THE NATIONAL SCIENCE FOUNDATION FOR THE FUTURE ACT

SEC. 1. Short Title

SEC. 2. Findings

SEC. 3. Definitions

SEC. 4. Authorization of Appropriation

SEC. 5. STEM Education and Workforce Training

(a) PreK-12 STEM Education - Supports a decadal survey to be carried out by the National Academies to identify research priorities in PreK-12 STEM education and an additional study on barriers to the widespread implementation of STEM education innovations. Establishes a program to fund multidisciplinary research and translation centers to scale STEM education innovations.

(b) Undergraduate STEM Education - Supports research and development to improve the alignment of undergraduate STEM education and training with workforce needs. Updates the Advanced Technological Education program to establish a network of centers for science and technical education.

(c) Advanced Technological Manufacturing Act – Amends and doubles the authorized budget for the Advanced Technological Education program.

(d) Graduate STEM Education - Expands requirement for funding proposals to include a mentoring plan to graduate students. Supports activities to facilitate career exploration for graduate students and postdoctoral researchers. Creates a requirement for funding proposals to include individual development plans for graduate students and postdoctoral researchers and provides supplemental funding to facilitate professional development activities. Supports research on the graduate education system. Updates the Graduate Research Fellowship Program to address workforce demand, increase the cost of education allowance, and recruit a more diverse pool of applicants. Requires an evaluation of mechanisms for supporting graduate student education and training.

(e) STEM Workforce Data - Requires a portfolio analysis of Foundation investments in the skilled technical workforce. Requires an assessment of the feasibility and benefits of adding rotating questions/topic modules to existing National Center for Science and Engineering Statistics (NCSES) surveys. Requires an assessment of the feasibility and benefits of incorporating new questions to existing (NCSES) surveys on a range of topics related to the nature of the STEM workforce and the workforce environment. Requires a Government Accountability Office evaluation of the capacity of NCSES to meet current and future needs for data on the STEM workforce.

(f) Cyber Workforce Development Research and Development - Supports research on the cyber workforce.

(g) Federal Cyber Scholarship-for-Service Program – Clarifies that cybersecurity-related aspects of artificial intelligence, quantum computing, aerospace, and other fields are within the scope of the NSF CyberCorps Scholarship-for-Service program.

(h) Cybersecurity Workforce Data Initiative – Establishes a data initiative to measure the cybersecurity workforce.

SEC. 6. Broadening Participation

(a) Presidential Awards for Excellence in Mathematics and Science Teaching - Updates the program to allow for the selection of at least one teacher each from the Commonwealth of the Northern Mariana Islands, American Samoa, the Virgin Islands of the United States, and Guam.

(b) Robert Noyce Teacher Scholarship Program Update - Requires outreach to historically Black colleges and universities, minority institutions, higher education programs that serve veterans and rural communities, and emerging research institutions.

(c) NSF INCLUDES Initiative - Codifies the NSF INCLUDES program.

(d) Broadening Participation on Major Facilities Awards - Establishes a requirement for organizations seeking management awards to demonstrate experience and capabilities in employing best practices in broadening participation and directs the Foundation to consider implementation of such practices in oversight of the award.

(e) Partnerships with Emerging Research Institutions - Establishes a pilot program to require multi-institution proposals seeking funding in excess of $1 million be submitted in partnership with emerging research institutions and requires annual reporting on such grants to include feedback directly from participating emerging research institutions.

(f) Tribal Colleges and Universities Program Update - Expands the scope of the Tribal Colleges and Universities program to include support for activities to build graduate programs.

(g) Diversity in Tech Research - Supports organizational research, including research on diversity, equity, and inclusion in the technology sector.

(h) Continuing Support for EPSCoR – Expresses the sense of Congress that the Foundation should continue to support research and education capacity building through the EPSCoR program.

(i) Fostering STEM Research Diversity and Capacity Program – Supports research capacity building for research institutions not in the top 100 of Federal research funding, including support for developing and expanding research programs, faculty professional development, stipends for students, acquisition of research instrumentation, and administrative research support.

(j) Capacity Building Program for Developing Universities – Supports administrative capacity building activities to increase the capacity of minority serving institutions to compete for and manage Foundation research and development awards.

(k) Chief Diversity Officer of the NSF – Establishes a Chief Diversity Officer position charged with providing guidance and leading the Foundation's strategic planning to broaden participation of individuals and institutions in NSF-funded activities.

SEC. 7. Fundamental Research

(a) Definitions.

(b) Broader Impacts - Directs an assessment of the application of the Broader Impacts review criterion across the Foundation and provides support for activities to improve its implementation.

(c) Sense of Congress - Expresses the sense of Congress that the Foundation should continue to identify opportunities to reduce administrative burden on researchers.

(d) Research Integrity and Security - Directs the Foundation to take steps to address security risks to Foundation-supported research, including through the Office of Research Security and Policy, the appointment of a Chief of Research Security, the development of an online resources to inform institutions and researchers of security risks, support for the establishment of a risk assessment center, and support for research on misconduct in the research environment. Authorizes NSF to request proposal supporting documentation, including talent recruitment program contracts and directs NSF to require and support the development of research security training. Supports an update to the National Academies Guide to Responsible Conduct in Research. Establishes a prohibition on participation by NSF-funded researchers in malign foreign talent recruitment programs sponsored by foreign countries of concern.

(e) Research Ethics - Expresses the sense of Congress with respect to potential ethical, social, safety, and security implications of research in emerging technologies. Establishes a requirement for the inclusion of an ethics statement in award proposals. Supports research on the ethical and social implications of Foundation-supported research and the development of approaches for risk mitigation.

(f) Research Reproducibility and Replicability - Establishes a requirement for the inclusion of a machine-readable data management plan in award proposals. Requires the development of a set of criteria for trusted open repositories and provides support for the development of open data repositories to address any gaps. Requires the establishment of a single web-based point of access for data, software, and code resulting from Foundation funded projects. Directs the Foundation to ensure that data resulting from Foundation-funded projects is made available in trusted open repositories. Supports research and development of tools and infrastructure to support research reproducibility.

(g) Climate Change Research - Supports research to improve understanding and predictability of the climate system and climate-change risk, resilience, and mitigation and to educate and train climate researchers.

(h) Violence Research - Supports research related to violence.

(i) Social, Behavioral, and Economic Sciences - Directs the Foundation to take steps to ensure the participation of social, behavioral, and economic science researchers in cross-cutting agency programs.

(j) Measuring Impacts of Federally Funded R&D - Supports research related to the impacts of Federally funded research and development on society, the economy, and the workforce.

(k) Food-Energy-Water Research - Supports research related to the food-energy-water system.

(l) Biological Field Stations and Marine Laboratories – Supports research instrumentation and other infrastructure at biological field stations and marine laboratories.

(m) Sustainable Chemistry Research and Education - Establishes a program to support research related to sustainable chemistry.

(n) Risk and Resilience Research - Supports research related to risk assessment and predictability and development of tools and technologies for increased resilience.

(o) UAV Technologies – Supports research and development related to unmanned aerial vehicle technologies.

(p) Leverage International Expertise in Research - Directs NSF to explore opportunities to support international research collaboration.

(q) Biological Research Collections - Supports databases and tools to secure and improve biological research collections. Establishes a requirement for the inclusion of a specimen management plan in award proposals. Supports the establishment of a center to facilitate coordination and data sharing.

(r) Clean Water Research and Technology Acceleration - Supports water system research and technology development.

(s) Technology and Behavioral Science Research - Supports social and behavioral science research on consumer technology and mental health.

(t) Manufacturing Research Amendment - Updates the list of technology areas eligible for funding through the NSF's advanced manufacturing research program to include additive and continuous manufacturing.

(u) Critical Minerals Mining Research and Development – Supports research to advance critical minerals mining strategies and technologies.

(v) Study of AI Research Capacity – Directs the Foundation to conduct or support a study on artificial intelligence research capacity at U.S. universities.

(w) Advancing IoT for Precision Agriculture – Supports research to improve the use of advanced sensing systems in rural and agricultural areas, highlights improving productivity in agriculture as a goal for activities funded under the Advanced Technological Education program, and supports a Government Accountability Office technology assessment of precision agriculture technologies.

(x) Astronomy and Satellite Constellations – Supports research on the impact of satellite constellations on ground-based astronomy and the development of mitigation strategies.

SEC. 8. Research Infrastructure

(a) Facility Operations and Maintenance - Requires the continuation of the Facility Operation Transition pilot program in the Facilities Construction (MREFC) account to provide cost sharing with the managing directorate during the first five years of operation.

(b) Reviews - Directs periodic assessment of the cost and benefits of extending the operation of research facilities beyond their planned operational lifespan.

(c) Helium Conservation - Expands eligibility for the Major Research Instrumentation program to include the purchase, installation, operation, and maintenance of equipment and instrumentation to conserve helium.

(d) Advanced Computing - Directs the Foundation to collect information and regularly publish a report on the computational needs for Foundation-funded projects. Directs the Foundation to develop and regularly update an advanced computing roadmap.

(e) National Secure Data Service – Establishes a National Secure Data Service demonstration project.

SEC. 9. Directorate for Science and Engineering Solutions

(a) Establishment - Establishes a new directorate to accelerate use-inspired and translational research and development to advance solutions to pressing societal challenges.

(b) Purposes – Describes the purposes of the directorate.

(c) Activities - Describes activities to be supported by the directorate, including support for use-inspired research and translation, the development of innovative approaches to connect research with societal outcomes, the development of partnerships and collaborations that include traditional and nontraditional players, support for translational research infrastructure and capacity building, and support for education and training of students.

(d) Assistant Director - Establishes an Assistant Director position to head the directorate.

(e) Advisory Committee - Establishes an advisory committee to assess the activities carried out by the directorate and propose new strategies for fulfilling the purpose of the directorate.

(f) Existing Programs - Authorizes the Foundation to place existing programs under the management of the directorate.

(g) Focus Areas - Directs the Foundation to identify focus areas to guide directorate activities and to consider focus areas that contribute to a list of societal challenge –climate change and environmental sustainability, global competitiveness, cybersecurity, national security, STEM education and workforce, and social and economic inequality.

(h) Technology Research Institutes – Supports Technology Research Institutes to advance transdisciplinary research, development, and commercialization in key technology areas, including through support for multi-user testbeds and instrumentation, accessible repositories for research data and computational models, workshops, and graduate student traineeships.

(i) Planning and Capacity Building Grants – Supports technology transfer capacity building for smaller research institutions, including support for technology transfer expert staff, private sector partnerships, and education and training of students and researchers.

(j) Entrepreneurial Fellowships – Establishes a fellowship program to provide scientists with entrepreneurial training.

(k) Low-Income Scholarship Program – Authorizes appropriations for the Scholarships in STEM program.

(l) Transfer of Funds - Authorizes the transfer of funds to other Foundation offices, directorates, or divisions and prohibits the reverse transfer of funds.

(m) Authorities - Provides flexible funding and hiring authorities.

(n) Ethical, Legal, and Societal Considerations - Directs the Foundation to take steps to ensure that ethical, legal, and societal considerations are integrated into the activities of the directorate.

(o) Reports and Roadmaps - Directs the Foundation to provide an annual report describing the activities of the directorate and a roadmap describing the strategic vision that will guide future investment decisions.

(p) Evaluation - Directs an evaluation of the success of the directorate in achieving its purpose to advance solutions to pressing societal challenges through use-inspired and translational research.

SEC. 10. Administrative Amendments

(a) Supporting Veterans in STEM Careers - Provides a technical fix.

(b) Sunshine Act Compliance - Relaxes the requirement for an annual review and report related to Sunshine Act Compliance of the National Science Board and authorizes a risk-based approach to scheduling compliance reviews.

(c) Science and Engineering Indicators Report Submission - Changes the deadline for a biennial report on science and engineering indicators from January 15 to March 15.