NOTICE OF FUNDING OPPORTUNITY (NOFO)
Professional Research Experience Program (PREP)

<u>EXECUTIVE SUMMARY</u>

- **Federal Agency Name:** National Institute of Standards and Technology (NIST), United States Department of Commerce (DoC)

- **Funding Opportunity Title:** Professional Research Experience Program (PREP)

- **Announcement Type:** Amendment

- **Funding Opportunity Number**: 2022-NIST-PREP-01

- **Assistance Listing (CFDA Number):** <u>11.620: Science, Technology, Business and/or Education Outreach</u>

- **Dates:** Full Applications must be received at <u>Grants.gov</u> no later than 11:59 p.m. Eastern Time, September 30, 2022. Applications received after this deadline will not be reviewed or considered. Please note that the due date has been extended from the original posting.

  Applicants should be aware, and factor in their application submission planning, that the Grants.gov system closes periodically for routine maintenance. Applicants should visit <u>Grants.gov</u> for information on any scheduled closures.

  NIST expects to complete its review, selection of successful applicants, and award processing by November 2022. NIST expects the earliest start date for awards under this NOFO to be December 2022.

- **Application Submission Address:** Applications must be submitted using Grants.gov. Paper applications will not be accepted.

- **Funding Opportunity Description:** The NIST PREP is seeking applications from eligible institutions of higher education in the U.S. and its territories that offer two- or four- year degrees in academic science, technology, engineering, and mathematics (STEM) disciplines to establish and manage a program to support collaborative research relationships in the NIST labs. Eligible applicants may apply to establish and manage a program at the relevant NIST campuses in Boulder, Colorado (CO) (PREP Boulder), Gaithersburg, Maryland (MD) (PREP Gaithersburg), and/or Charleston, South Carolina (SC) (PREP Gaithersburg).

- **Anticipated Amounts:** In FY22, NIST anticipates funding up to nine (9) awards for approximately $200 million in total with a project performance period of up to five years. New awards are expected to range from approximately $250,000 to $20,000,000 annually at PREP Boulder and from $500,000 to $24,000,000 annually at PREP Gaithersburg, with project performance periods of up to five (5) years, consistent with the multi-year funding policy described in Section II.2. of this NOFO. NIST may fund up to approximately $200 million for PREP awards operating across the NIST campuses in Boulder, CO, Gaithersburg, MD and Charleston, SC over five years. The specific number of awards will be determined during the selection process, based on the nature and quality of the proposals NIST receives and funding availability.

- **Funding Instrument:** COOPERATIVE AGREEMENT

- **Eligibility:** Eligible applicants include accredited institutions of higher education that offer two- or four-year degrees in the U.S. and its territories in academic disciplines relevant to the technical programs of the NIST laboratories and major programs. For the purposes of this NOFO, these disciplines include (but may not be limited to) artificial intelligence, biochemistry, biological sciences, chemistry, computer science, engineering, electronics, information technology, materials science, mathematics, nanoscale science, neutron science, physical sciences, physics, social sciences, scientific/technical writing, science and technology policy, and statistics. Although Federal entities are not eligible to receive funding under this NOFO, they may participate as unfunded collaborators.

- **Cost Sharing Requirements:** Non-federal cost sharing IS NOT required for awards issued pursuant to this NOFO.

- **Public Website, Frequently Asked Questions (FAQs):** NIST has a public website that provides a "Frequently Asked Questions" page and other information pertaining to this Funding Opportunity.

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FULL ANNOUNCEMENT TEXT

I. Program Description

The statutory authority for the NIST PREP Program is 15 U.S.C. § 278g-1(e)(1) and (e)(3) and 15 U.S.C. § 272(b) and (c).

The National Institute of Standards and Technology (NIST or the Institute), a non-regulatory Federal agency within the U.S. Department of Commerce, is one of the nation's premiere research institutions for the physical and measurement sciences, standards, technology, and engineering. NIST provides a strong interface between government, industry and academia. NIST embodies a science culture, developed from a large and well-equipped research staff that enthusiastically blends programs that address the immediate needs of industry and the nation with longer-term research that anticipates future needs.

NIST's mission in STEM education is to develop a diverse, world-class pool of scientists and engineers to support measurement science and standards research and develop a general population that understands and appreciates measurement science and standards.

Created in 1991, the Professional Research Experience Program (PREP) is designed to support the agency's mission in science, technology, engineering, and math (STEM) education and provide valuable laboratory experience and financial assistance to undergraduates, graduate students, postdocs, masters and bachelor's degree holders, and faculty. The program is intended to:

- Establish a five (5) year cooperative agreement to develop a collaborative relationship between NIST and U.S. institutions of higher education to host eligible PREP researchers to work at NIST.
- Develop and train a diverse, world-class pool of scientists and engineers to support NIST's mission in measurement science and standards research.
- Increase the recruitment, retention, and graduation rates of undergraduate and graduate students pursuing STEM degrees.
- Recruit and retain historically marginalized groups (women, minorities, and persons with disabilities) in STEM.
- Assure continued growth and progress of a highly skilled STEM workforce in the United States.

PREP collaborative relationships will include research opportunities at the relevant NIST campuses in Boulder, Colorado (CO) (PREP Boulder), Gaithersburg, Maryland (PREP Gaithersburg), and/or Charleston, South Carolina (SC) (PREP Gaithersburg). Eligible applicants may apply to establish and manage a PREP Boulder program or a PREP Gaithersburg program or may apply to establish and manage programs for both. NIST

encourages eligible institutions that primarily enroll historically marginalized groups in STEM, including those who self-identify as a woman, African American, Black, Hispanic, Latinx, American Indian, Alaska Native, Native Hawaiian, Pacific Islander, person with a disability, and/or LGBTQI+, to apply to establish and manage a PREP Boulder program, a PREP Gaithersburg program, or both.

1. NIST Administrative Roles

The management of the NIST PREP Program relies on a NIST PREP Program Manager, a NIST PREP Program Director for Boulder, and a NIST PREP Program Director for Gaithersburg.

The **NIST PREP Program Manager** is responsible for ensuring consistency with the application processes and the administration of the program across the Institute following award. In addition, the NIST PREP Program Manager coordinates with NIST PREP Program Directors in Boulder and Gaithersburg to resolve issues that arise throughout the period of the cooperative agreement.

The **NIST PREP Program Director for Gaithersburg** is a NIST employee stationed in Gaithersburg, MD responsible for day-to-day administration and execution of PREP Gaithersburg, including the application process and selections for PREP Gaithersburg researchers, and acts as a single point of contact for coordination with the PREP Gaithersburg Recipient University PREP Program Coordinators.

The **NIST PREP Program Director for Boulder** is a NIST employee stationed in Boulder, CO responsible for day-to-day administration and execution of PREP Boulder, including the application process and selections for PREP Boulder researchers, and acts as a single point of contact for coordination with the PREP Boulder Recipient University PREP Program Coordinators.

2. NIST Expectations of the Recipient

The recipient institution (PREP recipient) will establish and manage a program to support collaborative research relationships between NIST staff and the following categories of researchers, herein referred to collectively as PREP researchers[1]:

- Undergraduate students: Students enrolled full-time in a two-year or four-year degree program at an accredited U.S. academic institution seeking an associate's degree or bachelor's degree. Undergraduate students are eligible to collaborate with NIST as PREP researchers for five (5) years in this category. PREP researchers in the undergraduate student category may request one (1) additional year of eligibility under extenuating circumstances. The extension is

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[1] A PREP researcher is described as an Associate working at NIST, who is not a Federal Employee, is technically qualified, collaborates with NIST on research projects of mutual interest, is not exclusively performing NIST mission-related work, and is employed by a U.S. university/college that has a federal funding agreement with NIST.

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subject to approval by NIST and the recipient and must show compelling evidence for requesting the eligibility.

- Graduate students: Students enrolled full-time at an accredited U.S. academic institution seeking a master's degree or doctoral degree. PREP researchers in the graduate student category are eligible for three (3) years as master's degree seeking students and six (6) years as doctoral degree students. PREP researchers in the graduate student categories may request one (1) additional year of eligibility under extenuating circumstances. The extension is subject to approval by NIST and the recipient and must show compelling evidence for requesting the eligibility.

- Individuals with bachelor's or master's degrees: An individual holding a bachelor's degree and/or master's degree from an accredited U.S. academic institution who is engaged in temporary mentored research and/or scholarly training to acquire the skills necessary to pursue a career path of their choice. Additionally, these individuals are not allowed to enroll in a degree seeking program at any university/college in the United States or abroad during their time participating in this category. Bachelor's degree holders or master's degree holders are eligible to collaborate as PREP researchers for three (3) and five (5) years, respectively.

- Post-doctoral fellows: An individual holding a doctoral degree for five (5) years or less who is engaged in temporary mentored research and/or scholarly training to acquire the skills necessary to pursue a career path of their choice. Post-doctoral fellows are eligible to collaborate as PREP researchers for five (5) years in this category.

- Senior research fellows: An individual holding a doctoral degree for more than five (5) years. PREP researchers participating as senior research fellows are eligible to collaborate with NIST on research projects for five (5) years in this category.

- Academic affiliates:[2] Individuals holding appointments at academic institutions. These appointments include, but are not limited to, the following designations: faculty, research faculty, adjunct faculty, research associates, instructors, and lecturers. There is not a term limitation for this category.

  Note that PREP cooperative agreements are awarded for a maximum of five (5) years. Though certain PREP researcher categories may have an eligibility of five (5) years or beyond, individual PREP researcher appointments cannot exceed

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[2] Academic affiliate designation refers to individuals holding appointments at academic institutions. These appointments include, but are not limited to, the following designations: faculty, research faculty, adjunct faculty, research associates, instructors, and lecturers.

the period of performance of the governing cooperative agreement. If a subsequent cooperative agreement is established with a given PREP recipient, the PREP recipient may request to extend a PREP researcher's appointment, up to the maximum eligibility for a given category.

PREP researchers are employed by their academic institutions and may, if appropriate, matriculate to another PREP researcher category during their time participating in the program. As a result, PREP recipients are required to create Individual Development Plans for all PREP researchers to define their career goals and promote growth as PREP researchers. Furthermore, PREP recipients must develop a mechanism to provide career progression for PREP researchers who participate in the program for more than 12 months or matriculate to another PREP category (for example, advancing from a graduate student appointment to a postdoc appointment).

A recipient is expected to meet the objectives of the PREP Program, which are to:
- encourage the growth and progress of science and engineering in the United States by providing research opportunities for PREP researchers with NIST scientists and engineers and exposing them to cutting-edge research and development (R&D),
- increase the recruitment, retention, and graduation rates of all undergraduate and graduate students pursuing STEM degrees,
- promote diversity and equity in STEM, and
- provide professional development for PREP researchers.

In addition to the meeting the program objectives, each recipient will be required to have a **University PREP Program Coordinator** and **University PREP Program Manager**. This section will describe the duties of these roles and their engagement with the NIST administrative roles.

The **University PREP Program Coordinator** will work closely with the NIST PREP Program Director for Gaithersburg or Boulder as applicable, to recruit and select PREP researchers for research opportunities at a NIST campus. A recipient's PREP Program Coordinator should be a permanent employee within the recipient's organization and will be responsible for establishing and managing the PREP program within their organization; the duties should include but not be limited to:

(a) create an outreach plan that describes how the recipient will conduct outreach and advertise PREP opportunities within their organizations, to the scientific and academic communities, and the general public;
(b) formulate a diversity and inclusion plan to recruit, select, and retain historically marginalized groups in STEM (women, African Americans, Blacks, Hispanic, Latinx, American Indians, Alaska Natives, Native Hawaiians, Pacific Islanders, persons with disabilities and/or LGBTQI+) to the program;
(c) establish a PREP website, which includes job postings, appropriate program and contact information;

(d) develop a communication plan to communicate with the NIST PREP Program Director for Boulder or Gaithersburg, as applicable, to identify and secure opportunities for PREP researchers at a NIST campus and communicate with PREP researchers during their tenure in the program;

(e) host orientation to inform PREP researchers of fellowship expectations, key program points of contact, and available resources;

(f) facilitate mentorship and professional and career development plans for each category of PREP researcher;

(g) serve as a single point of contact for Recipient staff, PREP Program applicants and researchers, and the NIST PREP Program Director for Boulder or Gaithersburg, as applicable;

(h) resolve any difficulties (i.e. administrative, visa processing, benefits, pay, leave, etc.) that may arise for PREP researchers when they are applying to the program and once they are engaged in the program and working on a NIST campus; and

(i) conduct entry and exit surveys for PREP researchers in order to capture the PREP researchers' experience(s), as well as meet at least twice yearly with NIST PREP Program Manager and Program Directors to discuss outcomes and lessons learned.

Additionally, the recipient is required to establish a **University PREP Program Manager.** The University PREP Program Manager will work closely with the University PREP Program Coordinator for Gaithersburg or Boulder and sponsoring academic departments in their university to plan and manage professional development and career experiences of PREP researchers. As employees of PREP recipients, PREP researchers must receive appropriate career development and support through their employer and the University PREP Program Manager will have primary responsibility for ensuring the institution meets its obligations to its employees who participate as PREP researchers. This Manager should be a permanent employee within the recipient's organization and will be responsible for establishing and managing the technical and research aspects of PREP program and coordinate with the appropriate academic college or department including, but not limited to:

a. Ensure that every PREP researcher will have an advisor who is expected to mentor and support the PREP researcher's professional growth, including career goals, through the creation of an Individual Development Plan (IDP). The IDP is a combination of the technical performance, and professional and career development (which must include training) plans.

b. Develop and re-evaluate the PREP researcher's IDP.

c. Evaluate the PREP researcher's performance per the institution's established procedures, using specified criteria which is shared with the PREP researcher during on-boarding, and the PREP researcher's accomplishments to assess merit increases and candidacy for university technical awards.

d. Discuss PREP researcher concerns and experience to improve the broader PREP researcher experience.

The PREP Program is conducted in English, and it is expected that a recipient will recruit and successfully place PREP researchers in research opportunities at a relevant NIST campus who are proficient in both writing and speaking English. PREP researchers are also expected to have the ability to work with others, a commitment to honesty, and a committed, enthusiastic interest in learning measurement science (metrology), standards, data and technology, and using their own innovativeness to develop new science through experimental or theoretical determinations.

Once PREP researchers are selected and stationed at a NIST campus, they will be required to receive general research guidance and laboratory training from NIST staff as part of the collaboration. PREP researchers are classified as NIST associates and participation as a PREP researcher does not imply consideration for future federal employment. Further, PREP researchers, as NIST associates, are generally prohibited from receiving career development and other training offered to federal employees.

Applicants must be able to ensure the availability of a diverse pool of PREP researchers for on-site collaborative research experiences within the NIST Laboratories operating at the NIST campuses in Boulder, CO, Gaithersburg, MD, or Charleston, SC concurrent with their academic studies.

PREP researchers include students and degree holders. Participating undergraduate or graduate students must be enrolled full-time in an academic program, and it is recommended that participating students have an un-weighted grade point average of at least 3.0 on a 4-point scale, or equivalent. Additionally, PREP researchers participating as bachelor's and master's degree holders, post-doctoral fellows, and senior research fellows must earn the respective degree before beginning the appointment. For instance, a bachelor's degree holder must have a B.S., and/or B.A.; a master's degree holder must have a M.S. or M.A.; and post-doctoral fellows and senior research fellows must possess a Ph.D., Sc.D., or academically equivalent doctorate before beginning their appointment.

PREP researchers are not required to have U.S. citizenship to participate in the program. A Recipient must ensure that, for the duration of a PREP researcher's tenure in the program, any PREP researcher who is not a United States (US) citizen or lawful permanent resident is in possession of an appropriate nonimmigrant visa and, if applicable, authorization to work in the United States; verification may be through the Department of Homeland Security's E-Verify system[3] or another method, before a Recipient provides the PREP researcher with award funds. Recipients may not provide federal funding to a PREP researcher who no longer has valid immigration status or employment authorization. Any applicant assisting a PREP researcher who is not a US citizen or lawful permanent resident with visa or employment authorization applications is expected to take into consideration U.S. Department of State and Department of

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[3] https://www.uscis.gov/e-verify

Homeland Security processing times for obtaining the appropriate authorizations, including changing from one visa status to another and renewals of required documentation. If, at any time, a PREP researcher's visa or employment authorization is no longer valid, the PREP researcher may no longer receive funding under the PREP program, until the issue is resolved.

Expenses related to obtaining a PREP researcher's visa are allowable only at the time a Recipient initially hires a PREP researcher. Fees for expediting visa processing are not allowable costs and may not be included in the applicant's budget.

Applicants may include reasonable travel and related costs in their program budget for PREP researchers to attend in-person or virtual scientific meetings, technical events, or other events that are relevant to the PREP Program, the PREP topical research areas, the PREP objectives, or the NIST mission, as described above in this NOFO. These costs should be reasonable and reflected in the budget form "SF-424A" (*see* Section IV.2.a.(2). of this NOFO) and described in the budget narrative (*see* Section IV.2.a.(7). of this NOFO) and will be evaluated as part of the application review process (*see* Section V.1.d. for a description of the Budget Narrative evaluation criteria and how this information will be evaluated and scored). Federal funds may not be used to support expenses related to professional social gatherings, informal seminars, career and professional development trainings, or similar gatherings.

Applicants are encouraged to promote the participation of historically marginalized groups in any research conducted under an award pursuant to this NOFO.

a) NIST Laboratories and Facilities

NIST operates several laboratories to carry out its mission to promote innovation and industrial competitiveness by advancing technology in ways that enhance economic security and improve our quality of life:

1) Communications Technology (CTL),
2) Engineering (EL),
3) Information Technology (ITL),
4) Material Measurement (MML), and
5) Physical Measurement (PML).

In addition, NIST operates two unique and valuable laboratory facilities: the NIST Center for Neutron Research (NCNR) and the Center for Nanoscale Science and Technology (CNST). Applicants are encouraged to visit their websites to learn about the multi-disciplinary nature of the NIST laboratories and user facilities. Periodically, there are opportunities for PREP researchers to participate in technical special projects in NIST offices outside of the NIST laboratories and user facilities.

All the laboratories identified above participate in the PREP Program. Each is described below along with descriptions of the research topic areas for each of the laboratories that are relevant to the PREP Program, in the order they are presented above.

NIST's Communications Technology Laboratory (CTL) (in Boulder, CO and Gaithersburg, MD) promotes the development and deployment of reliable, resilient and secure communication networks of today and tomorrow, including advances in connectivity and interoperability for powerful solutions in manufacturing, public safety, and infrastructure. CTL's six research focus areas include: Core Network Technology, Fundamental Electromagnetic Technologies and Standards, Next Generation Wireless Systems, Public Safety Communications, Smart Infrastructure and Manufacturing, and Spectrum Sharing & Sensing. More information about CTL can be found [on the CTL website](#).

NIST's Engineering Laboratory (EL) (in Gaithersburg, MD only) promotes U.S. innovation and industrial competitiveness in areas of critical national priority by anticipating and meeting the measurement science and standards needs for engineering systems in ways that enhance economic prosperity and improve the quality of life. The EL research portfolio includes programs in Community Resilience, Earthquake Risk Reduction in Buildings and Infrastructure, Engineered Materials for Resilient Infrastructure, Fire Risk Reduction in Buildings, Fire Risk Reduction in Communities, Structural Performance for Multi-hazards, Net-Zero Energy, High-Performance Buildings, Embedded Intelligence in Buildings, Measurement Science for Additive Manufacturing, Measurement Science for Manufacturing Robotics, and Advanced Manufacturing Data Infrastructure and Analytics. More information about EL can be found [on the EL website](#).

NIST's Information Technology Laboratory (ITL) (in Boulder, CO and Gaithersburg, MD) develops and disseminates standards, measurements, and testing for interoperability, security, usability, and reliability of information systems, including cybersecurity standards and guidelines for Federal agencies and U.S. industry, supporting these and measurement science at NIST through fundamental and applied research in computer science, mathematics and statistics. Additional information about ITL can be found [on the ITL website](#).

NIST's Material Measurement Laboratory (MML) (in Boulder, CO, Gaithersburg, MD and Charleston, SC) serves as the national reference laboratory for measurements in the chemical, biological and material sciences through activities ranging from fundamental and applied research to the development and dissemination of certified reference materials, critically evaluated data, and other programs and tools to assure the quality of measurement results. MML is also responsible for coordinating the NIST-wide Standard Reference Material and Standard Reference Data programs. Additional information about MML can be found [on the MML website](#).

NIST's Physical Measurement Laboratory (PML) (in Boulder, CO and Gaithersburg, MD) develops and disseminates the national standards of length, mass, force and shock, acceleration, time and frequency, electricity, temperature, humidity, pressure and vacuum, liquid and gas flow, and electromagnetic, optical, microwave, acoustic, ultrasonic, and ionizing radiation. PML's activities range from fundamental measurement research through provision of measurement services, standards, and data. PML applies its measurement capabilities to problems of national significance through collaborations with industry, universities, professional and standards setting organizations, and other agencies of government. It supports the research community in such areas as communication, defense, electronics, energy, environment, health, lighting, manufacturing, microelectronics, radiation, remote sensing, space, and transportation. PML establishes spectroscopic methods and standards for infrared, visible, ultraviolet, x-ray, and gamma-ray radiation; investigates the structure and dynamics of atoms, molecules, and biomolecules; develops the electrical, thermal, dimensional, mechanical, and physical metrology for measuring the properties of precision measurement devices and exploratory semiconductor, quantum electronic, nanoelectronic, bioelectronic, biooptical, optoelectronic, and quantum information devices and systems; and examines the thermophysical and interfacial properties of streams of flowing fluids, fluid mixtures, and solids. It develops and disseminates national standards by means of calibrations, measurement quality assurance, standard reference materials, technology transfer, education/training, and a comprehensive weights and measurement program to promote uniformity and accuracy at the international, federal, state, and local levels. It generates, evaluates, and compiles atomic, molecular, optical, ionizing radiation, electronic, and electromagnetic data in response to national needs; measures and improves accuracy of the fundamental physical constants; and develops and operates major radiation sources for measurement science and metrology. To learn more about PML, visit the PML [webpage](#).

PML contains the **NIST Center for Nanoscale Science and Technology** (CNST). NIST's CNST (in Gaithersburg, MD only) supports the U.S. nanotechnology enterprise from discovery to production by providing industry, academia, NIST, and other government agencies with access to world-class nanoscale measurement and fabrication methods and technology. The CNST's shared-use NanoFab gives researchers access to and training on commercial state-of-the-art tools and clean room facilities required for cutting-edge nanotechnology development. Additional information about CNST can be found [on the CNST website](#).

NIST's Center for Neutron Research (NCNR) (in Gaithersburg, MD only) is a national resource for industry, universities, and government agencies, focused on providing neutron-measurement capabilities to the U.S. research community. Neutrons are powerful probes of the structure and dynamics of materials ranging from molecules inserted into membranes mimicking cell walls to protons migrating through fuel cells. The unique properties of neutrons can be exploited by a variety of measurement techniques to provide information not available by other means. Neutron-based research covers a broad spectrum of disciplines, including engineering, biology,

material science, polymers, chemistry, and physics. The NCNR is also operated as a major national user facility. Additional information can be found on the NCNR website.

b) Requirement to Comply with NIST Policies

In addition to adhering to the Administrative and National Policy Requirements in Section VI.2. of this NOFO, Applicants should be aware that participating PREP researchers will be required to comply with the following NIST policies:

a) The requirement that any research data[4] generated from NIST research or NIST funding be made accessible to the public. This requirement results from NIST's response to the Open, Public, Electronic, and Necessary (OPEN) Government Data Act, Title II of Public Law 115-435, and the Office of Science and Technology Memorandum for the Heads of Executive Departments and Agencies of February 22, 2013, Increasing Access to the Results of Federally Funded Scientific Research[5], as implemented through NIST Policy 5700.00, Managing Public Access to Results of Federally Funded Research[6], and NIST Order 5701.00 Managing Public Access to Results of Federally Funded Research[7].

b) The requirement that all research involving human subjects conducted or supported by NIST shall be carried out in accordance with 15 C.F.R. Part 27, the Department of Commerce's implementation of the Common Rule for Protection of Human Subjects. The NIST Research Protections Office (RPO) reviews any NIST research that potentially involves human subjects. If a NIST employee proposes to include a PREP researcher in such research, the NIST RPO would review the proposal. If the PREP researcher's participation in the proposal is approved by RPO, the PREP researcher's work would be conducted under NIST's Federalwide Assurance (FWA) issued by the Department of Health and Human Service's Office of Human Research Protection, unless other arrangements are made after consultation with the PREP researcher's employing institution. The PREP researcher will be required to complete the applicable NIST training, before being approved to participate in the research. For more information regarding research projects involving human subjects, contact Anne Andrews, Director, NIST Research Protections Office (e-mail: anne.andrews@nist.gov; phone: (301) 975-5445).

c) The requirement that all testing, research, and training conducted or supported by NIST involving live vertebrate animals, including the custom collection of materials from live vertebrate animals for NIST, shall be carried out in accordance with the

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[4] NIST adopted the definition of "research data" at 2 C.F.R. § 200.315(e)(3) (available at http://go.usa.gov/3sZvQ).
[5] https://www.science.gov/docs/ostp_public_access_memo_2013.pdf.
[6] https://www.nist.gov/system/files/documents/2018/06/19/final_p_5700.pdf.
[7] https://www.nist.gov/system/files/documents/2019/11/08/final_o_5701_ver_2.pdf.

Animal Welfare Act, its implementing regulations, and if appropriate, the Good Laboratory Practice for Nonclinical Laboratory Studies (21 C.F.R. Part 58). In addition, such research activities should be in compliance with the *"U.S. Government Principles for Utilization and Care of Vertebrate Animals Used in Testing, Research, and Training"* (Principles). The NIST RPO also reviews any NIST research that potentially involves live vertebrate animals. If a NIST employee proposes to include a PREP researcher in such research, the NIST RPO would review the proposal and consult with the PREP researcher's employing institution, as appropriate. The PREP researcher will be required to complete the applicable NIST training before being approved to participate in the research. For more information regarding research projects involving live vertebrate animals, contact Anne Andrews, Director, NIST Research Protections Office (e-mail: anne.andrews@nist.gov; phone: (301) 975-5445).

II. Federal Award Information

1. **Funding Instrument.**
   The funding instrument that will be used is a Cooperative Agreement. The nature of NIST's "substantial involvement" will generally include collaboration with the recipient organization in developing and implementing the approved scope of work, consistent with the definition of cooperative agreement in 2 CFR § 200.1.

2. **Multi-Year Funding Policy.**
   When a proposal for a multi-year award is approved, funding will usually be provided for only the first year of the award. If a project is selected for funding, NIST has no obligation to provide any additional funding in connection with that award. Continuation of an award to increase funding or extend the period of performance is at the sole discretion of NIST. Continued funding will be contingent upon satisfactory performance, continued relevance to the mission and priorities of NIST, and the availability of funds.

3. **Funding Availability.**
   In FY22, NIST anticipates funding up to nine (9) awards for approximately $200 million in total with a project performance period of up to five years. New awards are expected to range from approximately $250,000 to $20,000,000 annually at PREP Boulder and from $500,000 to $24,000,000 annually at PREP Gaithersburg, with project performance periods of up to five (5) years, consistent with the multi-year funding policy described in Section II.2. of this NOFO. NIST may fund up to approximately $200 million for PREP awards operating across the NIST campuses in Boulder, CO, Gaithersburg, MD and Charleston, SC over five years. The specific number of awards will be determined during the selection process, based on the nature and quality of the proposals NIST receives and funding availability.

III.   Eligibility Information

1. **Eligible Applicants**
   Eligible applicants include accredited institutions of higher education that offer two- or four-year degrees in the U.S. and its territories in academic disciplines relevant to the technical programs of the NIST laboratories and major programs (https://www.nist.gov/labs-major-programs/laboratories). For the purposes of this NOFO, these disciplines include (but may not be limited to) artificial intelligence, biochemistry, biological sciences, chemistry, computer science, engineering, electronics, information technology, materials science, mathematics, nanoscale science, neutron science, physical sciences, physics, scientific/technical writing, science and technology policy, technology management, and statistics. Although Federal entities are not eligible to receive funding under this NOFO, they may participate as unfunded collaborators.

   Applicants must be able to ensure the availability of a diverse pool of PREP researchers for on-site (in-person) or virtual (within the U.S. and its territories per NIST IT security requirements and Recipient's policy) collaborative research experiences within the NIST Laboratories operating at the NIST campuses in Boulder, CO, Gaithersburg, MD, or Charleston, SC.

   An eligible organization may work individually or include proposed sub-awardees, contractors or other collaborators in a project, effectively forming a team or consortium.

2. **Cost Sharing or Matching**
   Non-federal cost sharing IS NOT required for awards issued pursuant to this NOFO.

3. **Eligible PREP researchers.** Participating individuals are eligible for the following PREP research categories:
   a. **Undergraduate students**: Must be enrolled full-time in an associates or bachelor's degree academic program. It is recommended that the participating students have an unweighted grade point average of 3.0 on a 4-point scale or equivalent. Undergraduates are eligible for five (5) years in this category.
   b. **Graduate students**: Must be enrolled full-time in a master's degree or doctoral degree academic program. It is recommended that the participating students have an unweighted grade point average of 3.0 on a 4-point scale or equivalent. Master's degree students are eligible for three (3) years and doctoral degree students are eligible for six (6) years to collaborate with NIST in this category.
   c. **Individuals with bachelor's or master's degrees**: Must have earned a bachelor's degree and/or master's degree. Additionally,

these individuals are not enrolled at a university during their appointment as PREP researchers. Bachelor's degree holders are eligible for three (3) years and master's degree holders are eligible for five (5) years in this category.

d. **Post-doctoral fellows**: Must have earned or held a doctoral degree for five (5) years or less. Researchers participating as PREP Post-doctoral fellows are eligible for five (5) years in this category.

e. **Senior research fellows**: An individual holding a doctoral degree for more than five (5) years who has a unique expertise to contribute to research which meets the NIST mission. PREP researchers participating as senior research fellows are eligible for five (5) years in this category.

f. **Academic affiliates**: Individuals holding appointments at academic institutions. These appointments include, but are not limited to, the following designations: faculty, research faculty, adjunct faculty, research associates, instructors, and lecturers. There is not an appointment limitation for this category.

To clarify, PREP student researchers (undergraduate and graduate) must be enrolled full time in a program toward an applicable degree at the recipient's institution. PREP researchers participating as bachelor's and master's degree holders, post-doctoral fellows, senior research fellows, and academic affiliates must have earned an applicable degree (a B.S., B.A., M.S., M.A., Ph.D., Sc.D. or academically equivalent doctorate) before beginning their appointment in the applicable PREP research category. Furthermore, participating researchers may be considered for the next PREP research category after the years of eligibility are met and degree requirements are fulfilled for the initial category of the appointment. For instance, a postdoctoral fellow may transition to senior research fellow appointment five (5) years after their appointment, subject to the approval of both the recipient and NIST.

IV. Application and Submission Information

1. Address to Request Application Package

The application package is available at Grants.gov under Funding Opportunity Number 2022-NIST-PREP-01.

2. Content and Form of Application Submission.
Set forth below are the required content and form of applications submitted pursuant to this NOFO.

a. Required Forms and Documents. The Application must contain the following:

(1) SF-424, Application for Federal Assistance. The SF-424 must be signed by an authorized representative of the applicant organization.

For SF-424, Item 8.d. Zip/Postal Code field, should reflect the Zip code + 4 (#####-####) format.

For SF-424, Item 12, should list the NOFO number 2022-NIST-PREP-01.

SF-424, Item 15, must specify either "PREP Boulder" or "PREP Gaithersburg" depending on the sub-program to which the particular application is directed.

SF-424, Item 18, should list the total budget information for the duration of the project.

The list of certifications and assurances referenced in Item 21 of the SF-424 is contained in the Federal Financial Assistance Certifications and Representations (Certs and Reps) as part of the SAM.gov entity registration.

(2) SF-424A, Budget Information for Non-Construction Programs
The focus of PREP is the researcher's experience, and the budget must reflect this principle. The budget should reflect anticipated expenses for the entire project, considering all potential cost increases, including cost of living adjustments.

a. The applicant should reflect each year of the project, up to the first four (4) years, on the SF-424A form that appears as part of the mandatory forms in the Grants.gov application package. The second SF-424A form should be submitted to cover year five (5) of the project, and its submission details are found in in Section IV.2.a.(13). of this NOFO.

b. In Section A, the Grant Program Function or Activity on Line 1 under Column (a) should be entered as Science, Technology, Business and/or Education Outreach, CFDA 11.620, or an abbreviation thereof. The Catalog of Federal Domestic Assistance Number on Line 1 under Column (b) should be entered as "11.620". The total budget amount for the term of the award should be listed in Section A, Line 1, Column (e).

c. Section B, Column (1) of the SF-424A should reflect funds for the first year of the award. Section B, Column (2) of the SF-424A should reflect funds for the second year of the award. Section B, Column (3) of the SF-424A should reflect funds for the third year of the award. Section B, Column (4) of the SF-424A should reflect funds for the fourth year of the award.

d. *Cost share IS NOT required.* Section C may be blank since Non-Federal cost sharing is not required for awards issued pursuant to this NOFO. Applicants who wish to pledge voluntary cost share to the project must complete the following sections: For Column (b) enter resources provided by the applicant. If not applicable, leave blank. For Column (c), enter resources provided by one or more States. If not applicable, leave blank. For Column (d) enter resources provided by the other sources (e.g., in-kind contribution, program income). If not applicable, leave blank.

e. Section D requires a breakdown of the first year's budget by quarter.

f. Section E requires the budget estimate of federal funds needed for each year of the project. The budget estimate for the first year of the award should be entered in Section E, Line 16, Column (b). The budget estimate for the second year of the award should be entered in Section E, Line 16, Column (c). The budget estimate for the third year of the award should be entered in Section E, Line 16, Column (d). And the budget estimate for the fourth year of the award should be entered in Section E, Line 16, Column (e).

(3) CD-511, Certification Regarding Lobbying. Enter "2022-NIST-PREP-01" in the Award Number field. Enter either "PREP Boulder" or "PREP Gaithersburg", depending on the sub-program to which the particular application is directed, in the Project Name field.

(4) SF-LLL, Disclosure of Lobbying Activities (if applicable).

(5) Communication Plan: The plan describes the key personnel and response time for communicating with the NIST PREP Program Director for Boulder or Gaithersburg, as applicable; the procedures to identify and secure opportunities for PREP researchers at a NIST campus and the dissemination of expectations, program contacts, and information pertaining to the appointment with PREP researchers during their tenure in the program. Additionally, the plan must describe the recipient's approach to challenges (such as visa processing, conflict, and pay) which may occur before and during the appointment with PREP researchers.

(6) Outreach Plan: The plan describes how the recipient will conduct outreach and advertise PREP within their organization, to the scientific and academic communities, and the general public. Recipients are encouraged to describe the plan in detail.

(7) Diversity and Inclusion Plan: The plan describes strategies to recruit, select, and retain PREP researchers from populations historically marginalized groups in STEM. Additionally, the plan should be described with as much specificity as possible, including the types and/or names of academic institutions and professional organizations where students will be recruited and the efforts that will be made to attract members of underrepresented groups.

(8) Individual Development Plan: The plan is a combination of the Technical Performance Plan and Professional and Career Development Plan required for each category of PREP researchers. Additional details about the plan are described below.

   a. Technical Performance Plan: The plan details the management and evaluation of the technical performance for each PREP researcher category. Plans must define the appraisal cycle and specific criteria used to monitor and evaluate technical performance. Additionally, the plan must describe the PREP researcher, NIST sponsoring laboratory, and recipient's role in technical performance planning and review. Furthermore, the plan must describe how the recipient will use the PREP researcher's performance to assess merit increases and candidacy for university technical awards.

   b. Professional and Career Development Plan: The recipient is responsible for supporting the professional and career development for PREP researchers employed by the recipient. The plan must describe the proposed topics for professional and career development for each PREP research category and the frequency of the opportunities. Plans for professional and career development must include training in the responsible and ethical conduct of research. Additionally, recipients are encouraged to develop plans which include opportunities to prepare for graduate school and careers in STEM, managing work/life balance, and navigating the job search for PREP researchers.

   Federal funds may not be used to support expenses related to professional social gatherings, informal seminars, career and professional development trainings, or similar gatherings. Alternatively, recipients may offer professional and career development training created for traditional university staff in the plan. The Professional Development and Career Plan must include details of the course offerings for each PREP researcher category and the frequency which the trainings are available.

(9) Project Narrative. The Project Narrative is a word-processed document of no more than twenty-five (25) pages (double-spaced between lines),

which is responsive to the program description and the evaluation criteria.

The page limit includes *Cover Page; Table of Contents (if included); Project Narrative with all required information, including figures, graphs, tables, images, and pictures).*

The project narrative should contain the following information:

a. **Cover Page.** The cover page must specify to which program the applicant is applying (Gaithersburg or Boulder). If applying for both programs, the applicant must submit a separate application for each location.

b. **Executive Summary.** An executive summary of the proposed project should briefly describe the applicant's plan to establish and manage a program to support collaborative research relationships among NIST staff, PREP researchers and the PREP researchers' academic institutions (*see* Section I. of this NOFO), consistent with the objectives, requirements and priorities of this program (*see* Section I. of this NOFO). Additionally, the executive summary should include the institution's on-going research that aligns with NIST mission. The executive summary should include information indicating how each evaluation criterion (see Section V.1. of this NOFO) and its sub-factors are addressed. A table can be helpful in providing this information. The executive summary should not exceed two (2) pages.

c. **Background and Context**: Provide information on the academic institution's current STEM education and research capability such as a description of STEM degree programs, student enrollment, retention, graduate rates, number of students going to graduate schools, gatekeeper course performance, STEM faculty demographics, and STEM infrastructure resources at the institution and collaborating organizations. Additionally, recipients are requested to provide information on STEM related programs that have been implemented or currently active. This should include prior PREP awards and awards from other NIST programs, other federal programs, state programs, and institution programs. Explain the outcomes from these areas.

d. **Project Management Plan**: A description of the applicant's plan to manage the program, as mentioned in Section I.2., NIST Expectations of the Recipient. The plan must address the roles and responsibilities of the PREP Program Coordinator and PREP Program Manager.

e. **Project Impacts and Evaluation:** A detailed discussion of the: (i) anticipated impacts of the proposed project; (ii) methodology for identifying and evaluating project outcomes; and (iii) dissemination of project learnings consistent with the objectives, requirements and priorities of this program.

f. **Qualifications.** A description of the qualifications of the key personnel, the time commitments of the key personnel, and how the project staff qualifications will enable them to complete the project work. This section should address the applicant's qualifications and experience for implementing the program to support collaborative research relationships among NIST staff, PREP researchers and the PREP researchers' academic institutions, sufficient to permit evaluation of the proposal in accordance with the *Qualifications and Experience* evaluation criterion (*see* Section V.1.b. of this NOFO).

g. **Success Metrics**. A description of how the recipient will meet each of the PREP Program objectives described in Section I. of this NOFO. Outputs of the proposed program may be quantified to ascertain program results, such as: the number and quality of publications by PREP researchers; the number and types of patents, tools, or software developed by PREP researchers; the ability of students to earn college credits and work towards their undergraduate or graduate degree; the recruitment of underrepresented groups in STEM; the ability to provide professional development opportunities; and/or the number of science and technology jobs obtained by PREP researchers once they complete their participation in the PREP Program. The metrics and mechanisms should provide a sound basis for evaluating the technical success of specific projects, the quality of the research experiences provided to PREP researchers, and the extent to which collaborations have been formed or strengthened between the Recipient institution and NIST, sufficient to permit evaluation of the proposal in accordance with the *Success Metrics* evaluation criterion (*see* Section V.1.c. of this NOFO).

(10) Resumes of Key Personnel. Resumes for all key personnel assigned to the project must be provided. Resumes must be a maximum of two pages each. Additional pages beyond the two pages per resume will not be considered during the evaluation of the application. Resumes are not included in the page count of the Project Narrative.

(11) Budget Narrative and Justification. There is no set format for the Budget Narrative and Justification; however, further explanation must be provided for the specific cost categories and line items that you identified in the SF-424A form as well as any other information you deem necessary for NIST's consideration.

The written justification should include the necessity and the basis for the cost, as described below. Proposed funding levels must be consistent with the project scope, and only allowable costs should be included in the budget. Information on cost allowability is available in the Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards at 2 C.F.R. Part 200, which apply to awards in this program.

The Budget Narrative does not count against the twenty-five (25) page limit of the Project Narrative.

This section will be evaluated in accordance with the Budget Narrative evaluation criteria. It will also be reviewed to determine if all costs are reasonable, allocable, and allowable under 2 C.F.R. Part 200 Subpart E, Cost Principles.

Note that the annual budget for the proposed program should contain support for any number of (1) undergraduates, (2) post-baccalaureate individuals, (3) graduates, (4) post-graduate individuals, (5) post-doctoral fellows and (6) academic affiliates. Additionally, the stipend or wage for PREP researchers must be commensurate to what a researcher in the individual's given department would receive.

a. **Personnel**- At a minimum, the budget justification for all personnel (including PREP researchers, if classified as a Personnel cost) should include the following: job title, commitment of effort on the proposed project in terms of average number of hours per week or percentage of time, stipend or salary rate, total personnel charges for each identified position on the proposed project, description of the role of the individual on the proposed project and the work to be performed.

   Costs related to the verification of appropriate nonimmigrant visas and/or authorizations to work in the United States for PREP researchers who are not US citizens or lawful permanent residents in possession of an appropriate nonimmigrant visa may be included if the cost is not already captured in your organization's negotiated indirect cost rate.

Administration costs related to the management of this program should not exceed $100,000 per year.

b. **Fringe Benefits**– Fringe benefits for each position should be identified separately from salaries and wages and based on rates determined by organizational policy. The items included in the fringe benefit rate (e.g., health insurance, fees, etc.) should not be charged under another cost category.

c. **Travel**- Applicants may include reasonable travel (including in-person and virtual attendance) and related costs in their program budget for PREP researchers to attend scientific meetings, technical events, educational professional development events, or other events that are relevant to the PREP Program, the PREP topical research areas, the PREP objectives, or the NIST mission, as described above in this NOFO. For all travel costs, the budget justification for travel should include the following: destination; names or number of people traveling; dates and/or duration; mode of transportation, lodging and subsistence rates; and description of how the travel is directly related to the proposed project. For travel that is yet to be determined, please provide best estimates based on prior experience. If a destination is not known, an approximate amount may be used with the assumptions given for the location of the meeting.

d. **Equipment** – Not an allowable cost under this NOFO.

e. **Supplies** – Not an allowable cost under this NOFO.

f. **Contractual (i.e., Contracts or Subawards)** – Each contract or subaward should be treated as a separate item. Identify the cost and describe the services to be provided and the necessity of the subaward or contract to the successful performance of the proposed project. Contracts are for obtaining goods and services for the non-Federal Entity's own use and creates a procurement relationship with the contractor. A subaward is for the purpose of carrying out a portion of a Federal award and creates a Federal assistance relationship with the subrecipient.

g. **Construction** – Not an allowable cost under this NOFO.

h. **Other Direct Costs** - For costs that do not easily fit into the other cost categories, list the cost and the breakdown of the total costs by quantity or unit of cost. Include the necessity of the cost for the completion of the proposed project. Only allowable costs can be charged to the award. If applicable, full tuition assistance for graduate

students calculated at the in-state rate, and relocation expenses for post-baccalaureate individuals, post-graduate individuals, post-doctoral fellows and academic affiliates (limited up to $7,500 per individual) may be included.

   i. **Indirect Costs**- Commonly referred to as Facilities & Administrative (F&A) Costs, Indirect Costs are defined as costs incurred by the applicant organization that cannot otherwise be directly assigned or attributed to a specific project. The justification should include a cost calculation that reflects the applicable indirect cost rate. For more details, *see* Section IV.2.a.(12) of this NOFO.

(12) Indirect Cost Rate Agreement. If indirect costs are included in the proposed budget, provide a copy of the approved negotiated agreement if this rate was negotiated with a cognizant Federal audit agency. If the rate was not established by a cognizant Federal audit agency, provide a statement to this effect. If the successful applicant includes indirect costs in the budget and has not established an indirect cost rate with a cognizant Federal audit agency, the applicant will be required to obtain such a rate in accordance with Section B.06 of the Department of Commerce Financial Assistance Standard Terms and Conditions dated November 12, 2020. Please note, indirect rates are required to be calculated at the appropriate off-campus rate.

Alternatively, in accordance with 2 C.F.R. § 200.414(f), applicants that do not have a current negotiated (including provisional) indirect cost rate, except for those non-Federal entities described in Appendix VII, paragraph D.1.b. of 2 CFR 200, may elect to charge a de minimis rate of 10 percent of modified total direct costs (MTDC). Applicants proposing a 10 percent de minimis rate pursuant to 2 C.F.R. § 200.414(f) should note this election as part of the budget portion of the application.

(13) SF-424A, Budget Information- Non-Construction Programs (for applications with five-year projects).

The SF-424A form that appears as part of the mandatory forms in the Grants.gov application package covers the first four (4) years of the project. For projects covering five years, a second SF-424A form should be submitted to cover year five (5) of the project. A fillable SF-424A form can be found at https://www.grants.gov/web/grants/forms/sf-424 family.html near the top of the screen and labeled "Budget Information – Non-Construction Program SF-424A". Applicants should download the fillable SF-424A form, complete the information for year five (5) of the project and submit the completed form as an attachment, using the procedure described in Section IV.2.b., Attachment of Required

Application Documents.

(14) Letters of Commitment. Letters of Commitment must be submitted by all funded and unfunded entities that will have an active role in executing the activities outlined in the Project Narrative. Letters of Commitment must address the level of participation, qualifications of the personnel who will be actively involved, and how successful completion of this project would positively impact their profession or community. Letters of Commitment must also specify any voluntary committed cost-share, including the specific services and/or products to be used in the project. Letters of Commitment must be signed by an individual with authority to legally bind the organization to its commitment. Letters of Commitment do not count against the page limit of the Project Narrative.

(15) Current and Pending Support Form. Any application that includes investigators, researchers, and key personnel must identify all sources of current and potential funding, including this proposal. Any current project support (e.g., Federal, state, local, public or private foundations, etc.) must be listed on this form. The proposed project and all other projects or activities requiring a portion of time of the Principal Investigator (PI), co-PI, and key personnel must be included, even if no salary support is received.

The total award amount for the entire award period covered, including indirect costs, must be shown as well as the number of person-months per year to be devoted to the project, regardless of the source of support. Similar information must be provided for all proposals already submitted or that are being submitted concurrently to other potential funders.

Applicants must complete the Current and Pending Support Form, using multiple forms as necessary to account for all activity for each individual identified in the PI, co-PI and key personnel roles. A separate form should be used for each identified individual.

Applicants must download the Current and Pending Support Form from the NIST website at https://www.nist.gov/oaam/grants-management-division/current-and-pending-support and reference the guidance provided as it contains information to assist with accurately completing the form.

b. Attachment of Required Documents

Items IV.2.a.(1) through IV.2.a.(4) above are part of the standard application package in Grants.gov and can be completed through the download application process.

Items IV.2.a.(5) through IV.2.a.(15) should be attached to field 15 of the SF-424 form by clicking on "Add Attachments". Following these directions will create zip files which permit transmittal of the documents electronically via Grants.gov.

Applicants should carefully follow specific Grants.gov instructions at www.Grants.gov to ensure the attachments will be accepted by the Grants.gov system. A receipt from Grants.gov indicates only that an application was transferred to a system. It does not provide details concerning whether all attachments (or how many attachments) transferred successfully. Applicants will receive a series of e-mail messages over a period of up to two business days before learning whether a Federal agency's electronic system has received its application. Applicants are strongly advised to use Grants.gov's "Download Submitted Forms and Applications" option, found at https://www.grants.gov/help/html/help/Applicants/CheckApplicationStatus/DownloadSubmittedFormsAndApplications.htm to check that their application's required attachments were contained in their submission.

After submitting the application, check the status of your application here: CHECK APPLICATION STATUS. If any, or all, of the required attachments are absent from the submission, follow the attachment directions found above, resubmit the application, and check again for the presence of the required attachments.

If the directions found at https://www.grants.gov/help/html/help/index.htm#t=GetStarted%2FGetStarted.htm are not effective, please contact the Grants.gov Help Desk immediately. If calling from within the United States or from a U.S. territory, please call 800-518-4726. If calling from a place outside the United States or a U.S. territory, please call 606-545-5035. E-mails should be addressed to support@grants.gov. Assistance from the Grants.gov Help Desk will be available around the clock every day, with the exception of Federal holidays. Help Desk service will resume at 7:00 a.m. Eastern Time the day after Federal holidays.

Applicants can track their submission in the Grants.gov system by following the procedures at the Grants.gov site. It can take up to two business days for an application to fully move through the Grants.gov system to NIST.

NIST uses the Tracking Numbers assigned by Grants.gov and does not issue Agency Tracking Numbers.

c. Application Format

Applicants applying to both PREP Boulder and PREP Gaithersburg must submit a separate application for each location.

(1) Paper, Email, and Facsimile (fax) Submissions. Will not be accepted.

(2) Figures, Graphs, Images, and Pictures. Should be of a size that is easily readable or viewable and may be displayed in landscape orientation. Any figures, graphs, images, or pictures will count toward the page limits for the Project Narrative.

(3) Font. Easy to read font (10-point minimum). Smaller type may be used in figures and tables but must be clearly legible.

(4) Page Limit. The Project Narrative is limited to twenty-five (25) pages double-spaced, noting the limit of two (2) pages for the Executive Summary. Resumes are not included in the page count of the Project Narrative. However, if resumes are included, resumes must be a maximum of two (2) pages each.

(5) Page Limit Exclusions:
SF-424, Application for Federal Assistance;
SF-424A, Budget Information for Non-Construction Programs;
CD-511, Certification Regarding Lobbying;
SF-LLL, Disclosure of Lobbying Activities (if applicable);
Resumes;
Budget Narrative and Justification;
Indirect Cost Rate Agreement;
SF-424A, Budget Information for Non-Construction Programs for fifth year budget (if applicable);
Letters of Commitment;
Communication Plan;
Outreach Plan;
Diversity and Inclusion Plan;
Individual Development Plan (Technical Performance Plan and Professional and Career Development Plan);
Current and Pending Support Form.

(6) Page Layout. The Proposal must be in portrait orientation.

(7) Page size. 21.6 centimeters by 27.9 centimeters (8 ½ inches by 11 inches).

(8) Page numbering. Number pages sequentially.

(9) Application language. English. All documents must be in English, including but not limited to the initial application, any additional documents submitted in response to a NIST request, all reports, and any correspondence with NIST.

(10) Typed document. All applications, including forms, must be typed; handwritten forms will not be accepted.

d. **Application Replacement Pages.** Applicants may not submit replacement pages and/or missing documents once an application has been submitted. Any revisions must be made by submission of a new application that must be received by NIST by the submission deadline.

e. **Pre-Applications.** Pre-applications will not be accepted under this NOFO.

3. **Unique Entity Identifier and System for Award Management (SAM).**
Pursuant to 2 C.F.R. part 25, applicants and recipients are required to: (i) be registered in SAM before submitting its application; (ii) provide a valid unique entity identifier in its application; and (iii) continue to maintain an active SAM registration with current information at all times during which it has an active Federal award or an application or plan under consideration by a Federal awarding agency, unless otherwise excepted from these requirements pursuant to 2 C.F.R. § 25.110. NIST will not make a Federal award to an applicant until the applicant has complied with all applicable unique entity identifier and SAM requirements and, if an applicant has not fully complied with the requirements by the time that NIST is ready to make a Federal award pursuant to this NOFO, NIST may determine that the applicant is not qualified to receive a Federal award and use that determination as a basis for making a Federal award to another applicant.

4. **Submission Dates and Times**
Applications must be received at Grants.gov no later than 11:59 p.m. Eastern Time, September 30, 2022. NIST will consider the date and time recorded by Grants.gov as the official submission time. Applications received after this deadline will not be reviewed or considered. Paper applications will not be accepted. Please note that the due date has been extended from the original posting.

Applicants should be aware, and factor in their application submission planning, that the Grants.gov system closes periodically for routine maintenance. Applicants should visit Grants.gov for information on any scheduled closures.

When developing the submission timeline, please keep in mind that: (1) all applicants are required to have current registrations in the electronic System for Award Management (SAM.gov) and Grants.gov; (2) the free annual registration

process in the SAM.gov generally takes between three and five business days but can take more than three weeks; and applicants will receive e-mail notifications over a period of up to two business days as the application moves through intermediate systems before the applicant learns via a validation or rejection notification whether NIST has received the application. (See Grants.gov for full information on application and notification through Grants.gov.) Please note that a Federal assistance award cannot be issued if the designated recipient's registration in the System for Award Management (SAM.gov) is not current at the time of the award.

5. Intergovernmental Review
Applications under this Program ARE NOT subject to Executive Order 12372.

6. Funding Restrictions
Construction activities are not an allowable cost under this program. In addition, a recipient or a subrecipient may not charge profits, fees, or other increments above cost to an award issued pursuant to this NOFO.

7. Other Submission Requirements

a. **Applications must be submitted at** Grants.gov. **Paper applications will not be accepted.**

   (1) Applicants should carefully follow specific Grants.gov instructions to ensure that all attachments will be accepted by the Grants.gov system. A receipt from Grants.gov indicating an application is received does not provide information about whether attachments have been received. For further information or questions regarding applying electronically for the 2022-NIST-PREP-01 announcement, contact the Grants.gov Help Desk at 800-518-4726.

b. **Amendments.** Any amendments to this NOFO will be announced through Grants.gov. Applicants may sign up on Grants.gov to receive amendments by e-mail or may request copies by e-mail from PREPGaithersburg@nist.gov.

V. <u>Application Review Information</u>

1. Evaluation Criteria

The evaluation criteria that will be used in evaluating applications and their assigned weights are as follows:

a. **Program Approach and Management Plan (0 – 35 points)**. Reviewers will evaluate the comprehensiveness and quality of the applicant's proposed approach to plan, implement, and manage a program that meets the objectives of the PREP Program. Specifically, reviewers will evaluate

the comprehensiveness of the applicant's program approach and management plan and the likelihood that the approach and plan can effectively and efficiently:

i. provide research opportunities for PREP researchers with NIST scientists and engineers and expose them to cutting-edge research and development activities;

ii. promote the pursuit of degrees or professional development, as applicable, for PREP researchers;

iii. sustainably recruit and place a diverse pool of PREP researchers within the NIST Laboratories for collaborative research experiences throughout the award period;

iv. establish and design an Individual Performance Plan, which consists of a technical performance plan and a professional and career development plan for each category of PREP researcher;

v. manage the program, to include a PREP website, such as points-of-contact, response time, and reporting structure among the key areas of responsibility;

vi. conduct orientation to provide details about the appointment, roles of the university and NIST, and points of contact;

vii. facilitate two performance reviews per calendar year under the direction of the University PREP Manager; and

viii. develop a plan to evaluate performance for PREP researcher annually who perform satisfactorily and participated in the program for 12 months.

b. **Qualifications and Experience (0 – 35 points).** Reviewers will evaluate the applicant's demonstrated experience in placing undergraduate and graduate students, individuals with bachelor's or master's degrees, post-doctoral fellows, academic affiliates and/or historically marginalized groups in STEM in research programs, as defined in Section I.1. of this NOFO, in research laboratories, or other appropriate settings, consistent with furthering the pursuit of degrees or professional development. The extent to which the applicant's institutional degree programs and academic emphases align with the technical areas outlined in Section I. of this NOFO will also be considered. If this will be a new or developing activity for an applicant, the applicant's qualifications to plan and implement the new program and meet the objectives of the PREP Program as described in their proposal will be evaluated.

c. **Success Metrics (0 – 20 points).** Reviewers will evaluate the clarity and quality of proposed metrics and other mechanisms for evaluating the effectiveness of outputs from the proposed Program.

d. **Match of Budget to Proposed Work (0 – 10 points).** Reviewers will

assess the budgeted costs against the proposed activities to determine the practicality and cost effectiveness of the proposed budget with respect to developing and implementing the proposed Program, as described in Section I. of this NOFO.

2. Selection Factors

The Selection Factors for this competition are:

(1) The results of the reviewers' evaluations.
(2) The objectives as set forth in this NOFO (see Section I. of this NOFO).
(3) The availability of Federal funds
(4) Results of the merit reviewers' evaluations, including technical comments.
(5) The availability of funding.
(6) Whether the project duplicates other projects funded by NIST or other Federal agencies.
(7) Regional diversity.
(8) Demonstrated ability to recruit and retain a diverse pool of PREP researchers including historically marginalized groups in STEM.

3. Review and Selection Process

Proposals, reports, documents, and other information related to applications submitted to NIST and/or relating to financial assistance awards issued by NIST will be reviewed and considered by Federal employees, or non-Federal personnel who have entered into conflict of interest and confidentiality agreements covering such information, when applicable.

a. Initial Administrative Review of Applications.
Applications received by the deadline will be reviewed to determine eligibility, completeness, and responsiveness to this NOFO and to the scope of the stated program objectives. Applications determined to be ineligible, incomplete, and/or nonresponsive may be eliminated from further review. However, NIST, in its sole discretion, may continue the review process for an application that is missing non-substantive information, the absence of which may easily be rectified during the review process.

b. Full Review of Eligible, Complete, and Responsive Applications.
Applications that are determined to be eligible, complete, and responsive will proceed for full reviews in accordance with the review and selection process below:

Merit Review. At least three (3) objective reviewers, who may be Federal employees or non-Federal personnel, with appropriate professional and technical expertise relating to the topics covered in this NOFO, will evaluate and score each eligible, complete, and responsive application based on the evaluation criteria. While every application will have at least three (3) reviewers, applications may have more than three (3) reviewers if specialized expertise is needed to evaluate an application. During the review process, the reviewers may discuss the applications with each other, but scores will be determined on an individual basis, not as a consensus. Based on the numerical average of the reviewers' scores, a rank order will be prepared and provided to the Selecting Official for further consideration

Selection. The Selecting Official, who is the NIST PREP Program Manager, will make recommendations to the NIST Grants Management Division regarding the final application selections. The Selecting Official shall generally recommend applications for awards based upon the rank order of the applications but may recommend applications out of rank order based on the selection factors (see Section V.2 of this NOFO).

NIST reserves the right to negotiate the budget costs with any applicant selected to receive an award, which may include requesting that the applicant removes certain costs. Additionally, NIST may request that successful applicants modify objectives or work plans and provide supplemental information required by the agency prior to award. NIST also reserves the right to reject an application where information is uncovered that raises a reasonable doubt as to the responsibility of the applicant. NIST may select some, all, or none of the applications, or part(s) of any application. The final approval of a selected application - and issuance of an award - will be by the NIST Grants Officer. The award decisions of the NIST Grants Officer are final.

4. **Federal Awarding Agency Review of Risk Posed by Applicants.**
After applications are proposed for funding by the Selecting Official, the NIST Grants Management Division (GMD) performs pre-award risk assessments in accordance with 2 C.F.R. § 200.206, which may include a review of the financial stability of an applicant, the quality of the applicant's management systems, the history of performance, and/or the applicant's ability to effectively implement statutory, regulatory, or other requirements imposed on non-Federal entities.

In addition, prior to making an award where the total Federal share is expected to exceed the simplified acquisition threshold (currently $250,000), NIST GMD will review and consider the publicly available information about that applicant in the Federal Awardee Performance and Integrity Information System (FAPIIS). An applicant may, at its discretion, review and comment on information about itself previously entered into FAPIIS by a Federal awarding agency. As part of its review of risk posed by applicants, NIST GMD will consider any comments made

by the applicant in FAPIIS in making its determination about the applicant's integrity, business ethics, and record of performance under Federal awards. Upon completion of the pre-award risk assessment, the Grants Officer will make a responsibility determination concerning whether the applicant is qualified to receive the subject award and, if so, whether appropriate specific award conditions that correspond to the degree of risk posed by the applicant should be applied to an award.

5. **Anticipated Announcement and Award Date**
   Review of applications, selection of successful applicants, and award processing is expected to be completed by November 2022. The earliest start date for awards under this NOFO is expected to be December 2022.

6. **Additional Information**
   a. **Safety**. Safety is a top priority at NIST. Employees and affiliates of award recipients who conduct project work at NIST will be expected to be safety-conscious, to attend NIST safety training, and to comply with all NIST safety policies and procedures, and with all applicable terms of their guest research agreement.

   b. **Notification to Unsuccessful Applicants.** Unsuccessful applicants will be notified by e-mail and will have the opportunity to receive a debriefing after the opportunity is officially closed. Applicants must request within 10 business days of the email notification to receive a debrief from the program office. The program office will then work with the unsuccessful applicant in arranging a date and time of the debrief.

   c. **Retention of Unsuccessful Applications.** Unsuccessful applications will be retained in accordance with the General Record Schedule 1.2/021.

VI. Federal Award Administration Information

1. **Federal Award Notices.** Successful applicants will receive an award package from the NIST Grants Officer.

2. **Administrative and National Policy Requirements**

   a. **Uniform Administrative Requirements, Cost Principles and Audit Requirements.** Through 2 C.F.R. § 1327.101, the Department of Commerce adopted Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards at 2 C.F.R. Part 200, which apply to awards in this program.

   b. **Department of Commerce Financial Assistance Standard Terms and Conditions.** The Department of Commerce will apply to each award in

this program, the [Financial Assistance Standard Terms and Conditions](#) in effect on the date of award. The current version is dated November 12, 2020. Refer to Section VII. of this NOFO, Federal Awarding Agency Contacts, Grant Rules and Regulations, if you need more information.

c. **Pre-Award Notification Requirements.** The Department of Commerce will apply the Pre-Award Notification Requirements for Grants and Cooperative Agreements dated December 30, 2014 ([79 FR 78390](#)). Refer to Section VII. of this NOFO, Federal Awarding Agency Contacts, Grant Rules and Regulations, for more information.

d. **Funding Availability and Limitation of Liability.** Funding for the program listed in this NOFO is contingent upon the availability of appropriations. NIST or the Department of Commerce will not responsible for application preparation costs, including but not limited to if this program fails to receive funding or is cancelled because of agency priorities. Publication of this NOFO does not oblige NIST or the Department of Commerce to award any specific project or to obligate any available funds.

e. **Collaborations with NIST Employees.** If an applicant proposes collaboration with NIST, the statement of work should include a statement of this intention, a description of the collaboration, and prominently identify the NIST employee(s) involved, if known. Any collaboration by a NIST employee must be approved by appropriate NIST management and is at the sole discretion of NIST. Prior to beginning the merit review process, NIST will verify the approval of the proposed collaboration. Any unapproved collaboration will be stricken from the application prior to the merit review. Any collaboration with an identified NIST employee that is approved by appropriate NIST management will not make an application more or less favorable in the competitive process.

f. **Use of Federal Government-Owned Intellectual Property.** If the applicant anticipates using any Federal Government-owned intellectual property, in the custody of NIST or another Federal agency, to carry out the work proposed, the applicant should clearly identify such intellectual property in the proposal. This information will be used to ensure that no Federal employee involved in the development of the intellectual property will participate in the review process for that competition. In addition, if the applicant intends to use the Federal Government-owned intellectual property, the applicant must comply with all statutes and regulations governing the licensing of Federal government patents and inventions, described in 35 U.S.C. §§ 200-212, 37 C.F.R. Part 401, 2 C.F.R. §200.315, and in Section C.03 of the [Department of Commerce Financial Assistance Standard Terms and Conditions,](#) dated November 12, 2020.

Questions about these requirements may be directed to the Chief Counsel for NIST, (301) 975-2803,.

Any use of Federal Government-owned intellectual property by a recipient of an award under this announcement is at the sole discretion of the Federal Government and will need to be negotiated on a case-by-case basis by the recipient and the Federal agency having custody of the intellectual property if a project is deemed meritorious. The applicant should indicate within the statement of work whether it already has a license to use such intellectual property or whether it intends to seek a license from the applicable Federal agency.

If any inventions made in whole or in part by a NIST employee arise in the course of an award made pursuant to this NOFO, the United States Government may retain its ownership rights in any such invention. Licensing or other disposition of the Federal Government's rights in such inventions will be determined solely by the Federal Government, through NIST as custodian of such inventions, and include the possibility of the Federal Government putting the intellectual property into the public domain.

3. **Reporting**

   a. **Reporting Requirements.** The following reporting requirements described in Sections A.01, Reporting Requirements, of the [Department of Commerce Financial Assistance Standard Terms and Conditions](#) dated November 12, 2020, apply to awards in this program:

      (1) Financial Reports. Each award recipient will be required to submit an SF-425, Federal Financial Report on a semi-annual basis for the periods ending March 31 and September 30 of each year. Reports will be due within 30 days after the end of the reporting period. A final financial report is due within 120 days after the end of the project period.

      (2) Performance (Technical) Reports. Each award recipient will be required to submit a technical progress report on a semi-annual basis for the periods ending March 31 and September 30 of each year. Reports will be due within 30 days after the end of the reporting period. Technical progress reports shall contain information as prescribed in [2 C.F.R. § 200.329](#) and Section A.01 of the [Department of Commerce Financial Assistance Standard Terms and Conditions,](#) dated November 12, 2020. A final technical progress report is due within 120 days after the end of the project period.

i. As a component of the Performance Technical Reporting requirements, the recipient shall submit to the Federal Program Officer, on a quarterly basis, a Microsoft Excel spreadsheet that includes the following fields: Cost type (initial/extension), Participant Name, Type of Researcher (undergraduate, graduate, postdoc, etc.), Sponsoring NIST lab, Start date, End date, Benefit cost, Travel/Conference, Relocation (if applicable), Visa fees (if applicable), University Overhead Rates, Tuition (if applicable), Total cost, Year to Date billed, and Remaining balance.

ii. If your institution had administrative fees awarded, report in a separate table the following fields: Salary, Benefit cost, University Overhead Rates, Total Cost, Year to date billed.

iii. The reports are due for each calendar quarter and should be submitted no later than 30 days after the end of the quarter.

(3) Patent and Property Reports. From time to time, and in accordance with the Uniform Administrative Requirements and other terms and conditions governing the award, the recipient may need to submit property and patent reports.

(4) Recipient Integrity and Performance Matters. In accordance with section 872 of Public Law 110-417 (as amended; see 41 U.S.C. 2313), if the total value of a recipient's currently active grants, cooperative agreements, and procurement contracts from all Federal awarding agencies exceeds $10,000,000 for any period of time during the period of performance of an award made under this NOFO, then the recipient shall be subject to the requirements specified in Appendix XII to 2 C.F.R. Part 200, for maintaining the currency of information reported to SAM that is made available in FAPIIS about certain civil, criminal, or administrative proceedings involving the recipient.

b. **Audit Requirements.** The Department of Commerce Financial Assistance Standard Terms and Conditions, Section D.01, and 2 C.F.R. Part 200 Subpart F, adopted by the Department of Commerce through 2 C.F.R. § 1327.101, require any non-Federal entity (i.e., including non-profit institutions of higher education and non-profit organizations) that expends Federal awards of $750,000 or more in the recipient's fiscal year to conduct a single or program specific audit in accordance with the requirements set out in the Subpart. Additionally, unless otherwise specified in the terms and conditions of the award, entities that are not subject to Subpart F of 2 C.F.R. Part 200 (e.g., for-profit commercial entities) that expend $750,000 or more in DOC funds during their fiscal year must submit to the Grants Officer either: (i) a financial related audit of each DOC award or subaward in accordance with Generally Accepted Government Auditing Standards; or (ii) a project specific audit for each award or subaward in accordance with the requirements contained in 2

C.F.R. § 200.507. Applicants are reminded that NIST, the Department of Commerce Office of Inspector General, or another authorized Federal agency may conduct an audit of an award at any time.

c. **Federal Funding Accountability and Transparency Act of 2006.** In accordance with 2 C.F.R. Part 170, all recipients of a Federal award made on or after October 1, 2010, are required to comply with reporting requirements under the Federal Funding Accountability and Transparency Act of 2006 (Public Law No. 109-282). In general, all recipients are responsible for reporting sub-awards of $25,000 or more. In addition, recipients that meet certain criteria are responsible for reporting executive compensation. Applicants must ensure they have the necessary processes and systems in place to comply with the reporting requirements should they receive funding. Also see the Federal Register notice published September 14, 2010, at 75 FR 55663.

VII.   Federal Awarding Agency Contacts

Questions should be directed to the following:

Subject Area	Point of Contact
Programmatic and Technical Questions	Kara Robinson Phone: 202-236-4515 E-mail: kara.robinson@nist.gov with 2022-NIST-PREP-01 in subject line
Technical Assistance with Grants.gov Submissions	grants.gov Phone: 800-518-4726 E-mail: support@grants.gov
Grant Rules and Regulations	Dean Iwasaki Phone: 301-975-8449 E-mail: dean.iwasaki@nist.gov

VIII.   Other Information

1. Personal and Business Information

The applicant acknowledges and understands that information and data contained in applications for financial assistance, as well as information and data contained in financial, performance and other reports submitted by applicants, may be used by the Department of Commerce in conducting reviews and evaluations of its financial assistance programs. For this purpose, applicant information and data may be accessed, reviewed and evaluated by Department of Commerce employees, other Federal employees, and also by Federal agents and contractors, and/or by non-Federal personnel, all of whom enter into

appropriate conflict of interest and confidentiality agreements covering the use of such information. As may be provided in the terms and conditions of a specific financial assistance award, applicants are expected to support program reviews and evaluations by submitting required financial and performance information and data in an accurate and timely manner, and by cooperating with Department of Commerce and external program evaluators. In accordance with 2 C.F.R. § 200.303(e), applicants are reminded that they must take reasonable measures to safeguard protected personally identifiable information and other confidential or sensitive personal or business information created or obtained in connection with a Department of Commerce financial assistance award.

In addition, Department of Commerce regulations implementing the Freedom of Information Act (FOIA), 5 U.S.C. Sec. 552, are found at 15 C.F.R. Part 4, Public Information. These regulations set forth rules for the Department regarding making requested materials, information, and records publicly available under the FOIA. Applications submitted in response to this Federal Funding Opportunity may be subject to requests for release under the Act. If an application contains information or data that the applicant deems to be confidential commercial information that should be exempt from disclosure under FOIA, that information should be identified, bracketed, and marked as Privileged, Confidential, Commercial or Financial Information. In accordance with 15 CFR § 4.9, the Department of Commerce will protect from disclosure confidential business information contained in financial assistance applications and other documentation provided by applicants to the extent permitted by law.

2. **Public Website, Frequently Asked Questions (FAQs):**

NIST PREP has a public website that provides information pertaining to this Funding Opportunity[8]. Any amendments to this NOFO will be announced through Grants.gov.

Applicants must submit all questions pertaining to this funding opportunity in writing to PREPGaithersburg@nist.gov with 2022-NIST-PREP-01 in the subject line.

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[8] Refer to Section VII. of this NOFO, Federal Awarding Agency Contacts, Programmatic and Technical Questions, if more information is needed.