



April 13, 2020

The Honorable Eddie Bernice Johnson, Chair, and The Honorable Frank Lucas, Ranking Member
House Committee on Science, Space, and Technology
2321 Rayburn House Office Building
Washington, DC 20515

RE: COVID-19 Response and Recovery Ideas for the House Science, Space, and Technology Committee

Dear Chairwoman Johnson, Ranking Member Lucas, and staff of the House Science, Space, and Technology Committee,

Thank you for this opportunity to submit ideas for how the United States can address and mitigate the impacts of the COVID-19 crisis.

The mission of many Federal science agencies, in addition to their core research work, includes engaging the public with current scientific research; educating Americans in science, technology, engineering, and math (STEM); and seeding tomorrow's workforce. Indeed, the COVID-19 pandemic emphasizes the importance of providing tools for the public to evaluate scientific information, bolstering community science literacy, and engaging the public in conversation about scientific issues. We urge the Committee to ensure that any investment in U.S. research and development (R&D) to aid in the response and recovery from COVID-19—both near-term and long-term—should incorporate funding for public engagement, science communication, and science learning as essential elements.

Organizations like science and technology centers and museums, children's museums, zoos and aquariums, natural history museums, planetariums, along with arboreta and botanic gardens, play a leading role in engaging the public with science¹ and are among the nation's most trusted institutions.² Each year, hundreds of millions of Americans of all ages and backgrounds visit these institutions and/or participate in their programming.³ These nonprofit organizations spark interest and activate learning through public participation in scientific research in the field and laboratory,

¹ Public perceptions of the STEM learning ecology – perspectives from a national sample in the US. (2020). Authored by Rupanwita Gupta, John Voiklis, Shelley J. Rank, Joseph de la Torre Dwyer, John Fraser, Kate Flinger, and Kathryn Nock. In the *International Journal of Science Education, Part B*, DOI: 10.1080/21548455.2020.1719291

² *Museums and Public Opinion 2017* from the American Alliance of Museums and Wilkening Consulting. Retrieved from www.aam-us.org/programs/about-museums/museum-facts-data

³ *Encountering Science in America* (2019) from the American Academy of Arts and Science. Retrieved from www.amacad.org/publication/encountering-science

educational exhibitions, thought-provoking collections, hands-on and experiential programming, collaborations with STEM professionals, public dialogue and deliberation forums, and community-science events.

In the immediate response to the COVID-19 pandemic, science and technology centers and museums are leveraging their high level of public trust to provide education on COVID-19 and fight misinformation about its spread, including through online engagement programs while museums across the country are temporarily closed to the public. For example, prior to its temporary closure, the New York Hall of Science produced an exhibit on coronavirus and made it freely available to other institutions around the world.⁴ Several science centers hosted public forums on the emerging pandemic, connecting their communities with experts in public health to provide direct access to information.

Science and technology centers, natural history museums, and other museums are among the institutions supporting local healthcare workers and first responders, including by donating personal protective equipment (PPE) to local medical professionals and using 3D printers and maker spaces to make more PPE. They are contributing computing resources to aid in the fight against COVID-19,⁵ offering their facilities to host blood drives, providing emergency childcare for families of first responders and healthcare workers,⁶ distributing science kits for at-home learning and food, and even hosting meetings of state legislatures.⁷

By empowering the public with the information to make evidence-based decisions and lower their risk of contracting or spreading disease, science and technology centers and museums help sustain healthy and resilient communities and reduce the chances of an increase in discrimination or xenophobia often incited by global diseases. These centers and museums are community anchors, and in the long term they can build community-level science understanding and capital, which is so critical in societal crises that require making evidence-based decisions, such as this pandemic. These trusted institutions also develop innovative responses to community needs, made possible in part through enduring relationships with a range of partners, including school districts, youth-serving nonprofits, community-based organizations, public libraries, local businesses, and more.

Through the work of informal science learning and engagement institutions, Federal agencies such as the National Science Foundation (NSF), the National Aeronautics and Space Administration (NASA), and the National Oceanic and Atmospheric Administration (NOAA) have historically invested in the evidence-based development and implementation of STEM-learning initiatives that engage the public in STEM and educate K–12 learners and their families. Additional agencies under the House Science, Space, and Technology Committee’s jurisdiction—including the Department of Energy’s Office of Science and DOE national labs, the Environmental Protection Agency, NOAA

⁴ www.astc.org/member-news/science-behind-the-news-coronavirus-sharing-resources/

⁵ www.frostscience.org/frost-science-boinc/

⁶ www.discoverycenter.org/wp-content/uploads/2020/03/Press-Release_Emergency-Care.pdf

⁷ www.wtvr.com/news/local-news/virginia-senate-to-hold-session-at-science-museum-of-virginia

offices beyond the Office of Education, and the National Weather Service—could also partner with and support science and technology centers and museums to advance public engagement with science, STEM education, and workforce development.

Our community's ideas are presented below within the framework suggested by the Committee:

1. Opportunities for Additional R&D and Related Activities Specific to COVID-19 Response and Recovery

- a. NASA, NOAA, and NSF have long funded a diversity of projects to communicate science and STEM to the public, like development of science media, K-12 outreach, museum exhibitions, capacity-building professional networks and museum-based scientific research, including research experiences for undergraduates, younger students, and the public that often forms the foundation for public exhibitions, publications, and educational programs. Leveraging this existing expertise to grow and deepen public-engagement and -learning efforts around the science of COVID-19 and other public health insights can ensure our nation is prepared for future global crises where evidence-based decision making is critical.
- b. NSF's Education and Human Resources (EHR) directorate presents a multitude of R&D opportunities for STEM education. All types of education—K-12, trade schools, undergraduate research experiences, informal learning, etc.—are quickly pivoting to online, virtual, and distance learning models. To ensure that equity issues are addressed in these emerging modalities, new funding could be provided to NSF EHR to support informal science learning institutions as they draw on the existing body of research and evidence-based practices within EHR's portfolio to develop effective STEM learning related to COVID-19, public health, and science generally, including online and with populations underrepresented in STEM fields and individuals from underserved communities

2. Near-Term Response to COVID Impacts on the larger Research Enterprise

- a. NASA, NOAA, and NSF should be provided any needed flexibility with their research and informal STEM education grantees, including the ability to offer urgent operational support to maintain previous investments. These agencies should also be encouraged to use the expertise and existing educational products developed with previous support to inform the online learning and engagement opportunities informal STEM learning professionals are developing now.
- b. NSF, NOAA, and NASA research and educational programs that engage STEM students could provide operating support for informal STEM learning institutions, including science and technology centers and museums, that

administer fellowship⁸ and internship⁹ programs providing STEM students with learning and on-the-job training for science research and engagement.

3. Long-term Economic Stimulus and Recovery

- a. Ensure that new research and development funding awarded to science agencies is accompanied by funding for public engagement in science, public dialogue and deliberation forums about science and public health issues (which can be facilitated by science museums in partnerships with local partners), and STEM learning, to ensure all Americans have increased opportunities to participate in the U.S. scientific enterprise, pursue careers in STEM, and benefit from the results of research.
- b. Consistent with the Administration’s Federal 5-Year Strategic Plan for STEM Education,¹⁰ support funding for STEM education programs with emphasis on a “pathways” approach to workforce development, rather than a “pipeline” model,¹¹ to support STEM engagement among learners of all ages. People build STEM knowledge, skills, and interest throughout their lives and participation in informal STEM learning programs can supplement classroom learning at the K–12, postsecondary, and graduate levels, and impact a person’s career interests and choices. Ensuring lifelong access to quality STEM education and learning opportunities prepares American citizens for careers of the future.
- c. Support sustained and increased funding for science engagement in communities nationwide. Museums support 720,000 American jobs annually,¹² and talented experts in public engagement, science communication, and informal STEM education are employed at these institutions. Across the country, science centers and museums are facing widespread furloughs and layoffs due to the dramatic loss of earned revenue during mandated closures.

Both the recovery of our nation from this emergency—and longer-term efforts to advance public health and scientific research to prevent and minimize the impact of future similar events—depend on engaging the public in scientific issues and inspiring students to pursue STEM careers. Science and technology centers and museums—along with children’s museums, natural history museums, nature centers, aquariums, zoos, planetariums, arboreta and botanic gardens, multi-disciplinary museums with major science programming, as well as small businesses, consultants,

⁸ Example: www.floridamuseum.ufl.edu/science/2019-nsf-graduate-fellowships

⁹ The New York Hall of Science’s Science Career Ladder program is an internship for high school and college STEM students: <https://nysci.org/learninglab/youth-development/science-career-ladder>

¹⁰ See Charting a Course for Success: America’s Strategy for STEM Education (2018) here: www.whitehouse.gov/wp-content/uploads/2018/12/STEM-Education-Strategic-Plan-2018.pdf

¹¹ A study of the National Education Longitudinal Study of 1988 showed that people take many different paths into STEM college majors and careers (Cannady, Greenwald, & Harris, 2014). See also “STEM to What Ends? Pipelines, Pathways, and Agency” in Broadening Perspectives on Broadening Participation in STEM (pg. 6-8) from the Center for Advancement of Informal Science Education. Retrieved from www.informalscience.org/sites/default/files/BPreport.pdf

¹² Museums as Economic Engines: A National Study, commissioned by the American Alliance of Museums and conducted by Oxford Economics, 2017. Retrieved from www.aam-us.org/2018/01/19/museums-as-economic-engines

and other nonprofit organizations that share an interest in science education and public engagement in science—are critical to this future. We urge you to consider the variety of ways these institutions, in partnership with Federal agencies, can increase public understanding of science in the face of the current crisis.

Sincerely,

American Alliance of Museums (AAM)
www.aam-us.org

Association of Science and Technology
Centers (ASTC)
www.astc.org

American Public Gardens Association (APGA)
www.publicgardens.org

Association of Science Museum Directors
(ASMD)
www.asmd-us.org

Association of Children’s Museums (ACM)
www.childrensmuseums.org

Association of Zoos and Aquariums (AZA)
www.aza.org