to obtain perspectives on what is needed to establish a successful and sustainable Moon to Mars initiative, including information needed to inform decisions on the objectives, planning, architecture, acquisition, and implementation of a Moon to Mars initiative, among other factors.

Witnesses:

- Lt. General Thomas P. Stafford, USAF (Ret.); Member, National Academy of Engineering; Chairman, NASA ISS Advisory Committee; Pilot, Gemini 6; Commander, Gemini 9; Cdr. Apollo 10; Cdr. Apollo/Apollo-Soyuz Test Program; Former USAF Deputy Chief of Staff for Research, Development and Acquisition; and
- Mr. A. Thomas Young, Former Director of NASA Goddard Space Flight Center; Former President and Chief Operating Officer, Martin Marietta Corp.

3.6(h). HEARING VOLUME NO. 116–68

February 11, 2020

SUBCOMMITTEE HEARING: SPACE SITUATIONAL AWARENESS: KEY ISSUES IN AN EVOLVING LANDSCAPE

The purpose of this hearing was to examine issues related to Space Situational Awareness (SSA), how the changing space environment is challenging the current SSA system, and the factors anticipated to influence SSA in the future. The hearing also explored approaches to addressing the challenges, including activities at the international level.

Witnesses:

- Dr. Brian Weeden, Director of Program Planning, Secure World Foundation;
- Mr. Daniel Oltrogge, AIAA Space Traffic Management Space Governance Task Force Chair; Founder and Administrator, Space Safety Coalition; Official International Standards Organization (ISO) representative to the United Nations Committee for the Peaceful Use of Outer Space (UNCOPUOS);
- Professor Joanne Gabrynowicz, Professor Emerita of Space Law, University of Mississippi Law Center;
- Professor Danielle Wood, Director of the Space Enabled Research Group, Assistant Professor of Media Arts & Sciences and Aeronautics & Astronautics, Massachusetts Institute of Technology; and
- Dr. Ruth Stilwell, Adjunct Professor, Norwich University; Senior Non-Resident Scholar, Space Policy Institute, George Washington University.

3.6(i). HEARING VOLUME NO. 116–75

June 23, 2020

SUBCOMMITTEE HEARING: R&D TO SUPPORT HEALTHY AIR TRAVEL IN THE COVID–19 ERA AND BEYOND

The purpose of this hearing was to examine the status of R&D related to supporting healthy air travel during COVID–19 and future pandemics, and other issues.

Witnesses:

- Ms. Heather Krause, Director, Physical Infrastructure Issues, Government Accountability Office;
- Dr. Byron Jones P.E., Professor, Alan Levin Department of Mechanical and Nuclear Engineering; Director, National Gas Machinery Laboratory, Kansas State University; and
- Dr. Vicki Hertzberg, Professor and Director, Center for Data Science, Nell Hodgson Woodruff School of Nursing, Emory University.

3.6(j). HEARING VOLUME NO. 116–81

September 18, 2020

SUBCOMMITTEE HEARING: CYBERSECURITY AT NASA: ONGOING CHALLENGES AND EMERGING ISSUES FOR INCREASED TELEWORK DURING COVID–19

The purpose of this hearing was to examine the status of NASA's cybersecurity and information technology management, policies, and practices, including cybersecurity challenges associated with increased telework and remote operations during the COVID–19 pandemic, and other issues.

Witnesses:

- Mr. Jeff Seaton, Chief Information Officer (Acting), NASA;
- The Honorable Paul K. Martin, Inspector General, NASA; and
- Diana L. Burley, PhD, Vice Provost for Research, American University.

HISTORY OF THE COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY

The Soviet Union launched the first satellite, Sputnik 1, into orbit on October 4, 1957, initiating the "Space Race." When the 85th Congress reconvened in 1958, one of its first tasks was the creation of a Select Committee on Astronautics and Space Exploration. This Select Committee wrote the Space Act, which established the National Aeronautics and Space Administration (NASA) and the permanent House Committee on Science and Astronautics, the forerunner of the present Committee on Science, Space, and Technology.

The Science and Astronautics Committee was the first standing committee created in the House in 11 years and the first committee since 1892 to be established for an entirely new area of jurisdiction. The Committee's initial jurisdiction included exploration and control of outer space, astronautical research and development, scientific research and development, science scholarships and legislation relating to scientific agencies. The scientific agencies under the Committee initially included the National Bureau of Standards (now the National Institute of Standards and Technology (NIST), NASA, the National Aeronautics and Space Council and the National Science Foundation (NSF).

In 1974, the Committee's name was changed to the "Committee on Science and Technology." At that time, the Committee's jurisdiction was expanded to include legislation related to energy, the environment, the atmosphere, civil aviation research and development and the National Weather Service. The Committee on Science and Technology was also given a "special oversight" function providing for exclusive responsibility among all Congressional Standing Committees to review and study, on a continuing basis, all laws, programs and government activities involving Federal non-military research and development.

Civilian nuclear research and development was added to the Committee's jurisdiction in 1977 when the Joint Committee on Atomic Energy was abolished. The name was again changed at the outset of the 100th Congress to the Committee on Science, Space,

and Technology. The Republican Party took control of the House in 1995 and officially changed the name to the "Committee on Science."

In its early years, the Committee was an important partner in the Apollo Program that led to a man landing on the moon and strengthening science education and scientific research. After the Committee's role expanded, the Committee has played an important role in much of the legislation Congress has considered dealing with domestic and international science, technology, standards, and competitiveness.

After the terrorist attacks on September 11, 2001, terrorism moved to the forefront of the Committee's agenda. The Science Committee worked to ensure that the Federal Government was investing in the science and technology necessary to combat terrorism over the long term and to assist our nation's first responders. Congress established the Department of Homeland Security (DHS) in 2002 primarily to improve the nation's ability to prevent terrorist attacks. The Science and Technology Directorate—created though bill language developed by the Committee on Science and Technology—funds research, development, testing and evaluation to improve homeland security, and works to transfer relevant technologies to federal, state, and local governments, and the private sector.

When Democrats resumed control of Congress in 2007, the name of Committee was changed back to the "Committee on Science and Technology." Enhancing long-term economic competitiveness through investments in science and technology emerged as a centerpiece of Committee activities in the 110th and 111th Congresses. In response to the National Academies' landmark report, *Rising Above the Gathering Storm,* the Committee led a bipartisan effort to advance the Academies' recommendations, culminating in President Bush's signature of the America COMPETES Act in 2007. The legislation, as enacted, put the budgets of three key federal science agencies on a path to double over ten years: NSF, NIST, and DOE Office of Science. In 2010, a reauthorization of the America COMPETES Act extended and expanded activities called for in the original legislation. It passed as one of the last votes of the 111th Congress and was signed into law in January, 2011.

In the 112th Congress, Chairman Ralph Hall has added "Space" back into the Committee's name: "The Committee on Science, Space, and Technology"—a nod to the Committee's history, broad jurisdiction, and the importance of space exploration in maintaining American innovation and competitiveness.

During the 113th, 114th, and 115th Congresses, the Science, Space, and Technology pursued a vigorous agenda of oversight of both federal programs and non-Federal entities under Chairman Lamar Smith. During this time, the committee also moved a number of space related bills, including notably, the U.S. Commercial Space Launch Competitiveness Act in the 114th Congress.

At the start of the 116th Congress, Chairwoman Eddie Bernice Johnson became the first woman and first African American to Chair the Committee. The first session of the 116th Congress saw a return to extensive bipartisan legislating, with many of the Committee's key pieces of legislation sponsored or cosponsored by both Chairwoman Johnson and Ranking Member Frank D. Lucas. The

second session of the 116th Congress brought unprecedented challenges related to the COVID–19 pandemic. During this session, and pursuant to changes to the House Rules, the Committee held its first remote hearings conducted via the internet.

Today the Committee has jurisdiction over much of the non-defense federal research and development (R&D) portfolio. The Committee has exclusive jurisdiction over NASA, NSF, NIST, the National Weather Service, and the White House Office of Science and Technology Policy and National Space Council. The Committee also has authority over the R&D activities at DOE and civilian National Laboratories, the Environmental Protection Agency, National Oceanic and Atmospheric Administration, Department of the Interior, U.S. Geological Survey, Department of Agriculture, Department of Transportation, Federal Aviation Administration, Department of Homeland Security, and U.S. Fire Administration.

COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY,
Washington, DC, March 8, 2019.

Hon. JOHN YARMUTH,
Chairman, Committee on the Budget,
House of Representatives, Washington, DC.

Hon. STEVE WOMACK,
Ranking Member, Committee on the Budget,
House of Representatives, Washington, DC.

CHAIRMAN YARMUTH AND RANKING MEMBER WOMACK: Please find enclosed the Majority Views and Estimates of the Committee on Science, Space, and Technology on the FY 2020 Budget Request. Thank you for your consideration.

Sincerely,

EDDIE BERNICE JOHNSON,
Chairwoman.

Views and Estimates of the Committee on Science, Space, and Technology on the FY 2020 Budget Request for Submission to the Budget Committee

EDDIE BERNICE JOHNSON.
BILL FOSTER.
DANIEL LIPINSKI.
SUZANNE BONAMICI.
DONALD S. BEYER, JR.
MIKIE SHERRILL.
SEAN CASTEN.
KATIE HILL.
JENNIFER WEXTON.
PAUL D. TONKO.
JERRY MCNERNEY.
BRAD SHERMAN.
STEVE COHEN.
AMI BERA.
KENDRA S. HORN.
LIZZIE FLETCHER.
ED PERLMUTTER.
CONOR LAMB.
CHARLIE CRIST.
HALEY M. STEVENS.
ZOE LOFGREN.

Views and Estimates of the Committee on Science, Space, and Technology on the FY 2020 Budget Request for Submission to the Budget Committee

While it obviously is impossible to prepare a comprehensive review of the President's Fiscal Year (FY) 2020 budget request given that the FY 2020 budget request has not yet been released to Congress, we would note that in the President's FY 2019 budget request we witnessed a continued disregard for science as massive cuts were made to vital research and development (R&D) funding. Unfortunately, we again expect to see more proposed cuts in crucial funding areas like R&D, innovation, education, and technology in the FY 2020 request. We will not attempt to engage in detailed discussion of recommended funding levels for specific programs in these Views and Estimates. However, upon the release of the President's FY 2020 budget, we urge the Budget Committee, as it works to craft its Budget Resolution, to reject further cuts to civilian R&D and science and technology programs. These programs are vital to our scientific enterprise and further cutbacks would put our Nation's global competitiveness in jeopardy. We need to invest in our research agencies NASA, NOAA, NSF, NIST, DOE, EPA, and others that enhance America's economic strength, address our national priorities, advance knowledge, and inspire our youth.

Below are a few key priorities that we wanted to highlight. We hope they will be supported in the Budget Resolution presented to the House of Representatives.

Clean Energy Technologies

Department of Energy (DOE) funds a wide range of research, development, demonstration, and commercial application activities. Given the President's repeated promises to revitalize American infrastructure, and the need to transition to a clean energy economy, we believe strong investments across DOE's civilian energy activities should be a top priority. Instead, the Trump Administration has continually proposed cutting the Department of Energy's science and technology programs in its past budget requests. These proposed cuts would have significantly harmed the development of new clean energy technologies and done lasting damage to the U.S. research enterprise. Despite the proposed cuts for FY 2019, Congress provided DOE with an overall funding increase of 3.3% or $1.14 billion over its FY 2018 level.

While the Administration requested the *elimination* of ARPA–E and the Loan Programs Office (LPO), Congress provided $366 million for ARPA–E, a 3.6% increase from FY 2018, and maintained LPO's spending authority. Given ARPA–E's and LPO's strong records of success we support increased investments (in the case of ARPA–E) and increased leveraging of current statutory loan and loan guarantee authorities (in the case of LPO) going forward.

DOE's other energy technology offices received funding increases from Congress in FY 2019 despite the Administration proposing significant cuts in its request. These include the Office of Energy Efficiency and Renewable Energy, Fossil Energy R&D, and Nuclear Energy. The activities of the Office of Electricity and the Office of Cybersecurity, Energy Security, and Emergency Response were also slated for large decreases in FY 2019 by the Administration, which Congress rejected. To enhance these programs' roles in accelerating the United States toward a clean energy economy, we support continued increases to their funding well above inflationary levels.

The Trump Administration's FY 2019 request would also have cut the Office of Science's overall budget by 14% compared to FY 2018 funding levels. Yet the funding approved by Congress increased support for this Office by 5%, totaling $6.59 billion. The Office of Science is responsible for carrying out some of the most important science and energy research programs in the world. Without consistent, strong investments, the world-class user facilities and national laboratories stewarded by the Office will experience setbacks in facility construction, operations, and critical upgrades. Within the Office of Science, Fusion Energy Sciences received a 6% (or $32 million) funding increase, despite the Administration's proposal to cut this critical program by 36.1%. The ITER project, within the Fusion Energy Sciences program, ultimately received $10 million more compared to FY 2018 in contrast to a 38.5% cut proposed by the Administration, but its overall funding still failed to meet the levels that DOE has projected are required to keep this project on schedule and minimize its cost. Due to the previous shortfalls in meeting the U.S. commitments to this project, the required investment in the U.S. contribution to the ITER project is now $280 million in FY 2020, including $100 million for the cash contribution to the ITER Organization. We would strongly urge

that substantially stronger support for each of these programs be in the Budget Resolution.

Strong Environmental Protection Agency

Though a few will point to the successes of the Environmental Protection Agency (EPA) in protecting public health and the environment over the past 40 years as a reason to stop pushing for stricter limits on pollution, it is important to note that these protections must be sustained with robust funding for the Agency. Maintaining clean air and water, and protecting our most vulnerable populations from environmental contaminants, is a continuing endeavor. We should be investing more in EPA, not less. America has proven that a strong economy and a healthy and safe environment are not mutually exclusive.

This Administration has sought to cut the overall budget of the Agency by over 25% in both the FY 2018 and FY 2019 proposed budget requests. The Office of Research and Development (ORD), responsible for crosscutting research programs that provide the scientific foundation for many of the Agency's regulatory actions, has seen dramatic proposed cuts from this Administration of almost 50% in both the FY 2018 and FY 2019 budget requests, with some programs proposed to be eliminated altogether. Fortunately, Congress has stepped in these past two years and rejected these drastic cuts.

The FY 2019 Omnibus Appropriations Act provided flat funding compared to the FY 2018 enacted budget for both the Agency overall, as well as the Science and Technology programs. The FY 2019 Omnibus bill also provides funding for extramural research through the Science to Achieve Results (STAR) Research Grants, which funds research that is unique to the EPA and is not funded anywhere else in the federal government.

We would urge the Budget Committee to continue on the path laid out in the FY 2019 Omnibus Appropriations Act and maintain the top-line funding for the Agency and the EPA's Science and Technology programs, while continuing to provide sustained funding for the Office of Research and Development to meet critical research needs.

Climate Change Research

Last year, the publication of the second volume of the Fourth National Climate Assessment made it clear that our climate is already changing and will affect all Americans across the country. Our coastal communities are being threatened by rising sea levels, strong storm surges, and heavy precipitation. We have seen unprecedented extreme weather events in 2017 and 2018 ranging from drought, flooding, wildfires, and record heat and cold waves, which caused billions of dollars in disaster costs annually. These events are becoming more intense and frequent due to a changing climate, and will have numerous impacts to our public health, our economy, and our society.

Though our understanding of the physical drivers of climate change has improved, there is a clear need for continued sustained funding for research at agencies such as NOAA and NASA that

will help inform robust solutions to one of our nation's greatest challenges: climate change.

Civil Space and Aeronautics

The National Aeronautics and Space Administration (NASA) has long been recognized as the world leader in aeronautics and space research and exploration. We support robust funding that will allow NASA to maintain a balanced and healthy portfolio of programs in aeronautics, Earth and space science, technology development, and human spaceflight and exploration, as well as allowing investments in the infrastructure that will be required if NASA is to carry out the tasks our nation has given it.

With respect to NASA, ensuring the health of all of NASA's mission areas will require, among other things, that: scientific priorities established by the National Academies decadal surveys continue to be supported; NASA's role in educating and inspiring the next generation is maintained through its educational programs; that NASA's space technology research and development program continues to support cross-cutting mission areas; and, that any new initiatives in exploration be funded through increasing NASA's topline budget and not by robbing Peter to pay Paul.

The FY 2019 NASA budget request of $19.89 billion proposed to initiate a significant lunar exploration program by cutting high priority science and educational activities. In addition, the FY 2019 budget for NASA proposed a topline budget for NASA that was assumed to remain flat in the outyears. That approach is not one that facilitates sustainability, a much needed element of a long-term exploration program. Congress, in maintaining its strong, bipartisan support of NASA, appropriated $21.5 billion for FY 2019, a $1.6 billion increase over the enacted FY 2018 appropriation. In addition, Congress sustained funding for high-priority science and educational activities that were proposed to be eliminated in the FY 2019 budget proposal.

For FY 2020, we urge the Budget Committee to advocate for NASA funding that supports a robust, multi-mission agency, and that NASA's proposed outyear budgets reflect the resources required to maintain NASA's inspiring mission and global leadership in aeronautics, science, technology, and human exploration.

National Oceanic and Atmospheric Administration (NOAA)

The National Oceanic and Atmospheric Administration (NOAA) is responsible for collecting environmental data with its cutting-edge network of satellites and in-situ observations, and uses this data to protect life and property through weather forecasts and warnings of hazardous weather by the National Weather Service.

This Administration's last two budget requests have called for draconian cuts to the line offices within the Committee's jurisdiction, and has proposed deep cuts or complete elimination of numerous climate, oceanic, and atmospheric programs and grants. The FY 2019 Omnibus Appropriations Act provides $5.4 billion for NOAA, almost $900 million above the budget request, which includes funding for climate research, the National Weather Service, and procurement of future weather satellites.

We encourage the Budget Committee to maintain robust funding for NOAA across all line offices, especially for environmental data collection and scientific research needs to ensure the agency can continue to meet its critical mission.

It is also imperative that funding for the next generation of NOAA's weather satellites be maintained to ensure that those satellite programs remain on track for successful development and launch.

National Science Foundation (NSF)

Unfortunately, we expect another disappointing budget request for the National Science Foundation (NSF). NSF is the only federal agency to support basic research across all fields of science and engineering. At a time of increasing global competition and national urgency in critical research areas like quantum science, artificial intelligence, the future of work, and climate change, the Administration proposed a 4 percent cut to NSF for FY 2019, and an 11 percent cut in FY 2018. Congress had it right by appropriating a 4 percent budget increase for NSF in FY 2019. At a minimum, NSF should be funded at the FY 2019 level to support the cutting edge research that makes the U.S. the global leader in innovation.

National Institutes of Standards and Technology (NIST)

For two years in a row, the Administration requested significant cuts to the NIST budget. In FY 2018, it was a 24 percent cut, including a 13 percent cut to NIST's core measurement research and standards account, and complete elimination of the Manufacturing Extension Partnership (MEP) Program. There were cuts across the board, including in areas of immediate importance to U.S. competitiveness and national security. Two years in a row the Administration also proposed to slash funding for forensics research, including the elimination of funding for the Forensic Science Center of Excellence awarded in 2015, as well as funding for the Organization of Scientific Area Committees which led the forensic standards development process—even though the evidence is clear that there is much more work that needs to be done to strengthen forensic science and standards. The Administration also proposed to terminate support for three university-based testbeds under the Greenhouse Gas Measurements program, as well as for several other environmental measurements projects across NIST laboratories. The refusal to measure our changing environment doesn't mean it is not changing—it just means we won't have all the tools needed to prepare for and adapt to those changes. Even support for NIST's two major user facilities, the Center for Neutron Research and the NanoFab, was slated for cuts. We write this without an FY 2020 request in hand, but with little doubt that we will see an equally alarming budget request this year.

NIST is one of the most important but underappreciated agencies in our government. The work NIST does with its relatively modest budget yields incalculable benefits to the competitiveness of U.S. industry across all sectors while also protecting the security, privacy, safety, and wellbeing of all Americans. Any proposed cuts to

NIST should be rejected. To the contrary, NIST is worthy of additional support in the Budget Resolution.

Department of Homeland Security (DHS)

DHS's Science and Technology (S&T) Directorate is responsible for providing the research and technology capabilities for the operational components of the Department. While the FY 2019 funding level of $309 million represented a 2.5 percent decrease from FY 2018, it was still a clear rebuke of the Administration's FY 2019 proposal to cut the office by 29 percent. The Countering Weapons of Mass Destruction Office (CWMD), which combined the functions of the Domestic Nuclear Detection Office and the Office of Health Affairs, received a nearly 5 percent decrease in FY 2019. S&T and CWMD carry out critical research and development programs in cybersecurity, first responder technologies, critical infrastructure resilience, threat detection, and many more areas that keep Americans safe. For fiscal year 2020, we urge the Budget Committee to provide the level of funding necessary to fully support the work of both the S&T Directorate and CWMD Office.

COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY,
Washington, DC, March 13, 2019.

Hon. JOHN YARMUTH,
Chairman, Committee on the Budget,
House of Representatives, Washington, DC.

Hon. STEVE WOMACK,
Ranking Member, Committee on the Budget,
House of Representatives, Washington, DC.

CHAIRMAN YARMUTH AND RANKING MEMBER WOMACK: Please find enclosed the Minority Views and Estimates of the Committee on Science, Space, and Technology on the FY 2020 Budget Request. Thank you for your consideration.

Sincerely,

FRANK D. LUCAS,
Ranking Member.

BUDGET VIEWS AND ESTIMATES OF THE REPUBLICAN MEMBERS OF THE COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY FOR FISCAL YEAR 2020

Science and technology are essential to America's national defense and economic security. The basic research our government supports is foundational to our economic success. It allows us to stay at the forefront of cybersecurity, medical treatments, agricultural production, and technological exports.

The Republican Members of the Committee on Science, Space, and Technology will continue to build on the Committee's work over the last eight years to ensure that the United States remains the world's leader in Research and Development. This is not an easy task as we face enormous budget challenges. But it can be done. On a bipartisan basis this year Congress supported $151.5 billion in Fiscal Year 2019 for federal R&D, a 6 percent increase and the highest point ever in inflation-adjusted dollars.

Committee Republicans will seek to increase support for basic research in the physical sciences. These are the areas with the greatest potential for scientific breakthroughs that will benefit new industries and U.S. jobs. America's universities and research institutions carry out federally-funded basic and fundamental scientific research that drives new discoveries and innovations—creating new companies, new industries, more private sector jobs, and economic growth and security.

Committee Republicans support reauthorizing key federal science agencies, including the National Aeronautics and Space Administration (NASA), the Department of Energy's (DOE's) Office of Science and applied energy programs, the National Science Foundation (NSF), the National Institute of Standards and Technology (NIST), the National Oceanic and Atmospheric Administration's research, data, and weather programs, science and technology at the Department of Homeland Security, and research and development components within the Federal Aviation Administration.

Department of Energy {DOE)

• The minority seeks to prioritize basic research and science as directed in P.L. 115–246, the Department of Energy Research and

Innovation Act, which was signed into law in September 2018. The minority seeks to provide researchers in all 50 states with access to world-class user facilities, including supercomputers and light sources at DOE national labs. Federal funding focused on the commercialization of energy technologies often competes with private sector funding, and rarely provides the best investment of taxpayer dollars. A more appropriate role for the federal government sponsoring basic scientific research that cannot be undertaken by industry, often carried out in universities and the DOE national labs.

- The minority supports robust funding for the DOE Office of Science account funding level in Function 250. The minority will seek to prioritize basic research in the physical sciences, with specific focus on providing funding to high performance computing, nuclear physics, high energy physics, fusion energy sciences, and investments in critical user facility upgrades across the DOE national lab complex.
- The minority supports responsible funding for the DOE applied energy research programs, prioritizing early-stage research applied research that cannot be undertaken by industry. This includes investing in user facilities and computing capabilities that facilitate the demonstration of technologies to improve the efficiency, affordability, and reliability of all forms of energy.
- The minority recognizes that nuclear power is a vital emissions-free energy source, and seeks to prioritize nuclear energy R&D in accordance with P.L. 115–248, the Nuclear Energy Innovation Capabilities Act, which was signed into law in September 2018. This legislation authorizes the construction of the Versatile Test Reactor user facility, and combines the strengths of the DOE national labs, universities, and the private sector in the establishment of the National Reactor Innovation Center. These are critical tools necessary to facilitate private sector development of advanced nuclear reactor technology, and the minority is committed to ensuring full implementation of this legislation.
- The National Quantum Initiative Act (P.L. 115–368) was signed into law by the President in December 2018. This legislation authorizes basic research in quantum information science within the DOE Office of Science, and the establishment of up to five National Quantum Information Science Research Centers. The minority supports full implementation of this legislation.
- The minority seeks to promote collaborative, interagency research partnerships that leverage DOE's world-class computing capabilities. The minority supports passage of H.R. 617, the Department of Energy Veterans' Health Initiative Act, which authorizes the continuation of the MVP-CHAMPION partnership with the Department of Veterans Affairs, and a two-year DOE pilot program to advance research in artificial intelligence, data analytics, and computational research. Through this legislation, the minority strives to further enhance DOE's computing capabilities to meet nuclear science, energy, and security mission goals of the Department.

Environmental Protection Agency (EPA) Science

- EPA funding should be reflective of the Agency's mission focus of protecting human health and the environment. Office of Re-

search and Development resources should be focused on meeting EPA program and regional office priorities to prevent waste and promote efficiency.

National Science Foundation

• The minority supports NSF's efforts to promote interdisciplinary research across its research directorates through the "10 Big Ideas," which are high-priority areas that integrate multiple fields of science and engineering and create opportunities to partner with industry, private foundations, other federal agencies and the education sector. Last year's budget request called for NSF to invest $60 million in two Convergence Accelerators—new vehicles to leverage resources across the agency to support the most innovative science, pursuant to the Harnessing the Data Revolution and The Future of Work at the Human Technology Frontier Big Ideas. The minority supports prioritizing funding for NSF to continue these initiatives, while maintaining core research funding in priority areas like math and physical sciences, computer information science, engineering, and biological science.

• The National Quantum Initiative Act (P.L. 115–368) was signed into law by the President last Congress. As part of the initiative, NSF is directed to carry out a basic research and education programing on quantum information science and engineering. It also provides for NSF to award grants for the establishment of Multidisciplinary Centers for Quantum Research and Education. The minority will push for full implementation of policy provisions in P.L. 115–368,

• The minority will ensure that federally funded research conducted through NSF, and all agencies, is in the national interest. Throughout its history, the NSF has played an integral part in funding breakthrough discoveries in fields as diverse as mathematics, physics, chemistry, computer science, engineering and biology. A defined "national interest" requirement and criteria, as part of the American Innovation and Competitiveness Act (P.L. 114–329), has gone a long way towards ensuring the grant-making process at NSF is transparent and accountable to the American public.

Science, Technology, Engineering, Mathematics and Computer Science (STEM) Education

• The Administration recently released its 5-year STEM strategic plan, "Charting a Course for Success: America's Strategy for STEM Education." The three guiding objectives of the plan are to (1) build strong foundations for STEM Literacy; (2) increase diversity, equity, and inclusion in STEM; and (3) prepare the STEM workforce of the future. The minority supports and applauds these objectives and looks forward to following the subsequent implementation of the plan by federal science agencies.

• The federal government invests more than $4.3 billion into 255 different programs with the primary goal of growing the STEM workforce. Despite these investments, the number of students prepared for STEM degrees, pursuing STEM degrees, and staying in STEM careers continues to lag. While the minority believes these investments are of critical importance, it is also important to ensure they are not duplicative. It should be a priority for these agen-

cies to improve the coordination of STEM education and workforce development activities across the Federal agencies, including disseminating the latest discoveries on what works in teaching and learning and facilitating equal access.

• Last Congress, the president signed into law the "Innovations in Mentoring, Training and Apprenticeships Act" (P.L. 115–975). The minority will push to build off this progress and continue its work to ensure the American workforce has the flexible STEM skills needed to compete in the global economy. The number of U.S. jobs that require STEM skills has grown nearly 34 percent over the past decade and is expected to continue this trajectory. To remain competitive, the U.S. needs flexible STEM-capable works at every education level. A well-educated, trained and diverse STEM proficient workforce ensures our future economic prosperity.

National Institute of Standards and Technology (NIST)

• Last Congress, the president signed into law the "National Quantum Initiative Act" (P.L. 115–368). At NIST, the bill supports basic quantum information science research and standards development and provides funds to convene a workshop to examine the development of a quantum science and technology industry. These investments will allow the U.S. to take the lead in developing global quantum standards and measures. The minority will push for full implementation of policy provisions in P.L. 115–368.

• The minority supports prioritizing NIST's core lab capabilities in the Scientific and Technical Research and Services account to support the transformation of basic research into innovations and new technologies that are critical to America's industrial competitiveness, with a focus on emerging technology areas.

• It is important that NIST remains a global leader in cybersecurity knowledge, scientific standards-setting, and research and analysis of cyber security readiness. NIST should also prioritize its fundamental and applied cybersecurity research to address key questions relating to measurement of privacy, security, and vulnerability of software tools and communication networks, which will be essential as emerging technologies like artificial intelligence and internet of things are adopted.

National Aeronautics and Space Administration (NASA)

• With President Trump's enactment of P.L. 115–10, the NASA Transition Authorization Act of 2017, the Committee has reignited America's pioneering spirit for exploration of new frontiers and worlds through reinvigoration of our space science program with the entrepreneurial drive of commercial incentives and ideas.

• The minority will push for full implementation of the policy provisions in P.L. 115–10, as well as for at least maintaining the Fiscal Year 2019 funding level established in the recent omnibus appropriations bill.

• The minority is also cognizant of the counterproductive nature of authorizing funding for NASA that Appropriators are unable to match because of other statutory limitations. The result leaves NASA with unfunded obligations, fails to set national priorities, abdicates the responsibilities of an authorizing Committee, and sets NASA up for failure.

• NASA should maintain a balanced portfolio of programs, including Deep Space Exploration, Space Operations, Planetary Science, Astrophysics, Earth Science, and Heliophysics, and Aeronautics, while also being conscientious of expending taxpayer funding.
• NASA should ensure that the Space Launch System and Orion programs receive adequate funding to launch Exploration Mission 1 and Exploration Mission 2 on schedule.
• NASA should fully fund the commercial cargo and crew programs and support commercial low earth orbit and lunar payload development.

Department of Commerce

• The Department of Commerce should elevate the Office of Space Commerce in order to enhance its stature in interagency deliberations. The Office should be funded at no less than $5 million in order to expedite licensing of commercial remote sensing activities as well as additional responsibilities directed in the House-passed American Space Commerce Free Enterprise Act (H.R. 2809, 115th Congress).

Federal Aviation Administration (FAA)

• FAA R&D in FY 2020 should reflect a balanced portfolio of activities that appropriately prioritizes aviation safety. FAA R&D should also assist in the certification of new technologies, particularly unmanned aerial systems (UAS), into the national airspace system (NAS).
• FAA's Office of Commercial Space Transportation should be adequately funded at $21.6 million to license and permit commercial launch or reentry activities without delay. The Office should focus and prioritize its resources in order to execute these statutory responsibilities and not take on additional work beyond those explicitly tasked by Congress.

National Oceanic and Atmospheric Association (NOAA)

• Fund priority public safety NOAA Weather Research in the Office of Oceanic and Atmospheric Research at the $131.5 million authorized in P.L. 115–25, the Weather Research and Forecasting Innovation Act of 2017, in Function 300. Saving lives and protecting property must be NOAA's primary mission.
• Provide $6 million for the NOAA Commercial Weather Data Pilot project out of existing funding in the NOAA Procurement, Acquisition, and Construction account as authorized in P.L. 115–25.
• Improve weather observation data through the required use of observing system simulation experiments and next generation computing and modeling capabilities consistent with P.L. 115–25. This new law provides NOAA with the flexibility to buy new, affordable, and potentially better sources of data from the private sector that have the power to make real improvements to our weather forecasting capabilities and creates a much-needed new $20 million technology transfer initiative in NOAA's Office of Oceanic and Atmospheric Research.
• Funding for NOAA's climate change programs should be focused on shorter term predictions and local risk planning to miti-

gate the immediate impacts of climate change and adapt to changing weather patterns.

FRANK D. LUCAS.
RALPH NORMAN.
MICHAEL WALTZ.
ANTHONY GONZALEZ.
PETE OLSON.
MO BROOKS.
JAMES R. BAIRD.
ROGER W. MARSHALL.
RANDY K. WEBER, SR.
TROY BALDERSON.
BRIAN BABIN.
BILL POSEY.

COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY,
Washington, DC, March 23, 2020.

Hon. JOHN YARMUTH,
Chairman, Committee on the Budget,
House of Representatives, Washington, DC.

Hon. STEVE WOMACK,
Ranking Member, Committee on the Budget,
House of Representatives, Washington, DC.

CHAIRMAN YARMUTH AND RANKING MEMBER WOMACK: Please find enclosed the Minority Views and Estimates of the Committee on Science, Space, and Technology on the FY 2021 Budget Request. Thank you for your consideration.

Sincerely,

EDDIE BERNICE JOHNSON,
Chairwoman.

VIEWS AND ESTIMATES OF THE COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY ON THE FY 2021 BUDGET REQUEST FOR SUBMISSION TO THE BUDGET COMMITTEE

EDDIE BERNICE JOHNSON.
ZOE LOFGREN.
DANIEL LIPINSKI.
SUZANNE BONAMICI.
AMI BERA.
LIZZIE FLETCHER.
HALEY STEVENS.
KENDRA HORN.
BRAD SHERMAN.
STEVE COHEN.
JERRY MCNERNEY.
ED PERLMUTTER.
PAUL TONKO.
BILL FOSTER.
DON BEYER.
SEAN CASTEN.
JENNIFER WEXTON.
CONOR LAMB.

VIEWS AND ESTIMATES OF THE COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY ON THE FY 2021 BUDGET REQUEST FOR SUBMISSION TO THE BUDGET COMMITTEE

As was the case last year and the year before that, the President's Fiscal Year 2021 Budget Request reflects a lack of vision about the critical role that the nation's science and technology enterprise plays in ensuring our international competitiveness, promoting our citizens' quality of life, and protecting our national security. The Budget Request proposes deep cuts to vital research and development (R&D) programs and initiatives. America risks losing its preeminence in an increasing number of scientific and technological areas if we fail to make adequate investments in those areas.

Our message to the Budget Committee and the rest of Congress is a simple one: Namely, if enacted, the President's Fiscal Year 2021 budget request for the nation's R&D agencies would do serious harm to the nation both now and over the long term and it should be rejected by Congress.

The following sections address a few of the key areas that we believe are under threat and warrant increased investment rather than deep cuts.

National Science Foundation (NSF)

Funding for the National Science Foundation (NSF) has increased steadily in recent years, reaching $8.3 billion in FY 2020. The nearly $540 million cut proposed by the Administration for NSF in FY 2021 would represent a damaging step backwards for the agency. Our nation's leadership in science and technology is increasingly threatened across nearly all fields of science and engi-

neering, including artificial intelligence, quantum science, and engineering biology, and research funded by NSF constitutes the very foundation of our entire science and technology enterprise. In addition, our nation faces an increasing demand for workers with STEM skills, and NSF is the leader in advancing innovation in STEM education at all levels.

We applaud the agency for sustaining its commitment to take bold new steps to transcend disciplinary boundaries and drive new frontiers in science and engineering through the 10 Big Ideas and the Convergence Accelerator. Our science agencies need to think big if they are to address society's most pressing scientific and technological challenges. We support the increases for research on emerging technologies including artificial intelligence, quantum information science, and synthetic biology. However, it is short-sighted for these investments to come at the expense of the agency's support for other critical research and education activities. We urge sufficient funding to support these important technology areas while also sustaining investments in foundational research across all disciplines, broadening participation, and STEM education from K–12 through graduate student training. We also need to maintain progress on all of the ongoing projects within the Major Research Equipment and Facilities Construction Account.

National Aeronautics and Space Administration (NASA)

NASA's challenging and inspiring missions are a catalyst for our nation's economic growth, innovation, scientific advancement, and the development of our science, technology, engineering, and mathematics-based education and workforce. Given that, the President's Budget Request represents a missed opportunity. While it provides a 12 percent increase over the FY 2020 enacted appropriation for NASA—in large part to provide additional funding for the President's Artemis Moon-Mars program—a significant fraction of that increase would be obtained by cancelling a number of high-priority science missions and once again attempting to eliminate NASA's Office of STEM Engagement. While there is broad bipartisan support for a credible and sustainable program of human space exploration with the horizon goal of Mars, it should be pursued in a manner that is not premised on harmful cuts or cancellations to NASA's science and climate research programs or to its STEM education programs.

Department of Energy (DOE) R&D

The FY 2021 Budget Request would cut DOE's non-defense research, development, and demonstration budget by 34.8 percent overall compared to FY 2020 enacted levels, which would significantly harm the development of new clean energy technologies and do lasting damage to the U.S. research enterprise. These proposed cuts include the elimination of ARPA–E and the Loan Programs Office (LPO). Most of DOE's other energy technology offices would receive significant cuts from FY 2020 funding levels. The Office of Energy Efficiency and Renewable Energy (EERE) would receive the largest cut of 74.2 percent (or $2.07 billion). EERE's primary mission is to "create and sustain American leadership in the transition to a global clean energy economy." EERE makes crucial invest-

ments in sustainable transportation (including energy storage), renewable energy, and energy efficiency. Nuclear Energy, which supports the development of advanced nuclear energy technologies that may be critical to future emissions reductions, would also be cut by 21 percent (or $313 million). Large reductions to so many of these clean energy programs would hurt the global competitiveness of the United States as well as our nation's ability to mitigate the rapidly growing impacts of climate change.

In addition, the Budget Request would cut the Office of Science by $1.16 billion, or 16.6 percent, from FY 2020 enacted levels. The Office of Science is responsible for supporting some of the most important science and energy research programs and facilities in the country. Without consistent, strong investments, the world-class user facilities and national laboratories stewarded by the Office would experience setbacks in facility construction, operations, and critical upgrades to facilities that house sensitive equipment and host thousands of scientists annually.

National Institutes of Standards and Technology (NIST)

The National Institute of Standards and Technology (NIST) is one of the most important but underappreciated agencies in our Federal government. Unfortunately, the Administration's Budget Request would cut funding for NIST by nearly 31 percent in FY 2021, including a 13.5 percent cut to Scientific and Technical Research Services (STRS), which is NIST's core measurement research and standards account. Such a cut would result in the elimination of 479 employee positions. Much of this technical talent could be lost forever even if the budget rebounded in subsequent years. These cuts would set back progress in biosciences, environmental measurement, forensic science, advanced communications, materials, disaster resilience, and many more important but overlooked programs at NIST. Given the fact that NIST already lacks the resources it needs to lead on international standards setting across all technologies and sectors, including important industries of the future, these cuts would be a gift to China and our other competitors, ceding U.S. interests in important international standards that benefit our companies and economy. Finally, within STRS, the budget proposal seeks to cut funding at the Center for Neutron Research, an aging but critically important user facility.

The Administration is also proposing to once again dramatically decrease support for NIST's Industrial Technology Services (ITS) account. This decrease includes the elimination of the Manufacturing Extension Partnership (MEP) program. The MEP program has proven to be a successful model for federal-state partnerships with significant payoff in economic growth and job creation across our nation. According to NIST, for every dollar of Federal investment, the MEP National Network generates $29.5 in new sales growth for manufacturers and $31.0 in new client investment. The ITS account also includes the Manufacturing USA network, which is coordinated through NIST and develops partnerships between companies, academia, and entrepreneurs to develop and deploy manufacturing technologies. Finally, the FY 2021 request would cut NIST's construction budget by $77 million, or 66 percent. This proposal covers some basic maintenance of NIST facilities but

would not meet the agency's needs. Many of NIST's facilities are aging or outdated. Based on Department of Commerce standards, roughly 60 percent of NIST's facilities are in poor to critical condition.

National Oceanic and Atmospheric Administration

The President's FY 2021 Budget Request proposes cuts of over $727 million from NOAA programs and a reduction of 436 Full-Time Equivalent (FTE) positions. This is a 13.6 percent reduction in the agency's funding from the FY2020 Enacted Budget. These excessive cuts signal a retreat from NOAA's operational mission to understand and predict changes in climate, weather, oceans and coasts; share that knowledge and information; and conserve and manage coastal and marine ecosystems and resources. We cannot support these kinds of draconian cuts which endanger not only the vitality of the Agency itself but puts at risk the lives of millions of Americans that rely on the critical research, observations, and information produced by NOAA.

As NOAA celebrates its 50th anniversary this year, it is important to recognize the significant contributions the agency has made to the environmental understanding and protection of the nation since its inception. The proposed cuts to NOAA's funding for the National Climate Assessments, and reductions to NOAA's research and grants funding overall, would make it exceedingly difficult for the Agency to continue making strides in our understanding of climate change.

The President's Budget Request continues to propose reductions to critical earth and ocean observations, the tsunami warning program, marine debris removal and research, investments in numerical weather prediction models, funding for ocean exploration activities, and others along with eliminations or near eliminations of key programs like the National Sea Grant College Program, the Joint Technology Transfer Initiative, Regional Climate Services, the Air Resources Laboratory, the National Estuarine Research Reserve System, and the NOAA Office of Education. Climate competitive research, integrated water prediction, coastal zone management grants, arctic and Antarctic research programs, and many others are also proposed to be eliminated in the President's budget. In addition, the President's Budget Request proposes an unacceptable reduction of 365 positions, including 227 FTEs, within the National Weather Service despite an ongoing shortage of weather forecasters. The importance of maintaining a fully functioning NOAA cannot be overstated. We need to ensure that NOAA has adequate resources to continue to meet its lifesaving mission.

Environmental Protection Agency (EPA)

The President's Budget for FY2021 requests $6.7 billion for the Environmental Protection Agency, $2.4 billion (or 26 percent) below the FY2020 enacted level of $9.1 billion. The request for the Science & Technology programs within the EPA is $485 million, which is $232 million (or 32 percent) below the FY2020 enacted level of $716 million. While it is encouraging to see modest budget increases in multiple research program areas to deal with PFAS, lead, and harmful algal blooms, it does not counter the fact that

the R&D budget at the agency, primarily within the Office of Research and Development (ORD), has been proposed to be cut by approximately $201 million (or 40 percent) from the FY2020 enacted appropriations across five of the six integrated and transdisciplinary research programs.

II. OVERSIGHT ACTIVITIES

Oversight Authority & Responsibilities

The Committee on Science, Space, and Technology was first established as the Committee on Science and Astronautics on July 21, 1958 in a direct response to the Soviet Union's 1957 launch of Sputnik 1, the world's first satellite. The Committee was created to help the United States foster innovation and stay globally competitive in the science and technology domains. House Rule X, clause 1 (p) sets forth the legislative jurisdiction of the Committee. However, Rule X, clause 3 (k) grants the Committee "special oversight functions" that stretches beyond its legislative jurisdiction. As this clause sets out: "The Committee on Science, Space, and Technology shall review and study on a continuing basis laws, programs, and Government activities relating to nonmilitary research and development." [1] This provides the Committee with wide-ranging oversight authority over science and technology issues throughout the government.

Each of the Committee's five subcommittees, as well as the full Committee, engage in oversight work as authorized by House rules. These five subcommittees include the Subcommittee on Energy, Subcommittee on Environment, Subcommittee on Research and Technology, Subcommittee on Space and Aeronautics, and the Subcommittee on Investigations and Oversight. Although each subcommittee engages in oversight efforts, the Committee's investigations and oversight activities are led and coordinated by the Investigations & Oversight (I&O) Subcommittee.

Investigations and Oversight Efforts in the 116th

COVID–19. The Committee pursued an aggressive investigations and oversight agenda on topics related to COVID–19 during the second session of the 116th Congress. It sent three letters to agency heads seeking information about the Administration response to the pandemic and held the following events:

- March 5, 2020—Full Committee hearing: C*oronaviruses: Understanding the Spread of Infectious Diseases and Mobilizing Innovative Solutions*
- May 1, 2020—Investigations & Oversight Subcommittee briefing: *Serology Testing for COVID–19*
- May 5, 2020—Full Committee Roundtable: *COVID–19 and the Federal Research Enterprise*
- May 14, 2020—Investigations & Oversight Subcommittee briefing: *COVID–19 Vaccine Research and Development: Opportunities and Challenges*
- May 21, 2020—Investigations & Oversight Subcommittee briefing: *Fighting COVID–19 Using CRISPR Technologies*

[1] House Rule X, clause 3, (k)—attached as Appendix A.

- June 9, 2020—Investigations & Oversight Subcommittee briefing: *Approaches to COVID–19 Modeling and Lessons Learned*
- June 12, 2020—Full Committee hearing: *The Role of AFG and SAFER Grants in COVID–19 Response*
- June 19, 2020—Investigations & Oversight Subcommittee hearing: *Repurposing Therapeutic Drugs for COVID–19: Research Challenges and Opportunities*
- June 23, 2019—Space & Aeronautics Subcommittee hearing: *R&D to Support Healthy Air Travel in the COVID–19 Era and Beyond*
- July 14, 2020—Full Committee hearing: *Sweltering in Place: COVID–19, Extreme Heat, and Environmental Justice*
- September 9, 2020—Research & Technology Subcommittee hearing: *The Impact of the COVID–19 Crisis on University Research*
- September 11, 2020—Energy Subcommittee hearing: *Biological Research at the Department of Energy: Leveraging DOE's Unique Capabilities to Respond to the COVID–19 Pandemic*
- September 23, 2020—Investigations & Oversight Subcommittee hearing: *Data for Decision-Making: Responsible Management of Data during COVID–19 and Beyond*
- September 30, 2020—Environment Subcommittee hearing: *Coping with Compound Crises: Extreme Weather, Social Injustice, and a Global Pandemic*

Whistleblowers. The Committee maintained an open door policy for whistleblowers seeking to alert Congress to issues of waste, fraud, abuse, or mismanagement at agencies under the Committee's jurisdiction or within other activities within the Committee's broad oversight authority. The Committee received complaints and information from several anonymous whistleblowers during the 116th Congress. The Subcommittee on Investigations & Oversight heard testimony from a former agency official and whistleblower at a hearing, held pursuant to pursuant to Rule XI, clause 2, subsection (n), on July 17, 2019 on Scientific Integrity at Federal Agencies.

GAO & OIGs. The Committee coordinated with the Government Accountability Office (GAO) and the various Offices of Inspectors General (OIGs) within agencies under the Committee's legislative jurisdiction to ensure Departments, programs, and agencies were transparent and implementing GAO and OIG recommendations. The Committee investigated an effort by the Environmental Protection Agency to establish a new policy that would modify the expectations of employees to cooperate fully with inquiries by its OIG. It also examined refusals by the Department of Commerce to comply with the Commerce OIG in finalizing a report on the Department's actions in communicating risk during Hurricane Dorian in the fall of 2019.

The Committee also initiated a number of new study requests with GAO to address programmatic questions in detail. The Committee plans to review GAO's findings as they are published and consider what follow-on actions may be appropriate.

Climate science. The Committee tracked emerging issues and scientific research on climate science and observations, climate impacts, and strategies to support both greenhouse gas emissions reductions and adaptation. The GAO High Risk List for 2019 included "Limiting the Federal Government's Fiscal Exposure by Better Managing Climate Change Risks." Pursuant to Rule XI, clause 2, subsection (p), the committee held four hearings:

February 13, 2019—Full Committee hearing: *The State of Climate Science and Why it Matters*

June 4, 2019—Full Committee hearing: *Nature in Crisis: Biodiversity Loss and its Causes.*

May 21, 2019—Investigations and Oversight Subcommittee hearing: *The Need for Resilience: Preparing America's Transportation Infrastructure for Climate Change.*

January 15, 2020—Full Committee hearing: *An Update on the Climate Crisis: From Science to Solutions*

Extreme weather hazards. The Committee examined the increasing incidence of extreme weather events such as floods, fires and hurricanes, including the science behind these hazards and how climate change is influencing their frequency and severity. The Committee investigated EPA's air monitoring activities in the wake of Hurricane Harvey, which devastated parts of southeast Texas in 2017. To this end the Committee held three hearings:

July 22, 2019—Environment Subcommittee field hearing in Houston, TX: *Weathering the Storm: Improving Hurricane Resiliency through Research.*

September 26, 2019—Full Committee hearing: *Understanding, Forecasting, and Communicating Extreme Weather in a Changing Climate*

February 27, 2020—Joint Subcommittee hearing, Environment Subcommittee lead, with Investigations & Oversight Subcommittee: *An Examination of Federal Flood Maps in a Changing Climate*

Voting system design and integrity. The Committee considered election system vulnerabilities in the 116th Congress following election system vulnerabilities that surfaced following the 2016 and 2018 elections. On June 25, 2019 the Investigations & Oversight and Research & Technology subcommittees held a joint hearing on *Election Security: Voting Technology Vulnerabilities.* The hearing informed the development and introduction of H.R. 4990, the *Election Technology Research Act.*

Identifying and mitigating influence operations. The Committee investigated the use of social media and other online outlets for disseminating disinformation and conducting influence operations against the American public. On September 26, 2019, the Investigations & Oversight Subcommittee held a hearing on *Online Imposters and Disinformation.*

Unauthorized use of private data. The Committee explored the unauthorized use of private data for commercial purposes, focusing in particular on facial recognition technologies. To this end, the Committee investigated a private company that uses web scraping to aggregate facial imagery through online image repositories and social media.

Science integrity issues. The Committee evaluated scientific integrity concerns across several federal agencies, including efforts to silence scientists and sideline specific scientific activities for political purposes and episodes of agency managers modifying and suppressing scientific work products. Pursuant to Rule XI, clause 2, subsection (n), the Committee held three hearings:

March 27, 2019—Joint Subcommittee Hearing, Investigations and Oversight Subcommittee lead, with Environment Subcommittee: *EPA's IRIS Program: Reviewing its Progress and Roadblocks Ahead*

November 13, 2019—Full Committee Hearing: *Strengthening Transparency or Silencing Science? The Future of Science in EPA Rulemaking*

February 5, 2020—Investigations and Oversight Subcommittee Hearing: *Management and Spending Challenges within the Department of Energy's Office of Energy Efficiency and Renewable Energy*

DHS S&T Directorate. The Committee reasserted its oversight of the Department of Homeland Security's (DHS's) Science & Technology (S&T) Directorate in the 116th Congress. It held a Full Committee roundtable on May 5, 2020 on COVID–19 *and the Federal Research Enterprise* where the role of DHS S&T Directorate in combatting COVID–19 was considered.

Protecting the public's health & safety. The Committee conducted oversight on policy decisions related to public exposure to toxic chemicals and other harmful substances during the 116th Congress. On October 15, 2019 the Investigations & Oversight Subcommittee held a field hearing in Bloomfield, NJ on *Addressing the Lead Crisis through Innovation & Technology* to consider technology solutions to lead contamination in drinking water.

Scientific advisory boards. The Committee examined appointments to the independent scientific advisory boards entities that advise federal agencies and efforts by the Administration to eliminate and restructure various boards across the government. On July 16, 2019, pursuant to Rule XI, clause 2, subsection (n), the Subcommittees on Investigations & Oversight and Environment held a hearing on *EPA Advisory Committees: How Science Should Inform Decisions.*

Sexual harassment in the sciences. The Committee continued its bipartisan oversight of federal science agencies to ensure they have clear policies to address sexual harassment and are handling reports of sexual harassment effectively and efficiently. On June 12, 2019 the Full Committee held a hearing on *Combating Sexual Harassment in Science.*

IRIS Program Oversight. The Committee continued to conduct oversight of the EPA's Integrated Risk Information System (IRIS), develops critical toxicological assessments of environmental contaminants, providing the science that underpins regulations of toxic chemicals. On March 27, 2019, the Subcommittees on Investigations & Oversight and Environment held a hearing on *EPA's IRIS Program: Reviewing its Progress and Roadblocks Ahead.* The EPA's IRIS program was included in the Government Accountability Office (GAO) 2019 High Risk List and this hearing was held pursuant to Rule XI, clause 2, subsection (p).

Emerging technologies. The Committee explored several cutting-edge technologies, including artificial intelligence (AI), facial recognitions, gene editing, and deep fakes, and their implications for economic productivity, U.S. competitiveness, law enforcement and safety and security. To this end, the Committee held five hearings:

March 12, 2019—Research & Technology Subcommittee hearing: *Engineering Our Way to a Sustainable Bioeconomy*

June 26, 2019—Full Committee hearing: *Artificial Intelligence: Societal and Ethical Implications*

September 24, 2019—Research & Technology Subcommittee hearing: *Artificial Intelligence and the Future of Work*

January 29, 2020—Full Committee hearing: *Losing Ground: U.S. Competitiveness in Critical Technologies*

July 28, 2020—Joint Subcommittee hearing, Investigations & Oversight Subcommittee lead, with Research & Technology Subcommittee: *The Role of Technology in Countering Trafficking in Persons.*

Academic espionage. The Committee conducted oversight into the coordination and collaboration between law enforcement, the intelligence community, and institutions of higher education regarding the exfiltration of sensitive research by nontraditional collectors.

Telecommunications spectrum. The Committee investigated the growing private sector demand for licensed spectrum for applications like 5G networks and how increasing spectrum use may result in interference with incumbent spectrum users, including weather observation satellites operated by NASA, NOAA and the Department of Defense.

Lack of integrity in deregulatory actions at EPA. The Committee evaluated deregulatory actions proposed and executed by EPA and whether those actions approached cost-benefit and environmental justice evaluations with academic rigor and integrity.

STEM education and workforce. The Committee reviewed Science, Technology, Engineering, and Mathematics (STEM) education related subjects, particularly the need to increase the diversity of individuals who have access to STEM education and methods for retention of a diverse pool of individuals pursuing STEM-related degrees and careers. On May 9, 2019 the Full Committee held a hearing on *Achieving the Promise of a Diverse STEM Workforce.* The Research & Technology Subcommittee also held a hearing on February 11, 2020 on *More Hires, Fewer Hacks: Developing the U.S. Cybersecurity Workforce.*

ARPA–E. The Committee reviewed the management of the U.S. Department of Energy's (DOE's) Advanced Research Projects Agency-Energy (ARPA–E), which is tasked with promoting and funding high-risk, high-reward research and development of advanced energy technologies.

Department of Energy Nuclear Energy spending. The Committee reviewed large financial assistance agreements made between the Office of Nuclear Energy at DOE and private sector partners and how those expenditures adhered to best practices and applicable legal requirements for grant-making. On May 3, 2019 the Energy Subcommittee held a field hearing in Shippingport, Pennsylvania

on *How the Domestic Nuclear Industry Boosts Local Economies, Curbs Emissions, and Strengthens National Security.*

Clean energy technologies in general. The Committee examined whether the Department's applied energy technology offices are supporting the full range of high value research and identify potentially transformational clean energy technologies that currently receive little to no federal funding.

Critical infrastructure and electricity grid security. The Committee reviewed the state of the nation's critical infrastructure to ensure that vulnerabilities to cyberattacks, physical attacks, and natural hazards are identified and remedied to the extent possible, and to ensure the government has the capability to respond to such threats efficiently and effectively. On July 17, 2019 the Energy Subcommittee held a hearing on *The Future of Electricity Delivery: Modernizing and Securing Our Nation's Electricity Grid.* The Government Accountability Office (GAO) 2019 High Risk List included "Ensuring the Effective Protection of Technologies Critical to the U.S. National Security Interests" and this hearing was held pursuant to Rule XI, clause 2, subsection (p).

Oversight of NASA's flagship missions. The Committee conducted oversight into the management of major flagship science mission development projects, including the James Webb Space Telescope, the Wide-field Infrared Survey Telescope, Mars2020, and the Europa Clipper spacecraft. The Government Accountability Office (GAO) 2019 High Risk List included "NASA Acquisition Management" and these hearings were held pursuant to Rule XI, clause 2, subsection (p):

May 8, 2019—Space & Aeronautics Subcommittee hearing: *Keeping Our Sights on Mars: A Review of NASA's Deep Space Exploration Programs and Lunar Proposal.*

September 18, 2019—Space & Aeronautics Subcommittee hearing: *Developing Core Capabilities for Deep Space Exploration: An Update on NASA's SLS, Orion, and Exploration Ground Systems.*

November 13, 2019—Space & Aeronautics Subcommittee hearing: *Keeping Our Sights on Mars Part 2: Structuring a Moon-Mars Program for Success*

NASA Earth Science programs. The Committee conducted oversight of NASA's Earth science program and its plans for meeting the priorities set forth in the National Academies' Earth science decadal survey. On June 11, 2019 the Full Committee held a hearing on *Discovery on the Frontiers of Space: Exploring NASA's Science Mission.*

Civil Aeronautics Research and Development. The Committee conducted oversight of research and development activities at the Federal Aviation Administration (FAA) and NASA's aeronautics research. On June 26, 2019 the Space & Aeronautics Subcommittee held a hearing on *NASA's Aeronautics Mission: Enabling the Transformation of Aviation.*

ISS research priorities. The Committee conducted oversight of the use of the ISS and the prioritization of ISS resources to meet and enable key objectives. On July 10, 2019 the Space and Aeronautics Subcommittee held a hearing on *A Review of NASA's Plans*

for the International Space Station and Future Activities in Low Earth Orbit.

Committee on Science, Space, and Technology
History of Appointments, 116th Congress

January 3, 2019

Ms. Eddie Bernice Johnson (TX) named Chair (H. Res. 24)

January 4, 2019

Mr. Lucas (OK) named Ranking Minority Member (H. Res. 25)

January 23, 2019

Ms. Lofgren (CA), Mr. Lipinski (IL), Ms. Bonamici (OR), Mr. Bera (CA), Mr. Lamb (PA), Mrs. Fletcher (TX), Ms. Stevens (MI), Ms. Kendra S. Horn (OK), Ms. Sherrill (NJ), Mr. Sherman (CA), Mr. McNerney (CA), Mr. Perlmutter (CO), Mr. Tonko (NY), Mr. Foster (IL), Mr. Beyer (VA), Mr. Crist (FL), Mr. Casten (IL), Ms. Hill (CA), Mr. McAdams (UT), and Ms. Wexton (VA) appointed (H. Res. 67)

January 23, 2019

Mr. Brooks (AL), Mr. Hultgren (IL), Mr. Posey (FL), Mr. Massie (KY), Mr. Bridenstine (OK), Mr. Weber (TX), Mr. Knight (CA), Mr. Babin (TX), Mrs. Comstock (VA), Mr. Palmer (AL), Mr. Loudermilk (GA), Mr. Abraham (LA), Mr. LaHood (IL), Mr. Webster (FL), Mr. Banks (IN), Mr. Biggs (AZ), Mr. Marshall (KS), Mr. Dunn (FL), and Mr. Higgins (LA) appointed (H. Res. 68)

January 24, 2019

Mr. Cohen (TN) appointed (H. Res. 73) (to rank immediately after Mr. Sherman)

January 30, 2019

Democrat Members assigned to subcommittees; Mr. Lamb named Subcommittee on Energy Chair; Mr. Lipinski named Subcommittee on Energy Vice Chair; Ms. Fletcher named Subcommittee on Environment Chair; Ms. Bonamici named Subcommittee on Environment Vice Chair; Ms. Sherrill named Subcommittee on Oversight Chair; Ms. Bonamici named Subcommittee on Oversight Vice Chair; Ms. Stevens named Subcommittee on Research and Technology Chair; Mr. Lipinski Subcommittee on Research and Technology Vice Chair; Ms. Horn named Subcommittee on Space Chair; Ms. Lofgren named Subcommittee on Space Vice Chair

February 6, 2019

Republican Members assigned to Subcommittees; Mr. Weber named Subcommittee on Energy Ranking Member; Mr. Marshall named Subcommittee on Environment Ranking Member; Mr. Norman named Subcommittee on Oversight Ranking Member; Mr. Baird named Subcommittee on Research and Technology Ranking Member; Mr. Babin named Subcommittee on Space Ranking Member

March 28, 2019

Mr. Dunn resigned from the Committee on Science, Space, and Technology; Ms. Herrera-Beutler (WA) and Miss Gonzalez-Colon (PR) appointed (H. Res. 264)

July 24, 2019

Mr. Rooney (FL) appointed to the Committee on Science, Space, and Technology (H. Res. 516)

September 26, 2019

Miss. Gonzalez-Colon resigned from the Committee on Science, Space, and Technology; Mr. Murphy (NC) appointed (H. Res. 596)

November 5, 2019

Ms. Hill resigned from the Committee on Science, Space, and Technology

November 19, 2019

Mr. Lamb to rank immediately after Ms. Wexton on the Committee on Science, Space, and Technology (H. Res. 712)

January 9, 2020

Ms. Fletcher named Chairwoman of Subcommittee on Energy, Ms. Sherrill named Chairwoman of Subcommittee on Environment, Mr. Foster named Chairman of the Subcommittee on Investigations and Oversight

January 16, 2020

Ms. Jaime Herrera Beutler resigned from the Committee on Science, Space, and Technology

July 1, 2020

Mr. Olson resigned from the Committee on Science, Space and Technology; Mr. Garcia (CA) and Mr. Tiffany (WI) appointed (H. Res. 1037)

CONTENTS

Rules of the
Committee on Science, Space, and Technology
House of Representatives
For the One Hundred Sixteenth Congress

Rule I. General

(a) Application of Rules.

(1) The Rules of the House of Representatives ("House Rules") are the rules of the Committee on Science, Space, and Technology and its Subcommittees with the specific additions thereto contained in these rules.

(2) Except where the term "Subcommittee" is specifically referred to, the following rules shall apply to the Committee and its Subcommittees as well as to the respective Chairs and Ranking Minority Members.

(b) Other Procedures. The Chair of the Committee, after consultation with the Ranking Minority Member of the Committee, may establish such other procedures and take such actions as may be necessary to carry out these rules or to facilitate the effective operation of the Committee.

(c) Use of Hearing Rooms. In consultation with the Ranking Minority Member, the Chair of the Committee shall establish guidelines for the use of Committee hearing rooms.

Rule II. Regular, Additional, and Special Meetings

(a) Regular Meetings. The regular meeting day of the Committee for the conduct of its business shall be on the first Wednesday of each month, if the House is in session. If the House is not in session on that day, then the Committee shall meet on the next Thursday of such month on which the House is in session, or at another practicable time as determined by the Chair.

(1) A regular meeting of the Committee may be dispensed with if, in the judgment of the Chair, there is no need for the meeting.

(2) The Chair may call and convene, as he considers necessary and in accordance with the notice requirements contained in these rules, additional meetings of the Committee for the consideration of any bill or resolution pending before the Committee or for the conduct of other Committee business.

(b) Bills and Subjects to be Considered.

(1) The Chair shall announce the date, place, and subject matter of any Committee meeting, which may not commence earlier than the third calendar day (excluding Saturdays, Sundays, or legal holidays except when the House is in session on such a day) on which Members have notice thereof, unless the Chair, with the concurrence of the Ranking Minority Member, or the Committee by majority vote with a quorum present for the transaction of business, determines there is good cause to begin the meeting sooner, in which case the Chair shall make the announcement at the earliest possible date.

(2) At least 48 hours prior to the commencement of a meeting for the markup of legislation (excluding Saturdays, Sundays, and legal holidays except when the House is in session on such a day), the Chair shall cause the text of such legislation to be made publicly available in electronic form.

(3) To the maximum extent practicable, amendments to a measure or matter shall be submitted in writing or electronically to the designee of both the Chair and Ranking Minority

Member at least 24 hours prior to the consideration of the measure or matter, and the Chair may oppose any amendment not so submitted.

(c) Open Meetings. Meetings for the transaction of business and hearings of the Committee shall be open to the public or closed in accordance with the House Rules.

(d) Quorums. A majority of the Committee shall form a quorum, except that two Members shall constitute a quorum for taking testimony and receiving evidence, and one third of the Members shall form a quorum for taking any action other than for which the presence of a majority of the Committee is otherwise required. If the Chair is not present at any meeting of the Committee or Subcommittee, the Vice Chair on the Committee who is present shall preside at the meeting, unless another Member of the Committee is designated by the Chair.

(e) Postponement of Proceedings.

(1) Pursuant to clause 2(h)(4) of House Rule XI, the Chair may postpone further proceedings when a record vote is ordered on the question of approving a measure or matter or on adopting an amendment. The Chair may resume proceedings on a postponed vote at any time after reasonable notice.

(2) When proceedings resume on a postponed question, notwithstanding any intervening order for the previous question, an underlying proposition shall remain subject to further debate or amendment to the same extent as when the question was postponed.

(f) Time for Statements and Debate.

(1) Insofar as is practicable, the Chair, after consultation with the Ranking Minority Member, shall limit the total time of opening statements by Members at a Committee meeting to no more than ten minutes, the time to be divided equally between the Chair and Ranking Minority Member, except in the case of joint Subcommittee hearings, in which case the total time of opening statements by Members at such joint hearing shall be no more than twenty minutes, the time to be divided equally between the Chairs and Ranking Minority Members. When requested, ex officio Members of any Subcommittee shall also be recognized at a Subcommittee hearing for five minutes each to present an opening statement.

(2) The time any one Member may address the Committee on any bill, amendment, motion, or other matter under consideration by the Committee will be limited to five minutes, and then only when the Member has been recognized by the Chair. This time limit may be waived by the Chair pursuant to unanimous consent.

(g) Requests for Recorded Vote. A record vote of the Committee shall be provided on any question before the Committee upon the request of three or more Members or, in the apparent absence of a quorum, by any one Member.

(h) Transcripts. Transcripts of markups shall be recorded and may be published in the same manner as hearings before the Committee, and shall be included as part of the legislative report unless waived by the Chair of the Committee.

(i) Motion to Go to Conference. Without further action of the Committee, the Chair is authorized to offer a motion under clause 1 of House Rule XXII whenever the Chair considers it appropriate.

Rule III. Hearings

(a) Notice of Hearings.

(1) The Chair shall publicly announce the date, place, and subject matter of any hearing to be conducted by the Committee on any measure or matter at least one week before the commencement of that hearing. If the Chair, with the concurrence of the Ranking Minority Member, determines there is good cause to begin the hearing sooner, or if the Committee so determines by majority vote, a quorum being present for the transaction of business, the Chair shall make the announcement at the earliest possible date.

(2) The Chair shall publicly announce a list of witnesses to testify at a hearing as soon as a complete list of witnesses, including those to be called by the minority, is compiled. When practicable, the Chair and the Ranking Minority Member will seek to have a complete list of witnesses compiled at or as soon as practicable after the time that the hearing is publicly announced.

(b) Witnesses.

(1) Insofar as is practicable, no later than 48 hours in advance of his or her appearance, each witness who is to appear before the Committee shall file, in printed copy and in electronic form, a written statement of his or her proposed testimony and a curriculum vitae.

(2) Each witness shall limit his or her presentation to a five minute summary, however additional time may be granted by the Chair when appropriate.

(3) The Chair, or any Member of the Committee designated by the Chair, may administer oaths to witnesses before the Committee.

(4) Whenever any hearing is conducted by the Committee on any measure or matter, the Minority Members of the Committee shall be entitled, upon request to the Chair by a majority of them before the completion of the hearing, to call witnesses selected by the Minority to testify with respect to the measure or matter during at least one day of hearing thereon.

(5) In the case of a witness appearing in a nongovernmental capacity, a written statement of proposed testimony shall include a curriculum vitae and a disclosure of any Federal grants, cooperative agreements, or contracts, or contracts or payments originating with a foreign government, received during the current calendar year or either of the two previous calendar years by the witness or by an entity represented by the witness and related to the subject matter of the hearing. The disclosure shall include the amount and source of each Federal grant (or subgrant thereof), cooperative agreement, or contract (or subcontract thereof) related to the subject matter of the hearing; and the amount and country of origin of any payment or contract related to the subject matter of the hearing originating with a foreign government. Such statements, with ap-

propriate redactions to protect the privacy or security of the witness, shall be made publicly available in electronic form not later than one day after the witness appears.

(c) Questioning of Witnesses.

(1) The right to interrogate a witness before the Committee shall alternate between Majority and Minority Members of the Committee. Each Member shall be limited to five minutes in the interrogation of witnesses. No Member may be recognized for a second period of interrogation until each Member present, who wishes to be recognized, has been recognized at least once.

(2) Notwithstanding clause 1, upon a motion the Chair, in consultation with the Ranking Minority Member, may:

i. Designate an specified number of Members of the Committee from each party to question a witness for a period of time equally divided between the majority party and the minority party, not to exceed one hour in the aggregate; or

ii. Designate staff from each party to question a witness for a period of time equally divided between the majority party and the minority party, not to exceed one hour in the aggregate.

(3) Members of the Committee have two weeks from the date of a hearing to submit additional questions in writing for the record to be answered by witnesses who have appeared before the Committee. The letters of transmittal and any responses thereto shall be included in the hearing record.

(d) Claims of Privilege. Claims of common-law privileges made by witnesses in hearings, or by interviewees or deponents in investigations or inquiries, are applicable only at the discretion of the Chair, subject to appeal to the Committee.

(e) Publication of Transcripts. The transcripts of those hearings conducted by the Committee, when it is decided they will be printed, shall be published in substantially verbatim form, with the material requested for the record inserted at that place requested, or at the end of the record, as appropriate. Individuals, including Members, whose comments are to be published as part of a Committee document shall be given the opportunity to verify the accuracy of the transcription in advance of publication. Any requests by those Members, staff, or witnesses to correct any errors other than errors in the transcript, or disputed errors in transcription, shall be appended to the record, and the appropriate place where the change is requested will be footnoted. Prior to approval by the Chair of hearings conducted jointly with another Congressional Committee, a memorandum of understanding shall be prepared which incorporates an agreement for the publication of the transcript.

(f) Pertinence of Testimony. At the discretion of the Committee, brief and pertinent statements may be submitted in writing for inclusion in the record. The Committee is the sole judge of the pertinence of testimony and evidence adduced at its hearing.

Rule IV. Reports

(a) Bills and resolutions approved by the Committee shall be reported by the Chair pursuant to clauses 2–4 of House Rule XIII.

(b) A proposed investigative or oversight report shall be considered as read if it has been available to the Members of the Committee for at least 24 hours (excluding Saturdays, Sundays, or legal holidays except when the House is in session on such days).

(c) Every investigative or oversight report shall be approved by a majority vote of the Committee at a meeting at which a quorum is present. If at the time of approval of such a report a Member of the Committee gives notice of intent to file supplemental, minority, additional, or dissenting views that Member shall be entitled to file such views.

(d) Only those investigative or oversight reports approved by a majority vote of the Committee may be ordered printed, unless otherwise required by House Rules.

Rule V. Broadcasting

(a) Whenever a meeting for the transaction of business, including the markup of legislation or a hearing is open to the public, that meeting or hearing shall be open to coverage by television, radio, and still photography in accordance with clause 4 of House Rule XI.

(b) To the maximum extent practicable, the Committee shall provide audio and visual coverage of each hearing or meeting for the transaction of business in a manner that allows the public to easily listen to and view the proceedings, and maintain the recordings of such coverage in a manner that is easily accessible to the public. Operation and use of any Committee internet broadcast system shall be fair and nonpartisan, and in accordance with clauses 4 (b) and (f) of House Rule XI and all other applicable rules of the Committee and the House.

Rule VI. Subcommittees

(a) Committee Jurisdiction. The Committee shall have jurisdiction over such matters as determined by the Chair.

(b) Subcommittees and Jurisdiction. There shall be five standing Subcommittees of the Committee on Science, Space, and Technology, with jurisdictions as follows:

(1) *Subcommittee on Energy*. Shall have jurisdiction over the following subject matters: all matters relating to energy research, development, and demonstration projects therefor; commercial application of energy technology; Department of Energy research, development, and demonstration programs; Department of Energy laboratories; Department of Energy science activities; energy supply activities; nuclear, solar, and renewable energy, and other advanced energy technologies; uranium supply and enrichment, and Department of Energy waste management; fossil energy research and development; clean coal technology; energy conservation research and development, including building performance, alternate fuels, distributed power systems, and industrial process improvements; pipeline research, development, and demonstration projects; energy standards; other appropriate matters as referred by the Chair; and relevant oversight.

(2) *Subcommittee on Environment*. Shall have jurisdiction over the following subject matters: all matters relating to envi-

ronmental research; Environmental Protection Agency research and development; environmental standards; climate change research and development; the National Oceanic and Atmospheric Administration, including all activities related to weather, weather services, climate, the atmosphere, marine fisheries, and oceanic research; risk assessment activities; scientific issues related to environmental policy, including climate change; other appropriate matters as referred by the Chair; and relevant oversight.

(3) *Subcommittee on Research and Technology*. Shall have jurisdiction over the following subject matters: all matters relating to science policy and science education; the Office of Science and Technology Policy; all scientific research, and scientific and engineering resources (including human resources); all matters relating to science, technology, engineering and mathematics education; intergovernmental mechanisms for research, development, and demonstration and cross-cutting programs; international scientific cooperation; National Science Foundation; university research policy, including infrastructure and overhead; university research partnerships, including those with industry; science scholarships; computing, communications, networking, and information technology; research and development relating to health, biomedical, and nutritional programs; research, development, and demonstration relating to nanoscience, nanoengineering, and nanotechnology; agricultural, geological, biological and life sciences research; materials research, development, demonstration, and policy; all matters relating to competitiveness, technology, standards, and innovation; standardization of weights and measures, including technical standards, standardization, and conformity assessment; measurement, including the metric system of measurement; the Technology Administration of the Department of Commerce; the National Institute of Standards and Technology; the National Technical Information Service; competitiveness, including small business competitiveness; tax, antitrust, regulatory and other legal and governmental policies related to technological development and commercialization; technology transfer, including civilian use of defense technologies; patent and intellectual property policy; international technology trade; research, development, and demonstration activities of the Department of Transportation; surface and water transportation research, development, and demonstration programs; earthquake programs and fire research programs, including those related to wildfire proliferation research and prevention; biotechnology policy; research, development, demonstration, and standards-related activities of the Department of Homeland Security; Small Business Innovation Research and Technology Transfer; voting technologies and standards; other appropriate matters as referred by the Chair; and relevant oversight.

(4) *Subcommittee on Space and Aeronautics*. Shall have jurisdiction over the following subject matters: all matters relating to astronautical and aeronautical research and development; national space policy, including access to space; sub-orbital access and applications; National Aeronautics and Space Admin-

istration and its contractor and government-operated labs; space commercialization, including commercial space activities relating to the Department of Transportation and the Department of Commerce; exploration and use of outer space; international space cooperation; the National Space Council; space applications, space communications and related matters; Earth remote sensing policy; civil aviation research, development, and demonstration; research, development, and demonstration programs of the Federal Aviation Administration; space law; other appropriate matters as referred by the Chair; and relevant oversight.

(5) *Subcommittee on Investigations and Oversight*. Shall have general and special investigative authority on all matters within the jurisdiction of the Committee.

(c) Composition of Subcommittees.

(1) The Chair shall assign Members to the Subcommittees. Minority party assignments shall be made only with the concurrence of the Ranking Minority Member. The Chair shall determine the ratio of Majority Members to Minority Members of each Subcommittee; provided that the ratio of Majority Members to Minority Members on each Subcommittee (excluding any ex officio Member) shall be no less favorable to the Majority party than the ratio for the Committee.

(2) The Chair and Ranking Minority Member of the Committee shall be ex officio Members of each Subcommittee and shall have the right to vote and be counted as part of the quorum and ratios on all matters before the Subcommittee.

(d) Referral to Subcommittees. The Chair shall expeditiously refer all legislation and other matters referred to the Committee to the Subcommittee or Subcommittees of appropriate jurisdiction, unless the Chair deems consideration is to be by the Committee. Subcommittee Chairs may make requests for referral of specific matters to their Subcommittee if they believe Subcommittee jurisdictions so warrants.

(e) Subcommittee Procedures and Reports.

(1) Subcommittee Chairs shall set meeting dates with the concurrence of the Chair and after consultation with the other Subcommittee Chairs with a view toward avoiding simultaneous scheduling of Subcommittee meetings or hearings wherever possible. No Subcommittee may meet or hold a hearing at the same time as a meeting or hearing of the Committee without authorization from the Chair.

(2) Each Subcommittee is authorized to meet, hold hearings, receive testimony or evidence, mark up legislation, and report to the Committee on all matters referred to it. For matters within its jurisdiction, each Subcommittee is authorized to conduct legislative, investigative, forecasting, and general oversight hearings; to conduct inquiries into the future; and to undertake budget impact studies.

(3) Each Subcommittee shall provide the Committee with copies of such records of votes taken in the Subcommittee and such other records with respect to the Subcommittee as the Chair of the Committee deems necessary to ensure compliance with the House Rules.

(4) After ordering a measure or matter reported, a Subcommittee shall issue a report in such form as the Chair shall specify. To the maximum extent practicable, reports and recommendations of a Subcommittee shall not be considered by the Committee until after the intervention of 48 hours (excluding Saturdays, Sundays, and legal holidays except when the House is in session on such a day) from the time the report is submitted and made available to the Committee. Printed hearings thereon shall be made available, if feasible, to the Committee, except that this Rule may be waived at the discretion of the Chair after consultation with the Ranking Minority Member.

(5) Any Member of the Committee may have the privilege of sitting with any Subcommittee during its hearings or deliberations and may participate in such hearings or deliberations, but no Member who is not a Member of the Subcommittee shall vote on any matter before such Subcommittee, except as provided in Rule VI(c)(2).

Rule VII. Vice Chairs

(a) The Chair of the Committee shall designate a Member of the majority party to serve as Vice Chair of the Committee, and shall designate a Majority Member of each Subcommittee to serve as Vice Chair of the Subcommittee. Vice Chairs of the Committee and each Subcommittee serve at the pleasure of the Chair, who may at any time terminate his designation of a Member as Vice Chair and designate a different Member of the majority party to serve as Vice Chair of the Committee or relevant Subcommittee.

(b) The Chair may assign duties, privileges, and responsibilities to the Vice Chairs of the Committee or the various Subcommittees.

Rule VIII. Oversight and Investigations

(a) The Committee shall review and study, on a continuing basis, the application, administration, execution, and effectiveness of those laws, or parts of laws, the subject matter of which is within its jurisdiction, including all laws, programs, and Government activities relating to nonmilitary research and development in accordance with House Rule X.

(b) Not later than March 1st of the first session of the 116th Congress, the Chair, after consultation with the Ranking Minority Member, shall submit the Committee's oversight plan to the Committee on Oversight and the Committee on House Administration in accordance with the provisions of clause 2(d) of House Rule X.

(c) Any investigation undertaken in the name of the Committee shall be approved by the Chair. Nothing in this subsection shall be interpreted to infringe on a Subcommittee's authority to conduct general oversight of matters within its jurisdiction, short of undertaking an investigation.

Rule IX. Subpoenas

The power to authorize and issue subpoenas is delegated to the Chair as provided for under clause 2(m)(3)(A)(i) of House Rule XI. The Chair shall notify the Ranking Minority Member prior to

issuing any subpoena under such authority. To the extent practicable, the Chair shall consult with the Ranking Minority Member at least 24 hours in advance of a subpoena being issued under such authority.

Rule X. Deposition Authority

The Chair may authorize the staff of the Committee to conduct depositions pursuant to section 103 of House Resolution 6, 116th Congress, and subject to any regulations issued pursuant thereto.

Rule XI. Committee Records

(a) The records of the Committee at the National Archives and Records Administration shall be made available for public use in accordance with House Rule VII.

(b) The Chair shall notify the Ranking Minority Member of the Committee of any decision, pursuant to clauses 3(b)(3) or 4(b) of House Rule VII, to withhold a record otherwise available, and the matter shall be presented to the Committee for a determination on the written request of any Member of the Committee.

Rule XII. Official Committee Website

The Chair shall maintain an official Committee website for the purpose of furthering the Committee's legislative and oversight responsibilities, including communicating information about the Committee's activities to Committee Members and other Members of the House. The Ranking Minority Member of the Committee may maintain a similar website for the same purpose, including communicating information about the activities of the minority to Committee Members and other Members of the House.

Rule XIII. Committee Budget

From the amount provided to the Committee in the primary expense resolution adopted by the House of Representatives in the 116th Congress, the Chair shall designate one-third of the budget, after adjustment for the salaries of the shared administrative functions for the Clerk, Printer and Financial Administrator, under the direction of the Ranking Minority Member for the purposes of minority staff, travel expenses of minority staff and Members, and all other minority office expenses.

Rule XIV. Amendments to Committee Rules

The rules of the Committee may be modified, amended, or repealed, in the same manner and method as prescribed for the adoption of committee rules in clause 2 of House Rule XI, but only if written notice of the proposed change has been provided to each such Member at least 3 days before the time of the meeting at which the vote on the change occurs. Any such change in the rules of the Committee shall be published in the Congressional Record within 30 calendar days after their approval.

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