Union Calendar No. 510

117th Congress, 2d Session – – – – – – – – – – – – – House Report 117–694

REPORT ON THE ACTIVITIES

OF THE

COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY

U.S. HOUSE OF REPRESENTATIVES

FOR THE

ONE HUNDRED SEVENTEENTH CONGRESS

DECEMBER 30, 2022.—Committed to the Committee of the Whole House on the State of the Union and ordered to be printed

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LETTER OF TRANSMITTAL

COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY,
Washington, DC, December 30, 2022.

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

DEAR SPEAKER PELOSI: Pursuant to House Rule XI(1)(d)(1), I respectfully submit the activities report for the Committee on Science, Space, and Technology for the 117th Congress.

Thank you for your attention to this matter.

Sincerely,

EDDIE BERNICE JOHNSON,
Chairwoman.

COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY

One Hundred Seventeenth Congress

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

DECEMBER 30, 2022.—Committed to the Committee of the Whole House on the State of the Union and ordered to be printed

Ms. JOHNSON of Texas, 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. 117–44, Surface Transportation Extension Act of 2021

Purpose

The purpose of P.L. 117–44 is to extend Federal-aid highway, highway safety, and transit programs authorized in previous surface transportation legislation from the previous end date of September 30, 2021, through October 31, 2021.

Legislative History

H.R. 5434, Surface Transportation Extension Act of 2021, was introduced by Peter A. DeFazio on September 30, 2021, and referred to the Committee on Transportation and Infrastructure, and in addition to the Committees on Ways and Means, Natural Resources, Science, Space, and Technology, Energy and Commerce, and Oversight and Reform. On October 1, 2021, the House considered H.R. 5434 under suspension of the rules, and the bill passed by a record vote of Y–365 and N–51.

On October 1, 2021, the Senate considered and passed H.R. 5434 by unanimous consent.

On October 2, 2021, H.R. 5434 was signed by the President and became Public Law 117–44.

1.2 P.L. 117–52, Further Surface Transportation Extension Act of 2021

Purpose

The purpose of P.L. 117–52 is to extend Federal-aid highway, highway safety, and transit programs authorized in previous surface transportation legislation from the previous end date of October 31, 2021, through December 3, 2021.

Legislative History

H.R. 5763, Further Surface Transportation Extension Act of 2021, was introduced by Peter A. DeFazio on October 28, 2021, and referred to the Committee on Transportation and Infrastructure, and in addition to the Committees on Ways and Means, Natural Resources, Science, Space, and Technology, Energy and Commerce, and Oversight and Reform. On October 28, 2021, the House considered H.R. 5763 under suspension of the rules, and the bill passed by a record vote of Y–358 and N–59.

On October 28, 2021, the Senate considered and passed H.R. 5763 by unanimous consent.

On October 31, 2021, H.R. 5763 was signed by the President and became Public Law 117–52.

1.3 P.L. 117–58, Infrastructure Investment and Jobs Act

Purpose

The purpose of P.L. 117–58 is to reauthorize Federal-aid highway, highway safety, and transit programs authorized in previous surface transportation legislation and also to authorize and/or fund new programs related to infrastructure and energy. In addition to the types of programs typically authorized in "highway bills", P.L. 117–58 established a new Advanced Research Projects Agency-Infrastructure (ARPA–I) program. This program is modeled on the Department of Defense DARPA program to provide support for scientific and technical solutions to infrastructure challenges.

There is a total of approximately $38 billion in funding for energy related activities that *could* implicate programs within the jurisdiction of the Committee on Science, Space, and Technology. Approximately $9 billion of that is funding for various activities authorized in the Energy Act of 2020 (contained within P.L. 116–260), including various clean energy demonstration projects, nuclear power demonstration projects, and critical material research, development, and demonstration activities. Another $29 billion in funding is allocated to other energy research, development, demonstration, and deployment activities. Since the breakdown of development/demonstration activities versus deployment activities for some of this funding is left to the Department of Energy in carrying out the programs, the breakdown of exactly which of this funding would be allocated to programs under the jurisdiction of the Committee on Science, Space, and Technology remains unclear at the time of publication. Major programs funded from this $29 billion include activities related to carbon removal, hydrogen, battery recycling, grid reliability, and carbon storage.

Legislative History

H.R. 3684, the INVEST in America Act was introduced on June 4, 2021, and referred to the Committee on Transportation and Infrastructure. On June 21, 2021, Chairman Peter A. DeFazio and Chairwoman Eddie Bernice Johnson exchanged letters acknowledging the Committee on Science, Space, and Technology's jurisdiction over H.R. 3684 and waiving referral of the bill to the Committee on Science, Space, and Technology. On June 22, 2021, the Committee on Transportation and Infrastructure reported H.R. 3684 to the House with an amendment. On July 1, 2021, the House passed H.R. 3684 by a record vote of Y–221 and N–201.

On August 10, 2021, the Senate passed H.R. 3684, with an amendment, by a record vote of Y–69 and N–30.

On November 5, 2021, the House passed H.R. 3684 by a record vote of Y–228 and N–205.

The President signed H.R. 3684 on November 15, 2021, and it became Public Law 117–58.

1.4 P.L. 117–167, CHIPS and Science Act

Purpose

The purpose of P.L. 117–167, the CHIPS and Science Act, is to provide funding to advance the domestic semiconductor industry and to authorize civilian research and development activities at the National Science Foundation, Department of Energy, National Institute of Standards and Technology, National Aeronautics and Space Administration, and Department of Commerce.

P.L. 117–167 consists of three parts. Division A relates to funding for domestic semiconductor manufacturing and domestic semiconductor research and development. This Division provides for $54.2 billion in direct appropriations for semiconductor activities and wireless supply chain innovation. The bulk of this funding would be stewarded by the Department of Commerce for semiconductor manufacturing incentives ($39 billion) and research and development ($11 billion). The Department of Commerce would also steward $1.5 billion for wireless supply chain innovation. Additional monies are appropriated to the National Science Foundation ($200 million), Department of Defense ($2 billion), and Department of State ($500 million) for other semiconductor activities.

Division B consists of a large number of civilian science authorizations and policy provisions. This includes comprehensive multiyear authorizations for the National Science Foundation, National Institute of Standards and Technology, and the Department of Energy's Office of Science. In addition to these authorizations, Division B includes authorizations for a Regional Innovation and Technology Hub Program (Department of Commerce), ocean acidification programs (National Oceanic and Atmospheric Administration) and applied energy programs at the Department of Energy. Division B also includes several major policy provisions relating to broadening participation in science and combating sexual harassment in science.

Division B contains a number of provisions the Science Committee had previously marked up and/or considered on the House floor. Science Committee legislation contained in P.L. 117–167 includes: H.R. 144, Supporting Early-Career Research Act, H.R. 204,

STEM Opportunities Act, H.R. 210, Rural STEM Education Research Act, H.R. 1447, COAST Research Act of 2021, H.R. 2027, MSI STEM Achievement Act, H.R. 2225, National Science Foundation for the Future Act, H.R. 2695, Combating Sexual Harassment in Science Act, H.R. 3593, Department of Energy Science for the Future Act, H.R. 3858, National Science and Technology Strategy Act of 2021, H.R. 4521, Bioeconomy Research and Development Act of 2021, H.R. 4588, Regional Innovation Act of 2021, H.R. 4599, SUPER Act of 2021, H.R. 4606, Energizing Technology Transfer Act, H.R. 4609, National Institute of Standards and Technology for the Future Act of 2021, H.R. 4819, National Nuclear University Research Infrastructure Reinvestment Act of 2021, and, H.R. 6291, Micro Act.

Division C provides supplemental funding for Supreme Court security.

Legislative History

H.R. 4521, the Bioeconomy Research and Development Act of 2021, was introduced by Eddie Bernice Johnson on July 19, 2021, and referred to the Committee on Science, Space, and Technology, and in addition to the Committees on Agriculture and Energy and Commerce. On January 28, 2022, the Committee on Science, Space, and Technology reported the bill to the House (H.R. 117–235).

H.R. 4521 was then used as the vehicle for the America COMPETES Act of 2022. On February 4, 2022, the House passed H.R. 4521 by a record vote of Y–222 and N–210.

On March 28, 2022, the Senate amended H.R. 4521 with the text of S. 1260, the United States Innovation and Competition Act of 2021, and the amended bill passed by a recorded vote of Y–68 and N–28.

On March 30, 2022, Ms. Haley Stevens moved that the House disagree to the Senate amendment to H.R. 4521 and request a conference, and the motion was agreed to by unanimous consent. On April 28, 2022, the Senate agreed to a motion to insist on the Senate amendment to H.R. 4521 and go to conference by a record vote of Y–67 and N–27.

On May 12, 2022, the conference committee for H.R. 4521 met for the first time. There were no further official meetings of the conference committee. In late July 2022, the respective leaders of the House and Senate decided to move forward with provisions of the H.R. 4521 relating to semiconductors and science, and to use a different legislative vehicle for this purpose: H.R. 4346, the Supreme Court Security Funding Act of 2022.

On July 27, 2022, the Senate concurred in the House amendment to the Senate amendment to H.R. 4346 with an amendment by a record vote of Y–64 and N–33.

On July 28, 2022, the House agreed to the Senate amendment to the House amendment to the Senate amendment by a record vote of Y–243, N–187, and Present–1.

On August 9, 2022, H.R. 4346 was signed by the President and became Public Law 117–167.

1.5 P.L. 117–169, Inflation Reduction Act of 2022

Purpose

The purpose of P.L. 117–169 is to alter tax policy, make Federal investments, and reduce the deficit, among other things.

Provisions relevant to the Committee on Science, Space, and Technology focus on investments at the National Oceanic and Atmospheric Administration and the Department of Energy. Section 40004 invests $490 million in forecasting research and systems, climate research and services, computing capacity, and hurricane hunters at NOAA. Section 50172 invests $2 billion in national laboratory infrastructure at DOE. Section 50176 invests $700 million in research, development, demonstration, and deployment activities related to High-Assay Low-Enriched Uranium.

Legislative History

H.R. 5376, the Inflation Reduction Act, was legislation that was considered pursuant to budget reconciliation procedures established by the Budget Act. This process was initiated with S. Con. Res. 14, A concurrent resolution setting forth the congressional budget for the United State Government for fiscal year 2022 and setting for the appropriate budgetary levels for fiscal years 2023 through 2031. S. Con. Res. 14 was introduced in the Senate on August 9, 2021. On August 9, 2021, the Senate Committee on the Budget discharged the resolution pursuant. On August 11, 2021, S. Con. Res 14 passed the Senate by a record vote of Y–50 and N–49. On August 24, 2021, S. Con Res. 14 passed the House pursuant to the provisions of H. Res. 601, which passed the House on August 24, 2021, by a record vote of Y–220 and N–212.

On September 9, 2021, the Committee on Science, Space, and Technology met to consider a Committee Print to comply with the reconciliation directive included in section 2002 of the concurrent resolution on the budget for fiscal year 2022, S. Con. Res. 14. The Committee favorably reported the Committee Print to the Budget Committee by a recorded vote of Y–21 and N–17.

H.R. 5376 was introduced on September 27, 2021, by Budget Committee Chairman John A. Yarmuth.

On November 19, 2021, the House considered H.R. 5376 and the bill passed by a record vote of Y–220 and N–213.

On August 7, 2022, the Senate considered and passed H.R. 5376 by a record vote of Y–51 and N–50.

On August 12, 2022, the House considered and passed H.R. 5376 by a record vote of Y–220 and N–207.

On August 16, 2022 H.R. 5376 was signed by the President and became Public Law 117–169.

1.6 P.L. 117–81, National Defense Authorization Act For Fiscal Year 2022

Purpose

The purpose of the National Defense Authorization Act For Fiscal Year 2022 is to authorize appropriations for fiscal year 2022 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. In addition, the bill contained items in the Committee on Science's jurisdiction.

Legislative History

On July 2, 2021, Representative Adam Smith introduced H.R. 4350, the National Defense Authorization Act For Fiscal Year 2022.

On September 21, 2021 H.R. 6395 was considered under the provisions of rule H. Res. 667, and on September 23, 2021 the amended bill passed the House by a record vote 316–113.

On May 13, 2021 Senator Rick Scott introduced S. 1605, which was referred to the Senate Committee on Energy and Natural Resources, was discharged from Committee by unanimous consent and passed the Senate without Amendment by unanimous consent.

By July 20, 2021 the seven subcommittees of the Senate Armed Services Committee marked up draft legislative proposals with recommendations for matters in the Fiscal Year 2022 NDAA. On July 21, 2021 the full Senate Armed Services Committee considered the legislation in a closed session and voted 23–3 to order an original bill reflecting changes agreed to in markup. On September 22, 2021 the Senate Armed Services Committee reported S. 2792, introduced by Senator Jack Reed and filed the report. On November 19, Senator Jack Reed offered on the floor an amendment in the nature of a substitute to H.R. 4350 to replace the text of the House-passed legislation with S. 2792. The Senate failed to agree to end debate on the amendment and cloture failed to be invoked by a vote of 45–51.

On December 7, the House and Senate Armed Services Committees released a bicameral negotiated text that the two committees had reached an agreement on. The agreement text was filed as an amendment to S.1605 under consideration in the House. Then S. 1605 was considered under the provisions of H.Res. 838, and the amended bill passed the House by a record vote 363–70. On December 15, the Senate agreed to the House amendment to S. 1605 by a record vote 88–11.

On December 27, 2021 S.1607 was signed by the President and became Public Law 117–81.

1.7 P.L. 117–248, PFAS Act

Purpose

The purpose of P.L. 117–28 is to require the Department of Homeland Security to develop guidance and curriculum for firefighters and other emergency response personnel on how to prevent exposure and release of PFAS.

Legislative History

S. 231, PFAS Act, was introduced by Senator Gary Peters on February 4, 2021. On July 29, 2021, the Senate considered and passed S. 231 by unanimous consent.

On December 1, 2022, the House considered and passed S. 231 under suspension of the rules by a record vote of Y–400 and N–22.

On December 20, 2022, S. 231 was signed by the President and became Public Law 117–248.

1.8 P.L. 117–263, James M. Inhofe National Defense Authorization Act for Fiscal Year 2023

Purpose

The purpose of the National Defense Authorization Act For Fiscal Year 2023 is to authorize appropriations for fiscal year 20234 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. In addition, the bill contained items in the Committee on Science's jurisdiction related to research and development on distributed ledger technology, artic research budgets, financial assistance for test bed construction, acquisition of hurricane hunter aircraft, ocean exploration, and other items.

Legislative History

H.R. 7900, the National Defense Authorization Act for Fiscal year 2023 , was introduced by Representative Adam Smith on May 27, 2022. On July 14, 2022, the House considered and passed H.R. 7900 by a record vote of Y–329 and N–101.

On December 8, 2022, the House passed H. Res. 1512 under suspension of the rules by a record vote of Y–350 and N–80. Pursuant to that resolution, the text of H.R. 7776 was amended with the negotiated text of H.R. 7900 and passed the House.

On December 15, 2022, the Senate passed the House amendment to the Senate amendment to H.R. 7776 by a record vote of Y–83 and N–11.

On December 23, 2022, H.R. 7776 was signed by the President and became Public Law 117–263.

1.9 P.L. 117–246, Empowering the U.S. Fire Administration Act

Purpose

The purpose of H.R. 7077 is to authorize the U.S. Fire Administration to conduct on-site investigations of fires, in coordination and cooperation with appropriate federal, state, and local authorities and issues reports on such investigations.

Legislative History

H.R. 7077, the Empowering the U.S. Fire Administration Act, was introduced by Representative Torres on March 15, 2022. On, the Committee on Science, Space, and Technology marked up the bill ordered the bill reported favorably by voice vote.

On May 11, 2022, the House considered and passed H.R. 7077 under suspension of the rules by a record vote of Y–379 and N–37.

On December 6, 2022, the Senate considered and passed H.R. 7077, with an amendment, by unanimous consent.

On December 14, 2022, the House considered and passed H.R. 7077 under suspension of the rules by a record vote of Y–349 and N–80.

On December 20, 2022, H.R. 7077 was signed by the President and became Public Law 117–246.

1.10 P.L. 117–316, FLOODS Act

Purpose

The purpose of S. 558 is to direct the National Oceanic and Atmospheric Administration to establish a National Integrated Flood Information System to coordinate and integrate flood research, and other purposes.

Legislative History

S. 558, the FLOODS Act, was introduced by Senator Roger Wicker on March 3, 2021. On September 30, 2021, the Senate considered and passed S. 558 by unanimous consent.

On December 14, 2022, the House considered and passed S. 558 under suspension of the rules by a record vote of Y–349 and N–80.

On December 27, 2022, S. 558 was signed by the President and became Public Law 117–316.

1.11 P.L. 117–229, PRECIP Act

Purpose

The purpose of P.L. 117–229 is to direct the National Oceanic and Atmospheric Administration (NOAA) to support a study to understand best practices to support precipitation estimation, to regularly update out-of-date precipitation data in the U.S., and authorize funding for the study and for the precipitation estimates outlined in the bill.

The Act also contains continuing funding for the federal government for one week.

Legislative History

H.R. 1437, PRECIP Act, was introduced by Representative Mikie Sherrill on February 26, 2021. On November 16, 2021, the Committee on Science, Space, and Technology met to markup H.R. 1437, and it was favorably reported to the House with an amendment. On May 2, 2022, the House considered and passed H.R. 1437 under suspension of the rules by a record vote of Y–333 and N–81.

On November 17, 2022, the Senate passed an amended H.R. 1437 by unanimous consent.

On December 14, 2022, the House considered and passed H.R. 1437 (amended to include a continuous resolution for government funding) by a record vote of Y–224 and N–201.

On December 15, 2022, the Senate agreed to the House amendment to the Senate amendment to H.R. 1437 by a record vote of Y–71 and N–19.

On December 16, 2022, H.R. 1437 was signed by the President and became Public Law 117–229.

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 2021

Purpose

The purpose of H.R. 1 is to expand Americans' access to the ballot box, reduce the influence of big money in politics, strengthen ethics rules for public servants, and implement other anti-corruption measures.

Legislative History

On January 1, 2021, John P. Sarbanes introduced H.R. 1, which was referred to the Committee on House Administration and in addition to the Committee on Intelligence (Permanent Select); Judiciary; Oversight and Reform; Science, Space, and Technology; Education and Labor; Ways and Means; Financial Services; Ethics; Homeland Security; and, Armed Services. H.R. 1 was reported from the Committee on House Administration on March 2, 2021, and all other committees were discharged of consideration of the bill. The House considered H.R. 1 under the provisions of H. Res. 179 from March 2–3 2021, and the bill passed the House by record vote of 220–210.

2.2 H.R. 144, Supporting Early-Career Research Act

Purpose

The purpose of H.R. 144 is to forestall the loss of research talent by establishing a temporary early career research fellowship program.

Legislative History

Chairwoman Eddie Bernice Johnson introduced H.R. 144 on January 4, 2021, with Ranking Member Frank Lucas and the bill was referred solely to the Committee on Science, Space, and Technology. On February 25, 2021, the Committee on Science, Space, and Technology held a hearing entitled, *Building Back the U.S. Research Enterprise: COVID Impacts and Recovery.* On March 9, 2021, the Committee on Science, Space, and Technology met to consider H.R. 144. The bill was ordered reported by voice vote. The Committee reported the bill to the House on April 14, 2021. On May 17 and 18, 2021, H.R. 144 was considered under suspension of the rules, the yeas and nays were demanded, and passed the House by record vote of 350–75

The text of H.R. 144 was also included in Division B, Title VI, Subtitle A of H.R 4521, the America COMPETES Act of 2022. From February 2, 2022 to February 4, 2022, H.R. 4521 was considered under the provisions of the rule H. Res. 900 and on February 4, 2022 the bill passed the House by a record vote of 222–210. On April 7, 2022 the Speaker appointed conferees from the Committee on Science, Space, and Technology and included Committee members for consideration of Division B, Title VI, Subtitle A. This language was taken out of conference negotiations and added as an

amendment by the Senate to P.L. 117–80, the Chips and Science Act of 2022.

For further information regarding the legislative history of P.L. 117–80, please refer to entry 1.xx in Chapter 1.

2.3 **H.R. 204, STEM Opportunities Act**

Purpose

The purpose of H.R. 204 is to direct the Director of the Office of Science and Technology Policy to carry out programs and activities to ensure that Federal science agencies and institutions of higher education receiving Federal research and development funding are fully engaging their entire talent pool.

Legislative History

On May 9, 2019, the full Committee held a hearing entitled, *Achieving the Promise of a Diverse STEM Workforce.* Chairwoman Eddie Bernice Johnson introduced H.R. 204 on January 5, 2021, with Ranking Member Frank Lucas and the bill was referred solely to the Committee on Science, Space, and Technology. On May 17 and 18, 2021, H.R. 204 was considered under suspension of the rules, the yeas and nays were demanded, and passed the House by record vote of 350–75.

The text of H.R. 204 was also included in Division B, Title V, Subtitle A of H.R 4521, the America COMPETES Act of 2022. From February 2, 2022 to February 4, 2022, H.R. 4521 was considered under the provisions of the rule H. Res. 900 and on February 4, 2022 the bill passed the House by a record vote of 222–210. On April 7, 2022 the Speaker appointed conferees from the Committee on Science, Space, and Technology and included Committee members for consideration of Division B, Title V, Subtitle A. This language was taken out of conference negotiations and added as an amendment by the Senate to P.L. 117–80, the Chips and Science Act of 2022.

For further information regarding the legislative history of P.L. 117–80, please refer to entry 1.xx in Chapter 1.

2.4 **H.R. 210, Rural STEM Education Research Act**

Purpose

The purpose of H.R. 210 is to coordinate Federal research and development efforts focused on STEM education and workforce development in rural areas, including the development and application of new technologies to support and improve rural STEM education.

Legislative History

On May 8, 2019, the Subcommittee on Research and Technology held a hearing entitled, A Review of the National Science. On May 9, 2019, the full Committee held a hearing entitled, Achieving the Promise of a Diverse STEM Workforce. Ranking Member Frank Lucas introduced H.R. 210 on January 5, 2021, with Chairwoman Eddie Bernice Johnson and the bill was referred solely to the Committee on Science, Space, and Technology. On May 17 and 18, 2021, H.R. 210 was considered under suspension of the rules, the

yeas and nays were demanded, and passed the House by record vote of 350–75.

The text of H.R. 210 was also included in Division B, Title V, Subtitle B of H.R 4521, the America COMPETES Act of 2022. From February 2, 2022 to February 4, 2022, H.R. 4521 was considered under the provisions of the rule H. Res. 900 and on February 4, 2022 the bill passed the House by a record vote of 222–210. On April 7, 2022 the Speaker appointed conferees from the Committee on Science, Space, and Technology and included Committee members for consideration of Division B, Title V, Subtitle B. This language was taken out of conference negotiations and added as an amendment by the Senate to P.L. 117–80, the Chips and Science Act of 2022.

For further information regarding the legislative history of P.L. 117–80, please refer to entry 1.xx in Chapter 1.

2.5 **H.R. 847, Promoting Digital Privacy Technologies Act**

Purpose

The purpose of H.R. 847 is to support research on privacy enhancing technologies and promote responsible data use.

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.* Haley Stevens introduced H.R. 847 on February 4, 2021, with Anthony Gonzalez and the bill was referred solely to the Committee on Science, Space, and Technology. On Wednesday, April 28, 2021, the Subcommittee on Research and Technology held a hearing entitled, *National Science Foundation: Advancing Research for The Future of U.S. Innovation.* On September 28, 2021, the Investigations and Oversight Subcommittee held a hearing entitled, *The Disinformation Black Box: Researching Social Media Data.* On January 19, 2022, the Full Committee on Science, Space, and Technology met to consider H.R. 847. The bill was ordered to be reported favorably as amended by voice vote. On March 3, 2022, the Committee reported the bill to the House.

On May 10, 2022, H.R. 847 was considered under suspension of the rules, the yeas and nays were demanded, and passed the House by record vote of 401–19.

2.6 **H.R. 1437, PRECIP Act**

Purpose

The purpose of H.R. 1437 is to amend the Weather Research and Forecasting Innovation Act of 2017 to direct the National Oceanic and Atmospheric Administration to provide comprehensive and regularly updated Federal precipitation information.

Legislative History

Mikie Sherrill introduced H.R. 1437 on February 26, 2021, with Deborah Ross and the bill was referred solely to the Committee on Science, Space, and Technology. On April 21, 2021, the Subcommittee on the Environment held a hearing titled *Working To-*

wards Climate Equity: The Case for a Federal Climate Service. The purpose of the hearing was to highlight the need for a strengthened Federal role in climate risk information. On October 16, 2021, the Committee on Science, Space, and Technology met to consider H.R. 1437 and ordered the bill to be favorably reported as amended to the House by voice vote. On May 3, 2022, H.R. 1437 was reported to the House. On May 10 and 11, 2022, H.R. 1437 was considered under suspension of the rules, the yeas and nays were demanded, and passed the House by record vote of 333–81. On May 12, 2022 the Senate Received the bill. On November 17, 2022 the Senate passed the bill with an amendment by Unanimous Consent.

2.7 **H.R. 1447, COAST Research Act of 2021**

Purpose

The purpose of H.R. 1447 is to amend the Federal Ocean Acidification Research and Monitoring Act of 2009 to establish an Ocean Acidification Advisory Board, to expand and improve the research on Ocean Acidification and Coastal Acidification, to establish and maintain a data archive system for Ocean Acidification data and Coastal Acidification data.

Legislative History

On April 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. Suzanne Bonamici introduced H.R. 1447 on March 1, 2021, with Don Young and the bill was referred solely to the Committee on Science, Space, and Technology. On May 17 and 18, 2021, H.R. 1447 was considered under suspension of the rules, the yeas and nays were demanded, and passed the House by record vote of 350–75.

The text of H.R. 1447 was also included in Division B, Title VI, Subtitle E of H.R 4521, the America COMPETES Act of 2022. From February 2, 2022 to February 4, 2022, H.R. 4521 was considered under the provisions of the rule H. Res. 900 and on February 4, 2022 the bill passed the House by a record vote of 222–210. On April 7, 2022 the Speaker appointed conferees from the Committee on Science, Space, and Technology and included Committee members for consideration of Division B, Title VI, Subtitle E. This language was taken out of conference negotiations and added as an amendment by the Senate to P.L. 117–80, the Chips and Science Act of 2022.

For further information regarding the legislative history of P.L. 117–80, please refer to entry 1.xx in Chapter 1.

2.8 H.R. 1480, **Helping Emergency Responders Overcome Act of 2019**

Purpose

The purpose of H.R. 1480 is to require the Secretary of Health and Human Services to improve the detection, prevention, and treatment of mental health issues among public safety officers.

Legislative History

Ami Bera introduced H.R. 1480 on March 2, 2021, with Brian Fitzpatrick. The bill was referred to the Committee on Energy and Commerce, and in addition to the Committee on Science, Space, and Technology. After the Committee on Science, Space and Technology was consulted and the Committee on Energy and Commerce made assurances that the Committee on Science, Space and Technology's jurisdiction would not be diminished, prejudiced, or altered, Chairwoman Johnson of the Committee on Science, Space and Technology and Chairman Pallone of the Committee on Energy and Commerce exchanged correspondence and the Committee on Science, Space, and Technology waived formal consideration of H.R. 1480. On May 11 and 12, 2021, H.R. 1480 was considered under suspension of the rules, the yeas and nays were demanded, and passed the House by record vote of 349–74.

2.9 H.R. 1850, **Supporting Research and Development for First Responders Act**

Purpose

The purpose of H.R. 1850 is to amend the Homeland Security Act of 2002 relating to the National Urban Security Technology Laboratory.

Legislative History

Representative Kathleen Rice introduced H.R. 1850 on March 11, 2021, with Andrew Garbarino. The bill was referred solely to the Committee on Homeland Security. In the 116th Congress the Committee on Science, Space, and Technology claimed jurisdiction over a version of H.R. 1850 and were consulted during its consideration. In the 117th after seeing that H.R. 1850 was similar in form to the version in the prior congress, Chairwoman Johnson did not insist on a sequential referral on condition that the decision to forgo the referral be a waiver, reduction, or altering of the jurisdiction of the Committee on Science, Space, and Technology. Chairman Thompson of the Committee on Homeland Security agreed to these conditions and the two Chairs exchanged correspondences on July 7 and 8 2021. On July 20, 2021, H.R. 1850 was considered under suspension of the rules, the yeas and nays were demanded, and passed the House by record vote of 319–105.

2.10 **H.R. 2027, MSI STEM Achievement**

Purpose

The purpose of H.R. 2027 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 HBCUs, TCUs, and MSIs

Legislative History

On May 9, 2019, the full Committee held a hearing entitled, Achieving the Promise of a Diverse STEM Workforce. Chairwoman Eddie Bernice Johnson introduced H.R. 2027 on March 18, 2021, with Michael Waltz. The bill was referred solely to the Committee

on Science, Space, and Technology. On May 17 and 18, 2021, H.R. 2027 was considered under suspension of the rules, the yeas and nays were demanded, and passed the House by record vote of 350–75.

The text of H.R. 2027 was also included in Division B, Title V, Subtitle C of H.R 4521, the America COMPETES Act of 2022. From February 2, 2022 to February 4, 2022, H.R. 4521 was considered under the provisions of the rule H. Res. 900 and on February 4, 2022 the bill passed the House by a record vote of 222–210. On April 7, 2022 the Speaker appointed conferees from the Committee on Science, Space, and Technology and included Committee members for consideration of Division B, Title V, Subtitle C. This language was taken out of conference negotiations and added as an amendment by the Senate to P.L. 117–80, the Chips and Science Act of 2022.

For further information regarding the legislative history of P.L. 117–80, please refer to entry 1.xx in Chapter 1.

2.11 **H.R. 2225, National Science Foundation for the Future Act**

Purpose

The purpose of H.R. 2225 is to authorize appropriations for fiscal years 2022, 2023, 2024, 2025, and 2026 for the National Science Foundation.

Legislative History

Chairwoman Eddie Bernice Johnson introduced H.R. 2225 on March 26, 2021 with Ranking Member Frank Lucas. The bill was referred solely to the Committee on Science, Space, and Technology. On April 15, 2021, the Science, Space, and Technology Committee held a hearing entitled, *Reimagining Our Innovation Future.* On April 28, 2021 and May 6, 2021, the Research and Technology Subcommittee held a two-part hearing entitled, *National Science Foundation: Advancing Research for the Future of U.S. Innovation.* On May 13, 2021, the Research and Technology Subcommittee met to consider H.R. 2225 and favorably forwarded H.R. 2225 to the full committee. On June 15, 2021, the Full Committee on Science, Space, and Technology met to consider H.R. 2225 and ordered the bill as amended to be favorably reported to the House by voice vote. On June 28, 2021, H.R. 2225 was reported to the House and considered under suspension of the rules, the yeas and nays were demanded, and passed the House by record vote of 345–67.

The text of H.R. 2225 was also included in Division B, Title III (Division B, Title VI, Subtitle D for Malign foreign talent recruitment program) of H.R 4521, the America COMPETES Act of 2022. From February 2, 2022 to February 4, 2022, H.R. 4521 was considered under the provisions of the rule H. Res. 900 and on February 4, 2022 the bill passed the House by a record vote of 222–210. On April 7, 2022 the Speaker appointed conferees from the Committee on Science, Space, and Technology and included Committee members for consideration of Division B, Title III. This language was taken out of conference negotiations and added as an amendment by the Senate to P.L. 117–80, the Chips and Science Act of 2022.

For further information regarding the legislative history of P.L. 117–80, please refer to entry 1.xx in Chapter 1.

2.12 **H.R. 2533, NEAR Act of 2021**

Purpose

The purpose of H.R. 2533 is to provide for a study by the National Academies of Sciences, Engineering, and Medicine examining the impact of ocean acidification and other stressors in estuarine environments.

Legislative History

On April 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. The Committee on Science, Space, and Technology favorably reported an identical version of H.R. 2533 and passed the bill on suspension in 116th Congress. Bill Posey introduced H.R. 2533 on April 14, 2021, with Suzanne Bonamici. The bill was referred to the Committee on Science, Space, and Technology, and in addition to the Committee on Natural Resources. On April 16, 2021 Chairman Raul Grijalva of the Committee on Natural Resources and Chairwoman Johnson of the Committee on Science, Space, and Technology exchanged correspondence in which the Committee on Science, Space, and Technology acknowledge the Committee on Natural Resource's jurisdiction over provisions of the H.R. 2533 and Chairman Grijalva waived his Committee's formal jurisdiction for the purposes of consideration of this bill. On May 17 and 18, 2021, H.R. 2533 was considered under suspension of the rules, the yeas and nays were demanded, and passed the House by record vote of 350–75.

2.13 **H.R. 2695, Combating Sexual Harassment in Science Act**

Purpose

The purpose of H.R. 2695 is to provide for research to better understand the causes and consequences of sexual harassment affecting individuals in the scientific, technical, engineering, and mathematics workforce and to examine policies to reduce the prevalence and negative impact of such harassment.

Legislative History

On June 12, 2019 the Committee on Science, Space, and Technology held a hearing entitled *Combating Sexual Harassment in Science.* Chairwoman Eddie Bernice Johnson introduced H.R. 2695 on April 20, 2021, with Ranking Member Frank Lucas. On May 17 and 18, 2021, H.R. 2695 was considered under suspension of the rules, the yeas and nays were demanded, and passed the House by record vote of 350–75.

The text of H.R. 2225 was also included in Division B, Title V, Subtitle D of H.R 4521, the America COMPETES Act of 2022. From February 2, 2022 to February 4, 2022, H.R. 4521 was considered under the provisions of the rule H. Res. 900 and on February 4, 2022 the bill passed the House by a record vote of 222–210. On April 7, 2022 the Speaker appointed conferees from the Committee

on Science, Space, and Technology and included Committee members for consideration of Division B, Title V, Subtitle D. This language was taken out of conference negotiations and added as an amendment by the Senate to P.L. 117–80, the Chips and Science Act of 2022.

For further information regarding the legislative history of P.L. 117–80, please refer to entry 1.xx in Chapter 1.

2.14 **H.R. 3228, National Coastal Resilience Data and Services Act**

Purpose

The purpose of H.R. 3228 is to direct the Secretary of Commerce, acting through the Administrator of the National Oceanic and Atmospheric Administration, to improve science, data, and services that enable sound decision making in response to coastal flood risk, including impacts of sea level rise, storm events, changing Great Lakes water levels, and land subsidence.

Legislative History

On May 13, 2021, H.R. 3228 was introduced by Nydia M. Velázquez and referred to the Committee on Natural Resources, and in addition to the Committee on Science, Space, and Technology. H.R. 3228 was ordered to be reported as amended from the Committee on Natural Resources by voice vote on January 19, 2022, and Chairwoman Johnson exchanged correspondence with Chair Raúl Grijalva and discharged the Committee on Science, Space, and Technology of further consideration. The Committee on Natural Resources met to consider H.R. 3228 and ordered the bill to be favorably reported as amended to the House by voice vote.

2.15 **H.R. 3482, National Center for the Advancement of Aviation Act of 2022**

Purpose

The purpose of H.R. 3482 is to establish the National Center for the Advancement of Aviation.

Legislative History

On May 25, 2021, H.R. 3482 was introduced by André Carson and referred solely to the Committee on Transportation and Infrastructure. On July 20, 2021, the Subcommittee held a hearing titled *Bridging the Gap: Improving Diversity and Inclusion in the U.S. Aviation Workforce.* On July 23, 2021, Chairwoman Johnson wrote to Speaker of the House of Representatives, Nancy Pelosi making a claim to a sequential referral for the Committee on Science, Space and Technology. The Committee on Transportation and Infrastructure met to consider the bill on April 28, 2022, and ordered the bill to be reported to the House, as amended, by voice vote. On September 27, 2022, Chairwoman Johnson exchanged correspondence with Chairman DeFazio acknowledging the Committee on Science, Space, and Technology's jurisdiction over provisions of H.R. 3482 and Chairwoman Johnson foregoing consideration. On September 28, 2022, H.R. 3482 was reported and then was consid-

ered under suspension of the rules, the yeas and nays were demanded, and passed the House by record vote of 369–56.

2.16 **H.R. 3588, Mathematical and Statistical Modeling Education Act**

Purpose

The purpose of H.R. 3588 is to coordinate Federal research and development efforts focused on modernizing mathematics in STEM education through mathematical and statistical modeling, including data-driven and computational thinking, problem, project, and performance-based learning and assessment, interdisciplinary exploration, and career connections.

Legislative History

On May 28, 2021, H.R. 3588 was introduced by Chrissy Houlahan, James Baird, and Jerry McNerney, and referred solely to the Committee on Science, Space, and Technology. On April 28, 2021, and May 6, 2021, the Subcommittee on Research and Technology held a two-part hearing to discuss opportunities and challenges for leveraging and expanding the National Science Foundation mission to continue to advance excellent research; improve STEM education and research training; increase research accessibility, and accountability; and accelerate research to address major societal challenges. On April 5, 2022, the Committee on Science, Space, and Technology met to consider H.R. 3588. No amendments to the bill text were offered and the Committee ordered the bill to be favorably reported to the House by voice vote. On June 14, 2022, H.R. 3588 was reported to the House. On July 26, 2022, H.R. 3588 was considered under suspension of the rules, the yeas and nays were demanded, and passed the House by record vote of 323–92.

2.17 **H.R. 3593, Department of Energy Science for the Future Act**

Purpose

The purpose of H.R. 3593 is to provide guidance for and investment in the research and development activities of this Department of Energy Office and Science.

Legislative History

On January 15, 2020, in a hearing entitled *The Department of Energy's Office of Science: Exploring the Next Frontiers in Energy Research and Scientific Discovery,* the Subcommittee on Energyexamined the Office of Science as a whole and analyzed the research and development activities and facilities supported by the office—considering potential directions for its various programs. On September 11th, 2020, the Subcommittee on Energy held a legislative hearing entitled *Biological Research at the Department of Energy: Leveraging DOE's Unique Capabilities to Respond to the COVID–19 Pandemic.* On May 4, 2021, the Subcommittee on Energy held a hearing, entitled Climate and Energy Science Research at the Department of Energy, that examined the Basic Energy Sciences program as a whole and the Earth and Environmental Systems Sciences Division within the Office of Science's BES pro-

gram. On May 19, 2021, in a hearing entitled *Accelerating Discovery: The Future of Scientific Computing at the Department of Energy,* the Subcommittee on Energy examined the scientific computing capabilities stewarded by the Office of Science's Advanced Scientific Computing Research program, including its forthcoming exascale systems, and the implications of these capabilities for other scientific disciplines and their relevance to pressing societal challenges. The full Committee held a legislative hearing on May 27, 2021 entitled *Overview of the Science and Energy Research Enterprise of the U.S. Department of Energy,* that examined the research, development, demonstration, and commercialization programs and activities carried out by DOE.

On May 28, 2021, Chairwoman Eddie Bernice Johnson introduced H.R. 3593 with Ranking Member Frank Lucas, which was solely referred to the Committee on Science, Space, and Technology. On June 15, 2021, the full Committee on Science, Space, and Technology met to consider H.R. 3593 and ordered the bill to be favorably reported as amended to the House by voice vote. On June 28, 2021, H.R. 3593 was reported to the House and considered under suspension of the rules, the yeas and nays were demanded, and passed the House by record vote of 351–68.

The text of H.R. 3593 was also included in Division B, Title I of H.R 4521, the America COMPETES Act of 2022. From February 2, 2022 to February 4, 2022, H.R. 4521 was considered under the provisions of the rule H. Res. 900 and on February 4, 2022 the bill passed the House by a record vote of 222–210. On April 7, 2022 the Speaker appointed conferees from the Committee on Science, Space, and Technology and included Committee members for consideration of Division B, Title I. This language was taken out of conference negotiations and added as an amendment by the Senate to P.L. 117–80, the Chips and Science Act of 2022.

For further information regarding the legislative history of P.L. 117–80, please refer to entry 1.xx in Chapter 1.

2.18 **H.R. 3756, Department of Homeland Security Climate Change Research Act**

Purpose

The purpose of H.R. 3756 is to amend the Homeland Security Act of 2002 to require the Under Secretary for Science and Technology of the Department of Homeland Security to research and evaluate existing Federal research regarding approaches to mitigate climate change on homeland security and to identify areas for further research within the Department.

Legislative History

A version of H.R. 3756 was introduced in the 116th Congress (H.R. 4737) and the Committee on Science, Space, and Technology issued a jurisdictional claim letter on October 22, 2019. Subsequently, the Committees on Homeland Security and Committee on Science, Space, and Technology worked cooperatively and as a result the Science Committee waived the claim to formal consideration. On June 8, 2021, H.R. 3756, introduced by Yvette Clark, was solely referred to the Committee on Homeland Security. On September 14, 2022, the full Committee on Homeland Security met to

consider H.R. 3756 and ordered the bill to be favorably reported to the House by the Yeas and Nays: 19–14. On September 15, 2022, the Committees on Homeland Security and Committee on Science, Space, and Technology exchanged correspondence whereas the Science Committee agreed to again waive formal consideration of H.R. 3756 in light of a similar cooperation between committees.

2.19 **H.R. 3858, National Science and Technology Strategy Act of 2021**

Purpose

The purpose of H.R. 3858 is to establish a national science and technology strategy and a quadrennial science and technology review.

Legislative History

On April 15, 2021, the Science, Space, and Technology Committee held a hearing entitled, *Reimagining Our Innovation Future*. The purpose of the hearing was to examine the current outlook for U.S. leadership in science and technology and discuss how new investments and new, inclusive models of partnership in science and technology can be leveraged to ensure continued leadership and address economic, security, environmental, public health, and other societal challenges from the local to the global level. On June 11, 2021, Michael Waltz introduced H.R. 3858 and was solely referred to the Committee on Science, Space, and Technology. On July 27, 2021, the full Committee on Science, Space, and Technology met to consider H.R. 3858 and ordered the bill to be favorably reported to the House by voice vote. There were no amendments. On February 18, 2022, H.R. 3858 was reported to the House.

The text of H.R. 3858 was also included in Division B, Title VI, Subtitle B of H.R 4521, the America COMPETES Act of 2022. From February 2, 2022, to February 4, 2022, H.R. 4521 was considered under the provisions of the rule H. Res. 900 and on February 4, 2022 the bill passed the House by a record vote of 222–210. On April 7, 2022, the Speaker appointed conferees from the Committee on Science, Space, and Technology and included Committee members for consideration of Division B, Title VI, Subtitle B. This language was taken out of conference negotiations and added as an amendment by the Senate to P.L. 117–80, the Chips and Science Act of 2022.

For further information regarding the legislative history of P.L. 117–80, please refer to entry 1.xx in Chapter 1.

2.20 **H.R. 3952, NOAA Chief Scientist Act**

Purpose

The purpose of H.R. 3952 is to strengthen the role of the Chief Scientist of the National Oceanic and Atmospheric Administration in order to promote scientific integrity and advance the Administration's world-class research and development portfolio.

Legislative History

On June 16, 2021, Mikie Sherrill and Randy Feenstra introduced H.R. 3952 and the bill was referred to the Committee on Science, Space, and Technology, and in addition to the Committee on Natural Resources. On September 23, 2021, the Subcommittee on the Environment held a hearing titled *Advancing Earth System Science and Stewardship at NOAA.* On April 5, 2022, the Full Committee on Science, Space, and Technology met to consider H.R. 3952 and ordered the bill to be favorably reported as amended to the House by voice vote. On May 24, 2022, Eddie Bernice Johnson and Chairman Raul Grijalva or the Committee on Natural Resources exchanged correspondence and in response to the Committees working cooperatively together on H.R. 3952 and in respect of the provisions within the jurisdiction of the Committee on Natural Resources, Chairman Grijalva waived further consideration of H.R. 3952. On June 16, 2022, H.R. 3952 was reported to the House. On July 27, 2022, H.R. 3952 was considered under suspension of the rules, the yeas and nays were demanded, and passed the House by record vote of 336–90.

2.21 **H.R. 4270, Abandoned Well Remediation Research and Development Act**

Purpose

The purpose of H.R. 4270 is to amend the Energy Policy Act of 2005 to direct the Secretary of Energy to carry out a research, development, and demonstration program with respect to abandoned wells.

Legislative History

On May 27th, 2021, the Committee on Science, Space, and Technology held a hearing titled *Overview of the Science and Energy Research Enterprise of the U.S. Department of Energy,* that examined the research, development, demonstration, and commercialization programs and activities carried out by the Department of Energy. Conor Lamb introduced H.R. 4270 on June 30, 2021, with Stephanie Bice and the bill was referred solely to the Committee on Science, Space, and Technology. On January 19, 2022, the Committee on Science, Space and Technology met to consider H.R. 4270 and ordered the bill to be favorably reported as amended to the House by voice vote. On October 7, 2022, H.R. 4270 was reported to the House.

2.22 **H.R. 4521, Bioeconomy Research and Development Act of 2021**

Purpose

The purpose of H.R. 4521 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 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 and oversight of such science and technologies; and to examine the status of U.S. leadership in engineering biology. On April 15, 2021, the Committee on Science, Space, and Technology held a hearing entitled, Reimagining Our Innovation Future. The purpose of the hearing was to examine the current outlook for U.S. leadership in science and technology and discuss how new investments and new models of partnership in science and technology can be leveraged to ensure continued leadership and address economic, security, environmental, public health, and other societal challenges from the local to the global level.

Chairwoman Eddie Bernice Johnson introduced H.R. 4521 on June 19, 2021, with Ranking Member Frank Lucas and it was referred to the Committee on Science, Space, and Technology, in addition to the Committee on Agriculture, and the Committee on Energy and Commerce. On January 19, 2022, the Committee on Science, Space, and Technology met to consider H.R. 4521 and ordered the bill to be favorably reported as amended to the House by voice vote. On January 28, 2022, H.R. 4521 was reported to the House and the Committee on Agriculture and the Committee on Energy and Commerce were discharged.

H. Res. 900, was reported out by the House Committee on Rules on February 2, 2022. H.Res. 900 included an amendment in the nature of a substitute consisting of the text of Rules Committee Print 117–31 and H.R 4521 became the America COMPETES Act of 2022 with text added to it from other bills. From February 2, 2022 to February 4, 2022, H.R. 4521 was considered under the provisions of the rule H. Res. 900, the text reported out of Committee was moved to Division B, Title IV and on February 4, 2022 the bill passed the House by a record vote of 222–210. On March 28, 2022, the Senate agreed to and passed H.R. 4521 with an amendment that struck all House text and inserted the United States Innovation and Competition Act of 2021. On April 4, 2022, the House rejected the Senate Amendment and requested a conference. On April 7, 2022, the Speaker appointed conferees from the Committee on Science, Space, and Technology and included Committee members for consideration of Division B, Title IV. On April 28, 2022, the Senate insisted on its amendment and agreed to the House request for a conference. The language of H.R. 4521 was taken out of conference negotiations and added as an amendment by the Senate to P.L. 117–80, the CHIPS and Science Act of 2022.

For further information regarding the legislative history of P.L. 117–80, please refer to entry 1.xx in Chapter 1.

2.23 **H.R. 4588, Regional Innovation Act of 2021**

Purpose

The purpose of H.R. 4588 is to amend the Stevenson-Wydler Technology Innovation Act of 1980 to establish a regional technology and innovation hub program.

Legislative History

On July 17, 2020, the Subcommittee on Energy held a hearing entitled, *From Lab to Market: Accelerating our Progress toward Economic Recovery and a Clean Energy Future.* The purpose of the hearing was to examine technology transfer activities at the Department of Energy and their potential contributions to economic recovery from the current COVID–19 pandemic, including regional clean energy innovation initiatives. On April 15, 2021, the Science, Space, and Technology Committee held a hearing entitled, *Reimagining Our Innovation Future.* The purpose of the hearing was to examine the current outlook for U.S. leadership in science and technology and discuss how new investments and new, inclusive models of partnership in science and technology can be leveraged to ensure continued leadership and address economic, security, environmental, public health, and other societal challenges from the local to the global level. And on June 9, 2021, the Research and Technology Subcommittee held a hearing entitled, *Building Regional Innovation Economies.* The purpose of this hearing is to explore the role of the Department of Commerce, and particularly the Economic Development Agency (EDA), in supporting the development of regional innovation economies, and the opportunities for and challenges to expanding this role, including in partnership with Federal science agencies.

Susan Wild introduced H.R. 4588 on June 20, 2021, with James Baird and it was solely referred to the Committee on Science, Space, and Technology. On June 27, 2021, the Committee on Science, Space, and Technology met to consider H.R. 4588 and ordered the bill to be favorably reported as amended to the House by voice vote. On February 28, 2022, H.R. 4521 was reported to the House.

The text of H.R. 4588 was also included in Division B, Title VI, Subtitle C of H.R 4521, the America COMPETES Act of 2022. From February 2, 2022 to February 4, 2022, H.R. 4521 was considered under the provisions of the rule H. Res. 900 and on February 4, 2022 the bill passed the House by a record vote of 222–210. On April 7, 2022, the Speaker appointed conferees from the Committee on Science, Space, and Technology and included Committee members for consideration of Division B, Title VI, Subtitle C. This language was taken out of conference negotiations and added as an amendment by the Senate to P.L. 117–80, the Chips and Science Act of 2022.

For further information regarding the legislative history of P.L. 117–80, please refer to entry 1.xx in Chapter 1.

2.24 **H.R. 4599, SUPER Act of 2021**

Purpose

The purpose of H.R. 4599 is to strengthen and enhance the competitiveness of American manufacturing through the research and development of advanced technologies to reduce steelmaking emissions.

Legislative History

On March 26, 2019, 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 substantially lower greenhouse gas emissions in the manufacturing sector through both federal investment and public-private partnerships. On June 19, 2019, the Energy Subcommittee of the Committee on Science, Space, and Technology held a hearing to examine the Department of Energy's fossil energy research and development activities.

Anthony Gonzalez introduced H.R. 4599 on July 21, 2021, with Conor Lamb and it was referred solely to the Committee on Science, Space, and Technology. On July 27, 2021, the Committee on Science, Space, and Technology met to consider H.R. 4599 and ordered the bill to be favorably reported as amended to the House by voice vote. On January 18, 2022, H.R. 4599 was reported to the House.

The text of H.R. 4599 was also included in Division B, Title VI, Subtitle M of H.R 4521, the America COMPETES Act of 2022. From February 2, 2022 to February 4, 2022, H.R. 4521 was considered under the provisions of the rule H. Res. 900 and on February 4, 2022 the bill passed the House by a record vote of 222–210. On April 7, 2022, the Speaker appointed conferees from the Committee on Science, Space, and Technology and included Committee members for consideration of Division B, Title VI, Subtitle M. This language was taken out of conference negotiations and added as an amendment by the Senate to P.L. 117–80, the Chips and Science Act of 2022.

For further information regarding the legislative history of P.L. 117–80, please refer to entry 1.xx in Chapter 1.

2.25 **H.R. 4606, Energizing Technology Transfer Act**

Purpose

The purpose of H.R. 4606 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 Subcommittee on Energy held a legislative hearing entitled *From Lab to Market: Accelerating our Progress Toward Economic Recovery and a Clean Energy Future.* The hearing discussed how the draft Energizing Technology Transfer Act would authorize a series of activities for DOE to support and administer programs to accelerate the commercialization of clean energy and other technologies relevant to the mission of the Department of Energy, including those developed at the national laboratories, and to modernize the management and administration of demonstration projects and prize competitions, among other activities.

Debra Ross introduced H.R. 4606 on July 21, 2021 with Peter Meijer and the bill was solely referred to the Committee on Science, Space, and Technology. On July 27, 2021, the Committee on Science, Space, and Technology met to consider H.R. 4606 and ordered the bill to be favorably reported as amended to the House by voice vote. On August 19, 2022, H.R. 4606 was reported to the House.

The text of H.R. 4606 was also included in Division B, Title VI, Subtitle J of H.R 4521, the America COMPETES Act of 2022. From

February 2, 2022 to February 4, 2022, H.R. 4521 was considered under the provisions of the rule H. Res. 900 and on February 4, 2022 the bill passed the House by a record vote of 222–210. On April 7, 2022, the Speaker appointed conferees from the Committee on Science, Space, and Technology and included Committee members for consideration of Division B, Title VI, Subtitle J. This language was taken out of conference negotiations and added as an amendment by the Senate to P.L. 117–80, the Chips and Science Act of 2022.

For further information regarding the legislative history of P.L. 117–80, please refer to entry 1.xx in Chapter 1.

2.26 **H.R. 4609, National Institute of Standards and Technology for the Future Act of 2021**

Purpose

The purpose of H.R. 4609 is to reauthorize the National Institute of standards and Technology.

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.* The purpose of the hearing was to explore the major areas of research under the National Institute of Standards and Technology 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 April 15, 2021, the Science, Space, and Technology Committee held a hearing entitled, *Reimagining Our Innovation Future.* The purpose of the hearing was to examine the current outlook for U.S. leadership in science and technology and discuss how new investments and new, inclusive models of partnership in science and technology can be leveraged to ensure continued leadership and address economic, security, environmental, public health, and other societal challenges from the local to the global level.

On May 25, 2021, the Investigations and Oversight Subcommittee held a joint hearing with the Research and Technology Subcommittee entitled, *SolarWinds and Beyond: Improving the Cybersecurity of Software Supply Chains.* The purpose of the hearing was to examine the causes and impacts of recent supply chain attacks on Federal Agencies, explore how Federal Agencies currently mitigate their software supply chain risks, and consider how best to improve software supply chain security.

On June 9, 2021 the Research and Technology Subcommittee held a hearing entitled, *Building Regional Innovation Economies.* The purpose of this hearing was to explore the role of the Department of Commerce, including NIST's extramural manufacturing programs, in supporting the development of regional innovation economies, and the opportunities for and challenges to expanding this role, including in partnership with Federal science agencies.

On July 20, 2021 the full Committee held a hearing entitled, *Spectrum Needs for Observational Earth and Space Science.* The

hearing examined research and development efforts to examine spectral interference, including work at NIST.

Haley Stevens introduced H.R. 4609 on July 21, 2021, with Michael Waltz and was referred solely to the Committee on Science, Space, and Technology. On July 27, 2021, the Committee on Science, Space, and Technology met to consider H.R. 4609 and ordered the bill to be favorably reported as amended to the House by voice vote. On February 18, 2022, H.R. 4609 was reported to the House.

The text of H.R. 4609 was also included in Division B, Title II of H.R 4521, the America COMPETES Act of 2022. From February 2, 2022 to February 4, 2022, H.R. 4521 was considered under the provisions of the rule H. Res. 900 and on February 4, 2022 the bill passed the House by a record vote of 222–210. On April 7, 2022 the Speaker appointed conferees from the Committee on Science, Space, and Technology and included Committee members for consideration of Division B, Title II. This language was taken out of conference negotiations and added as an amendment by the Senate to P.L. 117–80, the Chips and Science Act of 2022.

For further information regarding the legislative history of P.L. 117–80, please refer to entry 1.xx in Chapter 1.

2.27 **H.R. 4819, National Nuclear University Research Infrastructure Reinvestment Act of 2021**

Purpose

The purpose of H.R. 4819 is to require the Secretary of Energy to revitalize existing university infrastructure relating to nuclear science and engineering and establish new university-based nuclear science and engineering facilities.

Legislative History

Anthony Gonzalez introduced H.R. 4819 on July 29, 2021, with Bill Foster and the bill was referred solely to the Committee on Science, Space, and Technology. On October 21, 2021, the Committee on Science, Space, and Technology held a hearing entitled *Judicious Spending to Enable Success at the Office of Nuclear Energy* to examine nuclear energy research and development activities at the Department of Energy. On January 19, 2022, the Committee on Science, Space, and Technology met to consider H.R. 4819 and ordered the bill to be favorably reported as amended to the House by voice vote. On September 14, 2022, H.R. 4819 was reported to the House.

The text of H.R. 4819 was also included in Division B, Title VI, Subtitle L of H.R 4521, the America COMPETES Act of 2022. From February 2, 2022 to February 4, 2022, H.R. 4521 was considered under the provisions of the rule H. Res. 900 and on February 4, 2022 the bill passed the House by a record vote of 222–210. On April 7, 2022 the Speaker appointed conferees from the Committee on Science, Space, and Technology and included Committee members for consideration of Division B, Title VI, Subtitle L. This language was taken out of conference negotiations and added as an amendment by the Senate to P.L. 117–80, the Chips and Science Act of 2022.

For further information regarding the legislative history of P.L. 117–80, please refer to entry 1.xx in Chapter 1.

2.28 **H.R. 5324, NWR Modernization Act of 2021**

Purpose

The purpose of H.R. 5324 is to provide guidance for and investment in the upgrade and modernization of the National Oceanic and Atmospheric Administration Weather Radio All Hazards network.

Legislative History

Stephanie Bice introduced H.R. 5324 on September 22, 2021, with Mikie Sherrill and was referred solely to the Committee on Science, Space, and Technology. On September 23, 2021, the Subcommittee on the Environment held a hearing titled *Advancing Earth System Science and Stewardship at NOAA.* On October 14, 2021 the full committee on Science, Space, and Technology held a hearing titled *The Future of Forecasting: Building a Weather-Ready Nation on All Fronts.*

On October 16, 2021, the Committee on Science, Space, and Technology met to consider H.R. 5324 and ordered the bill to be favorably reported as amended to the House by voice vote. On March 6, 2022, H.R. 5324 was reported to the House. On May 10 and 11, 2022, H.R. 5324 was considered under suspension of the rules, the yeas and nays were demanded, and passed the House by record vote of 397–20. H.R. 5324 was received in the Senate and referred to the Committee on Commerce, Science, and Transportation.

2.29 **H.R. 5746, NASA Enhanced Use Leasing Extension Act of 2021**

Purpose

The purpose of H.R. 5746 is to amend title 51, United States Code, to extend the authority of the National Aeronautics and Space Administration to enter into leases of non-excess property of the Administration.

Legislative History

Don Beyer introduced H.R. 5746 on October 27, 2021, with Brian Babin and was referred solely to the Committee on Science, Space, and Technology. On December 8, 2021, H.R. 5746 was considered under suspension of the rules, and the bill passed the House by voice vote. The Senate received H.R. 5746 and passed it with an amendment. The House received H.R 5746, and under H. Res. 868, the text of H.R 5746 was replaced by an amendment with the text of rule Committee Print 117–28, *The Freedom to Vote: John R. Lewis Act.* On January 13, 2022, H.R. 5746 was considered under the provisions of the rule H. Res. 868 and the House agreed with an amendment to the Senate amendment by a record vote of 220–203. The Senate failed to invoke cloture on the motion to concur with the House amendment.

2.30 **H.R. 6291, Micro Act**

Purpose

The purpose of H.R. 6291 is to provide for a comprehensive and integrative program to accelerate microelectronics research and development at the Department of Energy.

Legislative History

On Thursday, December 2, 2021, the Committee on Science, Space, and Technology held a hearing entitled *Ensuring American Leadership in Microelectronics* to examine the status of U.S. leadership in advanced microelectronics development and manufacturing, to discuss how new investments and partnership models can support continued U.S. leadership, and to explore the role of the federal government in supporting domestic microelectronics innovation and manufacturing throughout the supply chain.

Paul Tonko introduced H.R. 6291 on December 14, 2021, with Jake Ellzey and was referred solely to the Committee on Science, Space, and Technology. On January 19, 2022, the Committee on Science, Space, and Technology met to consider H.R. 6291 and ordered the bill to be favorably reported as amended to the House by voice vote. On August 19, 2022, H.R. 46291 was reported to the House.

The text of H.R. 6291 was also included in Division B, Title VI, Subtitle K of H.R 4521, the America COMPETES Act of 2022. From February 2, 2022 to February 4, 2022, H.R. 4521 was considered under the provisions of the rule H. Res. 900 and on February 4, 2022 the bill passed the House by a record vote of 222–210. On April 7, 2022 the Speaker appointed conferees from the Committee on Science, Space, and Technology and included Committee members for consideration of Division B, Title VI, Subtitle K. This language was taken out of conference negotiations and added as an amendment by the Senate to P.L. 117–80, the Chips and Science Act of 2022.

For further information regarding the legislative history of P.L. 117–80, please refer to entry 1.xx in Chapter 1.

2.31 **H.R. 6845, Commercial Remote Sensing Amendment Act of 2022**

Purpose

The purpose of H.R. 6845 is to provide for transparent licensing of commercial remote sensing systems.

Legislative History

On May 18, 2021, the Committee on Science, Space, and Technology held a hearing entitled *NASA's Earth Science and Climate Change Activities: Current Roles and Future Opportunities.* Ranking Member Frank Lucas introduced H.R. 6845 on February 24, 2022, with Ed Perlmutter and it was referred solely to the Committee on Science, Space, and Technology. On April 5, 2022, the Committee on Science, Space, and Technology met to consider H.R. 6845 and ordered the bill to be favorably reported as amended to the House by voice vote. On July 1, 2022, H.R. 6845 was reported to the House. On July 26, 2022, H.R. 6845 was considered under

suspension of the rules, and the bill passed the House by voice vote. The Senate received and referred to the Committee on Commerce, Science, and Transportation on July 28, 2022.

2.32 **H.R. 6933, Cost-Share Accountability Act of 2022**

Purpose

The purpose of H.R. 6933 is to amend the Energy Policy Act of 2005 to require reporting relating to certain cost-share requirements.

Legislative History

On October 21, 2021, the Investigations and Oversight Subcommittee and the Energy Subcommittee of the Committee on Science, Space, and Technology Committee held a joint hearing entitled, *Judicious Spending to Enable Success at the Office of Nuclear Energy,* to review several large financial assistance awards made by the Department's Office of Nuclear Energy.

Jay Obernolte introduced H.R. 6933 on March 3, 2022, with Bill Foster and it was referred solely to the Committee on Science, Space, and Technology. On April 5, 2022, the Full Committee on Science, Space, and Technology met to consider H.R. 3952 and ordered the bill to be favorably reported as amended to the House by voice vote. On June 14, 2022, H.R. 6933 was reported to the House. On July 26 and 27, 2022, H.R. 3952 was considered under suspension of the rules, the yeas and nays were demanded, and passed the House by record vote of 336–90. The Senate received H.R. 6933 and referred it to the Committee on Energy and Natural Resources on July 28, 2022.

2.33 **H.R. 7180, Brycen Gray and Ben Price COVID–19 Cognitive Research Act**

Purpose

The purpose of H.R. 7180 is to authorize the Director of the National Science Foundation to award grants to support research on the disruption of regular cognitive processes associated with COVID–19 infection.

Legislative History

Anthony Gonzalez introduced H.R. 7180 on March 21, 2022, with Susan Wild and Adam Kinzinger, and the bill was referred solely to the Committee on Science, Space, and Technology. On May 17, 2022, the Committee on Science, Space, and Technology met to consider H.R. 7180 and ordered the bill to be favorably reported to the House by voice vote. No amendments to H.R. 7180 were offered. On June 15, 2022, H.R. 7180 was reported to the House. On July 26, 2022, H.R. 7180 was considered under suspension of the rules, the yeas and nays were demanded, and passed the House by record vote of 350–69. The Senate received H.R. 7180 and referred it to the Committee on Health, Education, Labor, and Pensions.

2.34 **H.R. 7289, Federal PFAS Research Evaluation Act**

Purpose

The purpose of H.R. 7289 is to provide for the National Academies to study and report on a federal research agenda to advance the understanding of perfluoroalkyl and polyfluoroalkyl substances, commonly referred to as PFAS.

Legislative History

On December 7, 2021, the Subcommittees on Environment and Research and Technology held a joint hearing titled *Forever Chemicals: Research and Development for Addressing the PFAS Problem*. Lizzie Fletcher introduced H.R. 7289 on March 30, 2022, with Peter Meijer, and the bill was referred solely to the Committee on Science, Space, and Technology. On May 17, 2022, the Committee on Science, Space, and Technology met to consider H.R. 7289 and ordered the bill to be favorably reported as amended to the House by voice vote. On July 13, 2022, H.R. 7289 was reported to the House. On July 26, 2022, H.R. 7289 was considered under suspension of the rules, the yeas and nays were demanded, and passed the House by record vote of 359–62. The Senate received H.R. 7289 and referred it to the Committee on Environment and Public Works.

2.35 **H.R. 7361, National Weather Service Communications Improvement Act**

Purpose

The purpose of H.R. 7361 is to upgrade the communications service used by the National Weather Service.

Legislative History

On October 14, 2021, the Committee on Science, Space, and Technology held a hearing titled *The Future of Forecasting: Building a Weather-Ready Nation on all Fronts*. Randy Feenstra introduced H.R. 7361 on April 1, 2022, with Cynthia Axne, and it was referred solely to the Committee on Science, Space, and Technology. On May 17, 2022, the Committee on Science, Space, and Technology met to consider H.R. 7361 and ordered the bill be favorably reported to the House by voice vote. No amendments to H.R. 7361 were offered. On June 14, 2022, H.R. 7361 was reported to the House. On July 27, 2022, H.R. 7361 was considered under suspension of the rules, the yeas and nays were demanded, and passed the House by record vote of 336–90. The Senate received H.R. 7361 and referred to the Committee on Commerce, Science, and Transportation on July 28, 2022.

2.36 **H.R. 7569, Energy Cybersecurity University Leadership Act of 2022**

Purpose

The purpose of H.R. 7569 is to direct the Secretary of Energy to establish a program to provide financial assistance to graduate students and postdoctoral researchers pursuing certain courses of study relating to cybersecurity and energy infrastructure.

Legislative History

On March 18, 2021, the Committee held a hearing entitled "*Lessons Learned from the Texas Blackouts: Research Needs for a Secure and Resilient Grid*." The purpose of the hearing was to understand the causes of the extended power outages in Texas and other southern and midwestern states during a severe winter storm in February 2021 and to examine associated grid research and development needs.

Deborah Ross introduced H.R. 7569 on April 25, 2022, with Mike Carey and it was referred solely to the Committee on Science Space and Technology. On May 17, 2022, the Committee on Science, Space, and Technology met to consider H.R. 7569 and ordered to the bill to be favorably reported to the House by voice vote. No amendments to H.R. 7569 were offered. On June 14, 2022, H.R. 7569 was reported to the House. On July 27, 2022, H.R. 7569 was considered under suspension of the rules, the yeas and nays were demanded, and passed the House by record vote of 336–90. The Senate received H.R. 7569 and referred it to the Committee on Energy and Natural Resources on July 28, 2022.

3.1 Hearings Before the Full Committee

(a) HEARING VOLUME NO. 117–1

February 19, 2021

FULL COMMITTEE HEARING: THE SCIENCE OF COVID–19 VACCINES AND ENCOURAGING VACCINE UPTAKE

The purpose of this hearing was to discuss some of the processes and research achievements that allowed for several safe and effective COVID–19 vaccines to be designed, manufactured, and distributed at a record pace. The Committee also considered how vaccine hesitancy and impediments to access may affect the pace of our national recovery from COVID–19, strategies for increasing vaccine uptake, and how scientists and vaccine developers are responding to new variants of the virus.

Witnesses:

- Dr. Kathleen Neuzil of the University of Maryland School of Medicine
- Dr. Philip Huang from the Dallas County Department of Health and Human Services
- Mr. Keith Reed from the Oklahoma State Department of Health
- Dr. Alison Buttenheim of the University of Pennsylvania School of Nursing.

(b) HEARING VOLUME NO. 117–2

February 25, 2021

FULL COMMITTEE HEARING—BUILDING BACK THE U.S. RESEARCH ENTERPRISE: COVID IMPACTS AND RECOVERY

The purpose of this hearing was to assess the near- and long-term impacts of the COVID–19 health crisis on the U.S. science and innovation enterprise. The Committee examined the steps taken to mitigate the spread of the virus and the consequences for

research production, the pipeline of STEM talent, and U.S. economic competitiveness. The hearing was also an opportunity for Members to explore what is needed to recover from these setbacks and ensure the U.S. maintains its leadership role in science and innovation. This hearing was also an opportunity for the Committee to hear testimony on the *Research Investment to Spark the Economy (RISE) Act and the Supporting Early-Career Researchers Act*.

Witnesses:

- Dr. Sudip Parikh, Chief Executive Officer, American Association for the Advancement of Science
- Dr. Christopher Keane, Vice President for Research, Washington State University
- Dr. Felice J. Levine, Executive Director, American Educational Research Association
- Mr. Thomas Quaadman, Executive Vice President, Center for Capital Markets Competitiveness, U.S. Chamber of Commerce

(c) HEARING VOLUME NO. 117–3

Friday, March 12, 2021

FULL COMMITTEE HEARING: THE SCIENCE BEHIND IMPACTS OF THE CLIMATE CRISIS

The purpose of this hearing was to discuss the importance of science in understanding the impacts of the climate crisis, as well as how climate change is already impacting the U.S. on regional and local scales, including the record-setting 2020 wildfire and Atlantic hurricane seasons and other recent climate disasters. This included a discussion of the disproportionate impacts of climate change on vulnerable communities. The Committee considered new advancements in climate science and understanding, such as in observational and predictive capabilities and the ability to quantify climate impacts and assess societal risk. This hearing was an opportunity to discuss the importance of science in advancing adaptation and mitigation solutions.

Witnesses:

- Dr. Michael Oppenheimer, Albert G. Milbank Professor of Geosciences and International Affairs, Princeton University
- Dr. Zeke Hausfather, Director of Climate and Energy, The Breakthrough Institute
- Dr. Noah Diffenbaugh, Kara J. Foundation Professor, Department of Earth System Science, Kimmelman Family Senior Fellow, Woods Institute for the Environment, Stanford University
- Dr. Paula Bontempi, Dean, Graduate School of Oceanography, Professor of Oceanography, University of Rhode Island

(d) HEARING VOLUME NO. 117–5

March 18, 2021

FULL COMMITTEE HEARING: LESSONS LEARNED FROM THE TEXAS BLACKOUTS: RESEARCH NEEDS FOR A SECURE AND RESILIENT GRID

The purpose of the hearing was to understand what caused the recent extended power outages in Texas and other southern and

midwestern states during a severe winter storm over the second weekend of February, and to examine associated grid research and development needs. Witnesses and Members discussed grid security research activities at the Department of Energy, including relevant grid technology, energy generation technology, and cybersecurity research. The hearing also served as a legislative hearing for a bill that was introduced in the 116th Congress and was expected to be reintroduced in this Congress by Rep. Ami Bera, the GridSecurity Research and Development Act (H.R. 5760 in the 116th Congress). That bill authorized an interagency research, development, and demonstration program on electric grid and energy system cybersecurity, physical security, resilience, and emergency response.

Witnesses:

- Dr. Jesse Jenkins, Assistant Professor of Mechanical and Aerospace Engineering, Andlinger Center for Energy and the Environment at Princeton University
- Dr. Varun Rai, Associate Dean for Research; Professor of Public Affairs, LBJ School of Public Affairs at the University of Texas at Austin
- Mr. Juan Torres, Associate Laboratory Director, Energy Systems Integration National Renewable Energy Laboratory
- Ms. Beth Garza, Senior Fellow, R Street Institute
- Dr. Sue Tierney, Senior Advisor, Analysis Group

(e) HEARING VOLUME NO. 117–8

April 15, 2021

FULL COMMITTEE HEARING—REIMAGINING OUR INNOVATION FUTURE

The purpose of this hearing was to examine the current outlook for U.S. leadership in science and technology and discuss how new investments and new, inclusive models of partnership in science and technology can be leveraged to ensure continued leadership and address economic, security, environmental, public health, and other societal challenges from the local to the global level.

Witnesses:

- Mr. Norm Augustine
- Dr. Frances H. Arnold, Linus Pauling Professor of Chemical Engineering, Bioengineering and Biochemistry, California Institute of Technology
- The Honorable Ernest J. Moniz, President and Chief Executive Officer, Energy Futures Initiative, and Former Secretary, U.S. Department of Energy
- Dr. Farnam Jahanian, President, Carnegie Mellon University

(f) HEARING VOLUME NO. 117–18

May 27, 2021

FULL COMMITTEE HEARING: OVERVIEW OF THE SCIENCE AND ENERGY RESEARCH ENTERPRISE OF THE U.S. DEPARTMENT OF ENERGY

The purpose of this hearing was to examine the research, development, demonstration, and commercialization programs and activities carried out by the Department of Energy (DOE). It also con-

sidered the goals and impacts of the Department's Fiscal Year 2022 discretionary budget request.

Witness:

The Honorable Jennifer Granholm, Secretary of Energy, U.S. Department of Energy

(g) HEARING VOLUME NO. 117–20

June 9, 2021

FULL COMMITTEE HEARING—BUILDING REGIONAL INNOVATION ECONOMIES

The purpose of this hearing was to explore the role of the Department of Commerce, and particularly the Economic Development Agency (EDA), in supporting the development of regional innovation economies, and the opportunities for and challenges to expanding this role, including in partnership with Federal science agencies.

Witnesses:

- Mr. Dan Berglund, President and CEO, SSTI
- Professor Erica R.H. Fuchs, Department of Engineering and Public Policy, Carnegie Mellon University
- Ms. Paula Nas, Director, Office of Economic Development, University of Michigan-Flint
- The Honorable Elizabeth Hutt Pollard, Secretary of Science and Innovation, State of Oklahoma

(h) HEARING VOLUME NO. 117–21

June 23, 2021

FULL COMMITTEE HEARING: A REVIEW OF THE PRESIDENT'S FISCAL YEAR 2022 BUDGET PROPOSAL FOR NASA

The purpose of the hearing was to review the Administration's Fiscal Year (FY) 2022 budget request for the National Aeronautics and Space Administration (NASA), and related issues.

Witness:

The Honorable Bill Nelson, Administrator, National Aeronautics and Space Administration

(i) HEARING VOLUME NO. 117–23

Tuesday, June 29, 2021

FULL COMMITTEE HEARING: THE STATE OF FEDERAL WILDLAND FIRE SCIENCE: EXAMINING OPPORTUNITIES FOR FURTHER RESEARCH & COORDINATION

The hearing provided an opportunity to discuss the current state of wildland fire research, with a focus on how to improve understanding of on-the-ground conditions as well as how climate change is impacting wildfire risk. The Committee also examined research gaps and additional federal coordination, investment, and engagement needed to improve wildland fire prediction, management, and post-fire response.

Witnesses:

- Dr. Craig B. Clements, Professor of Meteorology and Director of the Wildfire Interdisciplinary Research Center at San José State University
- Dr. Jessica McCarty, Assistant Professor of Geography and Director of the Geospatial Analysis Center at Miami University
- Mr. George Geissler, State Forester and Deputy for Wildland Fire and Forest Health and Resiliency at the Washington Department of Natural Resources
- Fire Chief Erik Litzenberg (Ret.), Chair of the Wildland Fire Policy Committee at the International Association of Fire Chiefs

(j) HEARING VOLUME NO. 117–26

July 20, 2021

FULL COMMITTEE HEARING: SPECTRUM NEEDS FOR OBSERVATIONS IN EARTH AND SPACE SCIENCES

The purpose of this hearing was to review the spectrum needs of relevant science applications within the Committee's purview and consider threats of harmful interference in radio frequency bands used for observations that support weather forecasting and monitoring, climate science, and astronomy. The Committee examined remote sensing applications in the 23.6–24.0 GHz band (also called the 23.8 GHz band), the potential for harmful interference from operations in the adjacent 24.25–24.45 GHz band (commonly referred to as the 24 GHz band) that was auctioned for new applications by the Federal Communications Commission in 2019, and the consequences of such interference, including degradation of weather forecasting capabilities. Witnesses and Members discussed opportunities to ensure the needs of incumbent federal users and stakeholders in the scientific community are better accommodated in the federal spectrum management process. The Committee also considered research and technology development needs to help anticipate, evaluate, and mitigate harmful interference with spectrum used for passive observation.

Witnesses:

- Mr. Andrew Von Ah of the U.S. Government Accountability Office
- Mr. David Lubar from The Aerospace Corporation
- Dr. Jordan Gerth from the University of Wisconsin-Madison
- Mr. Bill Mahoney of the National Center for Atmospheric Research
- Ms. Jennifer Manner from EchoStar Corporation and Hughes Network Systems

(k) HEARING VOLUME NO. 117–32

September 29, 2021

FULL COMMITTEE HEARING: MEMBERS' DAY HEARING: HOUSE COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY

Witnesses:

- Representative Melanie Stansbury (D–NM)
- Representative Ed Case (D–HI)

- Representative Anna Eshoo (D–CA)
- Representative Bill Posey

(l) HEARING VOLUME NO. 117–34

Thursday, October 14, 2021

FULL COMMITTEE HEARING: THE FUTURE OF FORECASTING: BUILDING A WEATHER-READY NATION ON ALL FRONTS

The purpose of this hearing was to examine recent reforms, successes, and modernization efforts at the National Weather Service (NWS), how they support the goal of building a "weather-ready nation," and what these efforts mean for the NWS workforce. It was also an opportunity to discuss the findings and recommendations of several recent Government Accountability Office (GAO) reports on these topics and the status of NWS implementation of the recommendations. Additionally, the hearing included a discussion of the science and technology advancements needed to support forecasting improvements.

Witnesses:

- Dr. Louis Uccellini, Assistant Administrator for Weather Services and Director of the National Weather Service (NWS), National Oceanic and Atmospheric Administration (NOAA)
- Mr. Cardell Johnson, Acting Director, Natural Resources and Environment, U.S. GAO
- Mr. John Werner, President, National Weather Service Employees Organization (NWSEO)
- Mr. Erik Salna, Associate Director for Education and Outreach, International Hurricane Research Center, Extreme Events Institute, Florida International University

(m) HEARING VOLUME NO. 117–40

December 2, 2021

FULL COMMITTEE HEARING—ENSURING AMERICAN LEADERSHIP IN MICROELECTRONICS

The purpose of this hearing was to examine the status of U.S. leadership in advanced semiconductor development and manufacturing; to discuss how new investments and partnership models can support continued U.S. leadership; and to explore the role of the federal government in supporting domestic semiconductor innovation and manufacturing throughout the supply chain.

Witnesses:

- Dr. Ann Kelleher, Executive Vice President and General Manager of Technology Development, Intel Corporation
- Mr. Manish Bhatia, Executive Vice President, Global Operations, Micron Technology, Inc.
- Dr. Michael Witherell, Director, Lawrence Berkeley National Laboratory
- Dr. Mung Chiang, Executive Vice President and John A. Edwardson Dean, College of Engineering, Purdue University

(n) HEARING VOLUME NO. 117–43

February 8, 2022

FULL COMMITTEE HEARING—DATA CHALLENGES IMPACTING HUMAN TRAFFICKING RESEARCH AND DEVELOPMENT OF ANTI-TRAFFICKING TECHNOLOGICAL TOOLS

The purpose of this hearing was to discuss scientific research and technology development to counter human trafficking in the United States, including trafficking for forced labor and sexual exploitation. This hearing was an opportunity for experts to provide information related to current gaps in human trafficking research, data analysis challenges, opportunities for technology development to disrupt human trafficking networks, strengthening partnerships between academia and practitioners, and challenges in translating research into evidence-based anti-trafficking policy. The hearing was also an opportunity to discuss legislation the Committee may consider to support coordinated interagency research and technology development to prevent, measure, and disrupt trafficking in persons.

Witnesses:

- Dr. Gretta Goodwin, Director, Homeland Security and Justice, U.S. Government Accountability Office
- Dr. Louise Shelley, Omer L. and Nancy Hirst Endowed Chair and University Professor, Director, Terrorism, Transnational Crime and Corruption Center, George Mason University
- Ms. Theresa Harris, Interim Program Director, Scientific Responsibility, Human Rights and Law Program, American Association for the Advancement of Science
- Ms. Hannah Darnton, Associate Director, Ethics, Human Rights, and Technology, Business for Social Responsibility, Secretariate of Tech Against Trafficking

(o) HEARING VOLUME NO. 117–47

March 8, 2022

FULL COMMITTEE HEARING: FEDERAL CLIMATE ADAPTATION AND RESILIENCE FOR THE 21ST CENTURY

The purpose of this hearing was to evaluate the Federal Government's vulnerability to the impacts of climate change, and to assess the status of ongoing efforts to promote greater climate adaptation and resilience throughout Federal programs, operations, and facilities. The hearing explored the types of climate risks threatening Federal agencies and the urgent need to address those risks in order to protect Federal assets and investments. The hearing detailed the climate challenges confronting NASA, DOE, and NOAA, along with the adaptation and resilience strategies adopted by those agencies to respond to them. Finally, the hearing discussed potential opportunities to bolster Federal climate adaptation tools, including enhanced interagency resilience collaboration and the incorporation of accurate, up-to-date climate data into agency planning, implementation, and outreach.

Witnesses:

- Dr. Richard Spinrad of the National Oceanic and Atmospheric Administration
- Ms. Ingrid Kolb of the U.S. Department of Energy
- Dr. Joel Carney of the National Aeronautics and Space Administration
- Mr. Alfredo Gomez of the U.S. Government Accountability Office.

(p) HEARING VOLUME NO. 117–55

Thursday, April 28, 2022

FULL COMMITTEE HEARING: NOW OR NEVER: THE URGENT NEED FOR AMBITIOUS CLIMATE ACTION

This hearing provided an opportunity to examine the findings, conclusions, and recommendations of the three Working Group (WG) reports: WGI, "The Physical Science Basis"; WGII, "Impacts, Adaptation, and Vulnerability"; and WGIII, "Mitigation of Climate Change" which would comprise the Intergovernmental Panel on Climate Change's Sixth Assessment Report. The Committee considered the urgent need for adaptive research and development while meeting short- and long-term sustainable development goals. This hearing examined diverse communities' needs in order to rapidly adapt to climate change and extreme weather events.

Witnesses:

- Ms. Ko Barrett, Vice-Chair, Intergovernmental Panel on Climate Change; NOAA Senior Advisor for Climate
- Mr. Jeremy Harrell, Chief Strategy Officer, ClearPath
- Ms. Dominique M. David-Chavez, PhD, Assistant Professor of Indigenous Natural Resource Stewardship, Colorado State University
- Ms. Daniella Levine Cava, Mayor, Miami-Dade County, Florida

(q) HEARING VOLUME NO. 117–60

June 8, 2022

FULL COMMITTEE HEARING: DETECTING AND QUANTIFYING METHANE EMISSIONS FROM THE OIL AND GAS SECTOR

The purpose of this hearing was to assess the challenge of oil and gas sector methane leaks from a scientific, technological, and policymaking perspective. The hearing discussed the current scientific consensus regarding the role of methane leaks as a driver of oil and gas sector methane emissions. The hearing highlighted recent advances in innovative leak detection and repair technologies, as well as the importance of deploying such technologies broadly throughout oil and gas sector operations to achieve large-scale reductions in methane emissions. Finally, the hearing examined research gaps related to oil and gas sector methane emissions and opportunities for the Federal government to support scientific research activities pertaining to oil and gas sector methane leaks.

Witnesses:

- Dr. David Lyon from the Environmental Defense Fund
- Mr. Riley Duren from Carbon Mapper

- Dr. Brian Anderson from the National Energy Technology Laboratory
- Dr. Greg Rieker from LongPath Technologies

(r) HEARING VOLUME NO. 117–68

September 20, 2022

FULL COMMITTEE HEARING: AMPLIFYING THE ARCTIC: STRENGTHENING SCIENCE TO RESPOND TO A RAPIDLY CHANGING ARCTIC

This hearing discussed the Interagency Arctic Research Policy Committee's Arctic Research Plan 2022–2026, which was informed by the U.S. Arctic Research Commission. The hearing explored gaps in research and analysis, needed improvements to federal science capabilities, research vessels and infrastructure, and barriers to strengthening our response to local and global climate change impacts, such as carbon and methane emissions released from permafrost thaw. Additionally, we discussed gaps in Arctic system monitoring, observing, modeling, and prediction efforts. Importantly, we examined the role of traditional knowledge holders and equitable practices in the coproduction of research, especially in critical areas such as food security and biodiversity. Finally, the hearing was an opportunity to discuss the impact of geopolitical tensions on science diplomacy in the Arctic and challenges for future international collaboration in key research including boreal forest fires, sea ice melt and land ice loss, particularly the Greenland Ice Sheet.

Witnesses:

- Dr. Larry Hinzman, Assistant Director of Polar Sciences, White House Office of Science and Technology Policy and Executive Director, Interagency Arctic Research and Policy Committee
- Dr. Mike Sfraga, Chair, U.S. Arctic Research Commission
- Ms. Vera Kingeekuk Metcalf, Executive Director, Eskimo Walrus Commission
- Dr. Susan Natali, Arctic Program Director, Woodwell Climate Research Center

(s) HEARING VOLUME NO. 117–72

December 6, 2022

FULL COMMITTEE HEARING: BUILDING A SAFER ANTARCTIC RESEARCH ENVIRONMENT

The purpose of this hearing was to discuss the findings of a recent report on sexual harassment and assault in Antarctica. The hearing also examined the unique characteristics of remote research sites, including those managed by contractors, changes that have been made since the publication of the report, and additional steps that must be taken to protect those conducting and supporting the valuable research in Antarctica and other remote research sites.

Witnesses:

- Dr. Karen Marrongelle, Chief Operating Officer, National Science Foundation

• Ms. Kathleen Naeher, Chief Operating Officer of the Civil Group, Leidos
• Dr. Angela V. Olinto, Dean of the Physical Sciences Division and Albert A. Michelson Distinguished Service Professor, University of Chicago
• Dr. Anne Kelly, Deputy Director, The Nature Conservancy Alaska Chapter

3.2 Hearings Before the Subcommittee on Energy

(a) HEARING VOLUME NO. 117–7

March 25, 2021

SUBCOMMITTEE HEARING: BUILDING TECHNOLOGIES RESEARCH FOR A SUSTAINABLE FUTURE

The purpose of this hearing was to examine building technology research and development needs to reduce building energy usage and emissions. Witnesses and Members discussed building technology research, development, and demonstration activities at the Department of Energy (DOE) including grid interactive buildings, advanced building design, construction, and technologies such as improved building envelopes, windows, and lighting with a focus on the equitable distribution of the results of buildings research. New structures as well as retrofitting existing buildings were discussed. The hearing also examined ways that Congress and the Administration should consider directing the activities of the DOE Building Technologies Office (BTO). Legislative language to authorize and support such activities passed the House of Representatives in the 116th Congress as part of H.R. 4447, the Clean Economy Jobs and Innovation Act, but this language was not enacted.

Witnesses:

• Dr. Nora Esram, Senior Director for Research at American Council for an Energy- Efficient Economy
• Dr. Roderick Jackson, Laboratory Program Manager for Buildings Research at National Renewable Energy Laboratory
• Dr. James Tour, T.T. and W. F. Chao Professor of Chemistry at Rice University Ms. Jacqueline Patterson, Director of the NAACP Environmental and Climate Justice Program
• Mr. Joseph Hagerman, Group Leader for Building Integration and Controls at Oak Ridge National Laboratory

(b) HEARING VOLUME NO. 117–12

May 4, 2021

SUBCOMMITTEE HEARING: CLIMATE AND ENERGY SCIENCE RESEARCH AT THE DEPARTMENT OF ENERGY

The Subcommittee's hearing examined two major components of the Department of Energy's Office of Science: the Basic Energy Sciences (BES) program as a whole and the Earth and Environmental Systems Sciences Division within the Office of Science's Biological and Environmental Research (BER) program. Within BES, the hearing focused on initiatives to advance material and chemical sciences research for a broad range of energy applications. Climate and environmental systems research and its importance to under-

standing and reducing the threat of climate change were examined, including the integration of socioeconomic factors. The hearing considered the expansion of access to user facilities, collaboration with industry, and approaches to bridging knowledge gaps to solve our nation's most pressing energy needs. Finally, the hearing examined ways that Congress and the Administration should consider directing the activities of these programs going forward.

Witnesses:

- Dr. Kristin Persson, Director, Molecular Foundry, Lawrence Berkeley National Laboratory
- Dr. Fikile Brushett, Associate Professor of Chemical Engineering, Massachusetts Institute of Technology
- Dr. Esther Takeuchi, Chair, Interdisciplinary Science Department, Brookhaven National Laboratory
- Dr. Xubin Zeng, Professor, Hydrology and Atmospheric Sciences, The University of Arizona
- Dr. Narasimha Rao, Associate Professor of Energy Systems, Yale School of the Environment

(c) HEARING VOLUME NO. 117–16

May 19, 2021

SUBCOMMITTEE HEARING: ACCELERATING DISCOVERY: THE FUTURE OF SCIENTIFIC COMPUTING AT THE DEPARTMENT OF ENERGY

The purpose of this hearing was to explore the unique scientific computing capabilities of the Department of Energy (DOE), including the forthcoming exascale systems, and to discuss the implications of these capabilities for other scientific disciplines and their relevance to pressing societal challenges. In addition, the Subcommittee used the hearing to understand the role of DOE research and workforce development programs in driving innovation in scientific computing, especially in light of advancements in artificial intelligence, quantum science, neuromorphic computing, and other new and emerging capabilities and computing paradigms. The hearing examined ways in which Congress can contribute to DOE's scientific computing mission.

Witnesses:

- Dr. J. Stephen Binkley, Acting Director, Office of Science, Department of Energy
- Dr. Georgia (Gina) Tourassi, Director, National Center for Computational Sciences, Oak Ridge National Laboratory
- Dr. Karen Willcox, Director, Oden Institute for Computational Sciences and Associate Vice President for Research, University of Texas at Austin
- Dr. Christopher Monroe, Co-Founder and Chief Scientist, IonQ, Inc.
- Dr. Seny Kamara, Associate Professor of Computer Science, Brown University

(d) HEARING VOLUME NO. 117–25

July 16, 2021

SUBCOMMITTEE HEARING: FOSTERING EQUITY IN ENERGY INNOVATION

The purpose of this hearing was to examine best practices in clean energy research, development, demonstration, and commercial application activities to pursue an equitable energy transition for frontline and marginalized communities. Witnesses and members discussed how to ingrain equity within early research processes to enable the development of equitable energy solutions. The hearing also examined ways that Congress and the Administration should consider directing the Department of Energy's role in fostering equity within the agency's energy innovation activities and programs.

Witnesses:

- Dr. Dan Kammen, Distinguished Professor of Energy, University of California, Berkeley
- Dr. Myles Lennon, Professor of Environment and Society and Anthropology, Brown University
- Dr. Shobita Parthasarathy, Professor of Public Policy and Director, Science, Technology, and Public Policy program, University of Michigan
- Mr. Bruno Grunau, Regional Director of NREL's Cold Climate Housing Research Center (CCHRC) in Fairbanks, Alaska

(e) HEARING VOLUME NO. 117–38

November 17, 2021

SUBCOMMITTEE HEARING: FOSTERING A NEW ERA OF FUSION ENERGY RESEARCH AND TECHNOLOGY DEVELOPMENT

The purpose of this hearing was to examine the current status of fusion energy research and development (R&D) activities carried out by the U.S. Department of Energy, the private sector, and internationally. The hearing also considered next steps for Congress and the Administration to take in response to recent reports from the Fusion Energy Sciences Advisory Committee and the National Academies that provide roadmaps for fusion energy R&D and commercialization pathways over the next decade and beyond.

Witnesses:

- Dr. Troy Carter, Director, Plasma Science and Technology Institute, University of California, Los Angeles and Chair, Fusion Energy Sciences Advisory Committee Long Range Planning Subcommittee
- Dr. Tammy Ma, Program Element Leader for High Energy Density Science, Lawrence Livermore National Laboratory
- Dr. Robert Mumgaard, CEO, Commonwealth Fusion Systems
- Dr. Kathryn McCarthy, Director, U.S. ITER Project Office
- Dr. Steven Cowley, Director, Princeton Plasma Physics Laboratory

(f) HEARING VOLUME NO. 117–45

February 17, 2022

SUBCOMMITTEE HEARING: H2SUCCESS: RESEARCH AND DEVELOPMENT TO ADVANCE A CLEAN HYDROGEN FUTURE

The purpose of this hearing was to examine the state of hydrogen research and development in the United States. Witnesses and Members discussed hydrogen research, development, and demonstration activities as they relate to the advancement of clean hydrogen, including production, storage, transportation, and utilization. The role of hydrogen in the decarbonization of energy and industrial sectors, as well as opportunities and challenges for hydrogen deployment and utilization was also discussed. The hearing examined potential strategies for this Committee to direct the activities of the Department of Energy's (DOE's) Hydrogen and Fuel Cell Technologies Office.

Witnesses:

- Mr. Keith Wipke, Laboratory Program Manager, Fuel Cell and Hydrogen Technologies Program, National Renewable Energy Laboratory
- Dr. Julio Friedmann, Chief Scientist and Head Carbon Wrangler, Carbon Direct
- Ms. Rachel Fakhry, Senior Advocate, Climate and Clean Energy Program, Natural Resources Defense Council
- Dr. Tomás Díaz de la Rubia, Vice President for Research and Partnerships, University of Oklahoma
- Mr. Sheldon Kimber, Chief Executive Officer and Co-Founder, Intersect Power

(g) HEARING VOLUME NO. 117–48

March 16, 2022

SUBCOMMITTEE HEARING: BIOENERGY RESEARCH AND DEVELOPMENT FOR THE FUELS AND CHEMICALS OF TOMORROW

The purpose of this hearing was to examine the status of bioenergy research, development, and demonstration (RD&D) activities carried out by the U.S. Department of Energy. The hearing also considered advancements in bioenergy research and the potential role of this resource in a cleaner energy transition. Lastly, the hearing helped inform future legislation to support and guide the U.S.'s bioenergy RD&D enterprise.

Witnesses:

- Dr. Jonathan Male, Chief Scientist for Energy Processes and Materials, Pacific Northwest National Laboratory (PNNL)
- Dr. Andrew Leakey, Director of the Center for Advanced Bioenergy and Bioproducts Innovation at the University of Illinois Urbana-Champaign
- Dr. Laurel Harmon, Vice President of Government Affairs, LanzaTech
- Dr. Eric Hegg, Professor, Biochemistry and Molecular Biology, Michigan State University

(h) HEARING VOLUME NO. 117–54

April 27, 2022

SUBCOMMITTEE HEARING: SCIENCE AND ENERGY RESEARCH INFRASTRUCTURE NEEDS OF THE U.S. DEPARTMENT OF ENERGY

The purpose of this hearing was to examine the goals and impacts of the U.S. Department of Energy's (DOE) Fiscal Year (FY) 2023 budget request, with a primary focus on budget planning and management of construction of the DOE Office of Science's (SC) user facilities, experiments, and upgrades. There were additional questioning about the research, development, demonstration, and commercialization programs and activities carried out by DOE.

Witness:

Dr. Geraldine Richmond, Under Secretary for Science and Innovation, U.S. Department of Energy

(i) HEARING VOLUME NO. 117–61

Jun 22, 2022

SUBCOMMITTEE HEARING: INVESTIGATING THE NATURE OF MATTER, ENERGY, SPACE, AND TIME

The Subcommittee's hearing was to examine two major components of the Department of Energy's Office of Science: the High Energy Physics (HEP) program and the Nuclear Physics (NP) program. The Isotope Program and potential impacts and supply shortages due to the Russia-Ukraine conflict and the development of accelerator technology through the Accelerator R&D and Production program were also discussed. The hearing focused on initiatives to advance foundational research on the nature of matter, energy, and the cosmos; the construction and operation of large-scale experiments and unique user facilities; and the relevance of these research areas to the development of accelerator technologies, isotope production, and other applications. The centrality of these activities to U.S. preeminence in particle and nuclear physics, and to isotope research and supply, was also highlighted. Finally, the hearing examined ways that Congress and the Administration should consider directing the activities of these programs going forward.

Witnesses:

- Dr. Asmeret Berhe, Director, Office of Science, Department of Energy Professor Brian Greene, Director, Center for Theoretical Physics, Columbia University
- Dr. Lia Merminga, Director, Fermi National Accelerator Laboratory
- Mr. Jim Yeck, Associate Laboratory Director and Project Director, Electron-Ion Collider, Brookhaven National Laboratory
- Mr. Michael Guastella, Executive Director, Council on Radionuclides and Radiopharmaceuticals, Inc.

(j) HEARING VOLUME NO. 117–64

July 13, 2022

SUBCOMMITTEE HEARING NUCLEAR WASTE CLEANUP: RESEARCH AND DEVELOPMENT OPPORTUNITIES FOR THE DEPARTMENT OF ENERGY'S OFFICE OF ENVIRONMENTAL MANAGEMENT

The purpose of this hearing was to evaluate the Department of Energy's approach to research and development on new strategies and technologies to support the nuclear waste cleanup mission of its Office of Environmental Management (EM). Members and witnesses considered how better coordination and focused research investments at the Department could potentially reduce lifecycle costs and expedite schedules for both defense and non-defense environmental remediation around over a dozen Environmental Management sites.

Witnesses:

- Mr. William "Ike" White, Senior Advisor, Office of Environmental Management, U.S. Department of Energy
- Dr. Vahid Majidi, Executive Vice President and Director, Savannah River National Laboratory
- Dr. John Plodinec, Vice Chair, Committee on the Independent Assessment of Science and Technology for the Department of Energy's Defense Environmental Cleanup
- Program, National Academies of Sciences, Engineering, and Medicine
- Mr. Nathan Anderson, Director, Natural Resources and Environment, U.S. Government Accountability Office

3.3 Hearings Before the Subcommittee on Environment

(a) HEARING VOLUME NO. 117–9

Wednesday, April 21, 2021

SUBCOMMITTEE ON ENVIRONMENT HEARING: WORKING TOWARDS CLIMATE EQUITY: THE CASE FOR A FEDERAL CLIMATE SERVICE

The purpose of this hearing was to highlight the need for a strengthened Federal role in climate risk information. The hearing showcased the diverse constituencies urging improved investment in and coordination of Federal climate risk information, with a spotlight on local community planners, frontline communities, and adaptation professionals. The hearing was an opportunity to discuss the availability of climate information that impacts local decision-making, such as designing new roads, bridges, and dams, and implementing flood control projects. It also examined the current, fragmented landscape of Federal programs and nonfederal services that translate global climate data and model outputs to decision-relevant information for adaptation and resilience planning.

Witnesses:

- Richard Moss, PhD Senior Scientist, Pacific Northwest National Laboratory's Joint Global Change Research Institute at the University of Maryland, Chair, Convening Board, SCAN, and Non-Resident Fellow, Andlinger Center, Princeton University

- Ms. Beth Gibbons, Executive Director, American Society of Adaptation Professionals
- Jeffrey B. Basara, PhD Director, Kessler Atmospheric and Ecological Field Station, Executive Associate Director, Hydrology and Water Security Program, University of Oklahoma
- Ms. Liz Williams Russell, Climate Justice Program Director, Foundation for Louisiana

(b) HEARING VOLUME NO. 117–19

Monday, June 7, 2021

SUBCOMMITTEE ON ENVIRONMENT HEARING: DEFINING A NATIONAL 'OCEANSHOT': ACCELERATING OCEAN AND GREAT LAKES SCIENCE AND TECHNOLOGY

The purpose of this hearing was to discuss the importance of ocean, coastal, and Great Lakes research in the U.S., the science that needs to be done most urgently, and how we can point Federal investments in that direction. This hearing was an opportunity to hear from experts on innovative ideas for advancing ocean, coastal, and Great Lakes science and technology (S&T) and defining a national "oceanshot" as part of the U.S.'s participation and leadership in the UN Decade of Ocean Science for Sustainable Development (2021–2030). The hearing also discussed the importance of building a more diverse, equitable, and inclusive ocean, coastal, and Great Lakes science enterprise to underpin more creative and collaborative solutions. This hearing was timed to celebrate World Ocean Month in June and World Ocean Day on June 8.

Witnesses:

- Mr. Craig McLean, Assistant Administrator for Oceanic and Atmospheric Research and Acting Chief Scientist, National Oceanic and Atmospheric Administration, U.S. Department of Commerce
- Dr. Margaret Leinen, Vice Chancellor, Marine Sciences, Director, Scripps Institution of Oceanography
- Dr. Michael P. Crosby, President & CEO, Mote Marine Laboratory
- Dr. Robert D. Ballard, President, Ocean Exploration Trust, Explorer-at-Large, National Geographic Society

(c) HEARING VOLUME NO. 117–27

Wednesday, July 21, 2021

SUBCOMMITTEE ON ENVIRONMENT HEARING: SILENT KILLER: THE RISING PROBLEM OF EXTREME HEAT IN THE U.S.

This hearing provided an opportunity to discuss the state of our understanding of extreme heat events across the U.S., and touch on urban heat islands, the role of climate change, and impacts to public health. The Subcommittee also examined research gaps and additional Federal research, coordination, and monitoring needed to improve the U.S. response to extreme heat.

Witnesses:

- Dr. Vivek Shandas, Ph.D., Professor, Nohad A. Toulan School of Urban Studies and Planning, Founder and Director,

Sustaining Urban Places Research Lab, Portland State University

• Dr. Melissa Guardaro, Ph.D., Assistant Professor, Healthy Urban Environments & Knowledge Exchange for Resilience, Global Institute of Sustainability and Innovation, Arizona State University

• Mr. Shimon Elkabetz, CEO, Co-Founder, Tomorrow.io

• Dr. Aaron Bernstein, MD, MPH, Interim Director, The Center for Climate, Health, and the Global Environment, Harvard T.H. Chan School of Public Health, Pediatrician, Boston Children's Hospital, Fellow, Adrienne Arsht—Rockefeller Foundation Resilience Center

(d) HEARING VOLUME NO. 117–30

Thursday, September 23, 2021

SUBCOMMITTEE ON ENVIRONMENT HEARING: ADVANCING EARTH SYSTEM SCIENCE AND STEWARDSHIP AT NOAA

The purpose of this hearing was to discuss the Administration's priorities for the National Oceanic and Atmospheric Administration (NOAA) as they relate to climate science and services; scientific integrity; the scientific workforce; weather, water, and climate research and forecasting; and other issues within the Science Committee's jurisdiction. This hearing was an opportunity for Members to discuss their priorities related to the agency's mission.

Witnesses:

The Honorable Richard W. Spinrad, Ph.D., Under Secretary of Commerce for Oceans and Atmosphere, and Administrator, National Oceanic and Atmospheric Administration

(e) HEARING VOLUME NO. 117–41

Tuesday, December 7, 2021

JOINT SUBCOMMITTEE ON ENVIRONMENT AND SUBCOMMITTEE ON RESEARCH & TECHNOLOGY HEARING: FOREVER CHEMICALS: RESEARCH AND DEVELOPMENT FOR ADDRESSING THE PFAS PROBLEM

The purpose of this hearing was to discuss the role of federal research and development to better understand the class of manmade chemicals known as per- and polyfluoroalkyl substances (PFAS). There remains much uncertainty surrounding their toxicity and human health effects, how to safely and effectively remove them from the environment, and how to detect and quantify the thousands of different PFAS compounds that exist. The hearing provided an opportunity to explore gaps in federal research efforts, methods for improved interagency coordination, opportunities to collaborate with state governments and non-government entities, and ideas for improving public understanding and education about PFAS. While there is a lot of attention on regulation and remediation of PFAS, there remains a great deal of work to better understand PFAS chemicals and the role the federal government can play to support the development of detection, monitoring, treatment, and destruction methods and technologies.

Witnesses:

- Dr. Elsie Sunderland, Gordon McKay Professor of Environmental Chemistry, Harvard John A. Paulson School of Engineering and Applied Sciences, Harvard T.H. Chan School of Public Health
- Ms. Abigail Hendershott, Executive Director, Michigan PFAS Action Response Team (MPART)
- Ms. Amy Dindal, Director of Environmental Research and Development, Battelle Memorial Institute
- Dr. Peter Jaffé, Professor, Department of Civil and Environmental Engineering, Princeton University

(f) HEARING VOLUME NO. 117–46

Wednesday, March 2, 2022

SUBCOMMITTEE ON ENVIRONMENT HEARING: FROM GRAY TO GREEN: ADVANCING THE SCIENCE OF NATURE-BASED INFRASTRUCTURE

This hearing provided an opportunity to discuss the state of the science related to nature-based infrastructure. The Subcommittee considered the environmental, economic, and social co-benefits of nature-based infrastructure and its contribution to resilient communities. Members had the opportunity to discuss the co-benefits of nature-based infrastructure and the research, development, and long-term monitoring needed to quantify these co-benefits. Finally, the Subcommittee examined research gaps and additional federal coordination, investment, and engagement needed to support the implementation of nature-based infrastructure.

Witnesses:

- Dr. Steven Thur, Director, National Centers for Coastal Ocean Service, National Oceanic and Atmospheric Administration
- Dr. Sherry Hunt, Supervisory Civil Engineer, Agriculture Research Service, U.S. Department of Agriculture
- Dr. Todd Bridges, Senior Research Scientist, Environmental Science, U.S. Army Corps of Engineers

(g) HEARING VOLUME NO.117–58

Tuesday, June 14, 2022

SUBCOMMITTEE ON ENVIRONMENT HEARING: WHAT'S THE FORECAST: A LOOK AT THE FUTURE OF WEATHER RESEARCH

This hearing provided an opportunity to discuss the highest priority investments needed for weather research and development over the next decade, as described in the National Oceanic and Atmospheric Administration (NOAA) Science Advisory Board (SAB)'s "Priorities for Weather Research" report. This discussion included perspectives from the U.S. Weather Enterprise, comprised of public, private, and academic partners. This hearing also examined how investments in weather research and development can protect critical infrastructure, life, property, and enhance equity in the provision of weather services, while supporting the national economy.

Witnesses:

- Dr. Scott Glenn, Board of Governors Professor, Center for Ocean Observing Leadership of the Department of Marine and Coastal Sciences, Rutgers University

- Dr. Bradley Colman, President-Elect of the American Meteorological Society; Director of Weather-Strategy, Bayer & The Climate Corporation
- Dr. Frederick H. Carr, Professor Emeritus, School of Meteorology, University of Oklahoma
- Dr. Kevin R. Petty, VP, Weather and Earth Intelligence, Spire Global, Inc.

(h) HEARING VOLUME NO. 117–62

Thursday, June 23, 2022

JOINT SUBCOMMITTEE ON ENVIRONMENT AND SUBCOMMITTEE ON RESEARCH & TECHNOLOGY HEARING: ASSESSING FEDERAL PROGRAMS FOR MEASURING GREENHOUSE GAS SOURCES AND SINKS

The purpose of this hearing was to explore federal programs focused on monitoring, measuring, and verifying sources and sinks of greenhouse gas emissions (ghgs). the committee examined data and measurement challenges as well as research gaps related to improving ghg monitoring, measurement, and verification. finally, the committee discussed the measurement tools, methods, and standards that can enable industries and governments to have the information they need to manage emissions effectively and where congress should focus efforts to improve ghg monitoring, measurement, and verification.

Witnesses:

- Dr. Eric K. Lin, Director, Material Measurement Laboratory, National Institute of Standards and Technology
- Dr. Ariel Stein, Acting Director, Global Monitoring Laboratory and Director, Air Resources Laboratory, National Oceanic and Atmospheric Administration
- Dr. Karen St. Germain, Earth Science Division Director, Science Mission Directorate, National Aeronautics and Space Administration
- Dr. Bryan Hubbell, National Program Director for Air, Climate, and Energy, Office of Research and Development, United States Environmental Protection Agency

(i) HEARING VOLUME NO. 117–69

Wednesday, September 21, 2022

JOINT SUBCOMMITTEE ON ENVIRONMENT AND SUBCOMMITTEE ON SPACE & AERONAUTICS HEARING: LOOKING BACK TO PREDICT THE FUTURE: THE NEXT GENERATION OF WEATHER SATELLITES

This hearing provided an opportunity to discuss the partnership between the national oceanic and atmospheric administration (noaa) and national aeronautics and space administration (nasa) in the development, testing, acquisition, launch and management of noaa's operational weather satellite programs. furthermore, this hearing examined how lessons learned from past challenges in recent weather satellite programs are being incorporated into the future goals, architecture, and capabilities for the next generation of weather satellites.

Witnesses:

• Dr. Stephen Volz, Assistant Administrator, National Environmental Satellite, Data, and Information Services, NOAA
• Mr. John Gagosian, Joint Agency Satellite Division Director, NASA
• Mr. Fred Meny, Assistant Inspector General for Audit and Evaluation, U.S. Department of Commerce, Office of Inspector General

3.4 Hearings Before the Subcommittee on Investigations and Oversight

(a) HEARING VOLUME NO. 117–4

March 17, 2021

SUBCOMMITTEE HEARING: BRAIN DRAIN: REBUILDING THE FEDERAL SCIENTIFIC WORKFORCE

The purpose of this hearing was to assess recent widespread departures of career scientists from the Federal Government. The Subcommittee examined the cause and extent of the employment decline within the federal scientific workforce, as well as the implications of a smaller scientific workforce for science-based agencies. The Subcommittee also discussed potential policies to rebuild federal scientific capacity.

Witnesses:

• Ms. Candice Wright, Acting Director, Science, Technology Assessment, and Analytics, U.S. Government Accountability Office
• Mr. Max Stier, President and CEO,Partnership for Public Service
• Dr. Andrew Rosenberg, Director of the Center for Science and Democracy, Union of Concerned Scientists
• Dr. Betsy Southerland, Former Director of Science and Technology, Office of Water, Environmental Protection Agency.

(b) HEARING VOLUME NO. 117–14

May 12, 2021

SUBCOMMITTEE HEARING: COVID–19 VARIANTS AND EVOLVING RESEARCH NEEDS

The purpose of this hearing was to discuss how variants develop, how researchers identify and sequence variants, and how this information can be utilized by public health officials, government agencies, and medical practitioners to make decisions. The hearing examined the ways the Federal government can meet the research and forecasting needs that evolve as the virus continues to mutate. Members and witnesses discussed how the federal government can better coordinate its approach to best serve the American people through the COVID–19 pandemic and beyond.

Witnesses:

• Dr. Salim Abdool Karim, Director, Center for the Aids Programme of Research in South Africa (CAPRISA)
• Dr. Nathan Grubaugh, Assistant Professor of Epidemiology, Yale School of Public Health

• Dr. Stephen Streiffer, Deputy Laboratory Director for Science and Technology, Argonne National Laboratory
• Dr. Caitlin Rivers, Senior Scholar, Johns Hopkins Center for Health Security.

(c) HEARING VOLUME NO. 117–17

May 25, 2021

JOINT SUBCOMMITTEE HEARING, INVESTIGATIONS AND OVERSIGHT SUBCOMMITTEE LEAD, WITH RESEARCH AND TECHNOLOGY SUBCOMMITTEE: SOLARWINDS AND BEYOND: IMPROVING THE CYBERSECURITY OF SOFTWARE SUPPLY CHAINS

The purpose of this hearing was to examine the causes and impacts of recent supply chain attacks on Federal agencies, explore how Federal agencies currently mitigate their software supply chain risks, and consider how best to improve software supply chain security. The Subcommittees examined the challenges of Federal agency compliance with standards and best practices and heard recommendations on next steps to secure the software supply chain for Federal agencies, especially through improvements to the efficacy of guidance provided by the National Institute of Standards and Technology (NIST). The Subcommittees further explored how the Federal Government can help facilitate the adoption of supply chain standards and best practices within the private sector.

Witnesses:

• Mr. Matthew Scholl, Chief, Computer Security Division of the Information Technology Laboratory, NIST
• Dr. Trey Herr, Director, Cyber Statecraft Initiative, the Atlantic Council
• Ms. Katie Moussouris, Founder and CEO, Luta Security
• Mr. Vijay D'Souza, Director, Information Technology and Cybersecurity, U.S. Government Accountability Office.

(d) HEARING VOLUME NO. 117–24

July 14, 2021

SUBCOMMITTEE HEARING: PRINCIPLES FOR OUTBREAK INVESTIGATION: COVID–19 AND FUTURE INFECTIOUS DISEASES

The purpose of this hearing was to discuss the principles for investigating infectious disease outbreaks in the context of public interest in the origins of covid–19. the hearing considered how infectious diseases normally emerge; how understanding disease origins helps protect public health; methods for tracing outbreaks to a discrete origin; the scientific datasets and access that investigators need; and the principles for transparency, scientific integrity, objectivity, and public communication that accompany an ideal outbreak investigation.

Witnesses:

• Dr. David Relman, Thomas C. and Joan M. Merigan, Professor, Stanford University School of Medicine, and Senior Fellow, Center for International Security and Cooperation, Stanford University
• Dr. Stanley Perlman, Professor of Microbiology and Immunology, the University of Iowa

- Dr. Connie Price, Chief Medical Officer, Denver Health, and Professor of Medicine, Division of Infectious Diseases, University of Colorado School of Medicine
- Dr. Suzan Murray, Program Director, Smithsonian Global Health Program, Smithsonian National Zoo & Conservation Biology Institute

(e) HEARING VOLUME NO. 117–31

September 28, 2021

SUBCOMMITTEE HEARING: THE DISINFORMATION BLACK BOX: RESEARCHING SOCIAL MEDIA DATA

The purpose of this hearing was to discuss how researchers are able to access and analyze data from social media companies. Researchers testified about their work looking into the spread of misinformation and disinformation on social media platforms and how platforms drive traffic to advertisements and promoted posts. The hearing also explored the limitations of current tools, techniques, and datasets for researching social media platforms and how researchers have utilized information available to advertisers to flag privacy concerns to the platforms. The hearing examined how the Federal government can contribute to the ethical study of social media's impact on society while protecting the privacy of users.

Witnesses:

- Dr. Alan Mislove, Professor and Interim Dean, Khoury College of Computer Sciences, Northeastern University
- Ms. Laura Edelson, Ph.D. Candidate and Co-Director, Cybersecurity for Democracy at New York University
- Dr. Kevin Leicht, Professor, Department of Sociology at the University of Illinois Urbana-Champaign

(f) HEARING VOLUME NO. 117–33

October 5, 2021

JOINT SUBCOMMITTEE HEARING, INVESTIGATIONS AND OVERSIGHT SUBCOMMITTEE LEAD, WITH RESEARCH AND TECHNOLOGY SUBCOMMITTEE: BALANCING OPEN SCIENCE AND SECURITY IN THE U.S. RESEARCH ENTERPRISE

The purpose of this hearing was to explore the risks to research integrity and security posed by undue foreign influence in the u.s. research enterprise. the subcommittees examined ongoing efforts at universities and federal science agencies to address these risks and the need for additional clarity regarding the scale and scope of the risks and best practices for securing federally funded fundamental research. they also discussed the risks of overcorrection, including the impact on researchers, institutions, and the competitiveness of the u.s. research enterprise.

Witnesses:

- Dr. Maria Zuber, Co-Chair, National Science, Technology, and Security Roundtable, National Academies of Sciences, Engineering, and Medicine; Vice President for Research and E. A. Griswold Professor of Geophysics, Massachusetts Institute of Technology

• Ms. Candice Wright Director, Science, Technology Assessment, and Analytics, U.S. Government Accountability Office
• Ms. Allison Lerner, Inspector General, National Science Foundation
• Dr. Xiaoxing Xi, Laura H. Carnell Professor of Physics, Temple University.

(g) HEARING VOLUME NO. 117–36

October 21, 2021

JOINT SUBCOMMITTEE HEARING, INVESTIGATIONS AND OVERSIGHT SUBCOMMITTEE LEAD, WITH ENERGY SUBCOMMITTEE: JUDICIOUS SPENDING TO ENABLE SUCCESS AT THE OFFICE OF NUCLEAR ENERGY

The purpose of this hearing was to discuss several financial assistance awards made by the Department of Energy's Office of Nuclear Energy on a non-competitive basis. The Members and Witnesses discussed best practices and principles for financial assistance agreements and contracting, including maximizing competition, limiting risk to the taxpayer, and informing spending decisions with technical and market analysis and documentation. The hearing sought to understand priorities of the Office of Nuclear Energy and discuss steps taken to date to carry out the relevant directions and authorizations provided in the Energy Act of 2020.

Witnesses:

• Dr. Katy Huff, Acting Assistant Secretary, Office of Nuclear Energy, U.S. Department of Energy
• Ms. Amy Roma, Founding Member, Nuclear Energy and National Security Coalition, Atlantic Council, and Partner, Hogan Lovells US LLP
• Dr. Todd Allen, Director, Michigan Memorial Phoenix Project and Glenn F. andGladysH. Knoll Department Chair of Nuclear Engineering and Radiological Sciences, University of Michigan
• Mr. Scott Amey, General Counsel and Executive Editorial Director, Project on Government Oversight

(h) HEARING VOLUME NO. 117–51

March 31, 2022

SUBCOMMITTEE HEARING: THE NEW NORMAL: PREPARING FOR AND ADAPTING TO THE NEXT PHASE OF COVID–19

The purpose of this hearing was to discuss how research, data, and coordination efforts must evolve as COVID–19 surges ebb and flow. The hearing examined existing gaps in data and public health preparedness as we entered the third year of the pandemic in the United States. Members and witnesses discussed how the federal government can scale up data collection and communication to detect surges and variants as early as possible, and how federal guidance can best reflect the evolving threat of COVID–19 while minimizing social disruption.

Witnesses:

• Dr. Ezekiel Emanuel, Vice Provost for Global Initiatives, Co-Director of the Healthcare Transformation Institute, and

Levy University Professor at the Perelman School of Medicine and The Wharton School of the University of Pennsylvania

• Ms. Karen Ayala, Executive Director, DuPage County Board of Health

• Dr. Lucy McBride, Practicing Primary Care Physician in Washington, DC,

• Dr. Mariana Matus, CEO and Co-Founder, Biobot Analytics.

(i) HEARING VOLUME NO. 117–57

April 21, 2022

SUBCOMMITTEE FIELD HEARING: PEDAL TO THE METAL: ELECTRIC VEHICLE BATTERIES AND THE CRITICAL MINERALS SUPPLY CHAIN

The purpose of this hearing was to discuss the expected surge in demand for electric vehicle (ev) batteries over the next decade and consider the implications for critical minerals required in ev battery manufacturing, including cobalt, lithium, nickel, graphite, and manganese. the members and witnesses considered research opportunities to mitigate potential supply chain concerns, including new technologies for minerals extraction and processing, minerals recycling, and alternative battery chemistries. they also explored strategies to maximize the research, development, and demonstration investments already being supported by the department of energy (doe) pursuant to the energy act of 2020 and the infrastructure investment and jobs act (iija).

Witnesses:

• Mr. Nate Baguio, Senior Vice President of Commercial Development, Lion Electric Company

• Mr. Chris Nevers, Senior Director of Public Policy, Rivian

• Dr. Venkat Srinivasan, Deputy Director of the Joint Center for Energy Storage Research (JCESR) and Director of the Argonne Collaborative Center for Energy Storage Science (ACCESS), Argonne National Laboratory

• Dr. Chibueze Amanchukwu, Neubauer Family Assistant Professor of Molecular Engineering, University of Chicago.

(j) HEARING VOLUME NO. 117–56

May 11, 2022

JOINT SUBCOMMITTEE HEARING, INVESTIGATIONS AND OVERSIGHT SUBCOMMITTEE LEAD, WITH RESEARCH AND TECHNOLOGY SUBCOMMITTEE: SECURING THE DIGITAL COMMONS: OPEN-SOURCE SOFTWARE CYBERSECURITY

The purpose of this hearing was to discuss the unique benefits and risks inherent in open-source software, and to explore the ways in which industry and government can collaborate to enhance open-source cybersecurity. The hearing examined recent open-source software hacks and subsequent efforts to improve security for the development and deployment of open-sourced software. Members and witnesses discussed the Federal role in improving open-source cybersecurity, particularly at the National Institute of Standards and Technology (NIST). Finally, the hearing explored the use and

potential misuse of open-source software in the development of critical technologies, including artificial intelligence (AI).

Witnesses:

- Ms. Lauren Knausenberger, Chief Information Officer, Department of the Air Force
- Mr. Brian Behlendorf, General Manager, Open Source Security Foundation
- Ms. Amélie Erin Koran, Non-Resident Senior Fellow, Atlantic Council
- Dr. Andrew Lohn, Senior Fellow, Center for Security and Emerging Technology, Georgetown University

(k) HEARING VOLUME NO. 117–63

June 29, 2022

SUBCOMMITTEE HEARING: PRIVACY IN THE AGE OF BIOMETRICS

The purpose of this hearing was to evaluate the privacy implications of biometrics technologies. The hearing sought to define the problem space for privacy and biometrics and technical strategies for balancing privacy and security based on use cases. Members and witnesses discussed research opportunities in privacy enhancing technologies for biometric applications and their potential to address privacy risks. They considered a recent high-profile court case involving facial recognition technology and the privacy risks of its use without appropriate guardrails. They also reviewed the current Federal uses of biometric technologies and discussed strategies to ensure appropriate privacy protections in those applications.

Witnesses:

- Ms. Candice Wright, Director, Science, Technology Assessment, and Analytics, U.S. Government Accountability Office
- Dr. Charles H. Romine, Director, Information Technology Laboratory, National Institute of Standards and Technology
- Dr. Arun Ross, Professor, Department of Computer Science and Engineering, Michigan State University; Site Director, NSF Center for Identification Technology Research.

(l) HEARING VOLUME NO. 117–65

July 20, 2022

SUBCOMMITTEE HEARING: PAPER MILLS AND RESEARCH MISCONDUCT: FACING THE CHALLENGES OF SCIENTIFIC PUBLISHING

The purpose of this hearing was to discuss the current and future challenges in securing scientific literature from fraudulent academic papers. The hearing examined field-specific and industry-wide strategies for identifying fraud, the increasing number of fraudulent papers produced and sold by paper mills, and the impact of new technologies such as AI on both the perpetration and the detection of research misconduct. Members and witnesses discussed the successes of the largely volunteer post-publication review community, the challenges that community has faced, and the strategies publishers themselves are developing to combat research misconduct.

Witnesses:

- Dr. Jennifer Byrne, Director of Biobanking, New South Wales Health Pathology; Professor of Molecular Oncology, University of Sydney
- Mr. Chris Graf, Research Integrity Director, Springer Nature; Chair of the Governance Board, STM Association Integrity Hub
- Dr. Brandon Stell, Neuroscientist, French National Centre for Scientific Research; President and Co-Founder, The PubPeer Foundation.

(m) HEARING VOLUME NO. 117–67

September 15, 2022

SUBCOMMITTEE HEARING: THE FOUNTAIN OF YOUTH? THE QUEST FOR AGING THERAPIES

The purpose of this hearing was to discuss the state of geroscience, the study of aging and age-related diseases, and leading research efforts to develop therapeutic interventions that target aging and age-related diseases. The hearing examined the ethical and societal implications that may result as aging therapies grow closer to commercial readiness. It also considered the role of the federal government and barriers that may be affecting the research effort.

Witnesses:

- Dr. Jay Olshansky, Professor of Public Health, University of Chicago
- Dr. Laura Niedernhofer, Director, Institute on the Biology of Aging and Metabolism; Medical Discovery Team on the Biology of Aging; Professor, Department of Biochemistry, Molecular Biology and Biophysics, University of Minnesota
- Dr. Steve Horvath, Principal Investigator, Altos Labs.

3.5 Hearings Before the Subcommittee on Research and Technology

(a) HEARING VOLUME NO. 117–10

April 28, 2021

RESEARCH AND TECHNOLOGY SUBCOMMITTEE HEARING: NATIONAL SCIENCE FOUNDATION: ADVANCING RESEARCH FOR THE FUTURE OF U.S. INNOVATION

The purpose of this hearing was to discuss opportunities and challenges for leveraging and expanding the National Science Foundation mission to continue to advance excellent research; improve STEM education and research training; increase research accessibility, accountability, and security; and accelerate research to address major societal challenges. The Subcommittee considered the merits of the *National Science Foundation for the Future Act* for addressing such opportunities and challenges and examined the Administration's Fiscal Year 2022 budget request for the National Science Foundation.

Witnesses:

- Dr. Sethuraman Panchanathan, Director, National Science Foundation

• Dr. Ellen Ochoa, Chair, National Science Board

(b) HEARING VOLUME NO. 117–13

May 6, 2021

RESEARCH AND TECHNOLOGY SUBCOMMITTEE HEARING: NATIONAL SCIENCE FOUNDATION: ADVANCING RESEARCH FOR THE FUTURE OF U.S. INNOVATION PART II

The purpose of this hearing was to discuss opportunities and challenges for leveraging and expanding the National Science Foundation mission to continue to advance excellent research; improve STEM education and research training; increase research accessibility, accountability, and security; and accelerate research to address major societal challenges. The Subcommittee considered the merits of the National Science Foundation for the Future Act for addressing such opportunities and challenges.

Witnesses:

• Dr. Roger M. Wakimoto, Vice Chancellor for Research and Creative Activities, University of California, Los Angeles

• Ms. Gabriela Cruz Thompson, Director, University Research and Collaboration, Intel Labs, Intel Corporation

• Dr. Mahmud Farooque, Associate Director, Consortium for Science, Policy and Outcomes, DC and Clinical Associate Professor, School for the Future of Innovation in Society, Arizona State University

• Dr. Gerald Blazey, Vice President for Research and Innovation Partnerships, Northern Illinois University

• Dr. P. Barry Butler, President, Embry-Riddle Aeronautical University

(c) HEARING VOLUME NO. 117–22

June 24, 2021

SUBCOMMITTEE HEARING—PLASTIC WASTE REDUCTION AND RECYCLING RESEARCH: MOVING FROM STAGGERING STATISTICS TO SUSTAINABLE SYSTEMS

This hearing discussed federal research and development and standards development needs to help address the plastic waste crisis and barriers to the current recycling system. In addition, the Subcommittee explored challenges and opportunities for adopting sustainable upstream plastic waste reduction solutions and efficacy of existing lifecycle analysis models for assessing the impact of plastic waste and metrics for sustainability. The Subcommittee also considered the role that the Plastic Waste Reduction and Recycling Research Act can play in addressing these important issues.

Witnesses:

• Ms. Keefe Harrison, Chief Executive Officer, The Recycling Partnership

• Dr. Marc Hillmyer, Director and Principle Investigator, University of Minnesota National Science Foundation Center for Sustainable Polymers

• Dr. Gregory Keoleian, Director, Center for Sustainable Systems, Peter M. Wege Professor of Sustainable Systems, School for Environment and Sustainability Professor, Civil and

Environmental Engineering, co-Coordinator, Engineering Sustainable Systems Program, University of Michigan

• Mr. Joshua Baca, Vice President, Plastics Division, American Chemistry Council

(d) HEARING VOLUME NO. 117–33

October 5, 2021

JOINT HEARING OF THE SUBCOMMITTEE ON RESEARCH AND TECHNOLOGY & THE SUBCOMMITTEE ON INVESTIGATIONS AND OVERSIGHT: BALANCING OPEN SCIENCE AND SECURITY IN THE U.S. RESEARCH ENTERPRISE

The purpose of this hearing was to explore the risks to research integrity and security posed by undue foreign influence in the U.S. research enterprise. The Subcommittees examined ongoing efforts at universities and federal science agencies to address these risks and the need for additional clarity regarding the scale and scope of the risks and best practices for securing federally funded fundamental research. They also discussed the risks of overcorrection, including the impact on researchers, institutions, and the competitiveness of the U.S. research enterprise.

Witnesses:

• Dr. Maria Zuber, Co-Chair, National Science, Technology, and Security Roundtable, National Academies of Sciences, Engineering, and Medicine; Vice President for Research and E.A. Griswold Professor of Geophysics, Massachusetts Institute of Technology

• Ms. Candice N. Wright, Director, Science, Technology Assessment, and Analytics, U.S. Government Accountability Office

• Ms. Allison Lerner, Inspector General, National Science Foundation

• Dr. Xiaoxing Xi, Laura H. Carnell Professor of Physics, Temple University

(e) HEARING VOLUME NO. 117–37

November 10, 2021

RESEARCH AND TECHNOLOGY SUBCOMMITTEE HEARING: WEATHERING 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), including the importance of interagency collaboration. The Subcommittee also considered new and evolving challenges to improved windstorm and windstorm impact resilience, and opportunities to improve the Program.

Witnesses:

• Dr. Scott Weaver, Director, National Windstorm Impact Reduction Program, National Institute of Standards and Technology

• Dr. Linda Blevins, Deputy Assistant Director, Directorate for Engineering, National Science Foundation

• Mr. Michael Grimm, Assistant Administrator for Risk Management, Federal Emergency Management Agency

(f) HEARING VOLUME NO. 117–44

February 15, 2022

RESEARCH AND TECHNOLOGY SUBCOMMITTEE HEARING: STRENGTHENING THE U.S. MICROELECTRONICS WORKFORCE

The purpose of this hearing was to understand the critical workforce needs of the U.S. microelectronic manufacturing sectors as part of the ongoing investments in increasing domestic production. The Subcommittee examined current semiconductor workforce and training pipelines; explored gaps between current and future workforce needs; and discussed strategies to expand and diversify the microelectronics workforce.

Witnesses:

• Ms. Shari Liss, Executive Director, SEMI Foundation

• Dr. Osama Awadelkarim, UNESCO Chair Professor and Director of the Center for Nanotechnology Education and Utilization (CNEU), Pennsylvania State University

• Dr. Tsu-Jae King Liu, Dean and Roy W. Carlson Professor of Engineering, University of California, Berkeley

(g) HEARING VOLUME NO. 117–49

March 17, 2022

RESEARCH AND SUBCOMMITTEE HEARING: SETTING THE STANDARDS: STRENGTHENING U.S. LEADERSHIP IN TECHNICAL STANDARDS

The purpose of this hearing was to discuss the nature and importance of the standards-setting process to U.S. competitiveness and national security. The Subcommittee examined the technical standards-setting processes both domestically and internationally; the current intergovernmental processes that support Federal coordination and information exchange activities for standards engagement; the barriers that U.S. organizations face to participating in standards development; and the risks to loss of U.S. leadership in standards setting.

Witnesses:

• Dr. James K. Olthoff, Acting Director, National Institute of Standards and Technology

• Ms. Mary Saunders, Vice President, Government Relations and Public Policy, American National Standards Institute (ANSI)

• Dr. Alissa Cooper, Vice President and Chief Technology Officer, Technology Policy and Cisco Fellow, Cisco Systems Inc.

• Mr. Andrew Updegrove, Partner, Gesmer Updegrove L.L.P.

(h) HEARING VOLUME NO. 117–52

April 6, 2022

RESEARCH AND TECHNOLOGY SUBCOMMITTEE HEARING: SBIR TURNS 40: EVALUATING SUPPORT FOR SMALL BUSINESS INNOVATION

The purpose of this hearing was to review the role of the Small Business Innovation Research (SBIR) Program and Small Business Technology Transfer (STTR) Program in translating Federally funded research into commercial development, generating new economic growth, as well as in assisting federal science agencies in meeting their respective missions. The Subcommittee also considered recommendations for improvements to the SBIR and STTR Programs and received testimony on *Small Business Innovation Research and Small Business Technology Transfer Improvements Act of 2021*.

Witnesses:

- J. Stephen Binkley Ph.D., Acting Director, Office of Science, Department of Energy
- Dr. Ben Schrag, Program Director and Policy Liaison, SBIR/STTR Program, Directorate for Technology, Innovation and Partnerships, National Science Foundation
- Dr. Maryann Feldman, S.K. Heninger Distinguished Professor of Public Policy, Department of Public Policy; Professor of Finance, Kenan-Flagler Business School; Research Director, Kenan Institute of Private Enterprise; The University of North Carolina at Chapel Hill
- Mr. George Caravias, Chief Executive Officer, Geofabrica Inc.
- Dr. Nigel Reuel, Associate Professor, Jack R. and Carol A. Johnson Faculty Fellow, Director of Graduate Education, Iowa State University

(i) HEARING VOLUME NO. 117–57

May 20, 2022

RESEARCH AND TECHNOLOGY SUBCOMMITTEE HEARING: BUILDING A WORKFORCE TO NAVIGATE THE ELECTRIC VEHICLE FUTURE

The purpose of this hearing was to explore the workforce needs for the automotive mobility and electrification industry in order to position the United States at the center of growth for electric vehicles (EVs). Members explored issues facing workers across the emerging EV ecosystem, including design, manufacturing, installation, and maintenance of EVs and charging infrastructure. Witnesses provided insights and strategies for meeting clean energy goals while bolstering national competitiveness and ensuring shared prosperity for American workers.

Witnesses:

- Ms. Marcia Black-Watson, Industry Engagement Division Administrator, Workforce Development, Michigan Department of Labor and Economic Opportunity
- Ms. Jennifer Mefford, National Co-Chair, Electric Vehicle Infrastructure Training Program (EVITP)
- Mr. Benigno "Ben" Cruz, Director, Center for Advanced Automotive Technology (CAAT), Macomb Community College

• Mr. Josh Nassar, Legislative Director, United Auto Workers (UAW)

(j) HEARING VOLUME NO. 117–62

June 23, 2022

JOINT HEARING OF THE SUBCOMMITTEE ON RESEARCH AND TECHNOLOGY AND THE SUBCOMMITTEE ON ENVIRONMENT: ASSESSING FEDERAL PROGRAMS FOR MEASURING GREENHOUSE GAS SOURCES AND SINKS

The purpose of this hearing was to explore Federal programs focused on monitoring, measuring, and verifying sources and sinks of greenhouse gas emissions (GHGs). The Committee examined data and measurement challenges as well as research gaps related to improving GHG monitoring, measurement, and verification. Finally, the Committee discussed the measurement tools, methods, and standards that can enable industries and governments to have the information they need to manage emissions effectively and where Congress should focus efforts to improve GHG monitoring, measurement, and verification.

Witnesses:

• Dr. Eric K. Lin, Director, Material Measurement Laboratory, National Institute of Standards and Technology

• Dr. Ariel Stein, Acting Director, Global Monitoring Laboratory and Director, Air Resources Laboratory, National Oceanic and Atmospheric Administration

• Dr. Karen M. St. Germain, Earth Science Division Director, Science Mission Directorate, National Aeronautics and Space Administration

• Dr. Bryan Hubbell, National Program Director for Air, Climate, and Energy, Office of Research and Development, United States Environmental Protection Agency

(k) HEARING VOLUME NO. 117–70

September 29, 2022

RESEARCH AND TECHNOLOGY SUBCOMMITTEE HEARING:
TRUSTWORTHY AI: MANAGING THE RISKS OF ARTIFICIAL INTELLIGENCE

The purpose of this hearing was to discuss tools, best practices, and challenges in the design, development, testing, and deployment of trustworthy artificial intelligence (AI) systems. The Subcommittee examined efforts in academia, industry, and government to create a culture of responsibility around AI systems, identify and remove harmful bias in AI systems, improve explainability and transparency of AI systems, and mitigate other risks associated with AI systems. The Subcommittee also explored the National Institute of Standards and Technology's ongoing efforts to create an artificial intelligence risk management framework.

Witnesses:

• Ms. Elham Tabassi, Chief of Staff, Information Technology Laboratory, National Institute of Standards and Technology

• Dr. Charles Isbell, Dean and John P. Imlay, Jr. Chair of the College of Computing, Georgia Institute of Technology

• Mr. Jordan Crenshaw, Vice President of the Chamber Technology Engagement Center, U.S. Chamber of Commerce
• Ms. Navrina Singh, Founder and Chief Executive Officer, Credo AI

(l) HEARING VOLUME NO. 117–XX

December 14, 2022

RESEARCH AND TECHNOLOGY SUBCOMMITTEE HEARING—BUILDING REGIONAL INNOVATION ECONOMIES PART II

The purpose of this hearing was to explore the role of the Department of Commerce's Economic Development Administration to promote regional innovation through support for community-led economic development strategies that increase geographic diversity and expand participation in the innovation economy, bolster domestic supply chains, grow manufacturing capacity, and strengthen community resilience across the United States.

Witnesses:

• The Honorable Alejandra Y. Castillo, Assistant Secretary of Commerce for Economic Development, U.S. Department of Commerce
• Ms. Maureen Donohue Krauss, President and Chief Executive Officer, Detroit Regional Partnership
• Mr. David Spalding, Raisbeck Endowed Dean of the Debbie and Jerry Ivy College of Business and Interim Vice President of Economic Development and Industry Relations, Iowa State University
• Ms. Linda Olson, President and Chief Executive Officer, Tampa Bay Wave

3.6 Hearings Before the Subcommittee on Space and Aeronautics

(a) HEARING VOLUME NO. 117–6

March 24, 2021

SUBCOMMITTEE HEARING: EXAMINING R&D PATHWAYS TO SUSTAINABLE AVIATION

The purpose of the hearing was to examine research and technology approaches to sustainable aviation, including activities for improving the energy efficiency and reducing the climate and environmental impacts of civil and commercial aviation; inform research and development priorities to achieve emissions reduction goals for aviation sector; and other issues.

Witnesses:

• Dr. Karen A. Thole, Department Head and Distinguished Professor, Department of Mechanical Engineering, Pennsylvania State University
• Dr. R. John Hansman, Jr., T. Wilson Professor of Aeronautics & Astronautics and Director, MIT International Center for Air Transportation, Massachusetts Institute of Technology; Chair, FAA Research and Development Advisory Committee (REDAC); Co-director, FAA Center of Excellence for Alternative Jet Fuels and Environment (ASCENT)

• Mr. Steve Csonka, Executive Director, Commercial Aviation Alternative Fuels Initiative (CAAFI)

(b) HEARING VOLUME NO. 117–11

April 29, 2021

SUBCOMMITTEE HEARING: WHAT DO SCIENTISTS HOPE TO LEARN WITH NASA'S MARS PERSEVERANCE ROVER?

The purpose of the hearing was to explore the science of the National Aeronautics and Space Administration's Mars 2020 Perseverance Rover mission, including key scientific objectives and plans, and overall Mars science exploration strategy, and other issues.

Witnesses:

• Dr. Michael A. Meyer, Lead Scientist, Mars Exploration Program, National Aeronautics and Space Administration

• Dr. Bethany L. Ehlmann, Professor of Planetary Science and Associate Director of the Keck Institute for Space Studies, California Institute of Technology; President, The Planetary Society; Co-Investigator, Mars 2020 Perseverance mission

• Dr. Tanja Bosak, Returned Sample Science Co-Lead, Mars 2020 Perseverance Rover; Professor and Lead of the Option in Geology, Geochemistry, and Geobiology, Department of Earth, Atmospheric, and Planetary Sciences, Massachusetts Institute of Technology

(c) HEARING VOLUME NO. 117–15

May 18, 2021

SUBCOMMITTEE HEARING: NASA'S EARTH SCIENCE AND CLIMATE CHANGE ACTIVITIES: CURRENT ROLES AND FUTURE OPPORTUNITIES

The hearing examined the National Aeronautics and Space Administration's Earth science and climate change activities and plans, including the role of space-based observations, partnerships, and other issues.

Witnesses:

• Dr. Karen M. St. Germain, Division Director, Earth Sciences Division, Science Mission Directorate, NASA

• Dr. Gavin Schmidt, Senior Climate Advisor (Acting) and Director of Goddard Institute for Space Studies, NASA

• Mr. Riley Duren, Research Scientist, Office of Research, Innovation, and Impact, University of Arizona; Chief Executive Officer, Carbon Mapper, Inc.

• Mr. Robbie Schingler, Co-Founder and Chief Strategy Officer, Planet

(d) HEARING VOLUME NO. 117–28

July 29, 2021

SUBCOMMITTEE HEARING: ENABLING MISSION SUCCESS FROM THE GROUND UP: ADDRESSING NASA'S URGENT INFRASTRUCTURE NEEDS

The purpose of the hearing was to review the National Aeronautics and Space Administration's (NASA's) infrastructure and maintenance status, plans, and needs, including those related to

physical infrastructure, mission support systems, research laboratories and test facilities, and to examine the enabling role of infrastructure in achieving NASA's current and future mission goals in science, aeronautics, human spaceflight, and space technology while ensuring the safety of agency personnel and operations.

Witness:

Mr. Robert Gibbs, Associate Administrator for the Mission Support Directorate, National Aeronautics and Space Administration

(e) HEARING VOLUME NO. 117–29

September 21, 2021

SUBCOMMITTEE HEARING: NASA'S FUTURE IN LOW EARTH ORBIT: CONSIDERATIONS FOR INTERNATIONAL SPACE STATION EXTENSION AND TRANSITION

The purpose of the hearing is to examine the status of the International Space Station (ISS), NASA's requirements for future research and development in low Earth orbit, and plans for sustaining such activities once the ISS is no longer operating, among other issues.

Witnesses:

- Ms. Robyn Gatens, Director, International Space Station; National Aeronautics and Space Administration
- Dr. Kathleen "Kate" Rubins, Astronaut; National Aeronautics and Space Administration
- Mr. Jeffrey Manber, Chief Executive Officer; Nanoracks, LLC
- Mr. Todd Harrison, Senior Fellow and Director of the Aerospace Security Project; Center for Strategic and International Studies
- Captain William Shepherd (USN, Retired), Former Astronaut, National Aeronautics and Space Administration

(f) HEARING VOLUME NO. 117–35

October 20, 2021

SUBCOMMITTEE HEARING: ACCELERATING DEEP SPACE TRAVEL WITH SPACE NUCLEAR PROPULSION

The purpose of the hearing was to understand the opportunities and challenges of space nuclear propulsion for enabling deep space exploration, examine the status of NASA's R&D activities and plans for space nuclear propulsion, and to consider government and industry contributions to and collaboration on advancing space nuclear propulsion, among other issues.

Witnesses:

- Dr. Roger M. Myers, Co-Chair, Committee on Space Nuclear Propulsion Technologies, National Academies of Sciences, Engineering, and Medicine
- Dr. Bhavya Lal, Senior Advisor for Budget and Finance; NASA
- Mr. Greg Meholic, Senior Project Leader, The Aerospace Corporation

• Mr. Michael French, Vice President, Space Systems; Aerospace Industries Association
• Dr. Franklin Chang Diaz, Founder and CEO, Ad Astra Rocket Company

(g) HEARING VOLUME NO. 117–39

December 1, 2021

JOINT SUBCOMMITTEE ON SPACE AND AERONAUTICS AND SUBCOMMITTEE ON RESEARCH AND TECHNOLOGY HEARING: A REVIEW OF THE DECADAL SURVEY FOR ASTRONOMY AND ASTROPHYSICS IN THE 2020S

The purpose of this hearing was to review the science priorities and recommendations from the decadal survey on astronomy and astrophysics, *Pathways to Discovery in Astronomy and Astrophysics for the 2020s*, recently released by the National Academies of Sciences, Engineering, and Medicine.

Witnesses:

• Dr. Robert C. Kennicutt, Jr., Co-Chair, Steering Committee, Committee for A Decadal Survey on Astronomy and Astrophysics 2020, National Academies of Sciences, Engineering, and Medicine; Laureate Professor, University of Arizona; and Professor of Physics and Astronomy, Texas A&M University
• Dr. Fiona A. Harrison, Co-Chair, Steering Committee, Committee for A Decadal Survey on Astronomy and Astrophysics 2020, National Academies of Sciences, Engineering, and Medicine; Harold A. Rosen Professor of Physics, California Institute of Technology
• Mr. William Russell, Director, Contracting and National Security Acquisitions, Government Accountability Office

(h) HEARING VOLUME NO. 117–42

March 1, 2022

SUBCOMMITTEE HEARING: KEEPING OUR SIGHTS ON MARS PART 3: A STATUS UPDATE AND REVIEW OF NASA'S ARTEMIS INITIATIVE

The purpose of the hearing was to examine the status of plans and progress on the National Aeronautics and Space Administration's Artemis initiative; to review challenges related to the implementation of those activities; and to understand the factors that contribute to overall success in the nation's Moon to Mars efforts, among other issues.

Witnesses:

• Mr. James Free, Associate Administrator, Exploration Systems Development Mission Directorate, National Aeronautics and Space Administration
• Mr. William Russell, Director, Contracting and National Security Acquisitions, Government Accountability Office
• Dr. Patricia Sanders, Chair, Aerospace Safety Advisory Panel
• The Honorable Paul K. Martin, Inspector General, National Aeronautics and Space Administration
• Mr. Daniel Dumbacher, Executive Director, American Institute of Aeronautics and Astronautics

(i) HEARING VOLUME NO. 117–50

May 12, 2022

SUBCOMMITTEE HEARING: SPACE SITUATIONAL AWARENESS: GUIDING THE TRANSITION TO A CIVIL CAPABILITY

The purpose of the hearing was to consider testimony regarding planning for the transition of certain space situational awareness services and information to a civil capability, among other issues.

Witnesses:

- Dr. Matthew Hejduk, Senior Project Leader, The Aerospace Corporation
- Dr. Moriba Jah, Associate Professor, Aerospace Engineering and Engineering Mechanics Department, Mrs. Pearlie Dashiell Henderson Centennial Fellowship in Engineering, Oden Institute for Computational Engineering and Sciences, The University of Texas at Austin
- Mr. Andrew D'Uva, Senior Policy Advisor, Space Data Association
- Mr. Kevin M. O'Connell, Founder, Space Economy Rising, LLC
- Dr. Mariel Borowitz, Associate Professor, Sam Nunn School of International Affairs, Ivan Allen College of Liberal Arts, Georgia Institute of Technology

(j) HEARING VOLUME NO. 117–59

May 26, 2022

SUBCOMMITTEE HEARING: A REVIEW OF THE DECADAL STRATEGY FOR PLANETARY SCIENCE AND ASTROBIOLOGY 2023–2032

The purpose of the hearing was to review the science priorities and recommendations from the decadal survey on planetary science and astrobiology, Origins, Worlds, and Life: A Decadal Strategy for Planetary Science and Astrobiology 2023–2032, recently released by the National Academies of Sciences, Engineering, and Medicine.

Witnesses:

- Dr. Robin M. Canup, Co-Chair, Steering Group, Committee on the Planetary Science and Astrobiology Decadal Survey, National Academies of Sciences, Engineering, and Medicine; Assistant Vice President, Planetary Science Directorate, Southwest Research Institute
- Dr. Philip R. Christensen, Co-Chair, Steering Group, Committee on the Planetary Science and Astrobiology Decadal Survey, National Academies of Sciences, Engineering, and Medicine; Arizona State University

(k) HEARING VOLUME NO. 117–66

July 28, 2022

SUBCOMMITTEE HEARING: EXPLORING CYBER SPACE: CYBERSECURITY ISSUES FOR CIVIL AND COMMERCIAL SPACE SYSTEMS

The purpose of the hearing was to examine cybersecurity for civil and commercial space systems, including current and potential cybersecurity risks, the status of policies and guidance regarding cy-

bersecurity for space systems, and opportunities for facilitating and strengthening cybersecurity for civil and commercial space systems, among other issues.

Witnesses:

- Dr. Theresa Suloway, Space Cybersecurity Engineer, The MITRE Corporation
- Mr. Matthew Scholl, Chief, Computer Security Division, Information Technology Laboratory, National Institute of Standards and Technology
- Mr. Brandon Bailey, Senior Project Leader, Cyber Assessments and Research Department, The Aerospace Corporation

(l) HEARING VOLUME NO. 117–69

September 21, 2022

JOINT SUBCOMMITTEE ON SPACE AND AERONAUTICS AND SUBCOMMITTEE ON ENVIRONMENT HEARING: LOOKING BACK TO PREDICT THE FUTURE: THE NEXT GENERATION OF WEATHER SATELLITES

This hearing provided an opportunity to discuss the partnership between the National Oceanic and Atmospheric Administration (NOAA) and National Aeronautics and Space Administration (NASA) in the development, testing, acquisition, launch and management of NOAA's operational weather satellite programs. Furthermore, this hearing examined how lessons learned from past challenges in recent weather satellite programs are being incorporated into the future goals, architecture, and capabilities for the next generation of weather satellites.

Witnesses:

- Dr. Stephen Volz, Assistant Administrator, National Environmental Satellite, Data, and Information Services, NOAA
- Mr. John Gagosian, Joint Agency Satellite Division Director, NASA
- Mr. Fred Meny, Assistant Inspector General for Audit and Evaluation, U.S. Department of Commerce, Office of Inspector General

(m) HEARING VOLUME NO. 117–71

November 16, 2022

UNFOLDING THE UNIVERSE: INITIAL SCIENCE RESULTS FROM THE JAMES WEBB SPACE TELESCOPE

The purpose of the hearing was to receive testimony on the initial science, scientific findings and discoveries of National Aeronautics and Space Administration's James Webb Space Telescope, as well as plans for future scientific investigations.

Witnesses:

- Dr. Mark Clampin, Astrophysics Division Director, National Aeronautics and Space Administration
- Dr. Steven L. Finkelstein, Professor of Astronomy, University of Texas at Austin
- Dr. Natalie Batalha, Professor of Astronomy and Astrophysics and Director of Astrobiology, University of California, Santa Cruz

Chapter IV: Appendix

4.1. 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 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. Under Chairwoman Johnson's continued leadership in the 117th Congress, the Committee continued to legislate in a bipartisan fashion. These efforts culminated in the enactment of the CHIPS and Science Act, which was the largest Science Committee led bill to ever be enacted.

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.

4.2. Views and Estimates of the Committee on Science, Space, and Technology On the Fiscal Year 2022 Budget Request for Submission to the Budget Committee

The Committee looks forward to reviewing the President's detailed budget request later this spring. The following are the Committee's views on key priorities in the budget summary related to programs within the Science, Space, and Technology Committee jurisdiction.

National Science Foundation (NSF)

After more than a decade of flat or declining funding, in constant dollars, the National Science Foundation would be provided a 20 percent increase to $10.2 billion in the President's fiscal year 2022 budget request. While the details have not yet been provided, the budget increase supports increases for NSF's overall fundamental research and STEM education mission, in addition to significant focused increases for climate change research, technology development, and programs to broaden participation in STEM. We applaud the proposed increase for NSF overall, and look forward to seeing the details.

Notably, the budget includes a proposal for the creation of a new Directorate of Technology, Innovation, and Partnerships at NSF, the subject of ongoing discussion and debate in Congress. Since its creation in 1950, NSF has supported fundamental research across all fields of science and engineering, and STEM learning through all levels of education and training, in pursuit of its mission to promote the progress of science; advance the national health, prosperity, and welfare; secure the national defense; and for other purposes. From the beginning, a guiding assumption of the agency and its Congressional sponsors was that the results of these fundamental research investments would be picked up and translated into practice by industry and other potential users. While NSF rightly claims credit for the foundational science underlying countless innovations and the economic growth and other societal benefits that resulted, the translational work that brought these innovations into the market was typically not supported by the NSF.

Moreover, in many of the NSF's most successful cases of their work leading to profound societal benefits, the downstream innovations that resulted from the NSF research were not foreseeable when the NSF made its initial investments. That is the very heart of the debate over the creation of a new directorate at NSF, one that would expand the mission of the agency from what it has been over the past 70 years. The Committee looks forward to continuing this discussion within Congress, and with the Biden Administration.

National Institute of Standards and Technology (NIST)

The budget supports investment in our country's economic competitiveness by promoting innovation in U.S. manufacturing and advance science, standards, and technology development at the De-

partment of Commerce. Specifically, the budget would increase funding for NIST's scientific and technical research account by 16 percent to $916 million. The increased investment in NIST's core research account is the minimum needed for NIST to meet its statutory requirements in artificial intelligence, quantum science, cybersecurity, and resilience, while continuing to adequately support its many other critical areas of measurement science.

The budget would more than double funding for NIST's manufacturing programs, including $150 million to fully fund two new Manufacturing USA institutes and an additional $125 million for the Manufacturing Extension Partnership (MEP) program. Based on the previous competition NIST ran under the Manufacturing USA program, there are sufficient meritorious ideas to warrant two or more additional institutes. The MEP program plays an essential role in helping small and medium sized manufacturers adopt manufacturing innovations, protect their businesses and customers from cyberattacks, and compete in the global economy. We look forward to hearing more about the details of how the MEP program will implement the additional funding.

The budget request is silent on NIST's construction account. NIST itself estimates a need of $200 million per year to address its decaying infrastructure and maintenance backlog, an amount well above the FY 2021 enacted level. Addressing NIST's construction and maintenance needs will remain a priority for the Committee.

National Aeronautics and Space Administration (NASA)

The Administration has requested $24.7 billion for NASA in Fiscal Year 2022, a 6.3 percent increase from the FY 2021 enacted appropriation of $23.2 billion. The Committee is encouraged about the priorities highlighted in the discretionary budget request summary for NASA, including support for robotic science exploration, advancing Earth and climate science, sustainable aviation, continuity in the Moon to Mars effort and a sustainable deep space exploration program, innovation and space technology, and increased support for science, technology, engineering and mathematics (STEM) education activities that will expand opportunities for engaging underserved and underrepresented students in STEM fields. The Committee believes that NASA should continue to undertake the most cutting-edge research and serve as an inspiration to the next generation of scientists and engineers.

NASA has achieved significant accomplishments, despite the additional challenges of the COVID–19 pandemic. The Committee looks forward to reviewing the full budget request and plans for FY 2022 and to understanding the extent of COVID 0919 impacts on the agency's activities as it looks to reauthorize NASA's programs and activities.

Department of Energy (DOE)

The discretionary request provides $46.1 billion overall for the Department of Energy in FY22, a 10.2 percent increase from the 2021 enacted level, and includes robust support for advanced nuclear energy technologies, renewable energy, electric vehicles, green hydrogen, innovative approaches to air conditioning and refrigera-

tion, and a revitalized Office of Fossil Energy and Carbon Management, among many other important areas.

The Committee is pleased that the request strongly supports a comprehensive approach to clean energy innovation. This Committee has jurisdiction over the Department of Energy's science and energy research, development, demonstration, and commercial application activities including its national laboratories and research facilities, and knows how critical continued support of these programs will be to meet this moment for a meaningful energy transition. In addition, the Committee is encouraged by the Administration's support of additional grants and workforce development programs for MSIs. To achieve the best solutions, we need a diverse array of experts seated at the table to keep pace with our competitors and deliver benefits to all Americans.

The Committee also supports the Administration's goal of additional funding to support the DOE Office of Science's critical efforts to improve our competitiveness and decarbonize our country. However, we urge the administration to consider the benefits of additional funding to support some of our nation's most important science and energy research programs and facilities. The discretionary request includes a $400 million increase to a total of $7.4 billion. The Committee believes that this level of growth is not sufficient for the current needs of the world-class user facilities, research programs, and national laboratories stewarded by the Office. The Committee also voices concern over the structure of an Advanced Research Projects Agency—Climate (ARPA–C). Although the Committee applauds the Administration's commitment to advancing breakthrough solutions for climate and energy, an ARPA model may not be the most appropriate leading pathway to addressing the significant climate resilience and adaptation problems at hand, and the Committee looks forward to continued discussion with the Administration regarding this proposal.

Environmental Protection Agency (EPA)

The budget provides $11.2 billion for the EPA, a roughly 21 percent increase to the 2021 enacted funding level. In recent years, the Committee has noted the need for increased funding for research and development at the EPA to ensure that regulations are scientifically sound, and to address the most pressing environmental challenges of today and in the future. The Committee is encouraged by the proposed increase, which would more than double the Agency's climate change research budget, and expect that this budget would also provide for increased funding for other important research and development initiatives such as PFAS, harmful algal blooms, and lead in water.

The Committee applauds the Administration's commitment to assisting marginalized and underserved communities with an investment of $936 million to a new Accelerating Environmental and Economic Justice initiative at the agency. Finally, EPA has seen substantial attrition in its workforce in recent years, with the Committee finding significant impacts to the STEM workforce at the Agency in particular. Rebuilding the workforce of the agency is a key part of this budget with $110 million to restore EPA's critical staff capacity which will be crucial to the agency's research and development efforts to protect public health and the environment.

National Oceanic and Atmospheric Administration (NOAA)

The budget provides $6.9 billion for NOAA, a $1.4 billion increase from the 2021 enacted funding level. This budget prioritizes weather forecasting and climate observation work by providing $2 billion, an increase of $500 million from the 2021 enacted level, to fund the next generation of satellites, as well as an array of other technologies, to improve weather and climate forecasts. Additionally, the Committee has identified a need for the federal government to provide robust actionable climate information to communities and is encouraged to see $800 million in this budget go towards expanding investments in climate research, as well as regional and local decision-making support, data, and tools to improve community resilience to climate change. These investments will not only help gird our cities and towns against the more frequent and intense impacts of climate change, but also provide opportunities to grow our scientific workforce, and invest in the modern infrastructure needed to support these efforts.

4.2(a).

COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY
Washington, DC, May 7, 2021.

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

DEAR MR. CHAIRMAN: The House Science, Space, and Technology Committee Republicans appreciate the opportunity to share our views and estimates for the fiscal year 2022 budget cycle with respect to the programs within the Committee's jurisdiction, as well as our view of the budget process so far in the 117th Congress and how it should proceed as we move forward.

The Science Committee has a long history of working on a bipartisan basis to develop and pass meaningful science and technology legislation into law, when given the opportunity by House leadership to conduct its work in regular order. Unfortunately, the broken budget and legislative process under the leadership of House Democrats has unnecessarily impeded our Committee's bipartisan work.

The Science Committee has already been ostracized from the legislative process once in the 117th Congress when House Democratic leadership forced through the first budget reconciliation package without formal input from the Committee and its Members. The Science Committee had no opportunity to debate or discuss the $750 million allocated in the budget reconciliation package for research and development. Nor were we given the opportunity to address other missed opportunities for funding COVID relief for the research industry, which have broad bipartisan support. Budget reconciliation is a closed legislative process, and partisan wish lists are no way to approach the many opportunities that lie before us.

Republicans support doubling funding for basic federal research over the next 10 years and bipartisan consensus exists to increase federal investment in research and development. There is also broad bipartisan support for more rapidly growing federal investment in basic research at the Department of Energy (DOE) Office of Science and the National Science Foundation (NSF) over the

next 5 years, to contend with our global competitors like China. There is also bipartisan support for reauthorizing the National Aeronautics and Space Administration (NASA) to get America back to the Moon and on to Mars, to build our domestic STEM workforce and broaden participation in STEM studies and careers, and to foster American dominance in cutting-edge technologies.

Science Committee Republicans are committed to working on legislation to accomplish these critically important objectives. However, this can only be accomplished if the House proceeds through regular order, in an open and transparent process, where Members are provided an opportunity to legislate and engage in robust debate and discourse. It cannot be achieved by circumventing committees of jurisdiction under the guise of budget reconciliation, or by poisoning bipartisan consensus with partisan priorities.

Science and technology are essential to our national defense, economic security, and American prosperity. The basic research our government supports is foundational to our economic success and has allowed us to remain at the forefront of global science and technology innovation. We face very real threats to our scientific leadership from the Chinese Communist Party, and we can't afford to fall behind.

There is momentum on both sides of the aisle in the House and Senate for legislation to secure our global science and technology leadership. But our investments should be comprehensive, strategic, and sustainable. Unfortunately, the Biden-Harris Administration has proposed a $50 billion fund for a top-down approach to developing technologies at the National Science Foundation, and the Senate is considering a proposal to create a $100 billion slush fund for technology development. These proposals are not responsible or sustainable. America's continued scientific leadership requires a comprehensive and strategic approach to research and development that provides long-term increased investment and stability across the research ecosystem. It also requires national collaboration and public-private partnerships with a focus on evolving technologies that are crucial to our national and economic security, like quantum information science, artificial intelligence, advanced manufacturing, and high-performance computing.

The Republican Members of the Committee on Science, Space, and Technology will continue to build on the Committee's past work to ensure that the United States remains the world's leader in Research and Development. Committee Republicans believe that the only way to reach consensus and produce meaningful legislation on these matters is to engage in robust debate and dialogue, to proceed through regular legislative order, and to leave the partisan provisions for partisan measures. Anything less is an abdication of the Biden-Harris Administration's stated commitment to unity and would result in patchwork legislation that fails to serve the best interests of the American people.

We have an opportunity to ensure that America remains at the forefront of science and technology research, development, and innovation. We call on the House leadership and the Budget Committee to seize this opportunity for bipartisan legislation in support of science and technology by avoiding reconciliation and proceeding through regular order with an open amendment process, and to

check partisanship at the door. The American people deserve nothing less.

Respectfully,

FRANK LUCAS,
Ranking Member, Committee on Science, Space, and Technology.
BRIAN BABIN, D.D.S.,
Ranking Member, Subcommittee on Space and Aeronautics.
STEPHANIE BICE,
Ranking Member, Subcommittee on Environment.
BILL POSEY,
Member of Congress.
DR. JAMES R. BAIRD,
Member of Congress.
RANDY WEBER,
Ranking Member, Subcommittee on Energy.
MICHAEL WALTZ,
Ranking Member, Subcommittee on Research and Technology.
JAY OBERNOLTE,
Ranking Member, Subcommittee on Investigations and Oversight.
ANTHONY GONZALEZ,
Member of Congress.
PETE SESSIONS,
Member of Congress.
DANIEL WEBSTER,
Member of Congress.
YOUNG KIM,
Member of Congress.
JAKE LATURNER,
Member of Congress.
PETER MEIJER,
Member of Congress.
MIKE GARCIA,
Member of Congress.
RANDY FEENSTRA,
Member of Congress.
CARLOS GIMENEZ,
Member of Congress.

4.3.

COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY,
Washington, DC, May 20, 2022.

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

Hon. JASON SMITH,
Ranking Member, Committee on Budget,
House of Representatives, Washington, DC.

CHAIRMAN YARMUTH AND RANKING MEMBER SMITH: Please find enclosed the Majority Views and Estimates of the Committee on Science, Space, and Technology on the FY 2023 Budget Request. Thank you for your consideration.

Sincerely,

EDDIE BERNICE JOHNSON,
Chairwoman, Committee on Science, Space, and Technology.

Views and Estimates of the Committee on Science, Space, and Technology On the Fiscal Year 2022 Budget Request for Submission to the Budget Committee

EDDIE BERNICE JOHNSON.
ZOE LOFGREN.
SUZANNE BONAMICI.
AMI BERA.
HALEY STEVENS.
MIKIE SHERRILL.
JAMAAL BOWMAN, ED.D.
MELANIE STANSBURY.
BRAD SHERMAN.
ED PERLMUTTER.
JERRY MCNERNEY.
PAUL TONKO.
BILL FOSTER.
DONALD NORCROSS.
DONALD S. BEYER JR.
SEAN CASTEN.
CONOR LAMB.
DEBORAH K. ROSS.
GWEN MOORE.
DANIEL T. KILDEE.
LIZZIE FLETCHER.

Views and Estimates of the Committee on Science, Space, and Technology On the Fiscal Year 2023 Budget Request for Submission to the Budget Committee

The following are the Committee's views on key priorities in the budget summary related to programs within the Science, Space, and Technology Committee jurisdiction.

National Science Foundation (NSF)

The President's budget request includes $10.49 billion for NSF, an increase of $1.65 billion [19 percent] from the Fiscal Year (FY)

2022 appropriated level of $8.84 billion. While the proposed funding level falls short of what was authorized in the America COMPETES Act, it represents an important and overdue right-sizing of the agency, and we applaud the Administration's commitment to NSF. Among other the other priorities supported by the request, the additional funding will enable the Foundation to advance more cutting-edge research across all six research directorates; accelerate innovations in STEM education and training for students from all backgrounds; and move forward with the new Technology, Innovation and Partnerships (TIP) Directorate that will be focused on use-inspired research and technology-based solutions to pressing societal challenges. However, to allow the agency to properly support these and other initiatives as well as deal with the impact of covid on the construction of a number of its ongoing research projects, we support a further increase to a level of $12.5 billion, consistent with the level authorized in the America COMPETES Act. Such an increase is especially important to allow the agency to get its new TIP Directorate off the ground while continuing to increase core investments. It will also fund the many important existing and new STEM education and broadening participation programs authorized in COMPETES, which include a focus on geographic diversity.

National Institute of Standards and Technology (NIST)

The FY23 request for NIST is $1.47 billion, an increase of $237 million or 19 percent from the FY22 enacted level. Of this, Scientific and Technical Research Services—NIST's core measurement research and standards account—would increase by $162 million, or 20 percent. This request would increase funding for agency research into advanced communications, artificial intelligence, bioscience, climate and energy measurements, advanced manufacturing, and much more. The request would also increase funding for the NIST Center for Neutron Research to address the ongoing shutdown of the facility caused by an incident in February 2021. The Industrial Technology Services Account, which includes the Manufacturing Extension Partnership (MEP) Program and the Manufacturing USA institutes, would be increased by nearly $198 million or 113 percent. This large increase would support two new Manufacturing USA institutes and a 74 percent increase for MEP. The request also increases NIST's construction budget to $120 million. NIST has a significant construction and maintenance backlog on its two campuses. The agency estimates a need of $200 million per year for five years to address this challenge—an amount well above the President's budget request. We support funding for construction and maintenance at NIST's research campuses sufficient to address that backlog, so that NIST's scientists will have cutting-edge rather than crumbling facilities with which to carry out their critically important research.

National Aeronautics and Space Administration

The President's proposed FY23 investment of nearly $26 billion in the nation's civil space and aeronautics programs, a $2 billion [8 percent] increase over the FY22 enacted appropriation, represents a serious commitment to NASA's programs and to a balanced NASA portfolio. The President's FY23 budget request also

proposes continued operations for the International Space Station and requests a 121% increase over the FY22 enacted appropriation for preliminary work on commercial space stations that NASA is seeking to use for research and related activities in low Earth orbit following the end of ISS operations. The PBR proposes increases over the FY22 enacted appropriations for space technology, STEM education, science, and aeronautics, including NASA's important work on sustainable aviation and Earth and climate-related science. Funding is also included for NASA's Artemis Moon-Mars human exploration initiative, but it remains to be seen whether it is sufficient to develop and carry out a serious and sustained campaign of crewed lunar missions at an acceptable level of mission and safety risk.

Department of Energy (DOE)

The President's request provides $16 billion overall for Department of Energy science and energy research, development, demonstration, and commercial application activities in FY23, which would be a 16.7% increase over the total appropriated level for these activities in FY22. However, there is wide variation in how this proposed increase is distributed among DOE's programs, ranging from a 1.2% increase for nuclear energy R&D to 44.9% for energy efficiency and renewable energy R&D. The request also includes a proposed 55.6% increase for ARPA-E. DOE's Office of Science would receive a 4.3% increase. This level of growth at DOE's Office of Science is not sufficient to support the budget profiles that would be required to maintain the schedule and minimize the total project costs of the ongoing construction of a set of advanced research facilities currently stewarded by the Office. In addition, the proposed FY23 level for the DOE Office of Science is over a billion less than the FY22 authorization level for the Office included in the bipartisan DOE Science for the Future Act that is part of the America COMPETES Act. Further, the FY23 request for the Office of Science's fusion program would amount to a 1.4% increase over the FY22 appropriated level. That amount is significantly less than that authorized in the Energy Act of 2020 and the DOE Science for the Future Act, and is inconsistent with the progress made to date and the potential benefits of improved support for fusion energy R&D. Finally, we support the President's request for the Advanced Research Projects Agency-Energy (ARPA-E), which now has a proven track record that can be measured in the number of new companies, patents, follow-on private sector funding, and follow-on partnerships that have resulted from ARPA-E's investments to date.

National Oceanic and Atmospheric Administration (NOAA)

The President's FY23 request for the National Oceanic and Atmospheric Administration (NOAA) is $6.9 billion—an increase of $1.02 billion from the FY22 enacted level. This increase would support NOAA's work to predict the weather, including extreme weather associated with climate change, protect the oceans and coasts, and improve wildfire observation and prediction. Among the notable increases included in the request are $720 million towards the National Ocean Service (NOS), an increase of $70.80 million

from the FY22 enacted level; $1.37 billion towards the National Weather Service (NWS), an increase of $85.33 million from the FY22 enacted level; $824 million towards the Oceanic and Atmospheric Research (OAR), an increase of $176.05 million from the FY22 enacted level; $2.30 billion towards the National Environmental Satellite, Data, and Information Service (NESDIS), an increase of $680.88 million from the FY22 enacted level; and $608 million towards Mission Support (MS), an increase of $231.46 million from the FY22 enacted level. It is also encouraging that the request includes a $376 million investment in NOAA's climate resilience activities. This includes $92 million for expanded climate competitive research grants. It also proposes an investment of $2.3 billion for the next generation of weather satellites. Other critically important areas of investment are a total of $120 million specifically for wildfire-related activities at NOAA, including prediction, detection, observation, modeling, forecasting, and research. Moreover, the request intends for funds otherwise allocated to also support NOAA's wildfire work. In addition, the request proposes at least $80 million for research supercomputing to support weather and climate model development. Sustained advances in research will require the advanced computing resources needed to support those advances. Finally, the request proposes an unprecedented level of funding increase for the Office of Space Commerce, an increase of $72 million over the FY22 enacted level of $16 million. The request for the Office "expands opportunities for civil space situational awareness and supports the long-term sustainability of the space environment by committing $88 million . . . in order to improve real-time tracking and reporting of space objects and debris." The Committee is preparing legislation directed at space situational awareness, and as a result of that will be determining what is an appropriate funding level for those activities at Commerce.

Environmental Protection Agency (EPA)

The President's Budget Request for FY23 includes $11.9 billion for EPA, a $2.34 billion increase from the FY22 enacted level. This significant increase would support EPA's work to follow the science, ensure scientific integrity and science-based decision making and will help to restore EPA's capability to protect human health and the environment. The request provides an investment of $864 million, or 7.3% of EPA's total budget, for the Science and Technology account. This represents a $114 million increase in the Science and Technology budget from the $750 million enacted in the FY22 appropriations. Additionally, the request includes funding to support a total of 16,204 full-time equivalents (FTE), an increase of 1,907 above the current level, to restore the Agency's capacity to carry out its important tasks. The request includes $644 million and 1,853 FTEs for EPA's Office of Research and Development (ORD) as part of the prioritization of science within the EPA. The request provides a $37.5 million increase to Air, Climate, and Energy research within ORD from FY22 enacted to conduct science and technology activities to develop and implement strategies to improve air quality and take action on climate change, as well as to improve wildfire readiness.

4.4 Oversight plan for the 117th Congress

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 Science 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 117TH CONGRESS

The federal response to COVID–19. The Committee continued its oversight of the federal government's response to the COVID–19 pandemic, as well as the impact of the pandemic on the federal research enterprise. The Committee held five related hearings:

- February 19, 2021—Full Committee hearing: The Science of COVID–19 Vaccines and Encouraging Vaccine Uptake
- February 25, 2021—Full Committee hearing: Building Back the U.S. Research Enterprise: Covid Impacts and Recovery
- May 12, 2021—Investigations & Oversight Subcommittee hearing: COVID–19 Variants and Evolving Research Needs
- July 14, 2021—Investigations & Oversight Subcommittee hearing: Principles for Outbreak Investigation: COVID–19 and Future Infectious Diseases
- March 31, 2022—Investigations & Oversight Subcommittee hearing: The New Normal: Preparing for and Adapting to the Next Phase of COVID–19

*Scientific Integrity.*The Committee continued its oversight of scientific integrity policies and procedures in the executive branch, as well as its scrutiny of alleged instances of political interference with federal scientific activities.

Scientific advisory committees. Federal agencies receive scientific advice and analysis from independent science advisory committees to help inform policymaking. The Committee continued to examine

[1] House Rule X, clause 3, (k)—attached as Appendix A.

the structure, independence, functionality and ethical requirements of these committees to ensure that they are able to deliver sound expertise without undue influence by special interests.

Whistleblowers. The Committee maintained its open door policy for any whistleblower who would like 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 takes confidentiality issues seriously and will always help to protect the identity of any individual who approaches the Committee with issues of concern.

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 being transparent and implementing GAO and OIG recommendations. The Committee utilized the resources of the GAO and IG community to steer them towards oversight issues of concern to the Committee. The Committee continued to ensure the IG offices within the agencies under the Committee's jurisdiction are being managed appropriately and effectively.

Cybersecurity. The Committee continued its work to ensure federal agencies complied with cybersecurity standards across the government, considered the quality and adequacy of the standards and best practices themselves, and investigated reported breaches of government and private sector computer systems when the public's privacy, safety, or security was endangered. The Committee held three related hearings, the Government Accountability Office (GAO) 2021 High Risk List included "Ensuring the Cybersecurity of the Nation" and the first two hearings on the list were held pursuant to Rule XI, clause 2, subsection (p).

- May 25, 2021—Joint Subcommittee hearing, Investigations & Oversight Subcommittee lead, with Research and Technology Subcommittee: *Solarwinds and Beyond: Improving the Cybersecurity of Software Supply Chains,* which was also held pursuant to Rule XI, clause 2, subsection (n).
- May 11, 2022—Joint Subcommittee hearing, Investigations & Oversight Subcommittee lead, with Research and Technology Subcommittee: *Securing the Digital Commons: Open-Source Software Cybersecurity*
- July 28, 2022—Space & Aeronautics Subcommittee hearing: *Exploring Cyber Space: Cybersecurity Issues for Civil and Commercial Space Systems*

Voting system design and integrity. A multitude of election system vulnerabilities in the diffuse voting infrastructure in the United States were exposed following the 2016 and 2018 elections. The 2020 election cycle then saw state election officials marshalling an unprecedented shift to mail-in and early voting in order reduce the spread of COVID–19. The Committee continued to conduct oversight on the cyber and physical security standards and best practices for the complete supply chain of voting system technologies to help ensure secure and resilient elections.

Identifying and mitigating influence operations. The use of social media platforms for influence operations against the American public by both domestic and foreign actors has become an area of in-

tense interest. The Committee examined what tools and technologies are being developed by the scientific and technical community to help identify these threats to mitigate their impact. The Investigations & Oversight Subcommittee held a related hearing on September 28, 2021: *The Disinformation Black Box: Researching Social Media Data.*

Unauthorized use of private data. The unauthorized use of private data for commercial or political purposes is a growing concern. The Committee continued to examine such cases wherein public trust is breached, whether the perpetrator be a government or commercial entity and whether the intended use of the data is for financial, political, or other purposes. In an increasingly digital world, the Committee has a responsibility to expose Internet privacy failures and deliberate on potential solutions. A related full Committee Hearing occurred on February 8, 2022: *Data Challenges Impacting Human Trafficking Research and Development of Anti-Trafficking Technological Tools.* This hearing was also held pursuant to Rule XI, clause 2, subsection (n).

DHS Science & Technology Directorate. The Committee continued to reassert its oversight of the Department of Homeland Security's Science & Technology Directorate in the 117th Congress. The Committee persisted with its ongoing examination of the S&T Directorate's programs and activities to ensure they are being managed efficiently and effectively.

Sexual harassment in the sciences. Sexual harassment in academia drives talented scientists out of the field as some perpetrators continue to hold high-status positions and receive federal grant money. The Committee continued its bipartisan oversight of federal science agencies to ensure they have clear policies in place and handle reports of sexual harassment effectively and efficiently. A related full Committee hearing occurred on December 6, 2022: *Building A Safer Antarctic Research Environment.* This hearing was also held pursuant to Rule XI, clause 2, subsection (n).

Academic espionage. The Committee continued to conduct bipartisan oversight into the coordination and collaboration between law enforcement, the intelligence community, and institutions of higher education regarding the protection of sensitive, often government-funded research. The Committee considered strategies to ensure the United States remains a global science leader while respecting the international collaborations that help foster U.S. innovation. A related Joint Subcommittee hearing, led by the Investigations & Oversight Subcommittee, with the Research and Technology Subcommittee, occurred on October 5, 2021: *Balancing Open Science and Security in the U.S. Research Enterprise.* This hearing was also held pursuant to Rule XI, clause 2, subsection (n)

STEM Education. The Committee continued to review Science, Technology, Engineering, and Mathematics (STEM) education related subjects, particularly the need to increase the diversity of individuals who have access to STEM education. The Committee examined the effectiveness of federal programs in improving the recruitment and retention of a diverse pool of individuals pursuing STEM-related degrees and careers. The Committee held two related hearings:

- April 15, 2021—Full Committee hearing: *Reimagining Our Innovation Future*

- February 15, 2022—Research and Technology Subcommittee hearing: *Strengthening the U.S. Microelectronics Workforce*

Arctic Research. The Committee continued to examine the scientific issues related to the warming of the Arctic and the environmental, social, public health, and safety and security implications that represents for the United States and the world, as well as the challenges of Arctic research itself. The Committee held two related hearings:

- September 20, 2022—Full Committee hearing: *Amplifying the Arctic: Strengthening Science to Respond to a Rapidly Changing Arctic*
- December 6, 2022—Full Committee hearing: *Building A Safer Antarctic Research Environment,* which was held pursuant to Rule XI, clause 2, subsection (n)

Office of Science and Technology Policy (OSTP). The Committee continued to ensure that OSTP functioned as effectively as possible to confront national science priorities, including COVID–19, and fulfilled its statutorily mandated responsibilities.

Public Access to Federally Funded Research. The Committee continued to explore how well the model for federally funded research papers was functioning to maximize both academic rigor in science publishing and public access to a taxpayer funded resource.

Facial recognition technology. Facial recognition applications are growing widely around the globe, creating privacy concerns and enabling misidentification of individuals by law enforcement, particularly people of color. The Committee continued to explore the role of the National Institute of Standards and Technology and other federal science agencies in evaluating and validating the performance of facial recognition technologies. A related Investigations & Oversight Subcommittee hearing occurred on June 29, 2022: *Privacy in the Age of Biometrics.* This hearing was held pursuant to Rule XI, clause 2, section (n).

Critical infrastructure and electricity grid security. The Committee continued to conduct oversight over 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. A related full Committee hearing occurred on March 18, 2021: *Lessons Learned from the Texas Blackouts: Research Needs for a Secure and Resilient Grid.*

Clean energy technologies in general. The Committee conducted oversight to ensure that the newly enacted authorizations for DOE energy research, development, demonstration, and commercial application (RDD&CA) programs in the Energy Act of 2020 as part of the FY2021 Consolidated Appropriations Act, P.L. 116–260, were executed faithfully. The Committee examined whether the Department's energy technology offices are supporting the full range of high value RDD&CA activities that the private sector is unable or unwilling to support on its own. The Committee evaluated potentially transformational clean energy technologies that could potentially receive additional federal support. The Committee held eight related hearings:

- March 25, 2021—Energy Subcommittee hearing: *Building Technologies Research for a Sustainable Future*
- May 4, 2021—Energy Subcommittee hearing: *Climate and Energy Science Research at the Department of Energy*
- May 27, 2021—Full Committee hearing: *Overview of the Science and Energy Research Enterprise of the U.S. Department of Energy*
- July 16, 2021—Energy Subcommittee hearing: *Fostering Equity in Energy Innovation*
- November 17, 2021—Energy Subcommittee hearing: *Fostering a New Era of Fusion Energy Research and Technology Development*
- February 17, 2022—Energy Subcommittee hearing: *H2Success: Research and Development to Advance a Clean Hydrogen Future*
- March 16, 2022—Energy Subcommittee hearing: *Time Change: Bioenergy Research and Development for the Fuels and Chemicals of Tomorrow*
- April 21, 2022—Investigations & Oversight Subcommittee hearing: *Pedal to the Metal: Electric Vehicle Batteries and the Critical Minerals Supply Chain*

DOE Laboratory Complex. The management, upkeep, and security of the Department's aging facilities remained a continuing concern of the Committee. Efforts continued to assure that the Department will meet its responsibilities to control risks in and around these facilities. A related Energy Subcommittee hearing occurred on April 27, 2022: *Science and Energy Research Infrastructure Needs of the U.S. Department of Energy.*

Nuclear waste cleanup. Remediation and site management of legacy weapons sites accounts for over $6 billion annually from the Department of Energy. The Committee examined whether the Department is leveraging its science and technology capabilities to their maximum potential in order to achieve site cleanups more quickly and at less cost. The Government Accountability Office (GAO) High Risk List has included "The U.S. Government's Environmental Liabilities" since 2017, "Department of Energy's Contract and Project Management for the National Nuclear Security Administration and Office of Environmental Management" was on the List in 2021 and the Energy Subcommittee held a hearing on July 13, 2022: *Nuclear Waste Cleanup: Research and Development Opportunities for the Department of Energy's Office of Environmental Management,* pursuant to rule XI, clause 2, subsection (p).

Nuclear energy R&D spending. The Committee examined how the Department of Energy's Office of Nuclear Energy informs its decisions for financial assistance to private companies. A related Joint Subcommittee hearing, led by the Investigations & Oversight Subcommittee, with the Energy Subcommittee, occurred on October 21, 2021: *Judicious Spending to Enable Success at the Office of Nuclear Energy* a hearing. This hearing was held pursuant to Rule XI, clause 2, subsection (n).

DOE Loan Programs Office. The Committee continued to provide oversight of the Department of Energy's Loan Programs Office, which the prior Administration sought to terminate, to ensure that the Office is diligently carrying out its statutory mission.

Fusion research. The Committee continued to provide oversight of the Department of Energy's fusion energy research activities to ensure that direction provided in the Department of Energy Research and Innovation Act, P.L. 115–246, and the Energy Act of 2020, a Division of P.L. 116–260, is being faithfully executed, including the establishment of programs to advance inertial fusion for energy applications and to advance other innovative fusion energy concepts. The Committee also continued to oversee the U.S. contribution to the ITER fusion project to ensure that the Department is actually providing the resources that it has projected are required to minimize the project's schedule and total cost. A related Energy Subcommittee hearing occurred on November 17, 2021: *Fostering a New Era of Fusion Energy Research and Technology Development.*

Emerging technologies. The Committee continued to examine emerging technologies such as autonomous vehicles, artificial intelligence, deep fakes, and gene editing. The positive use cases of each of these are well-documented, as are their high-profile failures and misapplications. Where they are commercializing faster than the technical standards, cybersecurity standards and applicable public policies, emerging technologies may threaten the safety, security and privacy of the American people. The Committee examined their potential social, public health, economic, and security consequences. The Committee held three related hearings:

- September 28, 2021—Investigations & Oversight Subcommittee hearing: *The Disinformation Black Box: Researching Social Media Data*
- June 29, 2022—Investigations & Oversight Subcommittee hearing: *Privacy in the Age of Biometrics.* This hearing was held pursuant to Rule IX, clause 2, section (n)
- September 29, 2022—Research and Technology Subcommittee hearing: *Trustworthy AI: Managing the Risks of Artificial Intelligence*

Climate science. The Committee aggressively tracked emerging issues and scientific studies regarding global warming and climate science and elicited thoughtful science-based discussions on potential solutions and remedies to reduce greenhouse gas emissions. This included the role of federally funded research and innovative technology demonstration and development related to cutting-edge mitigation and adaptation strategies. The Committee held ten related hearings:

- March 12, 2021—Full Committee hearing: *The Science Behind Impacts of the Climate Crisis*
- April 21, 2021—Environment Subcommittee hearing: *Working Towards Climate Equity: The Case for a Federal Climate Service*
- May 4, 2021—Energy Subcommittee hearing: *Climate and Energy Science Research at the Department of Energy*
- May 18, 2021—Space and Aeronautics Subcommittee hearing: *NASA's Earth Science and Climate Change Activities: Current Roles and Future Opportunities*
- July 21, 2021—Environment Subcommittee hearing: *Silent Killer: The Rising Problem of Extreme Heat in the U.S.*
- September 23, 2021—Environment Subcommittee hearing: *Advancing Earth System Science and Stewardship at NOAA*

- April 28, 2022—Full Committee hearing: *Now or Never: The Urgent Need for Ambitious Climate Action*
- June 23, 2022—Joint Subcommittee hearing, Research and Technology Subcommittee lead, with Environment Subcommittee: *Assessing Federal Programs for Measuring Greenhouse Gas Sources and Sinks*
- September 20, 2022—Full Committee hearing: *Amplifying the Arctic: Strengthening Science to Respond to a Rapidly Changing Arctic*

On March 8, 2022 the Full Committee held a hearing on *Federal Climate Adaptation and Resilience for the 21st Century*. The Government Accountability Office (GAO) 2021 High Risk List included "Limiting the Federal Government's Fiscal Exposure by Better Managing Climate Change Risks" and this hearing was held pursuant to Rule XI, clause 2, subsection (p) & (n).

Environmental effects of COVID–19. The Committee examined how the vast societal and economic changes forced by COVID–19 have temporarily affected global environmental air quality and considered implications for environmental management strategies going forward.

Extreme weather hazards. The severity of storms, floods, fires, and hurricanes has increased tremendously over the past few years, leaving a path of death and multi-billion dollar destruction in their wake. The Committee examined various issues surrounding these extreme weather events, including the science behind these hazards and how climate change has increased the frequency and severity of these events, improvements to forecasting and warning, and proposed methods to reduce their impact. The Committee held three related hearings:

- June 29, 2021—Full Committee hearing: *The State of Federal Wildland Fire Science: Examining Opportunities for Further Research & Coordination*
- July 21, 2021—Environment Subcommittee hearing: *Silent Killer: The Rising Problem of Extreme Heat in the U.S.*
- November 10, 2021—Research and Technology Subcommittee hearing: *Weathering the Storm: Reauthorizing the National Windstorm Impact Reduction Program*

IRIS Program Oversight. The Committee continued its longstanding oversight of the EPA's Integrated Risk Information System (IRIS). IRIS develops critical toxicological assessments of environmental contaminants, providing the science that underpins regulations of toxic chemicals. Since a 2011 National Academies of Sciences (NAS) report on process issues at IRIS, the program has come a long way, and has received praise from NAS and EPA's Science Advisory Board (SAB) on its progress. The Committee's concerns that limited resources and political interference continue to restrict the IRIS program's productivity, resulting in delays to critical assessments, prompted continued oversight.

EPA chemicals. The Committee continued its oversight work to ensure that the public is being protected from the release of toxic chemicals, that EPA is using the best available science in its chemical policy decisions, and that the agency is not unduly influenced by the industries it is legally mandated to regulate.

Deregulatory actions at EPA. The Trump administration made rollbacks of environmental protection a hallmark of its policy agen-

da. The Committee continued to examine incidents where principles of scientific and analytical integrity were not met in the effort to promulgate these policy measures and evaluate strategies for ensuring EPA adheres to its mission of protecting human health and the environment in the future.

Methane leak detection. Methane is a powerful greenhouse gas. Methane emissions in the U.S. are systemically underestimated by the EPA, largely due to poorly quantified leaks in the oil and natural gas sector. The Committee reviewed the effectiveness of current leak detection technologies and the need for additional data, research, and development. A related Full Committee hearing occurred on June 8, 2022: *Detecting and Quantifying Methane Emissions from the Oil and Gas Sector*.

Earth observations satellite oversight. The Committee continued to review the federal government's development, management, and operation of its earth observations satellites at both the National Oceanic and Atmospheric Administration (NOAA) and the National Aeronautics and Space Administration (NASA). These satellites provide critical data that feed into weather forecasting and climate models. The current and future planning of the satellite architecture is crucial to ensuring continuity of data collection. The Committee held three related hearings:

- May 18, 2021—Space and Aeronautics Subcommittee hearing: *NASA's Earth Science and Climate Change Activities: Current Roles and Future Opportunities*
- July 20, 2021—Full Committee hearing: Spectrum Needs for Observations in Earth and Space Sciences. This
- September 23, 2021—Environment Subcommittee hearing: *Advancing Earth System Science and Stewardship at NOAA*
- September 21, 2022—Joint Subcommittee hearing, Space and Aeronautics Subcommittee lead, with Environment Subcommittee: *Looking Back to Predict the Future: The Next Generation of Weather Satellites*

National Weather Service workforce issues. The Committee has been concerned with workforce issues at NOAA and the National Weather Service (NWS), which the GAO is currently investigating. The Committee continued to monitor these issues and work with the GAO to ensure workforce issues are handled effectively and efficiently in a manner that does not jeopardize the ability of NWS or NOAA to perform their crucial life-saving missions. A related Full Committee hearing occurred on October 14, 2021: *The Future of Forecasting: Building a Weather-Ready Nation on All Fronts*, which was held pursuant to Rule XI, clause 2, sub. Another related Subcommittee on investigations and Oversight hearing was held pursuant to Rule XI, clause 2, subsection (n), it was on March 17, 2021 and it was titled *Brain Drain: Rebuilding the Federal Scientific Workforce*.

Access to the International Space Station (ISS). The Committee continued to examine NASA's oversight of contracted commercial crewed flights and the certification of commercial crew providers to ensure U.S. access to the ISS will continue safely and without a gap, as well as NASA's contingency plan should commercial crew certification or operational flights experience delays. A related Space and Aeronautics Subcommittee hearing occurred on Sep-

tember 21, 2021: *NASA's Future in Low Earth Orbit: Considerations for International Space Station Extension and Transition*.

ISS research priorities. The International Space Station, and its crew and facilities, are precious and limited resources. The Committee conducted oversight of the use of the ISS, the prioritization of ISS resources to meet and enable key objectives, and plans for meeting such objectives once the ISS reaches the end of its operational life. A related Space and Aeronautics Subcommittee hearing occurred on September 21, 2021: NASA's Future in Low Earth Orbit: Considerations for International Space Station Extension and Transition.

Oversight of NASA's flagship science missions. The Committee continued to oversee the management of major flagship science mission development projects, including the James Webb Space Telescope, the Wide-field Infrared Survey Telescope, and the Europa Clipper spacecraft. The Committee held three related hearings:

- April 29, 2021—Space and Aeronautics Subcommittee hearing: *What Do Scientists Hope to Learn with NASA's Mars Perseverance Rover?*
- December 1, 2021—Joint Subcommittee on Space and Aeronautics and Subcommittee on Research and Technology Hearing: *A Review of the Decadal Survey for Astronomy and Astrophysics in the 2020s*, which was held pursuant to Rule XI, clause 2, subsection (n)
- March 1, 2022—Pursuant to Rule XI, clause 2, subsection (n)(2) the Space and Aeronautics Subcommittee held the hearing: *Keeping Our Sights on Mars Part 3: A Status Update and Review of NASA's Artemis Initiative*
- November 16, 2022—Space and Aeronautics Subcommittee hearing: *Unfolding the Universe: Initial Science Results from the James Webb Space Telescope*

On March 1, 2022 Pursuant to

NASA Earth Science programs. NASA's Earth science programs offer valuable insights into Earth systems, climate change, severe weather, land change, and more. The Committee conducted oversight of NASA's Earth science program, its progress in implementing the priorities of the 2018 National Academies' Earth science decadal survey, and its contributions to climate change research. The Committee held two related hearings:

- May 18, 2021—Space and Aeronautics Subcommittee hearing: *NASA's Earth Science and Climate Change Activities: Current Roles and Future Opportunities*
- September 21, 2022—Joint Subcommittee hearing, Space and Aeronautics Subcommittee lead, with Environment Subcommittee: *Looking Back to Predict the Future: The Next Generation of Weather Satellites*

Orbital Debris. Hundreds of thousands of debris objects orbit the Earth. Travelling at very high velocities, debris of any size can pose significant risk to active space systems and human spaceflight operations. Mega constellation deployments comprising thousands of small satellites increase potential collision risk. The Committee conducted oversight of NASA's activities in orbital debris monitoring, mitigation, and modeling, as well as its efforts to coordinate

with other Federal agencies and internationally on orbital debris mitigation standards and guidelines.

Human spaceflight schedule pressure. The Space Shuttle Challenger accident in 1986 made clear that launch pressure can lead to catastrophic consequences. In all expeditions, but particularly human space flight, oversight must be conducted to ensure that schedule pressures do not influence decisions that have implications for the overall safety of human spaceflight systems and operations. The Committee continued to assess all matters pertaining to launch pressure and human space flight.

Lunar Campaign. The Trump Administration prioritized a return to lunar expeditions at NASA. Lunar missions could ostensibly contribute to the mission of getting humans to Mars. However, without clear objectives as part of a human exploration roadmap, significant investments in a lunar campaign could delay the United States' efforts to send humans to the surface of Mars by the 2030s. The Committee examined the status of lunar activities, NASA's management of development projects, and how they would contribute toward the goal of a manned mission to Mars. A related Space and Aeronautics Subcommittee hearing occurred on March 1, 2022: *Keeping Our Sights on Mars Part 3: A Status Update and Review of NASA's Artemis Initiative*.

Civil Aeronautics Research and Development. The Committee evaluated research and development activities at the Federal Aviation Administration (FAA) and NASA's aeronautics research into topics including the next generation air transportation system (NextGen), the integration of unmanned aviation systems into the national airspace system, safety of civil aviation and aeronautics, and efforts to mitigate the environmental impacts of civil aviation. The Committee held three related hearings:

- March 24, 2021—Space and Aeronautics Subcommittee hearing: *Examining R&D Pathways to Sustainable Aviation*
- May 12, 2022—Space and Aeronautics Subcommittee hearing: *Space Situational Awareness: Guiding the Transition to a Civil Capability*
- July 28, 2022—Space and Aeronautics Subcommittee hearing: *Exploring Cyber Space: Cybersecurity Issues for Civil and Commercial Space Systems*

FAA Commercial Space Transportation. FAA's Office of Commercial Space Transportation licenses commercial launch and reentry vehicles and commercial spaceports. The Committee conducted oversight on the FAA's AST, its licensing activities, and the implementation of the FAA's updated launch and reentry licensing regulations. In addition, the Committee examined the growing commercial launch industry, including the emerging commercial human space flight industry, and the challenges facing it. The Committee held two related hearings:

- May 12, 2022— Space and Aeronautics Subcommittee hearing: *Space Situational Awareness: Guiding the Transition to a Civil Capability*
- July 28, 2022—Space and Aeronautics Subcommittee hearing: *Exploring Cyber Space: Cybersecurity Issues for Civil and Commercial Space Systems*

CONSULTATION WITH OTHER COMMITTEES

The Committee coordinated on the following oversight priorities with other House Committees as appropriate:

- With Administration on election security technologies
- With Agriculture on integrity in cost-benefit analysis, biofuels, and climate change
- With Energy & Commerce on environmental policy, including climate change, emerging trends in technology that may affect American consumers, and public health research priorities
- With Homeland Security on facial recognition technology, advanced technology strategies for national security, including cybersecurity, and for addressing chemical, biological, radiological and nuclear threats
- With Natural Resources on climate change science, advanced energy technologies, and geological sciences
- With Oversight and Reform on ensuring the effectiveness and independence of Inspectors General at federal science agencies, on scientific integrity in the federal response to COVID–19, cybersecurity in federal agencies, the federal science workforce, and other general oversight priorities
- With Transportation & Infrastructure on advanced infrastructure materials and technologies, strategies for reducing aircraft emissions and climate resiliency of transportation infrastructure
- With the Select Committee on the Climate Crisis on climate science priorities

4.5. Committee on Science, Space, and Technology History of Appointments, 117th Congress

January 4, 2021

Ms. Eddie Bernice Johnson (TX) named Chair (H. Res. 9)
Mr. Lucas (OK) named Ranking Minority Member (H. Res. 10)

January 28, 2021

Ms. Lofgren (CA), Ms. Bonamici (OR), Mr. Bera (CA), Ms. Stevens (MI), Ms. Sherrill (NJ), Mr. Bowman (NY), Mr. Sherman (CA), Mr. Perlmutter (CO), Mr. McNerney (CA), Mr. Tonko (NY), Mr. Foster (IL), Mr. Norcross (NJ), Mr. Beyer (VA), Mr. Crist (FL), Mr. Casten (IL), Mr. Lamb (PA), and Ms. Ross (NC) appointed.(H. Res. 62)

Mr. Brooks (AL), Mr. Posey (FL), Mr. Weber (TX), Mr. Babin (TX), Mr. Gonzalez (OH), Mr. Waltz (FL), Mr. Baird (IN), Mr. Sessions (TX), Mr. Webster (FL), Mr. Garcia (CA), Mrs. Bice (OK), Mrs. Kim (CA), Mr. Feenstra (IA), Mr. LaTurner (KS), Mr. Gimenez (FL), Mr. Obernolte (CA),and Mr. Meijer (MI) appointed (H. Res 63)

February 11, 2021

Ms. Moore (WS), Mr. Kildee (MI), Ms. Wild (PA), and Ms. Fletcher (TX) appointed (H. Res. 111)

February 12, 2021

Democrat Members assigned to Subcommittees; Mr. Bowman named Subcommittee on Energy Chair; Ms. Bonamici named Sub-

committee on Environment Chair; Mr. Foster named Subcommittee on Investigations and Oversight Chair; Ms. Stevens named Subcommittee on Research and Technology Chair; Mr. Beyer named Subcommittee on Space and Aeronautics. Ami Bera named Vice Chair of the Committee on Science, Space, and Technology.

February 25, 2021

Republican Members assigned to Subcommittees; Mr. Weber named Subcommittee on Energy Ranking Member; Ms. Bice named Subcommittee on Environment Ranking Member; Mr. Obernolte named Subcommittee on Investigations and Oversight Ranking Member; Mr. Waltz named Subcommittee on Research and Technology Ranking Member; Mr. Babin named Subcommittee on Space and Aeronautics Ranking Member.

March 3, 2021

Ms. Stevens named Vice Chair.

June 15, 2021

Ms. Stansbury appointed (H. Res. 475) (to rank immediately after Mr. Bowman).

June 28, 2021

Mr. Sessions resigned as a member of the Committee on Science, Space, and Technology.

August 24, 2021

Mr. Ellzey (TX) appointed (H. Res. 602).

December 1, 2021

Mr. Carey (OH) appointed (H. Res. 826).

February 10, 2022

Mr. Waltz stepped down as Ranking Member of the Subcommittee on Research and Technology and was replaced by Mr. Feenstra.

August 31, 2022

Mr. Crist resigned as a member of the Committee on Science, Space, and Technology as well as from his office as the Representative for Florida's 13th Congressional District.

4.6.

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Rules of the Committee on Science, Space, and Technology U.S. House of Representatives For the One Hundred Seventeenth 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 Wednesday 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, when the Chair considers it 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. A curriculum vitae;

b. A disclosure of any Federal grants or contracts, or contracts, grants, or payments originating with a foreign government, received during the past 36 months by the witness or by an entity represented by the witness and related to the subject matter of the hearing; and,

c. A disclosure of whether the witness is a fiduciary (including, but not limited to, a director, officer, advisor, or resident agent) of any organization or entity that has an interest in the subject matter of the hearing.

Such statements, with appropriate redactions to protect the privacy or security of the witness, shall be made pub-

licly available in electronic form 24 hours before the witness appears to the extent practicable, but 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:

a. Designate a 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

b. 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; Department of Energy international research, development, and demonstration projects; energy supply activities; nuclear, solar, and renewable energy, and other advanced energy technologies; uranium supply and enrichment, and Department of Energy waste management; Department of Energy environmental management research, development, and demonstration; 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 environmental 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 Administration 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 117th 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 3 of House Resolution 8, 117th 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 117th 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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