

NISE

NATIONAL INFORMAL
STEM EDUCATION
NETWORK



nisenet.org



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NISE NETWORK

The National Informal STEM Education Network (NISE Net) is a community of informal educators and scientists.

NISE Net

is dedicated to supporting learning about science, technology, engineering, and math (STEM).

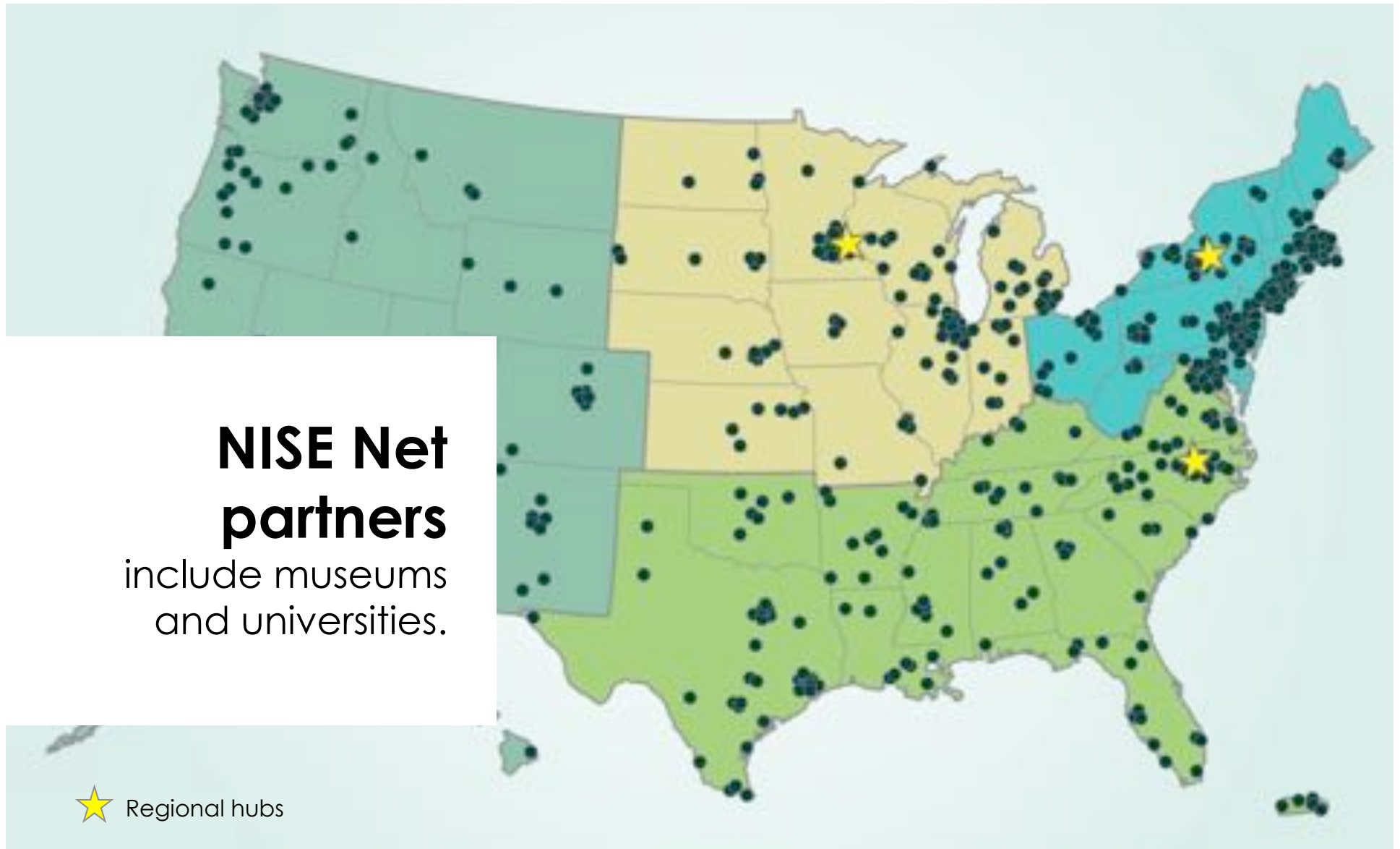


NISE Net supports **informal learning about STEM** in communities across the United States.



Our activities are
**fun and
accessible**
for everyone.

Hundreds of organizations participate in the Network.



NISE Net creates **engagement materials** for a variety of audiences and settings.



Public resources include hands-on activities, public programs, exhibits, and media.

Partner organizations use Network resources to engage audiences in their communities.



**Local
collaborations**

increase our reach
and impact.

The Network provides **professional development** for educators and scientists.



Professional resources

include meetings, guides, videos, and online workshops.

Together we reach **millions of people** each year!



NISE Net

brings together diverse people to share and learn from each other.

NISE Net has projects in many areas of STEM.

Synthetic biology
2014-2018



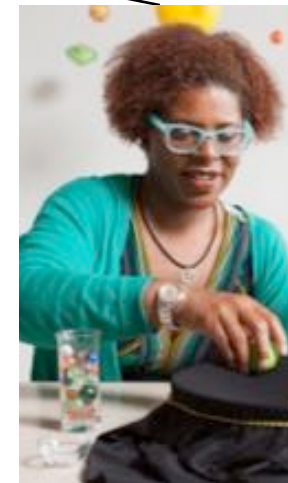
Chemistry
2016-2019



Nanotechnology
2005-2017



Responsible innovation



Earth & Space

SPACE & EARTH

Space and Earth



STEM focus

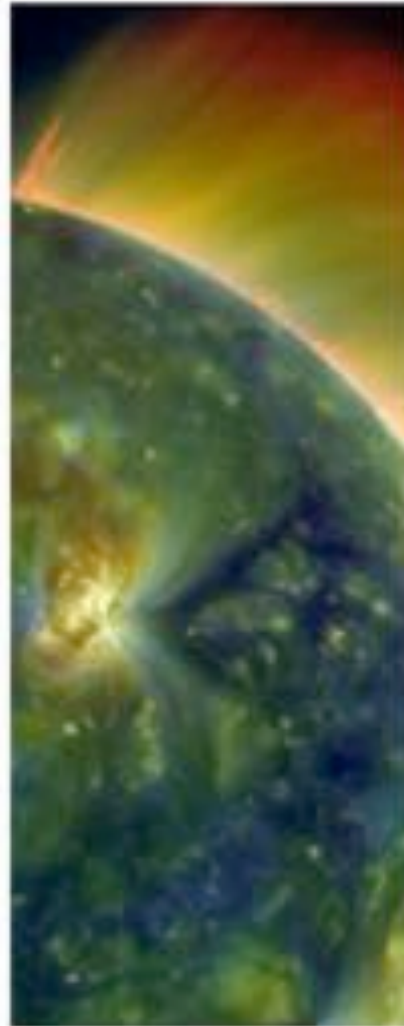
Astrophysics



Earth Science



Heliophysics



Planetary Science



Project team



NASA

SMD & STEM Activation team

LEAD INSTITUTIONS

Arizona State University
Children's Creativity Museum
Science Museum of Minnesota
Museum of Science

TEAM MEMBERS

Astronomical Society of the Pacific
Museum of Life and Science
Sciencenter
University of Notre Dame

Audiences



PUBLIC

Museum audiences

- Families with children ages 6-10
- School groups K-6
- Other museum visitors

Underserved audiences

- Museum visitors
- Offsite programs

PROFESSIONAL

Educators

- Museums
- Out of school settings

Subject matter experts

- Event volunteers
- Project partners

Project activities

PUBLIC ENGAGEMENT MATERIALS

STEM activity toolkits

Small-footprint exhibitions

PROFESSIONAL RESOURCES

Professional development

Regional hubs, website, and infrastructure

EVALUATION

Public impacts

Professional impacts

SHARING & CONNECTING

STEM Activation community

NASA Museum Alliance

Other resources



Planning tools

DESIGN PRINCIPLES

Engaging
Authentic
Current
Relevant
Accessible

LEARNING FRAMEWORK

Experience Earth and space **phenomena** and explore scientific discoveries.

Use the scientific **process** and reflect on science as a way of knowing.

Participate in the scientific community and identify as a science learner.

CONTENT OVERVIEW

The **Sun** powers Earth and our solar system.

Earth is a changing planet of air, water, rock, and life.

Planetary systems like ours may contain water and life.

The **universe** is very large, old, and mysterious.

STEM activity toolkits support programming and partnerships.



STEM activity toolkits



DESCRIPTION

STEM learning resources, including hands-on activities and programs

Professional resources for planning, implementation, and training

Materials and supplies to engage the public, build partnerships, and provide professional development

TIMELINE

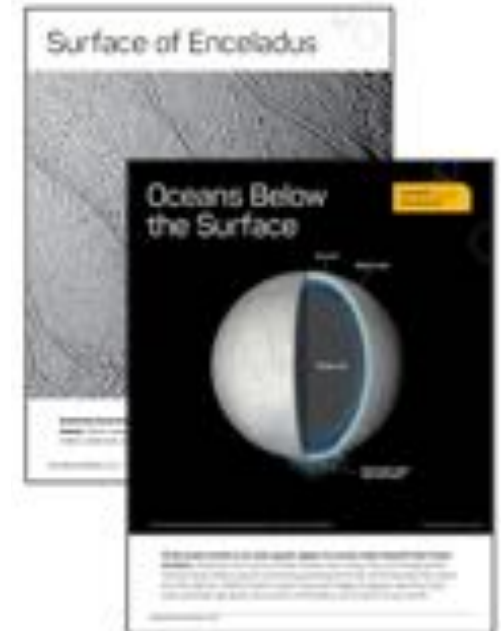
Four toolkits developed 2016–2019

250 copies distributed 2017 and 2018

350 copies distributed in 2019 and 2020

Public engagement materials

Exploring the Solar System: Ice Orbs



Professional training materials

Exploring the Solar System: Ice Orbs



EXPLORING THE SOLAR SYSTEM
Ice Orbs

Try this!

Look closely at the ball of ice. What do you see on the outside and the inside? Compare what you see to the images of the moons.

Choose an object hidden under the surface of the ice. What do you observe? Try using tools to get more information!

Can you tell what the hidden object is made of? Is it alive? How would you learn more about the object on the ice?

Given worlds may be the most likely places to discover life beyond Earth.

Some of the most interesting worlds in our solar system are the moons of Jupiter and Saturn. These moons have liquid water, subsurface oceans, and hydrothermal vents. They are also thought to have organic molecules and a methane atmosphere. The moons of Jupiter and Saturn are also thought to have a subsurface ocean of liquid water. This is because they have a subsurface ocean of liquid water. This is because they have a subsurface ocean of liquid water.



FACILITATOR GUIDE
Ice Orbs

Learning Objectives

- 1. Understand the concept of a subsurface ocean.
- 2. Understand the concept of a hydrothermal vent.
- 3. Understand the concept of an organic molecule.
- 4. Understand the concept of a methane atmosphere.

Materials

- 1. Ice
- 2. Water
- 3. Food coloring
- 4. Small objects (e.g., beads, buttons)
- 5. Tools (e.g., knives, spoons)

Procedure

1. Fill a container with water.
2. Add food coloring to the water.
3. Freeze the water.
4. Place small objects in the water before freezing.
5. Observe the objects after the water has frozen.

Using positive responses with difficult concepts

Activities

1. Ask students to describe what they see in the image of the moon.
2. Ask students to describe what they see in the image of the moon.
3. Ask students to describe what they see in the image of the moon.

Toolkit distribution – 250 copies

(2017 and 2018)



Toolkit distribution – 350 copies

(2019 and 2020)



PURPOSE

Increase project reach and impact

Engage geographically diverse communities across the United States

TIMELINE

Applications due in November 2018/2019

Informal learning institutions such as museums, planetariums, and NASA Visitor Centers are eligible

Free digital materials are available to everyone

www.nisenet.org/earthspacekit

Exhibitions reach millions of people and promote institutional investment in Earth and space content.



Interactive exhibition

DESCRIPTION

STEM learning components, including hands-on exhibits, graphics, and a seating area

Professional resources for planning, implementation, and staff training

Compact, modular design can be arranged in different configurations within 500 square feet (46 square meters)

TIMELINE

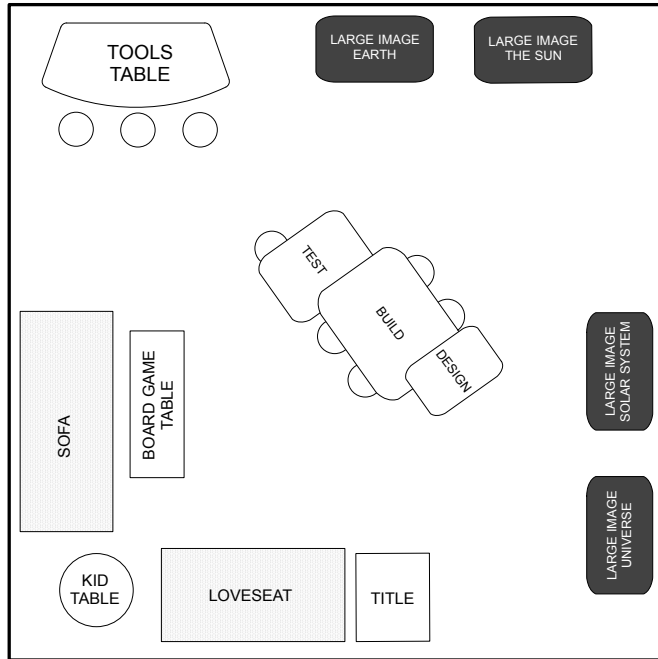
Exhibition developed in 2016-2017

Application process spring – summer 2018

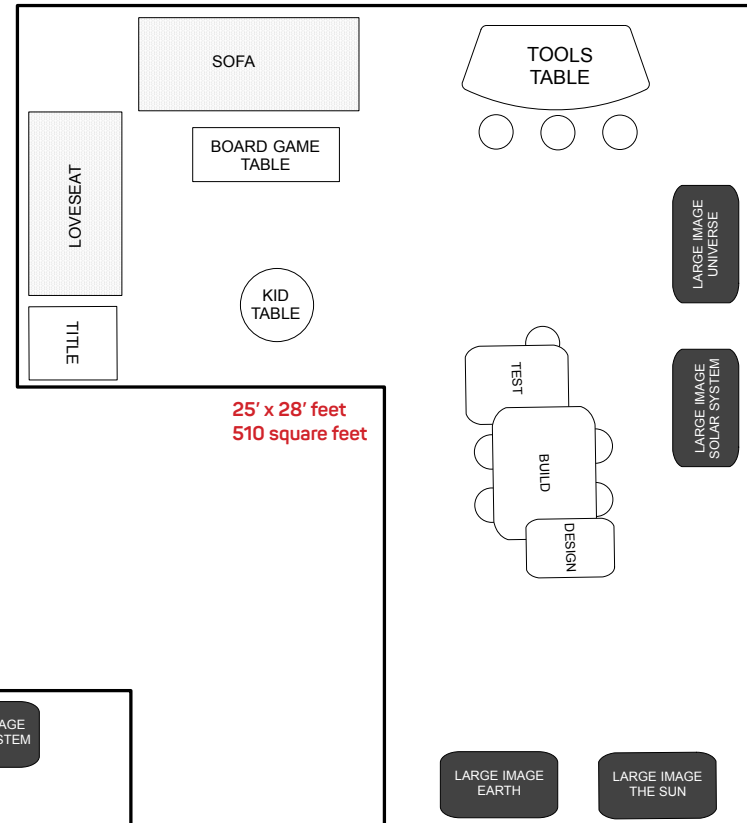
50 copies distributed in 2018-2019



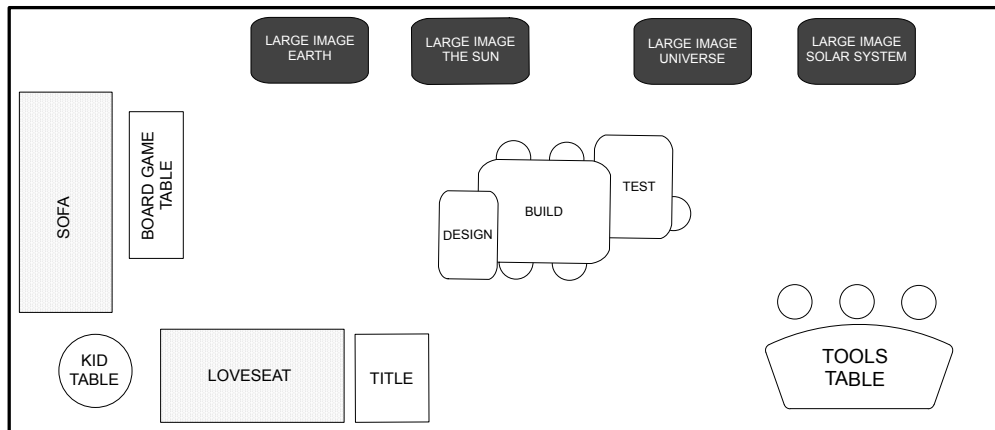
Exhibition 500 square feet (46 square meters)



22'4" x 22'4" feet
500 square feet



25' x 28' feet
510 square feet



34' x 14'6" feet
500 square feet

Exhibition



Professional development raises the capacity of informal educators and organizations to participate in project activities.



Professional development

DESCRIPTION

Online workshops provide “just in time” professional development for informal educators

In-person meeting provides deeper learning opportunities and networking across STEM Activation projects

Professional resources support public engagement products and activities

TIMELINE

Online workshops 2017–2020

In-person meeting 2019

Professional resources packaged with toolkits and exhibitions



Network and NASA infrastructure and expertise support the project and increase its impact.



Network infrastructure



Regional hubs provide coordination, communication, and partner support

Website distributes resources and information

Project databases and systems facilitate reporting and record maintenance

NASA infrastructure



NASA Science Mission Directorate
STEM Activation team
NASA Education
NASA Museum Alliance
NASA Visitor Centers
NASA Space Place
NASA Wavelength
Night Sky Network
Solar System Ambassadors
STEM educational resources
STEM images, visualizations, and other assets
Subject matter experts
...and more!

Subject matter experts

Institute for Global Environmental Studies

Harvard-Smithsonian Center for Astrophysics

NASA Ames Research Center

NASA Goddard Space Flight Center

NASA Jet Propulsion Laboratory

NASA Langley Research Center

NASA Science Mission Directorate

Space Telescope Science Institute

Cross-collaborations with SMD STEM Activation projects

American Museum of Natural History

Arizona State University

Exploratorium

GLOBE

Gulf of Maine Research Institute

Lunar and Planetary Institute Education

NASA Wavelength

NASA WOW!, NASA Education EXPRESS

National Institute Of Aerospace Associates

Night Sky Network

Northern Arizona University

Space Science Institute

University Of Washington, Seattle

Evaluation informs product development, helps the team make decisions, and allows stakeholders to understand the project's reach and outcomes.



Evaluation

TYPES OF EVALUATION

Front-end
Formative
Summative

PUBLIC IMPACTS

Who and how many members of the public do SEISE STEM learning products reach?

How do SEISE learning products impact the public's knowledge, interest, and understanding of STEM content areas?

PROFESSIONAL IMPACTS

Who and how many professionals are reached by the SEISE project?

What kinds of partnerships are formed between professionals during SEISE?

How does SEISE impact professionals' use of relevant products and practices?

How does SEISE impact professionals' knowledge and understanding of SMD content areas?

Project outcomes

1. **Widespread use** of project resources, including STEM learning and professional development products
2. **Broad reach** to sizeable public and professional audiences across the US
3. **New and strengthened partnerships** among national and local organizations that support informal and lifelong learning
4. **Demonstrated learning** by public and professional audiences



THANK YOU

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