



STEM Kit Program Guide for State Libraries

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Science-Technology Activities &
Resources For Libraries



TABLE OF CONTENTS

[FOREWORD](#)

[ACKNOWLEDGEMENTS](#)

1. OVERVIEW

- A. [Introduction](#)
- B. [State Library Agency Activities](#)
- C. [How to Use This Guide](#)

2. MANAGING A STEM KIT PROGRAM

- A. [Introduction](#)
- B. [Promoting STEM Kits to Public Libraries](#)
- C. [Managing the Circulation of STEM Kits to Public Libraries](#)

3. TRAINING LIBRARY STAFF TO USE STEM RESOURCES

- A. [Introduction](#)
- B. [Strategies and Methods to Train Public Library Staff](#)
- C. [STEM Workshops for State and Public Library Staff](#)

4. ENGAGING UNDERSERVED STEM AUDIENCES

- A. [Introduction](#)
- B. [State Libraries - Working Internally to Engage Underserved STEM Audiences](#)
- C. [Help Public Libraries Engage Underserved STEM Audiences](#)
- D. [Challenges Encountered by State Libraries](#)

5. BUILDING RELATIONSHIPS WITH SUBJECT MATTER EXPERTS

- A. [Introduction](#)
- B. [In-person Library Programs](#)
- C. [Virtual Library Programs Featuring Scientists](#)

6. APPENDIX

- A. [STEM Kit Program Resources](#)
- B. [Training Library Staff Resources](#)
- C. [Underserved STEM Audiences](#)
- D. [Resources for Engaging NASA Volunteers](#)

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FOREWORD

One of the hallmarks of success for a State Library Agency is the provision of effective support and leadership. The ways in which this is demonstrated vary by at least 54, the current number of states and territories that comprise the membership of the Chief Officers of State Library Agencies (COSLA). These organizations have several characteristics in common though. They provide unparalleled reach into communities through access to virtually every public library in the United States. State Library Agency staff are influential leaders, skilled at working together to share promising practices, successes, and challenges. The agencies and the staff are trusted partners, working at the intersection of local libraries and state, even national, organizations. It is against this backdrop that beginning in 2016, COSLA was pleased to join with *NASA@ My Library* to help engage, select and monitor the progress of eighteen State Library Agencies in this national earth and space science education initiative.

As Executive Director, over the past five years I've had the pleasure of watching this project blossom. COSLA periodically has promoted the results of this project to our members and offered advice on the project's professional development activities and final products. We are excited now to have this guide to support State Library Agency staff in efforts to engage public libraries in STEM programming. The participating State Library Agencies were central to the project's success. They formed a community of practice between themselves and other project partners. A major focus of their work was on managing an earth and space science kit loan program that public libraries in their states used to offer programming to their patrons. The results are impressive!

- Two different STEM kits were created, and the State Libraries made over 240 copies of the kits. They promoted them to their public libraries, trained library staff, and loaned the kits a total of 681 times. (There are 2400 public libraries in these 18 states - which means collectively they were able to reach about 25% of their libraries.)
- They used the kits to prepare their public libraries for a very successful 2019 Collaborative Summer Library Program that focused on "*A Universe of Stories*".
- The response from the public libraries was very positive. 90% *agreed or strongly agreed* that they would like to receive similar kits in the future, and that the kits were easy to use (87%). Public library staff appreciated the kit materials and accompanying resources, noting that having ready-to-go activities from a reliable source made it easy for them to implement STEM programming in their library. They shared many stories about how patrons of all ages were engaged in the programs, especially because they had the opportunity for fun, hands-on learning, and discovery. Others mentioned that the programs made patrons want to explore and learn more, and for a few, even sparked an interest in STEM-related careers.

This Guide for State Library Agencies presents many of the best practices that they developed and shared with their colleagues during the project. I know that you will find it helpful as you promote STEM in libraries and participate in *NASA@ My Library* activities in the years to come.

Timothy Cherubini
Executive Director
Chief Officers of State Library Agencies (COSLA)

ACKNOWLEDGEMENTS

The success of *NASA@ My Library* STEM Facilitation Kit lending program rests firmly on the shoulders of our eighteen State Library agency partners. For more than 18 months, they provided sound counsel, created and managed lending processes for their public libraries to access these kits, and participated in our project evaluation plan. During this time, nearly 700 public libraries and over 20,000 library patrons used these kits to learn about NASA science discoveries and enjoy space science learning experiences. Please accept our special thanks.

State Library Agency Partners

(Hyperlinks below are *NASA@ My Library* state library web pages)

Alaska	Daniel Cornwall
Alabama	Melissa Smith
California	Lena Pham
Colorado	Beth Crist
Connecticut	Gail Hurley
Idaho	Deana Brown
Indiana	Kara Cleveland and Beth Yates
Maryland	Carrie Sanders and LaShawn Myles
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SECTION 1: OVERVIEW

1A. Introduction

The purpose of this Guide is to support state library agency efforts to engage their public libraries in successful and effective programming in Science, Technology, Engineering and Mathematics (STEM). It presents the best practices and accompanying resources that occurred as a result of state libraries participating in a project called *NASA@ My Library*.

The Space Science Institute’s (SSI) National Center for Interactive Learning (NCIL) manages the *NASA@ My Library* project. This guide was prepared for the nation’s State Library Agencies (SLAs). The Chief Officers of State Library Agencies (COSLA) was a valued partner.

Between 2018 and 2020, SLAs worked with *NASA@ My Library* and NASA to engage their public libraries in increasing STEM learning opportunities for library patrons. The project evaluation was conducted by Education Development Center (EDC). A range of formative and summative evaluation methods were used to understand the experiences of participating SLAs and the public libraries in their state that received a circulating STEM kit. Evaluation results and recommendations from EDC’s [Summative Evaluation Report](#) (hereafter referred to as the “EDC Report”) are presented throughout the Guide.

About *NASA@ My Library*

Through the *NASA@ My Library* project, NASA, public libraries, and state library agencies work together to increase and enhance STEM learning opportunities for library patrons throughout the nation. *NASA@ My Library* is made possible through the support of the [National Aeronautics and Space Administration \(NASA\) Science Mission Directorate](#) (SMD) as part of its [STEM Activation program](#).

The project is designed to promote access to NASA science discoveries and provide learning experiences to persons of diverse backgrounds. NCIL – together with project team partners American Library Association, Cornerstones of Science, Lunar and Planetary Institute, and Education Development Center – aim to advance the NASA SMD vision for education by engaging public audiences nationwide in informal and lifelong learning.

NASA@ My Library leveraged the [STAR Library Network](#) (STAR Net), a library community resource developed by NCIL. STAR Net helps library professionals facilitate STEM learning for their patrons by providing “science-technology activities and resources” (STAR) and training to use those resources. The *NASA@ My Library* team engaged key stakeholders (e.g., NASA subject matter experts, public

Commonly used acronyms:

- CoS:** Cornerstones of Science
- DEIA:** Diversity, Equity, Inclusion, & Accessibility
- EDC:** Education Development Center
- LPI:** Lunar and Planetary Institute
- NASA:** National Aeronautics and Space Administration
- POPNet:** Portal to the Public Network
- SLA:** State Library Agency
- STEM:** Science, Technology, Engineering, & Mathematics
- STEAM:** STEM + Arts
- SSI:** Space Science Institute
- STAR Net:** STAR Library Network
- SME:** Subject Matter Expert

library partners, and state library partners) centered around high-profile NASA, Earth, celestial, and library events (e.g., 2017 solar eclipse, Earth Day, and summer learning events at libraries). Key activities included stakeholder engagement, resource and experience development, professional development, a research project regarding patron interest development, and a comprehensive project evaluation effort. Visit the [NASA@ My Library](#) page for more information.

1B. State Library Agency Activities

The principal reasons *NASA@ My Library* partnered with state libraries on a STEM kit program included: (1) state libraries can build on their efforts to share resources and best practices statewide by distributing materials to public libraries; (2) public libraries want a self-contained kit that contains easy to use materials to implement a quality STEM program for their patrons; and (3) it is most economical to create loanable kits that can be used by many public libraries. The result was state library staff were more confident in promoting earth and space experiences, public libraries were able to offer relevant and effective programming, and library patrons became more knowledgeable about earth and space science.

Participating state library agencies performed four key roles (see Figure 1 below):

1. Circulated multiple STEM Kits to public libraries in their state;
2. Participated in professional development for State Library staff and offered training to public library staff;
3. Built relations with NASA and other space science organizations through connections with subject matter experts; and
4. Served as *NASA@ My Library* advisors to offer advice, share insights, and lessons learned with other state libraries.

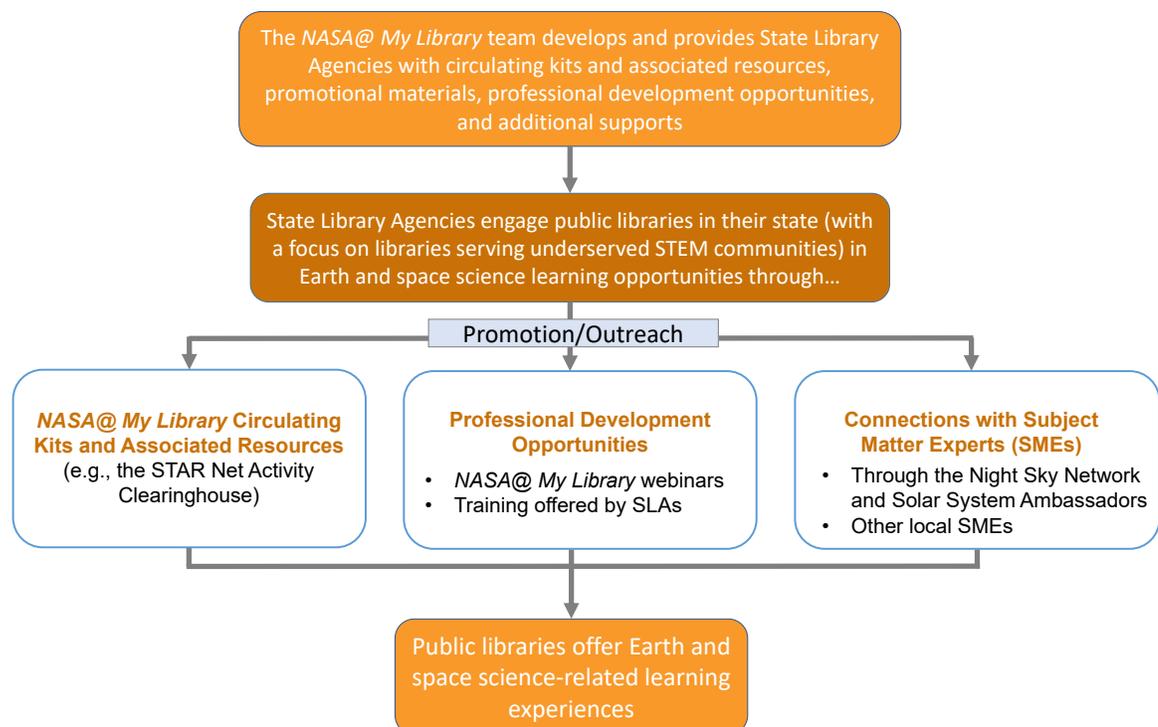


Figure 1. The *NASA@ My Library* Model of State Library Engagement

Summer Space^{of}

Celebrating 60 Years
of Space Exploration



Building on the 2019 Summer Learning Event

State libraries across the country (including the ones participating in *NASA@ My Library*) provided resources and programs for the 2019 summer reading event called “A Universe of Stories” that was led by the [Collaborative Summer Library Program](#) (CSLP). *NASA@ My Library* and CSLP formed a partnership to coincide with NASA’s [60 years of achievement](#) and its celebration of the [50th Anniversary of the Apollo 11 Moon Landing](#). *STAR Net’s Summer of Space* (SoS) campaign was chosen to serve both NASA and CSLP interests. The webpage included numerous free STEM resources that libraries used to promote space exploration such as a collection of vetted STEM activities, giveaways, partnership opportunities, media templates, printables, and a collection of spectacular images and videos.



Figure 3. 2019 Summer of Space event.
Credit: Fort Meade Public Library, FL

1C. How to Use This Guide

This Guide is a valuable resource that all state libraries can use when implementing a circulating STEM kit program in their state. While *NASA@ My Library* focused on earth and space science, the lessons learned apply to all STEM content areas. Summarized below are the best practices that the state libraries developed that are organized in the following four sections: Managing a STEM Kit Program; Training Library Staff; Engaging Underserved Audiences; and Working with Subject Matter Experts. In the report these areas are supported with “Tips” and vignettes from the State Library Partners along with relevant evaluation results.

Section 2: Managing a STEM Kit Program

This section describes how two different loanable STEM Facilitation Kits were developed and duplicated; the roles SLAs had in promoting and circulating these kits to their public libraries including their best practices and tips; and adaptations they made for particular audiences such as the visually impaired and Native Americans. The best practices that emerged included:

Promoting STEM Kits to Public Libraries

[Best Practice #1](#): Use multiple promotional methods

[Best Practice #2](#): Use state and regional library training events to engage public library staff

[Best Practice #3](#): Use multiple methods to reach public library staff

[Best Practice #4](#): Engage community partners

[Best Practice #5](#): Connect with related science events

Managing the Circulation of STEM Kits to Public Libraries

[Best Practice #1](#): Make it easy for public libraries to get a kit

[Best Practice #2](#): Anticipate circulation challenges

[Best Practice #3](#): Provide an adequate length of time to circulate a kit

[Best Practice #4](#): Collect user evaluations

Section 3: Training Library Staff to use STEM Resources

This section describes how *NASA@ My Library* offered state and public library staff training on several key themes including increasing staff confidence with STEM content and facilitating earth and space science programming; engaging and working with NASA experts including building effective partnerships; and engaging underserved STEM audiences in an intentional manner. Different types of training were designed and conducted by the *NASA@ My Library* team. The best practices that emerged included:

[Best Practice #1](#): Be clear about training program objectives

[Best Practice #2](#): Focus training on hands-on learning

[Best Practice #3](#): Make it easy and fun

Section 4: Engaging Underserved STEM Audiences

This section describes how the State Library Partners worked to engage all members of their communities including underserved STEM audiences. They recognized that they need to be more intentional in their strategies and developed an *Underserved and Underrepresented STEM Audience Strategy* for their state that guided their work – both internally and when they engaged their public libraries. Their intention was to be systematic in identifying these audiences and to then work with their public libraries on reaching these underserved STEM audiences. The best practices that emerged included:

[Best Practice #1](#): Develop intentional strategies and timelines to engage selected underserved audiences

[Best Practice #2](#): Support the efforts of public libraries to directly engage underserved STEM audiences

Section 5: Building Relations with NASA and Science Experts

This section describes two types of subject matter experts (SMEs). Professional experts such as NASA-funded scientists, planetarium and museum staff contributed their knowledge of space science. Avocational enthusiasts such as amateur astronomers were available through NASA volunteer networks and other methods. They can make in-person and virtual presentations, provide science resources, provide advice, and support staff professional development. The best practices that emerged included:

[Best Practice #1](#): Help public libraries Identify SMEs

[Best Practice #2](#): Help public libraries collaborate with SMEs

[Best Practice #3](#): Use technology to feature a SME



Star viewing at the Deaf Smith County Library, Hereford, TX.
Credit: Deaf Smith County Library

SECTION 2: MANAGING A STEM KIT PROGRAM

2A. Introduction

The National Center for Interactive Learning and Cornerstones of Science worked collaboratively to develop two different earth and space science facilitation kits that contained scientifically accurate, “ready-to-go” high quality science activities.

Kit 1: Sun-Earth-Moon Connections focuses on activities and experiences that better help patrons understand their place in space, and how the Sun and Moon interact with our planet. Major content areas in this kit included modeling both lunar and solar eclipses with easy to use tools, detecting ultraviolet light in a creative way, using sorting cards to explore concepts relating to size, distance, and temperature, and an experiential activity that allows for a greater understanding of the vast scale of our Solar System and beyond. The kit included a pair of Sunoculars for solar viewing and materials including work sheets for fun hands-on activities such as Modeling Meaningful Eclipses, “UV Kid” and “Jump to Jupiter”. See this [YouTube video](#) for more information about Kit 1.

Kit 2: Be a NASA Detective focuses on how scientists learn about phenomena that we cannot see with our naked eye and the tools that scientists use to make these observations. Major content areas in this kit included night-sky viewing, magnetism, data collection and processing, scale modeling, applying the elements of art to express scientific information, and the properties and characteristics of light. The kit included a small telescope and pair of binoculars, an infrared thermometer and magnets to expand patrons’ understanding of the process of science. See this [YouTube video](#) for more information about Kit 2.



Figure 4. Kit 1: Sun-Earth-Moon Connections.
Credit: NCIL/SSI



Figure 5. Kit 2: Be a NASA Detective.
Credit: NCIL/SSI

Each Kit Included:

- STEM programming for Pre-K to adults, and story-time books;
- A facilitation guide for library staff or others to assist their work with patrons and to understand the science behind the activities;
- NASA space science information and [tactile resources](#);
- Links to STAR Net’s [STEM Activity Clearinghouse](#) where additional activities are available.

Participating public libraries – 90% reported they were *very* or *extremely satisfied* with the support they received from their SLA in the use of the Kit and 90% agreed that they would be interested in *receiving additional STEM kits in the future*.

Source: EDC Report

“Having a Facilitation Guide and all of the steps available that were backed up with videos made it so that when our public libraries felt uncomfortable about their ability, they were able to go read it, look it up, and see somebody else doing it.” State Library Partner

The Kit Development Process

The development of the kits started with a concept plan that included the following elements: [Learning Objectives](#), [Kit Activities](#) (including name, connections to 2018/2019 events and NASA missions, and key concepts); [Science Tools](#) (e.g., binoculars, telescopes); [Books](#) (e.g., *Moonbear’s Shadow*, *Secrets of Our Earth*); [Evaluation Plans](#); [Costs](#); and [Timeline](#).

Each participating state library received one copy of Kit 1 and two copies of Kit 2. Most State Library Partners made duplicate copies to expand the reach of circulation within their state.

Program Highlights

- In total, 240 kits (146 of Kit 1 and 94 of Kit 2) were distributed by eighteen State Libraries to their public libraries.
- Based on 357 surveys collected from public libraries that received a kit over 16,000 patrons attended kit-related programs over a 12-month period.
- 70% of participants were elementary-aged and families attended 68% of programs together.
- 94% of SLAs reported that the kit materials were very useful to their public libraries.
- Many state and public libraries supplemented the basic kit contents with additional resources.

Tips from State Library Partners

"We created Quick Startup guides and placed them in the kits for the library staff to see upfront, right when they open the kits. We also made laminated cards for library patrons to accompany the activity items in the kits. I believe this approach makes it as simple and quick as possible for library staff to utilize the kits."

The eighteen State Library Partners most frequently used the kits as follows:

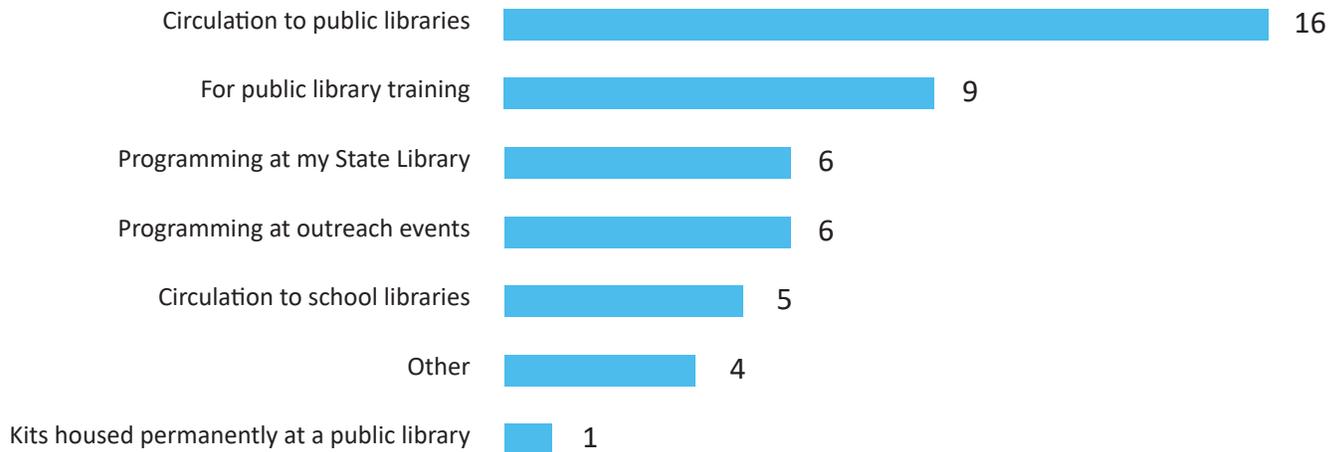


Figure 6. Different ways that State Library Partners used their two STEM Kits.
Source: EDC Report



Library Staff learn how to conduct the [Strange New Planet](#) activity.
Credit: NCIL/SSI

2B. Promoting STEM Kits to Public Libraries

Participating SLA staff agreed that effective promotion has three ingredients: a clear understanding of what motivates public library staff (e.g., library director, youth services, STEM coordinator) and using effective methods to get them to take action; developing and rolling-out promotional materials; and implementing word-of-mouth strategies during the distribution phase. The approach State Library Partners used to engage staff in public libraries was also affected by the type and location of these libraries (e.g., large urban to small rural settings, libraries with significant underserved STEM populations such as native Americans, those with multiple cultures and languages spoken).

Finally, the 2019 CSLP event (“Universe of Stories”) described in [Section 1B](#) provided a real boost for engaging public libraries in the project’s STEM theme of earth and space science.

Promotion, in the context of *NASA@ My Library*, is (1) the process of inviting public library staff to request the project’s loanable kits and providing them with clear information on how to do so, (2) engaging subject matter experts to enrich public library programming, and (3) supporting public library staff to better serve underrepresented STEM audiences in their community.



Best Practice #1: Use multiple promotional methods

State libraries found that placing materials on their webpage was particularly useful in promoting the kits because they could post links to various resources and provide information about the activities in the kits that library staff needed to help plan their subsequent programs. (See the Acknowledgements page for links to state library sites.) State libraries used a variety of additional methods to promote *NASA@ My Library* circulating kits and curated earth and space science learning resources to public libraries. These included: listservs, newsletters, flyers, archived webinars, monthly public library chats, social media (e.g., blogging, posting, media sharing, tweeting, pinning, bookmarking, commenting on social media websites, teen message boards, [LibGuide](#), Facebook, and Instagram), circulating the [Kit Facilitation Guides](#) in advance of lending, and promotion at in-person trainings and conferences.

Tips from State Library Partners

“We did do a variety of promotions from a press release, to creating a project [libguide](#), and promotions through our newsletter, library listservs, and in-person workshops and events. The in-person events were the most effective, followed by information distributed through the library listservs and newsletter.”

**Best Practice #2:****Use state and regional library training events to engage public library staff**

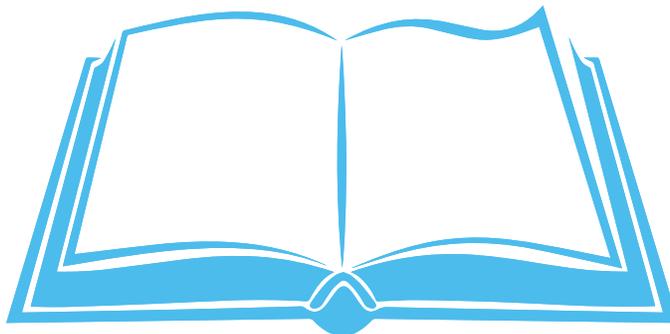
Public libraries rely on and trust state library staff and consultants. State and regional library events (e.g., conferences, professional development workshops, training sessions, special events for Youth Services Coordinators) enable in-person promotion and allow hands-on experience with the kits and proved to be very effective at increasing library interest in reserving the kits. Some SLAs were able to help public library staff plan events in advance of receiving a kit. It's noteworthy that some previous experience with the kits during a training event was important. Librarians, without this experience, often felt intimidated by the topic or the amount of material in the kits. Seeing how everything was used made them feel more confident and interested in implementing kit activities.

Tips from State Library Partners

"Despite promoting and sharing resources, we didn't have a lot of interest in the kits until librarians saw them in person and had someone show them a few activities during training. Naturally there was some hesitancy to jump in by the public libraries."

"In some instances, we offered "first dibs" on booking the kits to those that attended these training sessions. Allowing libraries to reserve the kit at these events also proved to be effective."

"The project coordinator attended two regional Children's Librarians Roundtables to talk about the project and kits. She also presented a program with colleagues from Harvard at the annual Library Association Conference called Exploring Space with NASA. Besides describing the project this was an opportunity to demonstrate the kits and sample activities and talk about working with the Solar System Ambassadors and Night Sky Network. In addition to the presentation, we had an exhibit table in the conference hall to promote the project to the attending librarians through the two days of the conference."



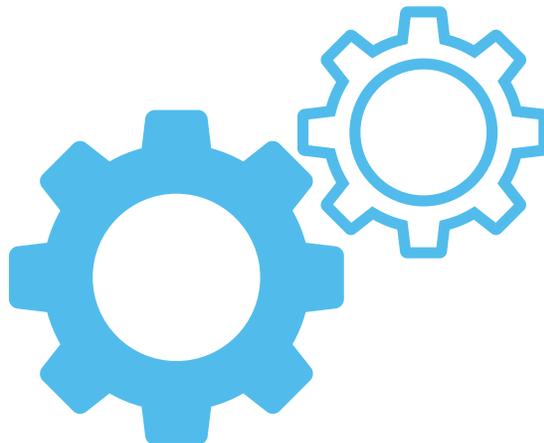


Best Practice #3:

Use multiple methods to reach public library staff

State Library Partners used many different methods to promote the kits to public library staff. Examples they found effective included:

- Distribute flyers and other promotional resources (see [Appendix A2](#) for samples) to their libraries such as links to “kit unboxing” [YouTube videos](#). Some noted that their listserv does not allow them to attach documents. In this instance, they used the flyers to create a descriptive narrative that directed people to the state library project webpage was helpful. Effective flyers described the contents of the kits. Public libraries often adapted the flyer and used it to promote upcoming events at their library. There was space for them to insert an inspirational, locally relevant image to capture attention, convey a message, and arouse curiosity by library patrons.
- Host an introductory webinar for librarians to explain how the kits can be used and the process for reserving and circulating them. Archive the session and then publicize.
- Make personal phone calls to public library staff that would benefit from the kits (e.g., reaching underserved STEM audiences, small rural libraries, etc.). This provided them with the opportunity to market the kits and answer questions immediately.
- Assemble a bibliography of current popular fiction and nonfiction titles on space-related topics (e.g., Native American lore concerning the skies and the world around us). These proved useful in sustaining interest and promoting the kits year-round.
- Expand the appeal of a kit to underserved STEM audiences such as adapting it to make it accessible to the visually impaired.
- Encourage public libraries that use a kit to share their kit experiences through social media, videoconferencing and e-mail messages with their colleagues. They could also network with neighboring libraries to encourage them to use the kit. Secure and promote testimonials.





Best Practice #4: Engage community partners

State libraries worked with existing and new community partners (e.g., space science volunteers, museums, teachers, and NASA volunteer networks). They helped to nurture the interest of library staff in offering STEM programming. *STAR Net's [Community Dialogue Framework](#)*, described in Section 4, is a great tool for libraries to use to build key partner organizations who can help them promote a STEM kit program and even provide financial support to maximize its impact.

The Montana State Library has partnered with the Museum of the Rockies since 2012 to create activities, curriculum, and materials to support summer reading programs in public libraries across the state. *"Each year we create a summer reading kit based on the CSLP theme and the museum's thematic holdings. Then we distribute the kits to public libraries to use and share with their patrons over the summer."*

Tips from State Library Partners

"We created new partnerships with other organizations such as the New England Air Museum where we were able to have an exhibit table at their annual Space Expo. They loved including the State Library and put us on their promotional materials as one of the main exhibitors. We also met with other exhibitors from museums and science-related organizations."

"We learned there was a NASA Research Center on the State University campus and reached out to them. We organized a joint program for public, academic and school libraries to come and see the types of materials available to them."

"My advice is to do some basic research to find out about all the related organizations you may have in the state and reach out to see if there is anything you can do with them in terms of sharing resources, presenting programs, etc."



Best Practice #5: Connect with related science events

Prepare an interactive calendar that highlights recurring and special earth and space science-related events including links to associated activities and promotional materials. Promote the calendar to stimulate kit requests by libraries (e.g., *NASA@ My Library's Our Planet: EARTH campaign will be this coming April - what a great reason to check out a kit!*). Develop activities that are tied to earth and space events to sustain interest in and relevance of the kits. Check out [NASA's Science Page](#) for upcoming mission events and resources. *STAR Net's [Events Page](#)* is also a useful resource.

2C. Managing the Circulation of STEM Kits to Public Libraries

Many state libraries have considerable experience in circulating loanable kits to public libraries that either public library staff use to offer programs or that public library patrons may check-out and use. Others were new to the logistics of sharing kits statewide. During the project, State Library Partners were able to share their experiences with their colleagues and learn from each other.



Astronaut John Herrington at Donnelly Public Library, ID.
Credit: Donnelly Public Library



Best Practice #1: Make it easy for public libraries to get a kit

State Library Partners developed simple and efficient processes to receive requests from public libraries and to manage the circulation of loanable kits.

Step #1 - Receive requests from public libraries

A state library webpage (see hyperlinks on [Page 4](#)) with an online reservation/booking request system proved to be easiest for busy public library staff to use at their convenience and for state library agency staff to receive requests. Various commercial products were used such as KitKeeper, Springshare, My Turn, Google Kit request forms and calendars. These webpages can be associated with the state's online catalogue system, contain Machine-readable Cataloguing (MARC), and use existing interlibrary loan mechanisms that public libraries are familiar with.

On their webpage, State Library Partners described: the contents of each kit, the activities that could be facilitated by library staff with their patrons, the intended ages for the activities, and consumable items that the receiving library may have needed to provide when conducting kit activities.

Step #2 - Manage public library requests for a kit

State libraries used a variety of methods to internally manage public library kit requests and to track circulation. These methods best fit staffing capacity, expertise, and existing management frameworks. Requests for kits were often reviewed against lending criteria, including competing requests. Schedules were then developed, and libraries notified.

Tips from State Library Partners

"After each request is processed, the library is sent a confirmation email. The email confirms the week that the library will have the kit and the return date. We attach a PDF of the Kit Facilitation Guide. This allows the libraries to preview the materials and plan programming prior to receiving the kit materials. A second email is sent to the library when the kit is shipped to them. After the loan period is over libraries receive an email reminding them to return the kit and to complete the user survey."

"We interviewed other libraries to learn how they handled STEM kits and assessed our shelving space. We then weeded our collections to create space. We created a collection development policy and collaborated with Technical Services regarding the ordering, cataloging, and processing. Finally, we developed a return policy that placed the responsibility of checking the contents on Youth Services (not Circulation)."



Best Practice #2: Anticipate circulation challenges

During the project, State Library Partners sometimes encountered circulation challenges. The following checklist addresses some of the challenges encountered and provides a useful tool for state libraries to use in their future programming.

Circulation considerations	Yes	No
Is there adequate state library staff capacity to manage circulating kits and space to store the kits?		
Are kit items in sturdy totes that can be easily accepted by shipping vendors and that are not too heavy or awkward for library staff to handle?		
Are there size restrictions for interlibrary loan deliveries?		
Can kit activities be packaged individually to make it easier for public library staff to use?		
Can we coordinate the transportation of a kit to and from the receiving public libraries including the use of the state library delivery/courier system or commercial vendors?		
Can our website provide the resources public library staff need to fully use the kit activities?		
Can we offer to provide pre-paid return shipping labels? (Or make return postage reimbursement contingent on the library completing a user evaluation.)		
Do we have a plan to replace broken, missing, and consumable items in the kit and repacking the kit to prepare it for redistribution?		
Do we have a plan to maintain sufficient supplies of kit consumables?		

Tips from State Library Partners

“The regional State Library offices that provided hands-on in-service trainings (e.g., that allowed the librarians to see the kits at work) had the most success in circulating the kits. Those that relied on emails and presentations at board meetings had lower circulation requests.”

“In order to keep track of missing or damaged pieces, staff created a spreadsheet to outline the workflow on when we would need to replace parts. She or a volunteer then tested the kit to see if it could still be used without the part and would create a note of what was missing. One problem encountered is that it is sometimes difficult to relay to vendors what pieces you need to reorder.”

“Our kits included a sticker that inventoried what was contained in the kit and also noted what consumables or perishables were not included and would need to be provided by the library. We also included a baggie of “extras” in the kits for replenishing materials while being used by a library. Having this ‘replenishable’ bag of materials ensured no emergencies arose during use by library staff.”



Best Practice #3: Provide an adequate length of time to circulate a kit

State libraries planned for an average circulation period of 4 to 6 weeks and recognized that circulating a kit includes:

- transporting the kit to a library and the return (2-weeks in some instances to accommodate the chosen delivery system and weather conditions);
- public library staff familiarizing themselves with the activities (e.g., become comfortable with the contents);
- offering a variety of programs over several weeks (winter weather may affect the use of certain activities in a kit);
- returning the kit to the SLA (or sending it on to the next library) and completing a library survey (described below).

Tips from State Library Partners

“During the Summer of Space months, project staff personally delivered kits to libraries or at meetings where librarians were to maximize the time the libraries had with the kits to do their programming. In some cases, kits were passed off from one person to another at the same meeting. We also tried to do the bookings for each individual kit geographically to improve the amount of time each library would have with their kit.”



Best Practice #4: Collect user evaluations

State libraries placed a priority on public libraries completing a brief survey that provided information about their experience with the kits. Examples of information that can be collected include: the people served (e.g., number of attendees, age groups and underserved STEM audiences served); the programs offered (e.g., who led the programs, resources used, patron experiences); and library staffs’ experience with a kit (e.g., ease of accessing the kit from the state library, staff comfort/confidence in using a kit). This information can be used to shape all aspects of the kit circulation program including needed improvements. See [Appendix A3](#) for a sample user survey.

SECTION 3: TRAINING LIBRARY STAFF TO USE STEM RESOURCES



Figure 7. STEM Library Session at the 2018 ALA Conference
Credit: American Library Association

3A. Introduction

The purpose of the STEM training was to help library staff grow in their confidence by providing time to try hands-on activities and discuss implementation strategies with colleagues.

In-person workshops can be a valuable experience for participants. Workshops can be convened in association with a regional or state library event or as a separate training. Webinars can be a convenient way to connect, especially if participants can follow along with the activities and materials on their own and if ample time is provided for peer-to-peer discussion. State libraries also have an important role to play in communications by curating training videos, facilitation guides, and other resources and promoting them through established networks.

“Embedded within these methods is an underlying theme: giving library staff the confidence to provide STEAM programming. Some staff are apprehensive about STEAM programming if they think they’re going to be “teaching science”. They fear that they won’t know enough. Providing the training and demonstrating that the kits and associated online materials provide everything they need to lead the activities in their libraries successfully—and that they do not need to have prior scientific knowledge on the subject—is key.” State Library Partner

“We partnered with the Eastern Connecticut State University (a NASA Education Resource Center) and held an onsite program there called “Know Your STEM: Educational Resources and Where to Find them in CT.” Staff from academic, public, school and special libraries attended to learn about the resources we have at both of our locations and to hear about the NASA Education Collaborative.” State Library Partner

Types of SLA training provided to public libraries on the use of NASA@ My Library Kits:
(n=16; Sums to > 16 because State Libraries could select more than one answer)

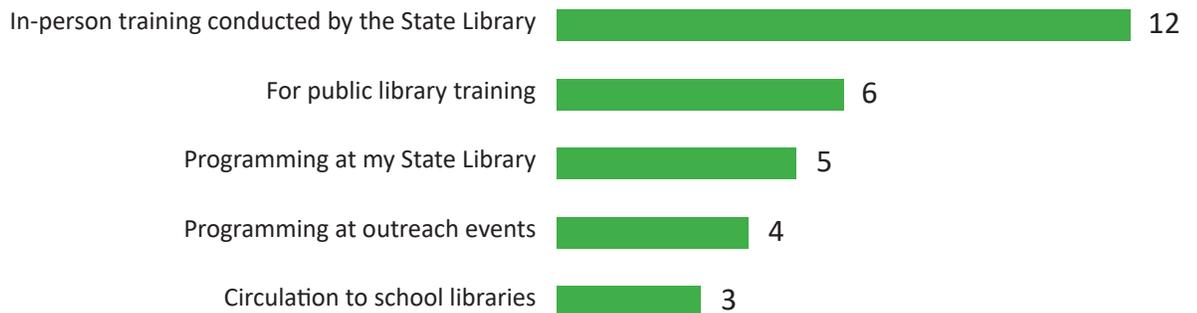


Figure 8. Different types of training used by State Library Partners.
Source: EDC Report

State Library Partners provided some in-person training to public libraries on the use of the two STEM kits. They reported that these face-to-face trainings were especially effective because they provided the opportunity for public library staff to see and interact with the materials, which helped increase their excitement and confidence around the kit activities. (See [STAR Net’s STEM Kit Resources](#) for other guides, material lists, and helpful hints to support training.)

State Library Partners used the [Unboxing Webinars and NASA STEM Kit Videos](#) created by NASA@ My Library as both a refresher as well as when in-person training was not available. Some mentioned that this allowed library staff to become familiar with the contents of the kits prior to checking them out. These resources helped facilitate their planning as well as avoid a situation where a library would check out a kit simply to see what was included without plans to use it for programming. These videos were promoted on several State Library Partner websites.

The training activities focused on using the program’s STEM Facilitation Kits ([Section 2](#)), strategies to engage underserved STEM audiences ([Section 4](#)), and how to find and work with subject matter experts ([Section 5](#)) including building effective partnerships. STAR Net’s [STEM Activity Clearinghouse](#) was a valuable resource for activities beyond just the ones found in the kits. For the 2019 summer learning event, a special collection of vetted STEM activities called [Universe of Stories](#) was assembled and promoted broadly to the library community.

In order to increase public library utilization of the STEM Facilitation Kits, state libraries designed a variety of trainings and often invited STEM experts to assist them. As a result, state and public library staff were able to increase their confidence with promoting the STEM content to their patrons and facilitating earth and space science programming.

Tips from State Library Partners

“Space and astronomy are topical areas in which many library staff have limited previous knowledge. Overall, STEM programming can become a bit intimidating for librarians and library staff to plan and implement. Training can make them more confident.”

“Having a trained scientist who was a capital-E expert come to speak to the librarians kind of blows their minds ... That was what gave them the enthusiasm to go back to their libraries and provide this [programming]. To me it’s about inspiring the librarians to go ahead and get engaged in the project. It’s not just this is a great resource, it’s that they were so amazed with the information that they couldn’t wait to go back and tell other people about it.”

“Many of our public library staff are unsure about STEM programming but they are realizing that they do not need to be experts in all the fields to facilitate programs.”

“Knowing exactly what’s in the STEM kit and knowing how to use its materials and activities makes it much more likely that people will apply for the kits and actually use all of the different parts.”



Figure 9. The NASA STEM Workshop hosted by the Alaska State Library.
Credit: NCIL/SSI

3B. Strategies and Methods to Train Library Staff



Best Practice #1:

Be clear about training program objectives

The *NASA@ My Library* training objectives for State Library Agency and public library staff were established in advance of receiving the kits. Key factors in implementing these objectives included:

- **Determine the focus and target ages for the session.** Is the focus on earth and space science programming, working with underserved audiences, or building partnerships with community-based organizations? Determine the age range for the science activities. Are the resources appropriate for pre-school, teens, or adults? (Be prepared for requests to revise activities for other audiences.)
- **Create an agenda.** Be prepared – your participants will know that you value their time. Begin with an engagement activity to focus participants on the training topic. Use a variety of presentation techniques (e.g., lecture, demonstration, discussion, small group, case study). See [Appendix B](#) for examples.
- **Prepare your materials.** As described below, STEM training relies on hands-on explorations, so many materials are required – and it can get messy! Participants may raise many novel ideas during the discussions. Consider posting a large sheet of paper or using a white board to capture off-topic discussions that you can return to when time permits or after the event.
- **Plan the training with input from your intended audience.** Consider what participants will want and need. For instance, if the training is intended to help children’s librarians prepare for infusing STEM into summer reading programs plan to hold it before they have finalized their summer programs. If scheduling does not allow in-person training at an optimal time, how-to-videos can be used to provide just-in-time training. Ongoing training is available through [STAR Net’s Webinar Series](#).
- **Consider how participants can contribute to the evaluation of the session.** Encourage library staff to develop and implement evaluation methods to measure and assess patron participation.
- **Set your expectations.** Decide what do you expect participating librarians to do as a result of attending? Explain that participants will not become “experts” in the STEM topic, but rather will be able to leverage the topic to engage their patrons. Provide resources and connections to experts. Reduce participants’ anxieties around mastery of the content by providing fundamental concepts through resources and discussion.



Best Practice #2: Focus training on hands-on learning

STEM training for public library staff is most effective when it focuses on how to incorporate hands-on STEM explorations into library programs, rather than trying to get library staff to become masters of STEM facts. Key strategies they used included:

- The majority of the time should be devoted to the actual STEM activities and discussions about them. Library staff, like all learners, will better understand an activity's intent if they conduct the activity themselves (or try it during a webinar).
- Limit the time spent explaining the STEM content; for instance, in a workshop about the solar system, most of the content should be conveyed through participant discussion and activities (e.g., Jump to Jupiter), not through presentations by the workshop leader. *STAR Net's* activity sheets and facilitation guides use [“Guide on the Side vs. Sage on the Stage”](#) facilitation methods.

Tips from State Library Partners

“Provide opportunities for library staff to see the kits and practice some of the activities firsthand; this is the best promotional tool for them. During my intro sessions, I provided an overview on the project, the website, and how to check out the kits, then had 4 stations set up with activities from the kit; attendees then tried out the activities at each station to experience them directly.”

“Taking the time in a webinar to conduct, step-by-step, each activity was a great way to brainstorm together. Participants had the time to think about how they were going to use the materials, or how they would alter them to fit their community. They then shared those thoughts with the group. We were also able to go over possible questions that might come from patrons. Just making the librarians aware of those resources made them feel more confident in their ability to lead these activities, and where to go for more information to prepare.”

“It was a great experience bringing the NASA @ My Library STEM Facilitation Kits to our public library staff. Library staff loved the hands-on experience with several of the Kit activities and exploring the contents: the books, the tactile materials, and the telescope. Involving a local Astronomy Club to demo the telescope and provide information about astronomy programs they provide was greatly appreciated, and we believe we helped forge some new partnerships between these organizations and our libraries for future programming opportunities. We were also thrilled that one of our library staff who served as a Facilitator at these trainings was a NASA Solar System Ambassador who could talk about that program as well as share her knowledge about the subject matter.”

- Bring in an outside expert (e.g., museum staff, outreach coordinator, diversity expert) and dedicate a part of the training session to them. They can contribute resources and strategies that can translate to the library setting. Have them describe ways that library staff can work with them to offer programming. Provide an example such as accessing the directories of the [Solar System Ambassadors](#) and [Night Sky Network](#). See [Section 5](#) for more details about working with science experts. They can also help answer participants' questions during training and share their excitement for earth and space science to help inspire library staff.

Tips from State Library Partners

"We worked with a NASA Solar System Ambassador and a local astronomy club on a series of 'Cosmic Roadshow Workshops'. Public library staff had hands-on experiences with the kits, practiced the activities, and shared programming ideas."

"We hosted a telescope workshop with a staff member from Charleston County Public library. They had circulated telescopes for several years and were familiar with the lending process. Attendees liked hearing first-hand about their experience and how to troubleshoot issues with telescopes."

"Our State Library partnered with the Sloan Museum and Longway Planetarium to convene five hands-on training workshops for public library staff. Our focus was on space science programming for children and teens. The workshop was designed around a fast-paced hands-on series of STEM activities to cover the following lessons: Astronomy 101, Planets & Moons, NASA @ My Library Facilitation Kit review, Introduction to the Telescope"



Maryland State Library training event.
Credit: MSL



Best Practice #3: Make it easy and fun

Participants have many professional development opportunities to choose from so a STEM training session needs to be appealing.

- To minimize costs and increase attendance, leverage existing in-person events (e.g., summer learning program training and roundtables, state and regional library conferences). Alternatively organize and host regional hands-on training workshops throughout the state so their travel time is minimized.
- Provide slides, handouts, and verbal explanations about the contents of the material. Provide them with hands-on opportunities to become familiar with science tools so they feel confident.
- Include time for implementation planning and discussion. Periodically pause to invite participants to describe what they liked best about an activity and how they would modify it for their program and audience. Provide a mechanism for participants to capture notes on each activity. Facilitate small group discussions to help participants brainstorm potential challenges. For example, dedicate time to strategies for how to structure programming for all ages.
- Get the right space – If the training is in-person, prepare for noisy discussions and messy activities. Have a large space available for kinesthetic activities. Encourage people to move about.

Tips from State Library Partners

“We hired a consultant to lead trainings at youth services events we had planned for the year, used our state library conference and library consortium meetings, and incorporated brief presentations into existing training sessions.”

“We partnered with the Indiana Astronomical Society and two public libraries to organize and host two webinars – Essential Astronomy for Libraries presented and Bring NASA to Your Library with STEM Programming.”

“We offered a workshop in the ‘train-the-trainer’ model for our libraries. This gave rural librarians an opportunity to become familiar with the NASA kits and to develop ideas for local programming. We also prepared a bibliography of current popular fiction and non-fiction titles on space-related topics including Native American and Lakota folk lore. Libraries used it to support their own programming.”

“We used the Summer Reading Conferences to provide hands-on time with the contents of the kit. Having the opportunity to work with the kits was a large part of the kits losing their ‘intimidation’ factor. Additionally, I created a Libguide for the kits that gave comprehensive information about what was in each one.”



Best Practice #1: Be clear about training program objectives

Workshop objectives were included in the descriptions for the SLAs and in flyers advertising the workshops to librarians in each state. The agenda was planned around content and activities from the CSLP summer program and conducted from October 2018 through May 2019 before the summer reading program, with dates selected by the SLAs. Some space science content was included, but facilitators emphasized that librarians should not expect to become an expert “sage on the stage” but instead should plan to enable their patrons’ learning through “guide on the side” techniques.



Best Practice #2: Focus training on hands-on learning

The agenda was planned with most time spent in sessions where participants conducted the activities themselves. Networking allowed for engaging discussions on how participants could implement the interactive STEM activities in their library. External experts, such as [Night Sky Network](#) members, were invited to describe their clubs and how libraries can partner with them to conduct evening observing sessions for patrons. See [Section 5](#) for more information on how to connect to subject matter experts (SMEs). [Appendix B1](#) has sample agendas for presenters and participants.



Best Practice #3: Make it easy and fun

It is challenging for youth services librarians to create programming. They are routinely asked to create fun and engaging programs that do not remind children of school. The activities created by *STAR Net* and LPI did just that. The activities selected (e.g., How Big?, How Far?, Looney Lunar Phases, Crater Creations) were ready for libraries to implement as is, or to modify, and were adaptable for different ages. Library staff can find high quality, vetted STEM activities that are appropriate for public libraries using *STAR Net*’s [STEM Activity Clearinghouse](#).

The *NASA STEM Workshops* reached almost 800 library professionals. Feedback from participants was consistently positive (EDC Report):

“[The best part of the workshop] was all the activities —getting to see, no, actually not see, but participate in them—so that we can know how to use them in our own libraries. That was priceless and will make summer reading so much richer for the kids.”

“The information and examples of the Solar System, Galaxy, & Universe was fabulous and so engrossing! I understand so much more than before.”

SECTION 4: ENGAGING UNDERSERVED STEM AUDIENCES

AFTERSCHOOL AND LIBRARY PARTNERSHIPS



“ These are the kids who don’t make it to the library often. It’s great to get them in. Through this partnership, they got access. ”

-Ypsilanti District Library

STARnet

Science-Technology Activities & Resources For Libraries

4A. Introduction

A core mission of state and public libraries is to engage all members of their communities including populations that are underserved and underrepresented in STEM-related fields (hereafter called underserved). NASA describes these populations as including Hispanics and Latinos, African Americans, American Indians, Alaska Natives, Native Hawaiians and Pacific Islanders, the economically disadvantaged, people in rural areas with limited access to STEM resources, people with disabilities, women and girls. Diversity, Equity, Inclusion, and Accessibility (DEIA) are key factors in designing and implementing public library programs. In fact, DEIA is a core value of librarianship (ALA, 2019).

Public libraries are one of the leading institutions in America to create spaces and programs that are accessible to their whole community and conform to the Americans with Disabilities Act. Accessibility includes the design of products, devices, services, and environments for people with disabilities. [Universal Design for Learning](#) provides a framework for developing learning experiences that meet the needs of all learners, thereby maximizing accessibility. State libraries have also been at the vanguard with implementing programs that increase accessibility for all learners.

The Community Dialogue Framework – A Key Strategy for Broadening Participation

Community Dialogues are a successful community conversation strategy. This *STAR Net* framework is aligned with other community engagement practices such as ALA's *Libraries Transforming Communities* (LTC) framework. *Community Dialogues* encourage library staff to reach out to community leaders and stakeholders to engage in a two-way dialogue. They offer an opportunity for underserved communities to participate in important discussions about pressing community issues. Dialogues have yielded valuable data about the needs of underserved audiences (e.g., how they use the library and barriers to participation in certain types of programming) and have identified and solidified community partnerships. State libraries are encouraged to let their public libraries know about this approach and to provide training and support if possible.



Figure 11. A Community Dialogue event in Florida.
Credit: NCIL/SSI

While libraries have a mandate to be open and accessible to people of all races, ages and socio-economic backgrounds, State Library Partners recognized that they need to be intentional in their strategies to engage all members of their communities including underserved STEM audiences.

One objective of the *NASA@ My Library* project is to help public and state library staff reach communities with diverse populations through NASA science-based authentic learning experiences.

“We always said that we served all members of our community. Being intentional in this project about reaching underserved STEM audiences was a challenge. I know it got me thinking about that in relation to the broader work I do at my State Agency and how it applies to all of the programs that I coordinate.” State Library Partner

Each of the eighteen State Library Partners developed an *Underserved and Underrepresented STEM Audience Strategy* that guided their work – both internally and when they engaged their public libraries. See *Guidance for State Library Agencies* in [Appendix C1](#). Their intention was to be more systematic in identifying these audiences and to then prioritize their engagement and participation in STEM learning through the *NASA@ My Library* kit circulation program. See Figure 12 on Page 34 for the key audiences that were identified. Examples of strategies and methods they recommended were:

- Make working with underserved audiences an organizational priority. Amend the agency’s long-range or strategic plan to contain strategies to intentionally engage underserved STEM audiences;
- Place a priority on distributing the kits to public libraries serving significant immigrant or rural communities;
- Choose segments of the state’s underserved populations and then work closely with public libraries that serve these populations. For example, distressed municipalities that have a significant percentage of school age children that qualify for free and reduced-price meals;
- Engage public libraries that have children who receive special education services or a high percentage of residents living at or below 150% of the Federal Poverty Level;
- Contact staff in specific libraries either directly (e.g., by phone) or indirectly (e.g., targeted listservs);
- Host a program for librarians from underserved communities for them to learn about the program and its resources;
- Solicit tribal library and community feedback to ensure the library is offering opportunities that are culturally responsive and create positive experiences for Native American learners. Consider using location-specific resources;
- Work with tribal college libraries to jointly create resources for their patrons and work together to figure out the best way to reach those most in need;
- Circulate *NASA@ My Library* STEM Facilitation Kits through the regional library system to ensure children in rural areas have access to tools and training they would not normally receive;
- Ask library staff travel around the state to provide training and use videoconferences and webinars to share information and resources with their public libraries in geographically remote areas; and
- Expand existing programs that are presently serving underserved STEM audiences.

A focus on rural areas

Through *NASA@ My Library*, nearly all State Library Partners (83%) identified rural areas as a focal point. Generally these areas 1) lack ready access to informal STEM education infrastructure (e.g., science centers, zoos, aquariums); 2) have a preponderance of economically disadvantaged families that cannot afford STEM related resources and experiences that often contribute to an individual’s success in STEM fields; (See *STAR Net’s STEM in Libraries* section on its website); and 3) face disproportionate challenges given the distributed nature of rural areas (e.g., limited access to high speed internet, minimal public transportation, driving is time consuming and expensive due to the distances involved).

Examples of populations State Library Partners mentioned in their *Strategies* included immigrant and rural communities, women and girls, Native American communities, ethnically diverse populations, economically disadvantaged populations, communities with children who have low math and science test scores, visually impaired patrons, distressed municipalities that have a significant percentage of children that qualify for free and reduced price school lunch, children who receive special education services, and geographically remote small libraries in communities with few STEM resources.

All but one State Library Partner agreed or strongly agreed that participation in *NASA@ My Library* helped them reach underrepresented audiences in their state.

While circulating the *NASA@ My Library* Kits to underserved audiences they focused on the following: (n=18)

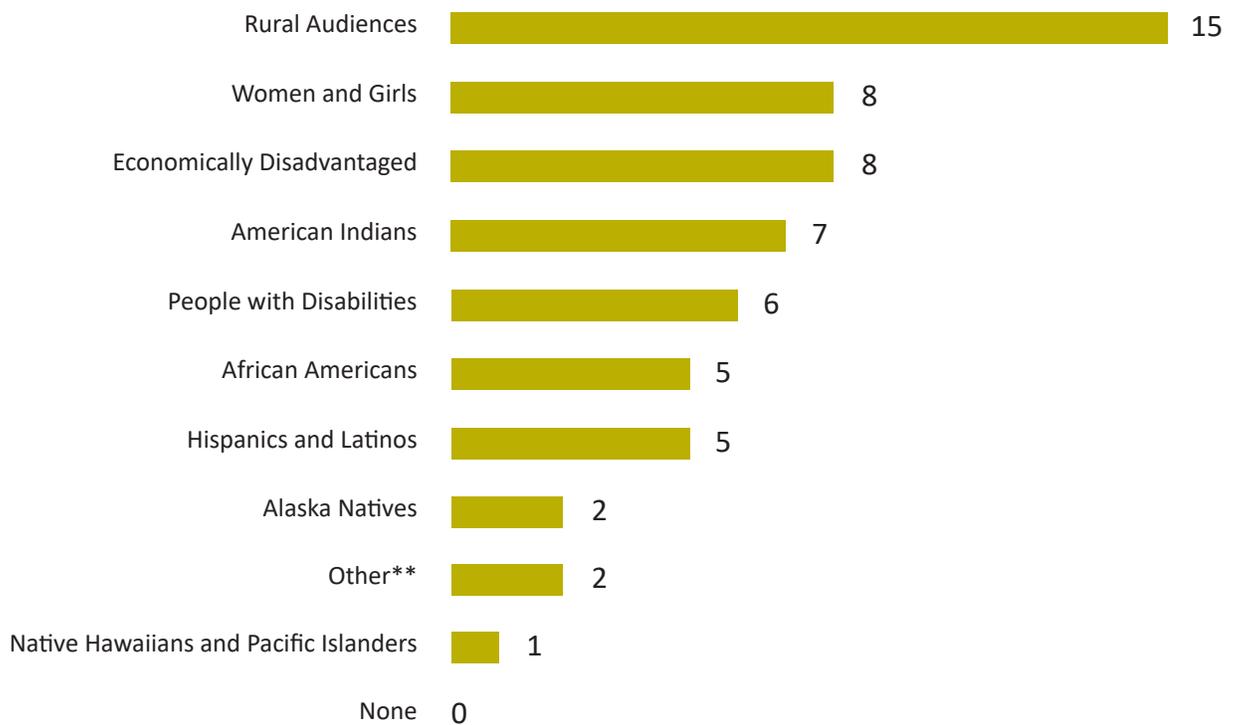


Figure 12. Reaching underserved audiences was a focus of the State Library Partners.
Source: EDC Report

4B. State Libraries - Working Internally to Engage Underserved STEM Audiences



Best Practice #1: Develop intentional strategies and timelines to engage selected underserved audiences.

The State Library Partners offered programs and activities for underserved and underrepresented STEM audiences in their states. During this project, there was an appreciation amongst the SLAs they needed to pursue four strategies to engage these underserved STEM audiences.

- 1. Make working with underserved audiences an organizational priority.** Amend the agency's long-range or strategic plan to contain strategies to intentionally engage underserved STEM audiences. Ensure annual work plans and budgets address the needs of underserved STEM audiences. (Leading by example will inspire public libraries to also make this a priority for them.) Give priority in the state's LSTA grant program to working with underserved audiences. Dedicate a portion of a youth services consultant time to working with libraries that have specific audiences that the state library wants to assist.

An approach from Alabama – “We created several reports based on information produced by [Maptitude](#) – a Geographic Information System. Our reference librarian produced maps for each county. These maps include factors such as race and income. By utilizing these maps in conjunction with our reservation system we can easily determine the priority of the reservations. Our goal is to reserve the kits for libraries that are in economically disadvantaged areas and have little access to STEM/STEAM resources.”
- Alabama State Library

Tips from State Library Partners

“We dedicated a staff meeting to develop our Underserved STEM Audience Plan. Just spending time to talk through how we could identify some priority audiences was very helpful and caused our staff to focus on this issue as we had never done before.”

“The state maintains a list of distressed municipalities and we routinely work closely with those city and town libraries that serve these populations. We targeted our NASA@ My Library promotional efforts for the STEM kits on those libraries.”

“Maryland State Library created [four accessible kits](#) that would travel with Kit 2. The customization of the kits included supplementing the existing content with alternative activities as well as providing accessible materials to support the content. Though all the activities did not translate into a viable activity for those who are blind or visually impaired, we included activities or material that may support it.”

2. Engage others working with underserved STEM audiences. State libraries can describe a few underserved STEM audiences in their state that they want to better engage and then assess current efforts to engage them. Other state agencies, organizations and partners that support underserved STEM populations can offer advice on where and how to focus efforts. (State Library Partners recognized that working with these groups increases the agency’s confidence that its approach is sound, and it is using existing data to support decision-making.) Examples of external organizations that State Library Partners identified included:

- girls-only clubs
- scouting programs
- coding groups
- ESL organizations
- organizations promoting rural development
- science museums
- makerspace advocates
- tribal leaders
- tribal college libraries
- state libraries for the blind & physically handicapped
- STEM Councils and forums
- state prison libraries
- summer nutrition programs

It was recognized that an important benefit of working with the types of organizations and programs listed above is that they can help to ensure strategies and programs are culturally responsive and create positive experiences for specific audiences.



Figure 13. Young patrons explore NASA’s [Getting a Feel for Lunar Craters](#) tactile book. Credit: Stratford Library, CT

Tips from State Library Partners

“We worked with another agency in our state that serves underserved populations to determine where to focus efforts. This increased confidence that we were reaching appropriate areas because another agency had data to support locations to target.”

“We encourage our libraries to work with other organizations in their community to use and borrow the kit. We provided them with publicity materials, and email templates, so that they can easily reach out to schools, after-school organizations, home school communities, and the like.”

- 3. Leverage existing efforts.** State libraries can identify and explore how to expand existing programs that are presently serving underserved STEM audiences. This can be an economical and timely way to expand services in an era of scarce resources.

Tips from State Library Partners

“We decided to partner with a Library Cooperative for this project, a consortium of 39 independent city, county and special district public library systems. We prioritized circulation of the kits and NASA@ My Library programming to areas within their service area where there are high Latino populations. Participating libraries were then asked to nominate branch libraries with high Latino populations, and we provided them with bilingual (Spanish/English) marketing resources.”

“We have Science Clubs that are dominated by girls interested in earth science and astronomy (the clubs are open to children - grades K-5, public or homeschooled). They used the kits to benefit their club members, to promote membership in the clubs, and support our Summer Reading Program. The clubs also helped us to promote the kits - it’s win-win!”

- 4. Connect with community leaders.** State Library Partners suggested that getting representatives from these underserved groups to be spokespersons for the effort (e.g., female scientists, scientists from minority ethnic backgrounds, museum staff) helps to increase credibility and can expedite implementation. Working with them to create resources and identify the best way to reach those most in need is more likely to be effective.

Tips from State Library Partners

“We featured professionals from underrepresented STEM groups through our annual STEM Like a Girl program that gathers local women to share their work, research and skills in a science fair like setting.”

4C. Help Public Libraries Engage Underserved STEM Audiences



Best Practice #2: Support the efforts of public libraries to directly engage underserved STEM audiences

State libraries provide ongoing professional development and training to their public libraries on a wide range of issues affecting the services they provide to members of their community. Strategies the state libraries discussed that would build the capacity of their public libraries to intentionally engage underserved STEM audiences in their communities included:

Make a personal appeal. Leverage the excellent relationships state libraries have with public library staff. Identify communities that have significant representation of underserved audiences and make direct contact (e.g., phone call, visit) with these libraries to encourage their participation in STEM programming for underserved audiences. Help them develop achievable strategies for their community. Give priority in conference and training registrations to library staff working in communities that have a high proportion of underserved STEM populations.

Tips from State Library Partners

“Being able to step out more and speak to our librarians in person most definitely showed us the importance of on-site communication. In-person excitement about a project is contagious.”

Showcase success. Convene public libraries that have successful approaches to engaging underserved STEM audiences. Make, archive and promote a video of the event to share their experiences with others. Help public library staff to produce a webinar on how to promote STEM materials to these audiences.

Promote “going to” the audience. Provide training and documentation that makes the case for library staff to go to where underserved STEM audiences are. For example: conduct *Community Dialogues* at other venues, attend community center meetings; make personal appeals; produce bilingual flyers/promotional materials and post in areas these audiences visit; attend community events; engage Native American radio stations; attend Head Start programs; talk with immigrant services staff; attend early literacy programs; leverage programs that target adults such as *English as a Second Language* classes; present at conferences that engage these audiences such as the Indian Education Summit and economic development forums.

Tips from State Library Partners

“We partnered with a local organization off-site and brought programming to them. This made it easier for our audience to attend and it was in a familiar, comfortable and accessible location. We were able to reach hundreds of people that were new to our public library.”

“We worked with the STEM Preschool Partnership. We take programming to them once a month to do STEM activities with children identified as at risk for school success because of low family income.”

Promote strategies for engaging underserved audiences. Produce and promote materials that are accessible to visually impaired audiences (e.g., Talking Book programs, tactile resources, large print). For example, the Maryland State Library included a tactile version of the Moon Phases graphic in their Kit 2. See Figure 14. Provide training on how public libraries can adapt STEM resources for specific underserved STEM audiences (e.g., girls, Native Americans, visually impaired) and location-specific resources (e.g., [Montana Skies: Crow Astronomy](#) developed by Lynn Moroney).

Accessible Activities

Be a NASA Detective – Expanding Your Senses

Kit 2: Looney Lunar Phases



Kit 2: Accessible Activity Included



Figure 14. [Moon Phases - Tactile Graphic](#)
Credit: Perkins - School for the Blind

Tips from State Library Partners

“The [Maryland State Library for the Blind and Physically Handicapped](#) customized the kits by supplementing the content with alternative activities and providing accessible materials to support the content.” (see Figure 14)

“We know that being able to engage Native Americans has unique challenges because very few of them have transportation to get to the library for these types of events.”

“The [South Dakota Braille and Talking Book Library](#) brought a unique perspective to this year’s theme of space and ‘Universe of Stories’. We were able to provide thematically connected materials in accessible formats such as book lists, resources guides, tactile and braille astronomy maps with a goal of making library programs accessible to all. Our [website](#) has the materials we adapted for the visually impaired and Native Americans.”

Develop lending priority criteria. When there is competing demand for STEM lending resources give priority to those public libraries that can demonstrate significant underserved populations.

Tips from State Library Partners

“In our online application to reserve a NASA@ My Library Kit libraries must identify the underserved population(s) they plan to serve and how they plan to promote the programs to those populations.”

4D. Challenges Encountered by State Libraries Engaging Underserved Audiences

State Library Partners often noted that they faced challenges determining what underserved groups to focus on and then developing strategies to reach these groups. They suggested that learning from other states and training could greatly inform their work.

Some SLAs described unease with how to define and determine where underserved populations are located in their state and the corresponding public libraries that serve these audiences. They also mentioned that it was difficult to know if the public library programs that used the NASA STEM kits were actually serving their target underserved audiences.

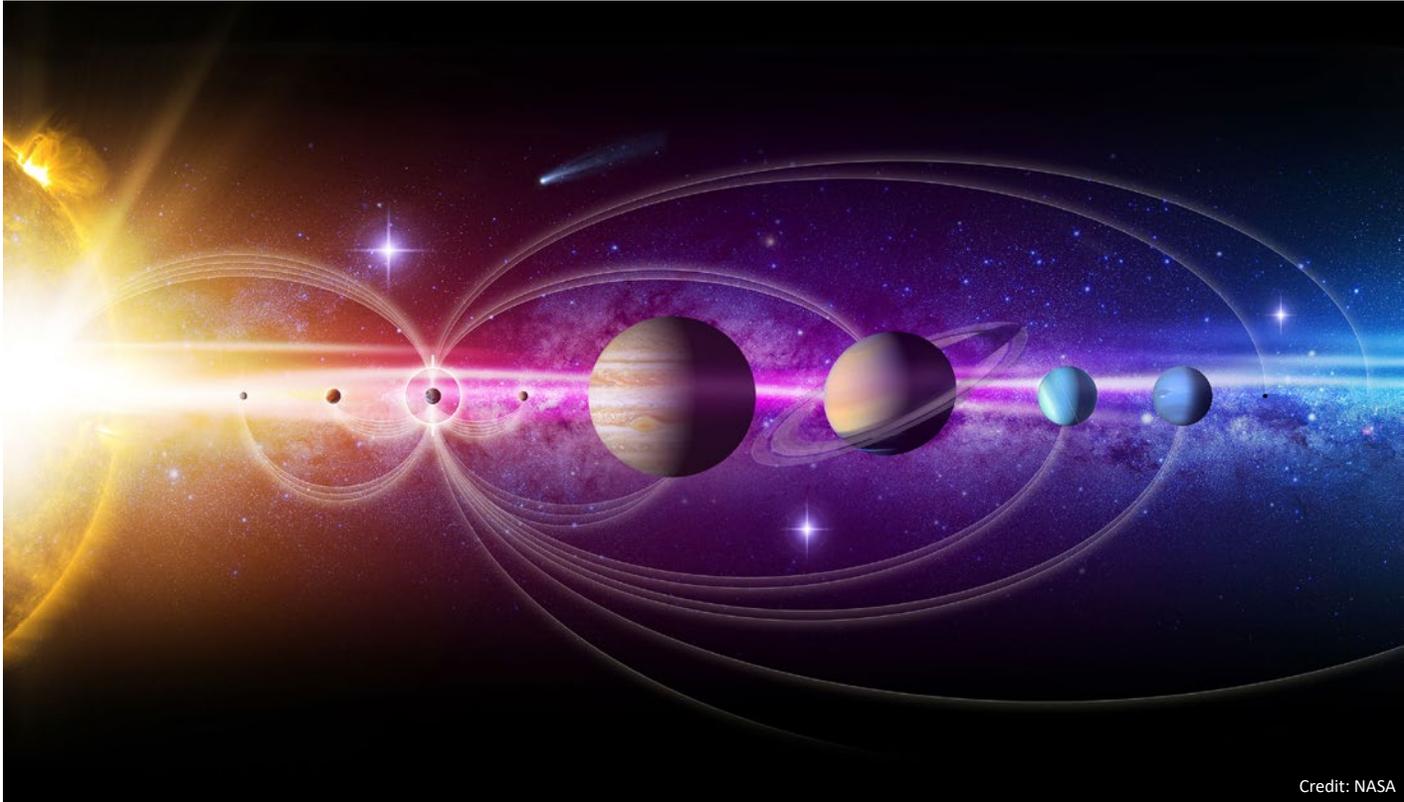
Resources: The [ALA Office for Diversity, Literacy and Outreach Services](#) promotes DEIA strategies and provides training opportunities. The [STAR Library Network](#) contains resources that could be helpful. STAR Net's [Community Dialogue Framework](#), described earlier, is another strategy that is working well to assist public libraries in reaching out to key community stakeholders, especially those that represent underserved communities

"This was the hardest part of the whole project, trying to figure out how, at the state level, we could focus on an underserved population. This would have been easier at the local level because they know their community and the underserved areas. So trying to figure out specifically how to promote to the underserved audiences was the most challenging part." State Library Partner



A Summer of Space program in South Dakota.
Credit: Siouxland Libraries

SECTION 5: BUILDING RELATIONSHIPS WITH SUBJECT MATTER EXPERTS



Credit: NASA

5A. Introduction

This section provides some strategies and resources that state libraries can use to help public libraries in their state find NASA experts to collaborate with. Within NASA's science enterprise, there are scientists exploring the frontiers of Earth and the Universe beyond. Many NASA-funded scientists are excellent science communicators, come from diverse backgrounds, and are willing to share their experiences with the public. NASA has a network of subject matter experts (SMEs) that public libraries can connect with to participate in their STEM programs.

"Subject matter experts provide validity to programs, especially when adults are in attendance."
State Library Partner

A central focus of NASA's vision for education is to leverage NASA's science discoveries and enable NASA-funded scientists and engineers to engage more effectively with learners of all ages. While NASA-funded SMEs are a key resource for public libraries to work with, there are also many NASA-affiliated and non-NASA groups that public libraries can collaborate with.

In the context of *NASA@ My Library* there were two types of subject matter experts (SMEs) that worked with public libraries and their patrons:

- *Professional* – examples of these include NASA-funded scientists at NASA Centers and research organizations like universities and labs and other staff such as those identified in NASA’s [Speakers Bureau](#) and NASA-affiliated organizations such as [Space Grant Programs](#) and [Challenger Centers](#). A full list of NASA resources are described in Section 5B. Examples of other SMEs working in this field include non-NASA affiliated scientists, planetarium and observatory staff, science museum staff, local science teachers and college faculty, park rangers and local weather forecasters and meteorologists.
- *Avocational* – examples of these include [Solar System Ambassadors](#), [Night Sky Network](#) volunteers and amateur astronomers.

Roles for SMEs

There are many ways that an SME can support library staff, including:

- **Co-presenting interactive STEM learning experiences.** STAR Net has many vetted STEM activities on its [STEM Activity Clearinghouse](#) that include supporting resources like how-to videos, tips, and links. [NASA Wavelength](#) provides a catalogue of activities that are designed to highlight the work of NASA scientists. SMEs and library staff can offer these activities together as virtual programs (see Section 5C).
- **Serving as a resource.** SMEs can work with library staff by contributing advice on Earth and space science programs and materials (e.g., what content exists and may be of interest to library patrons, where it can be found, how it could be presented, etc.). SMEs can review and comment on outreach materials intended to engage public library staff in Earth and space science programming (e.g., ensure factual accuracy, ways to engage lay people in space science).
- **Supporting professional development.** SMEs can mentor and train library staff to increase their knowledge and confidence about earth and space science.
- **Providing earth and space science resources.** SMEs can provide earth and space science materials, NASA mission stickers and bookmarks, books and book reviews, posters, and equipment such as telescopes and binoculars to name but a few.
- **Participate in a live or recorded program and describe how they became interested in and pursued their science careers.** These presentations are preferably live in the library or through virtual video formats (e.g., Zoom, WebEx, etc.) where they interact with library staff and/or patrons, but may be pre-recorded (e.g., archived webinars, YouTube videos). Virtual programs featuring scientists are described in Section 5C.

Library and SME Collaborations

Many public libraries have developed strong collaborations with local SMEs who are passionate about sharing their earth and space science knowledge with members of their community – young and old. Either a library staff person can initiate a collaboration by reaching out to an expert or vice versa. Effective collaborations take work and time and require that both parties understand each other’s needs and strengths. They also benefit from shared goals that are actionable and timely. If you’re just starting out, it is important to be intentional. Begin with small, achievable steps. The library and the expert each need to benefit from working together. These collaborations can blossom into ongoing partnerships that evolve well beyond programming support.



Figure 15. Solar System Ambassador Presentation.
Credit: Fort Worth Public Library, TX

SME Interactions can be in-person or online

Face-to-face conversations between scientists or other SMEs and public audiences in an informal learning environment (such as public libraries) provide a valuable opportunity to support public engagement with scientific research. These types of experiences have significant benefits for members of the public and for scientists. For public audiences, interacting face-to-face with a scientist can expand awareness of the range of careers in science, spark new questions about scientific topics, and increase interest in learning more about the scientist’s topic. Scientists, too, are positively impacted by this type of public engagement. Scientists who participate in public engagement training and programs report that their pedagogical and communication ability and skills improved and that the experience was fun and rewarding.

However, in-person connections between scientists and public audiences are not always a feasible programming option. Scientists often live in urban areas, where universities, research centers, and private labs are located, while a large segment of the U.S. population lives in more rural locations (Health Resources & Services Administration, 2018). Presumably, more rural populations are less likely to have contact with a scientist. Typically, neither scientists nor individuals from rural communities have the time or resources to travel long distances to participate in public programs. Virtual programming, in which a scientist is connected to public audiences who are geographically remote through a video-conferencing platform, may be able to help close this gap.

Strategies to engage SMEs to help with in-person (Section 5B) and online programs (Section 5C) are described below. State libraries are in an excellent position to help public libraries in their state learn how to take advantage of both types of SME engagement.

5B. In-person Library Programs Featuring SMEs



Figure 16. Solar System Ambassador helps a young patron learn about science.
Credit: Sausalito Library, CA

Best Practice #1: **Help public libraries identify SMEs**

Public libraries have a rich history of engaging individuals from their community and science-based organizations. During the project, State Library Partners uncovered a logical sequence for their public libraries to use when seeking to engage subject matter experts.

- **Build awareness and interest in STEM.** State libraries can encourage public libraries to engage NASA and other SMEs in ways that grow the capacity of library staff and the knowledge of their patrons. They can prepare and distribute materials to their public libraries that describe the benefits and likely results of engaging subject matter experts. Public library staff can then determine what their needs are for outside expertise and assistance (e.g., advice and counsel, presentations, access to materials).
- **Consider sources of support.** Library staff can speak with colleagues and current partners to uncover possible experts. Are they already working with an amateur astronomy group or a science interest group? Do they have recommendations? Are there science institutions in their region, such as universities or community colleges? Research scientists in physics and astronomy, space science, and earth science departments that might be funded to conduct NASA mission research? Check with colleagues and partners and online profiles for indications that their work uses NASA data and for evidence of interest in outreach.

- **Establish collaborations with NASA organizations.** Below is a list of NASA supported collaborators that may provide valuable support:
 - o [NASA Speakers Bureau](#) – Libraries may request a presentation about NASA’s human space exploration, rockets, or aeronautics programs.
 - o [NASA Centers and Facilities](#) – NASA has 20 centers and facilities that have STEM resources that state libraries and public libraries can use to build programs around.
 - o [NASA Visitor Centers](#) – There are 14 NASA Centers that are similar to science centers and museums. They are a great place to visit if patrons live nearby or are visiting the area.
 - o [National Space Grant and Fellowship Program](#) – Space Grant is a national network of university-based Space Grant consortia. The consortia fund fellowships and scholarships for students pursuing careers in science, mathematics, engineering, and technology, as well as curriculum enhancement and faculty development.

NASA Volunteer Networks (watch a webinar about these networks on [YouTube](#))

[Night Sky Network \(NSN\)](#) is a nationwide coalition of amateur astronomy clubs (over 425) bringing the science, technology, and inspiration of NASA’s missions to the general public. Members share their time and telescopes to provide unique astronomy experiences at science museums, public libraries, observatories, classrooms, and under the real night sky.



[Solar System Ambassadors \(SSA\)](#) [bad link] is a public engagement program that works with motivated volunteers (over 1,000) across the nation to communicate the science and excitement of NASA’s space exploration missions and discoveries with the public. It is managed by the Astronomical Society of the Pacific in partnership with NASA’s Jet Propulsion Laboratory. Some public library staff are even SSA Ambassadors.



St. James Parish Library event hosted by Night Sky Network members, Lutcher, LA.
Credit: NSN



Best Practice #2: Help public libraries collaborate with SMEs

Some useful coaching tips for state libraries to use to help public library staff work with NASA organizations (like the ones listed above) are: 1) Create a clear outline for the request; 2) Be specific (for a presentation, select specific dates/times, ages, and sizes of audience); and 3) Define the relationship (a one-time event or a longer commitment to help with multiple programs). Most experts prefer emails, but library staff should consider following up with a phone call. Library staff may want to ask for a meeting or teleconference to discuss the details of their program and request. The Keys For A Successful Event discussion below has some additional tips.

Take steps to build the relationship. If a library's goal is to partner with an expert, they need to recognize the need for time, frequent communication, and awareness of mutual interests or goals. Partnerships require compatible goals. Libraries can share information about their program goals, resources and needs. They can learn about the expert's goals in sharing their science and their thoughts on relevant aspects of the planned program and the best ways they might be involved. This is particularly important when considering hands-on, interactive learning programs.

State libraries acknowledged that when public library staff work with science experts it builds the confidence of library staff and increases the likelihood that a library will offer earth and space science programming.

"Library staff loved meeting with a science expert and were all blown away that they are in the local community and they never tapped into them. I'm hopeful some connections were made, and they will keep in touch. The group that came in was having just as much fun sharing their passion and knowledge as the library staff. We were excited to meet them and have them as part of our training. It was an element that enriched our workshops." State Library Partner

Public libraries and local experts create relationships that benefit both the library and community residents. One example is an amateur astronomer that periodically visits with library staff to maintain their loanable telescopes and offer astronomy programs.

Keys for a Successful Event

Prior to the Event. The material that follows was used during *NASA@ My Library's* promotion of NASA's NSN and SSA volunteer programs. See [Appendix D1](#) for a sample flyer about both programs that SLAs can disseminate.

- **Schedule well in advance.** Try to give your volunteer at least a month to make sure they are available and have enough time to ensure a quality event.
- What is the exact **time, date and location**? Is there a backup date in case of poor weather?
- Is there a **theme for your event** or do you want them to provide any type of activity or presentation that they'd like?
- What **type of event** is it? Is it a science fair, scout campout, community event?
- **Who** is this event for, and **how many** will be there? Will it be children? Young adults? Senior citizens? An all-ages event? Dozens of people or hundreds? Notify the volunteer of any audience special needs or considerations.
- **Who** should they contact, and what is their **preferred contact information**? In addition to your own info, is there a backup person? Is there a person in charge of the event facility itself or a custodian that can help with basic issues with the event space?
- Ask them what **presentation tools** they may need – projector, chairs, tables, outside space etc.
- Share what you are doing to **advertise the event** and your volunteer can probably help spread the word through their channels, including the SSA and NSN websites.
- **Promotion and marketing** should focus on social media, using multiple websites, as well as using print media to reach participants who may not be online—printed flyers, newspaper articles, or other publications that lists events. Send reminders prior to the program. Consider requiring registration to know who is coming, send targeted reminders, and have contact info to follow up.
- Make sure promotional materials reflect a **diversity** of populations and make the program look interesting to the targeted audience(s).

During and After the Event

- Help your SME by ensuring they have easy access to your event space (including parking), and they have all of the supplies and tools they need available well before the event is scheduled to start so there is plenty of set up time.
- Crowd control and clear safety guidelines for your volunteers and visitors are essential for a smooth event.
- Be sure to communicate what your standard emergency procedures are and where all the restrooms or breakrooms are for the volunteer to use.
- At the end of the event, if you want to provide the volunteer with any feedback, photos or schedule another event, it is a good time to discuss that before they leave.
- Thank your SME! Consider providing refreshments or a meal as part of their visit. A follow-up email about the positive impact of the event would be appreciated.

Tips from State Library Partners

“Our State Library staff developed some awareness about earth and space science experts in our state including Solar System Ambassadors and volunteers with the Night Sky Network. We then developed flyers for our public libraries so that they could connect with these people. We offered training sessions at both regional and state library conferences. We posted a SME resource page on our website and promoted space opportunities to our public libraries such as participating in downlinks with the International Space Station and talks with astronauts.”

“Knowing the different kinds of subject matter experts out there pushed me to look at everything that NASA had to offer...I stumbled across the astronaut office and publicized that contact information around the state. Four libraries absolutely ran with that, cooperated together [to bring in an astronaut] and that was an incredible hit.”

5C. Virtual Library Programs Featuring SMEs



Best Practice #3: Use technology to feature a SME

It can be challenging for some public libraries to host science experts for in-person programming, especially if the library is in a rural area or if budget funds are limited (such as to support SME travel costs). Hosting SMEs virtually still allows patrons to benefit by meeting SMEs whom they might not otherwise have access to.

Using Technology to Engage Families

A group of families gathers around a large screen at a public library as they get ready to meet three scientists at “Meet a NASA Scientist!” in Bothell, Washington. The on-site librarian and staff at the Oregon Museum of Science and Industry (OMSI) have spent months collaborating with the scientists to craft the event. After a short introduction to the program and the scientists, the families move towards the edges of the room and locate themselves at stations where scientists, each calling in from a separate location in Oregon, wait to speak with them. Each station is equipped with materials for a hands-on-activity, an iPad, and a speaker.

As some families engage in conversations at the three stations, others explore additional activities while they wait for their turn to talk face-to-face over video with a scientist. Across the room, a young girl points a thermal camera at her dad, who is wearing a heated pad on his shoulder. Her mother smiles as she watches the iPad screen and observes how the color changes based on temperature readings from the thermal camera. After one hour of conversations with scientists and hands-on-activity exploration, the families gather back around the large screen for a final Q&A with all three scientists.

NASA@ My Library partnered with the [Portal to the Public Network](#) (PoPNet) to develop a strategy for public libraries to feature scientists virtually. PoPNet is a collaboration of museums and science centers that work to connect scientists to public audiences. Several PoPNet members (e.g., Oregon Museum of Science and Industry, South Dakota Discovery Center) worked to link NASA-funded scientists with public libraries and their communities. Their programs used a variety of formats, including a live stream of an in-person presentation by scientists and programs featuring multiple virtual connections to scientists leading activities. Hands-on activities were often included to make the programs more interacting and engaging for patrons. NASA@ My Library created a practical [Virtual Programs Guide](#) for organizations interested in creating their own virtual programs with scientists in collaboration with public libraries. It includes recommendations for preparing scientists for virtual programs, partnering with libraries, and navigating technical challenges.

The intent of this project was to connect trained scientists with library patrons in remote locations for high quality, engaging public programming about NASA science topics. Each PoPNet-public library collaboration aimed for the following characteristics within their virtual programs:

- Facilitation by a scientist or engineer who was prepared for public engagement through communication training;
- Opportunity for two-way dialogue between scientists and library patrons;
- Hands-on engagement that relates to the scientist’s area of expertise, which provide a concrete opportunity for interaction and a starting point for conversations.

The basic Virtual Program Model is shown below along with a photo from an event in South Dakota:

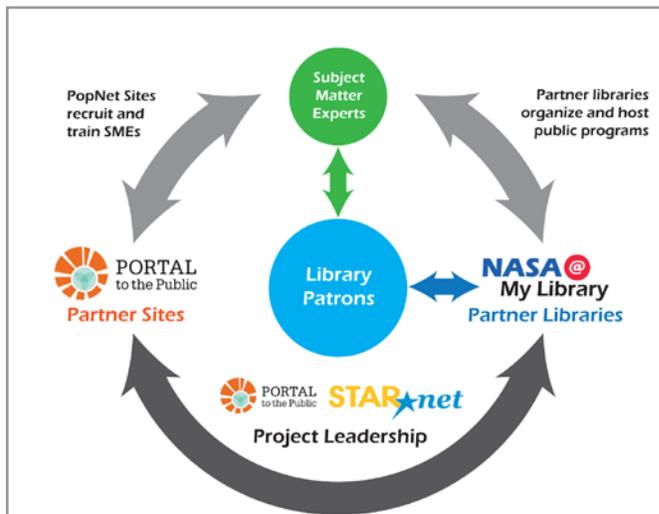


Figure 17. SME Virtual Program Model.
Credit: NCIL/SSI



Figure 18. Virtual program event.
Credit: South Dakota Discovery Center

As part of their training, PoPNet member staff supported scientists in selecting, adapting, or developing hands-on activities designed to help explain and facilitate a conversation around an important component of their work. Some scientists were guided in selecting a pre-existing activity, such as from *STAR Net's* [STEM Activity Clearinghouse](#). Others, with coaching from PoPNet staff, crafted new activities designed to represent or relate to their research. Unlike standard table-top activities, these activities needed to be facilitated through a screen, and required materials that libraries either had on-hand or were fairly inexpensive to ship. For scientists, who often have little experience in creating interactive educational activities for a lay audience, support from PoPNet staff was highly valued.

A summary of the benefits is described in the Table below.

Stakeholder	Benefits of Virtual Programs with a SME
PopNet Organization	<ul style="list-style-type: none"> • Explored virtual programming and training scientists for virtual presentations • Connections and experience working with libraries • Reached expanded audiences with virtual programming (without travel time or expense)
Library	<ul style="list-style-type: none"> • Connections to scientists trained in engaging a public audience • Increased comfort with STEM programming and programs with a virtual connection to a scientist • Opportunity to connect patrons to a NASA scientist (without travel time or expense)
Scientist	<ul style="list-style-type: none"> • Increased interest in public outreach • Learned new skills for engaging audiences in science
Patrons	<ul style="list-style-type: none"> • Engaged in science and hands-on activities • Learned about Earth science, space science, and/or engineering • Increased interest in learning more about Earth science, space science, and/or engineering and NASA science or careers

An evaluation of 29 virtual *NASA@ My Library* programs featuring SMEs concluded that, overall, participating librarians, SMEs, and patrons felt the programs were successful. Specifically:

- Benefits to the virtual presentations, according to SMEs and librarians, were reaching a broader audience (usually more rural populations) without travel time or funding, more flexibility in scheduling, and more scientists available to “visit” their library.
- The majority of librarians and SMEs agreed there was a connection between the SME and the audience despite not being in the same physical space.
- Nearly all patrons agreed that the programs were interesting and engaging. Many patrons shared that they liked being able to have access to people who they would not typically be able to connect with and that they enjoyed being able to talk to and ask questions of “professionals” or “experts.”

SECTION 6: APPENDIX

A. STEM Kit Program Resources

1. [Guidance for State Library Agencies: Kit Management Plan](#)
2. [Kit Promotion Flyers](#)
 - Sun-Earth-Moon Connections*
 - Be a NASA Detective: How to expand your senses*
3. [Sample Kit User Evaluation Survey](#)

B. Library Staff Training Resources

1. [NASA STEM Workshop: Presenters and Participants Agendas](#)
2. [Maryland Cosmic Roadshow Workshop Agenda and Flyer](#)

C. Underserved STEM Audiences

1. [Guidance for State Library Agencies: Engaging Underserved Audiences](#)
2. [Sample Plans from State Library Partners \(Connecticut and Maryland\)](#)

D. Resources for Engaging NASA Volunteers

1. [Guidance for Libraries Connecting with NASA Volunteers](#)
2. [Night Sky Network Astronomy Clubs \(NSN\) and Solar System Ambassadors \(SSA\) Flyers](#)

A. STEM Kit Program Resources

A1. Guidance for State Library Agencies: Kit Management Plan



The information below was provided to each State Library Partner early in the project (January 2019) to help them with developing their *NASA@ My Library* Kit Management Plan. These ideas and suggestions should be helpful to all SLAs planning a similar program.

1. Promotion

- Describe the methods the SLA will use, including training activities, electronic media, in-person events, to promote the two *NASA@ My Library* kits to their respective public libraries. (Please refer to *Promoting NASA@ My Library to public libraries: some examples* section below. These examples were drawn from the Fall 2018 SLA Letters of Interest.) If you have created a project webpage on your website, please provide the URL.

2. Circulation

- Describe when circulation will commence for both kits;
- The system public libraries will use when reserving a kit from the SLA;
- The length of time/loan period a library may have a kit; and
- Procedures the SLA will use to ensure libraries complete the evaluation form associated with each kit.

3. Duplication

- Identify *NASA@ My Library* kits that the SLA will make duplicate copies of; and
- The number of duplicates to be made (SSI will then provide the required number of NASA tactile books).



Idaho Commission for Libraries participates in the Idaho STEM Days event using *NASA@ My Library* kit materials. Credit: Idaho Commission for Libraries



Promoting *NASA@ My Library* to public libraries: some examples

Overview

Described below are some methods that State Library Agencies have suggested they will use to (1) promote *NASA@ My Library* kits and (2) encourage their public libraries to invite expert earth and space science volunteers to participate in library programming.

Electronic media

- Social media such as Facebook and Twitter
- Content and links on the State Library webpage
- Listservs (e.g., development directors, youth services librarians, etc.)
- E-newsletter
- Monthly public library chats
- SLA library blog
- E-publications sent to library staff and trustees with information about current programming opportunities

In-person meetings

- Monthly board and membership meetings
- Visits by SLA library consultants/staff and CEE coordinators
- Statewide Library Association Conferences
- Full day 'train-the-trainer' workshops
- Sessions at annual professional library events and multi-day training events

Possible Activities

- Model/demonstrate one or more of the kits & offer hands-on experiences
- Distribute *NASA@ My Library* project flyer and handout on expert space volunteers (e.g., Solar System Ambassadors, Night Sky Network, NASA Field Centers)
- Take library staff to science organizations to participate in a space program
- Assemble a bibliography of current popular fiction and nonfiction titles on space-related topics including Native American lore concerning the skies and the world around us
- Host an introductory webinar for librarians to explain how the kits can be used and the process for reserving and circulating them. Then archive and publicize them.
- Make programming presentations at state and regional library meetings, conferences and workshops. Engage library staff. Increase awareness and generate interest.
- Secure and publicize librarian testimonials
- Host a poster session at Library Association annual meetings
- Host live video sessions to promote the project once underway

A2. Kit Promotion Flyers

Sun-Earth-Moon Connections

NASA @ My Library

Bringing Earth & Space Science to Your Library

Reserve a NASA Facilitation Kit Today!



Credit: NASA



This state library project was made possible in part by the Institute of Museum and Library Services

Sun-Earth-Moon Connections Kit

Patrons Will Be Able To:

- Model both lunar and solar eclipses with easy-to-use tools
- Detect ultraviolet light in a creative way
- Use sorting cards to explore concepts relating to size, distance, and temperature
- Create a scale-size model of the Solar System
- Safely view the Sun with Sunoculars



Credit: Red Feather Lakes Mountain Library

This Facilitation Kit Includes:

- STEM programming for all ages from the very young to adults, and books focused for storyline.
- An activity guide for librarians or others to facilitate the activities with patrons and to understand the science behind the activities
- NASA space science information
- Links to STAR Net's STEM Activity Clearinghouse where even more activities are available



Credit: Space Science Institute/NCIL

Bring Earth & Space Science programming to your library!

Public libraries throughout the state are encouraged to borrow the **Sun-Earth-Moon Connections** kit that provides activities and experiences that help patrons understand their place in space, and how the Sun and Moon interact with our planet.

For reservations, loan periods, and other details, please contact:

<Name1> <Email Address1>

<Name2> <Email Address2>

Note: Kit availability is limited to reservations made prior to <Date>

NASA@ My Library is a national STAR Library Network (STAR Net) initiative that connects NASA, public libraries, state libraries, and their communities. Together we are working to increase STEM learning opportunities for millions of library patrons nationwide, particularly those underserved in STEM education.

NASA@ My Library is based upon work funded by NASA under cooperative agreement No. NNX16AE30A. Any opinions, findings, and conclusions or recommendations expressed in this material are those of NASA@ My Library and do not necessarily reflect the views of the National Aeronautics and Space Administration.



Be a NASA Detective: How to expand your senses

NASA @ My Library

Bringing Earth & Space Science to Your Library

Reserve a NASA Facilitation Kit Today!



Credit: NASA



This state library project was made possible in part by the Institute of Museum and Library Services

Be a NASA Detective: Expanding Your Senses Kit

Patrons Will Be Able To:

- Model the vast distances in our Solar System using a fun paper folding activity
- Create the shapes of the Moon's phases with some "tasty" resources
- Explore art as science and science as art through planetary images
- Investigate the insides of planets using hands-on objects and detecting tools
- Use scientific tools such as a telescope and infrared thermometer to observe the properties of objects that are difficult to see with our eyes



Credit: Cornerstones of Science

This Facilitation Kit Includes:

- STEM programming for all ages from the very young to adults, and books focused for storyline
- An activity guide for librarians or others to facilitate the activities with patrons and to understand the science behind the activities
- NASA space science information
- Links to STAR Net's STEM Activity Clearinghouse where even more activities are available



Credit: Space Science Institute/NCIL

Bring Earth & Space Science to Your library!

Public libraries throughout the state are encouraged to borrow the **Be a NASA Detective: Expanding Your Senses** kit that focuses on activities and experiences that help patrons be more comfortable using tools of science, and making predictions based on their observations.

For reservations, loan periods, and other details, please contact:

< Name > < Email address >

< Name > < Email address >

NASA@ My Library is a national STAR Library Network (STAR Net) initiative that connects NASA, public libraries, state libraries, and their communities. Together we are working to increase STEM learning opportunities for millions of library patrons nationwide, particularly those underserved in STEM education.

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A3. Sample Kit User Evaluation Survey

SLA Kit Evaluation Survey

Library & Program Information

Program Date:	
Name of Library (Branch name, City, State):	
Community Type (Check one):	<input type="checkbox"/> City <input type="checkbox"/> City/Suburb <input type="checkbox"/> Suburb <input type="checkbox"/> Suburb/Rural <input type="checkbox"/> Rural <input type="checkbox"/> Other (e.g., tribal reservation, please describe):
How did you learn about this kit? (Check all that apply):	<input type="checkbox"/> State Library website <input type="checkbox"/> Promotional materials (e.g. flyers, emails) from my State Library <input type="checkbox"/> Regional conferences or meetings <input type="checkbox"/> Word of mouth <input type="checkbox"/> Other (please describe):
Contact Name/Title:	
Contact email:	

Who led or co-led the program (Check all that apply):	<input type="checkbox"/> Library staff <input type="checkbox"/> Library volunteer(s) <input type="checkbox"/> Local science experts (e.g., individuals from local astronomy clubs, planetariums, universities) <input type="checkbox"/> Other (please describe):
Which items from the kit did you use? (Check all that apply):	Materials/Activities: <input type="checkbox"/> <List materials in your kit here>

People Served

Total # of people in attendance:	
Age group(s) in attendance (Check all that apply):	<input type="checkbox"/> Infant <input type="checkbox"/> Pre-K <input type="checkbox"/> Early Elementary <input type="checkbox"/> Upper Elementary <input type="checkbox"/> Tweens <input type="checkbox"/> Teens <input type="checkbox"/> Adults <input type="checkbox"/> Seniors
Did families attend? (Check one)	<input type="checkbox"/> Yes <input type="checkbox"/> No
Which underserved audiences did you <u>specifically</u> reach out to for this program? (Check all that apply):	<input type="checkbox"/> African Americans <input type="checkbox"/> American Indians <input type="checkbox"/> Hispanics & Latinos <input type="checkbox"/> Native Hawaiians & Pacific Islanders <input type="checkbox"/> Alaska Natives <input type="checkbox"/> Rural audiences <input type="checkbox"/> Economically disadvantaged <input type="checkbox"/> Women and girls <input type="checkbox"/> People with disabilities <input type="checkbox"/> None <input type="checkbox"/> Other (Please describe):

Public Library Experience with Kit Resources

How satisfied or not satisfied were you with the following:	Not satisfied	Slightly Satisfied	Moderately Satisfied	Very Satisfied	Extremely Satisfied	N/A
The kit reservation process						
State Library support in the use of the kit						
State Library assistance in accessing other resources such as Earth and space science experts						

How much do you agree or disagree with the following:	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
The kit was easy to use					
I would be interested in receiving more kits like this one					
Our library patrons appeared to enjoy the program					

Do you have any stories or quotes from patrons that you'd like to share?

Is there anything else you would like us to know about your program or your experience using the kit?

B. Library Staff Training Resources

B1. NASA STEM Workshop: Presenters and Participants Agendas



NASA STEM Workshop Presenters Agenda

Presenters names and contact information; for example:

Brooks Mitchell – Education Coordinator II – STAR Library Network – bmitchell@spacescience.org
Christine Shupla – Senior Education Specialist – Lunar and Planetary Institute – Shupla@lpi.usra.edu

Day 1

While gathering:

- Place out bowls of candy.
- Invite participants to jot down their goals for attending the workshop, and add them to a chart paper.
- Create a chart for the Parking Lot

1 pm Welcome and Introductions

- After presenters are introduced, invite participants to name themselves, their library, their position
- Red Mars activity: get to know names
- Quick overview of their goals and ours (based on what is on the chart)
- Introduce the Parking Lot

1:30 What we see in the sky:

- Human sundial activity—introduce and observe shadows
 - Cancel this activity if needed for time or weather issues
 - If there is strong interest, mark positions in chalk and return outside at the break and then around 3-4pm to mark positions again.
- Modified Oreo Phases activity
- Sorting Game: How Big? How Far? How Hot?
 - Discuss sorting games, and the different ways to use it
 - Discuss how presenters can avoid/deflect on questions; they don't need to be an expert on space
- Post charts for Planets, Solar System, Galaxy, and Universe
 - Invite participants to jot down thoughts on each on post-its
 - Conduct a gallery walk to let them review posted thoughts
 - Summarize the difference between these systems, possibly with an analogy. [e.g. Solar System– like the picture-book section filled with books (planets, asteroids, comets, and the Sun); = children's section; Universe = library, with all of the sections.]

2:30 Break

2:45 Solar System

- Jump to Jupiter activity
 - discuss scale models
- Teen Moon: Moon Ooze activity
 - Connect to Apollo missions and what we see when we look at the Moon
- Crater Creations activity
 - Discuss limitations of models (impactor doesn't remain, scale of crater)
 - Connect to features (rays, crater walls, ejecta, etc)

Event date and location



NASA STEM Workshop Presenters Agenda

4:00 Break

4:15 Beyond the Solar System

- 15 minute presentation on astronomy basics (stars, galaxies)
- Let's Make a Supernova activity (model without the pasta)
- Light Up Exploded Stars activity (paper circuits)
 - If running out of time, introduce and then let them take to finish for homework

5 pm Implementation discussion.

Options:

- Small group for different topics, with each writing down ideas, then a gallery walk
- Inner/outer circle (talk with partner for 1 minute each, then inner circle rotates)
- Jot down notes on post-its, to put onto different topics.

Topics

- How can you use any of the activities/ presentation content from today in your programs/activities?
- What barriers do you anticipate? How can you modify activities to suit your needs?
- Are there ways you can partner with others?

5:30 – 7 pm dinner break

7-8:30 pm Evening observing session (Weather permitting)

- Big Dipper Star Clock activity
- Constellation and Moon stories, resources

Day 2

9am Welcome back

Burning Questions from yesterday (check Parking Lot)

9:30 Resources discussion

- STAR NET website
- Night Sky Network
- Portal to the Public
- Solar System Ambassadors
- LPI traveling exhibits

10 am Exploring Space

- UV Kid activity
 - Include discussion of conducting an experiment, the need to form a prediction and test it
- Health in Space stations/activities
 - Skip these if running behind on schedule

10:45 Break

- display My Trip to Mars activity for them to play

Event date and location



NASA STEM Workshop Presenters Agenda

11 am How We Explore

- Strange New Planet activity
 - Emphasize the role that group discussion and planning takes
 - Give options for how the models are created

12 pm lunch

- Make Strange New Planet models to take, if time permits

1 pm How We Explore continues

- Touch Down activity
 - Emphasize the engineering design process

2 pm Discussion

- Check parking lot, then:
Continue Implementation planning
- Options:*
 - Small group for different topics, with each writing down ideas, then a gallery walk
 - Inner/outer circle (talk with partner for 1 minute each, then inner circle rotates)
 - Jot down notes on post-its, to put onto different topics.
- Topics*
 - How can you use any of the activities/ presentation content from today in your programs/activities?
 - What barriers do you anticipate? How can you modify activities to suit your needs?
 - Are there ways you can partner with others?

3 pm Closing

- Index cards: what was best, what needs to be changed
- Next steps: upcoming webinars, etc.
- Certificates



NASA STEM Workshop

Agenda

January 31 – February 1, 2019
Tallahassee, FL

Presented by the STAR Library Network (STAR Net)

Christine Shupla – Senior Education Specialist, Lunar and Planetary Institute,
shupla@lpi.usra.edu

Andy Shaner – Public Engagement Lead, Lunar and Planetary Institute, shaner@lpi.usra.edu

STEM ACTIVITY Clearinghouse Activities available in the "Universe of Stories" collection:
clearinghouse.starnetlibraries.org/143-universe-of-stories

Day 1

- 12:00 pm Welcome and Introductions**
- 1:30 Our Place in Space**
Sorting Games: How Big? How Far? How Hot?
Discussion: incorporating patrons' prior knowledge in STEM activities
Jump to Jupiter activity
Discussion: using models to answer patrons' questions
- 2:30 Break**
- 2:45 What We See in the Sky**
Looney Lunar Phases activity
Teen Moon: Moon Ooze activity
Crater Creations activity
Discussion: adapting activities for your audiences
- 4:00 Beyond the Solar System**
Let's Make a Supernova activity
Assemble *Big Dipper Star Clock*
- 5:00 Break for Dinner** (on your own)
- 7-8:30 pm Night Sky Viewing with the Tallahassee Astronomical Society**
(weather permitting)



Day 2

- 9:00 am Welcome and Reflection of Day 1**
- 9:15 Online Resources Tour**
- 9:30 How We Explore**
My Trip to Mars game
Touch Down activity
Discussion: tips and tricks for facilitating design challenges
- 10:30 Break**
- 10:45 How We Explore (continued)**
Strange New Planet activity and discussion
Assemble take-home "planets"
- 12:00 pm Networking Lunch**
- 1:00 Health in Space**
UV Kid activity
Discussion: facilitating learning
Health in Space stations/activities
- 2:15 Implementation Discussion**
- 3:00 pm Conclude**

Additional Websites and Resources

STAR Library Network (STAR Net): www.starnetlibraries.org
Summer of Space: ... universe-of-stories
Webinars: ... [webinars](#)
Conference presentations: ... [resources/conferences](#)
Blog: ... [blog](#)
YouTube channel: www.youtube.com/starnetlibraries

Lunar and Planetary Institute
Explore! Activities and Resources: www.lpi.usra.edu/education/explore
Traveling Exhibits: www.lpi.usra.edu/exploration/education/exhibits

Collaborative Summer Library Program: www.csipreads.org

NASA Collaboration Opportunities:
Solar System Ambassadors: www.solarsystem.nasa.gov/ssa
Night Sky Network: www.nightskynetwork.org



B2. Maryland Cosmic Roadshow Workshop Agenda and Flyer



NASA @ My Library
 MD Cosmic Roadshow Workshop
 Mount Airy Branch, Carroll County Public Library
 705 Ridge Avenue, Mount Airy, Maryland 21771
 September 26, 2019

Agenda

- 9:30-10:00 Check-in
- 10:00-10:15 Welcome and Introductions
- 10:15-10:45 Astronomy 101: "What Do We Know About Space?"/Questions Spark Discussion

NASA@ My Library Facilitation Kits Introduction

- 10:45-12:00 **Kit 1: Sun-Earth-Moon Connections** Review
 Sorting Games, "How Big? How Far? How Hot?...."
 (low tech)
 UV Kid! (high tech)
 Jump to Jupiter (outside activity)
- 12:00 Lunch -- Sharing -- Space Zoo
- 12:45-1:45 **Kit 2: Be A NASA Detective: Expanding Your Senses** Review
 Pocket Solar System - Low tech
 Taking Earth's Temperature (Infrared Thermometer)
 - high tech
- 1:45-2:20 **Accessibility Focus**
 Loony Lunar Phases
- 2:20-2:30 Break

- 2:30-3:30 **Astronomy Star Party** (Southern Maryland Astronomical Society)
- 3:30-3:45 **N@ML Kit Evaluation Review & Resources**, [MSL Lending Website](#)
- 3:45-4:00 Parking Lot, Wrap-up, Sharing;
 How to Be a Solar System Ambassador (Erin Gambrell)

Additional Websites and Resources

- STAR Library Network (STAR Net):** www.starnetlibraries.org
 Summer of Space: .../universe-of-stories
 Webinars: .../webinars
 Conference presentations: .../resources/conferences
 Blog: .../blog
 YouTube channel: www.youtube.com/starnetlibraries
- Lunar and Planetary Institute**
 Explore! Activities and Resources: www.lpi.usra.edu/education/explore
 Traveling Exhibits: www.lpi.usra.edu/exploration/education/exhibits
- Collaborative Summer Library Program:** www.cslpreads.org
- NASA Collaboration Opportunities:**
 Solar System Ambassadors: www.solarsystem.nasa.gov/ssa
 Night Sky Network: <https://nightsky.jpl.nasa.gov/>
- Southern Maryland Astronomical Society (SMAS):** <https://www.smas.us/> [change to reflect the local group presenting at the workshop]
- Website link to Borrow a STEM Facilitation Kit
- Erin Gambrell, Children's Services Supervisor, Carroll County Public Library and NASA Solar System Ambassador, egambrell@carr.org
- LaShawn Myles, Youth Librarian, MD State Library for the Blind & Physically Handicapped, lashawn.myles@maryland.gov
- Carrie Sanders, Youth Services Coordinator, Maryland State Library, carrie.sanders@maryland.gov



C. Underserved STEM Audiences

C1. Guidance for State Library Agencies: Engaging Underserved Audiences



The information below was provided to each State Library Partner early in the project (January 2019) to help them with developing their *NASA@ My Library* Plan for Engaging Underserved Audiences. These ideas and suggestions should be helpful to all SLAs who are planning to build diversity and equity into a STEM kit program.

NASA@ My Library seeks to reach learners from populations underserved and underrepresented in STEM-related fields (hereafter referred to as “underserved audiences”). These audiences include African Americans, Hispanics, Native Americans, women, persons with disabilities, and persons with low socioeconomic status.

Our overarching aim is to provide STEM experiences that increase the interest, engagement, and knowledge of NASA’s space and earth science domains for these audiences. We anticipate that each State Library Agency will determine the most effective approaches to engage these audiences.

Examples of strategies and methods to engage underserved STEM audiences

(Source: 2018 SLA Letters of Interest applications)

1. Prioritize distribution of kits to public libraries serving significant immigrant or rural Communities.
2. Prioritize underserved populations by working closely with public libraries that serve these populations. For example, distressed municipalities that have a significant percentage of school age children that qualify for free and reduced-price meals.
3. Engage public libraries that have children who receive special education services and a high percentage of residents living at or below 100% of the Federal Poverty Level.
4. Host a program for librarians from underserved communities for them to learn about the program and its resources.
5. Solicit tribal library and community feedback to ensure we are offering opportunities that are culturally respectful and create positive experiences for Native American learners.
6. Work with tribal college libraries to jointly create resources for their patrons and work together to figure out the best way to reach those most in need.
7. Circulate *NASA@ My Library* kits through the regional library system to ensure children in rural areas have access to tools and training they would not normally receive.
8. Library consultants will travel around the state to provide training and use videoconferences and webinars to share information and resources with their public libraries in geographically remote areas.
9. Expand existing programs that are presently serving underserved STEM audiences.

C2. Sample Plans from State Library Partners (Connecticut and Maryland)



NASA@ My Library

Engage Underserved and Underrepresented STEM Audiences

Connecticut State Library

Background Information: The Middletown Library Service Center (MLSC) currently has the following STEM kits that have been circulating since 2015: 3 Little Bits Workshop Sets; 2 kits of 6 Makey Makeys; 4 Snap Circuit Kits on Basic Electricity and Electronics; 1 each of Dash & Dot; Ozobot Bits; and 2 Keva Planks kits of 800 pieces each. Last year's statistics showed more than 30 loans of these materials for 20 different libraries, 8 of which are from Distressed Municipalities, as defined by the CT Department of Economic & Community Development. A summary [report](#) explains the factors in determining this status including the poverty and unemployment rates.

Focus: The State Library serves all communities in Connecticut and will prioritize underserved populations from distressed municipalities by working closely with city and town libraries that serve these populations. The current list as of 2017 of distressed communities include cities and towns we have directly targeted for the kits or from towns who had an immediate interest in using the kits. These include East Hartford, Hartford, Willimantic (Windham), Enfield, Bridgeport and New Haven. For example, East Hartford is a distressed municipality, where 58% of children in the school system qualify for free and reduced price lunch. According to the 2012-2016 American Community Survey 5-year Estimates compiled by the U.S. Census Bureau, of East Hartford's 50,834 residents, 50% identify as white, 31% as Hispanic or Latino, 28% as black, 4.5% as Asian, and 3.4% as two or more races. 22.1% of residents were born outside of the United States. The current top 5 distressed communities in the 2017 table include New London, Ansonia, Waterbury, Derby and New Britain. A special effort will be made to reserve the duplicate kits for these cities/towns and encourage STEM programming for their populations.

Other Underserved Populations: Connecticut is also a state with Native American populations. Many are located in the area of Ledyard, Connecticut which is close to the two casinos, Mohegan Sun and Foxwoods, managed by the Mohegan tribe on reservation land and the Mashantucket Pequot tribe on reservation land, respectively. Another underserved audience for the STEM field are girls and women. Some great efforts are being made through the Girl Scouts program to introduce new STEM-related badges and activities. We will suggest to libraries that they hold programs with local Brownie and Girl Scout troops as a way to introduce or continue the momentum of STEM education to these audiences through the NaML kits. CSL hopes to reach a large number of girls at the Space Expo at the New England Air Museum in April and spark their interest with the displays and activities we showcase. Finally, through CSL's statewide delivery service, deliverIT, the STEM kits are able to travel across the state including the more remote rural areas several times a week ensuring that populations in these areas being served by the public libraries are equally able to participate in STEM programming using the NaML kits.

NASA@ My Library
Cohort 2
Maryland State Library



Engage underserved and underrepresented STEM audiences

The Maryland State Library (MSL) will extend the reach of the Facilitation Kits by adapting them for the visually impaired. There is a need nationwide to provide services and remove barriers whenever possible for this underserved population. More than 560,000 American youths (under 18) and more than 7,500 Maryland youths have a vision impairment (ACS 2017 1-yr estimates). Additionally, according to Bureau of Labor Statistics, twenty-one of the thirty fastest growing occupations directly require postsecondary education in one or more of the STEM fields. This means that the greatest opportunities for stable careers with good earning potential will require STEM education. If students who are visually impaired are going to be successful in the competitive education and job markets, they will need early and consistent exposure to a wide variety of STEM learning opportunities.

The Maryland State Library's structure allows for this successful creation, revision, marketing, training, and distribution of the Facilitation Kits to this underserved audience. LaShawn Myles, Youth Librarian for the Maryland State Library for the Blind & Physically Handicapped (LBPH) and Carrie Sanders, Youth Services Coordinator for the Public Library and State Networking Branch (PLSNB) of the Maryland State Library will collaborate to build and distribute "accessible addendums" to the original Facilitation Kit 1 Facilitation Kit 2. These "accessible addendums" will include items that are tactile-oriented so that these STEM activities and experiences are accessible.

PLSNB fosters a robust network of productive collaborations across Maryland libraries. This allows for feedback and communication between MSL and the library systems that leads to responsive and timely addressing of needs. Staff from all over the state participate in role-specific Communities of Practice, and system Administrators meet several times a year to discuss trends and resolve issues on very short timelines. MSL staff participate, synthesize, and support library systems by creating programming and training opportunities for topics raised by these groups. One result of these regular group meetings is a schedule of events that draws participants from other types of libraries (school, academic and special) and neighboring states. Two such marquee events are the annual Tech Connect and Information Literacy Summits, hosted by MSL. Additionally, the work of these groups leads to dozens of statewide staff training opportunities on a wide range of topics in a variety of modes. MSL's model for interpreting state-wide needs as identified through these groups allows us to pilot projects that begin with a core group of systems that then expand to a broader audience of library staff.

The MSL will meaningfully contribute to the national conversation on innovative, inclusive STEM programming through the creation, distribution, and training guidance of these accessible Facilitation Kits. In this time of heightened awareness by public libraries of the critical role we play in our communities to serve ALL in an inclusive spirit, the Maryland State Library is poised to bring the amazing world of space exploration through these accessible Kits to an underserved population.

D. Resources for Engaging NASA Volunteers

D1. Guidance for Libraries Connecting with NASA Volunteers

How to Partner with Your Local NASA volunteers: Night Sky Network Astronomy Clubs (NSN) and Solar System Ambassadors (SSA)

Find nearby NSN astronomy clubs: bit.ly/findnsn. Enter your zip code and find a club near you. Many clubs accept event requests directly from their page or send them an email.



Find an SSA via solarsystem.jpl.nasa.gov/ssa. Search by state using the Directory, then click on their map pin or name to access their bio and email contact form.



What to have prepared when contacting them: Make sure to have the following info handy and keep a few considerations in mind:

- **Schedule well in advance.** Try to give them at least a month to make sure they are available and have enough time to ensure a quality event.
- What is the exact **time, date and location**? Is there a backup date in case of poor weather?
- Is there a **theme for your event** or do you want them to provide any type of activity or presentation that they'd like?
- What **type of event** is it? Is it a science fair, scout campout, community event?
- **Who** is this event for, and **how many** will be there? Will it be children? Young adults? Senior citizens? An all-ages event? Dozens of people or hundreds? Notify the volunteer of any audience special needs or considerations.
- Who should they contact, and what is their **preferred contact information**? In addition to your own info, is there a backup person? Is there a person in charge of the event facility itself or a custodian that can help with basic issues with the event space?
- Ask them what **presentation tools** they may need – projector, chairs, tables, outside space etc.
- Share what you are doing to **advertise for the event** and your volunteer can probably help spread the word through their channels, including the SSA and NSN websites.

At the Event

Please help your volunteer out by ensuring they have easy access to your event space (including parking), and they have all of the supplies and tools they need available well before the event is scheduled to start so there's plenty of set up time.

Crowd control and clear safety guidelines for your volunteers and visitors are essential for a smooth event. Be sure to communicate what your standard emergency procedures are and where all the restrooms or breakrooms are for the volunteer to use.

At the end of the event, if you want to provide the volunteer with any feedback, photos or schedule another event, it's a good time to discuss that before they leave. Remember, these are volunteers - they are sharing their time simply for the joy it brings. Be sure to pass on thanks and comments from your community!

Night Sky Network Astronomy Clubs
nightskynetwork.org
nightskyinfo@astroscopy.org

Solar System Ambassadors
solarsystem.jpl.nasa.gov/ssa
ambassad@jpl.nasa.gov

D2. Night Sky Network Astronomy Clubs (NSN) and Solar System Ambassadors (SSA) Flyers

NASA @ My Library

Connect with Your Local Astronomy Club to Learn More About the Night Sky



Source: GoodFreePhotos.com, Photo by Greg Rakozy



This state library project was made possible in part by the Institute of Museum and Library Services

NASA's Night Sky Network

The Night Sky Network is a nationwide coalition of amateur astronomy clubs bringing the science, technology, and inspiration of NASA's missions to the general public.



With numerous clubs in each state, many of them are excited to share their time and telescopes to provide your community with unique astronomy experiences at the public library and under the real night sky.

Astronomy clubs will bring a wealth of knowledge and resources to your library. Whether you're looking for a speaker, a display, or a star party, these volunteers are equipped with NASA activities and information to share.

To find a club near you:

- 1) Go to the Clubs and Events page at the Night Sky Network website: bit.ly/FindNSN
- 2) Type in your zip code and submit

For other space science activities:

- 1) Go to STAR Net's STEM Activity Clearinghouse: clearinghouse.starnetlibraries.org
- 2) Go to the Outreach Resources page at the Night Sky Network website: <http://bit.ly/nsnresources>



Credit: Grand Canyon National Park 23rd Annual Star Party 2013

Disclaimer: Astronomy club members are volunteers and excited to share their telescopes and knowledge at events when they are able, but may not be able to accept all requests.

NASA@ My Library is a national STAR Library Network (STAR Net) initiative that connects NASA, public libraries, state libraries, and their communities. Together we are working to increase STEM learning opportunities for millions of library patrons nationwide, particularly those underserved in STEM education.

NASA@ My Library is based upon work funded by NASA under cooperative agreement No. NNX16AE30A. Any opinions, findings, and conclusions or recommendations expressed in this material are those of NASA@ My Library and do not necessarily reflect the views of the National Aeronautics and Space Administration.



NASA @ My Library

Connect with a Solar System Ambassador Volunteer to Aid in Your Space Science Program



Credit: NASA



This state library project was made possible in part by the Institute of Museum and Library Services

NASA's Solar System Ambassadors

The Solar System Ambassadors (SSA) program works with motivated volunteers across the nation to share the latest science and discoveries of NASA's space exploration missions through a variety of events that inspire their communities.



To find a local ambassador near you:

- 1) Visit the Solar System Ambassadors Program's website at: solarsystem.nasa.gov/ssa
- 2) Click on the "Directory" link
- 3) Search by Name, State and/or Country
- 4) Contact a SSA Volunteer for your program



Credit: NASA/Jenny Mottar

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