MOONSHOTS IN THE MUSEUM: Creative ways to engage museum audiences in big challenges

ASTC 2019

Presenters

Darrell Porcello, Children's Creativity Museum

Jayatri Das, The Franklin Institute

Jeannie Colton, Arizona State University

Paul Martin, Arizona State University

Rae Ostman, Arizona State University

Sari Custer, Arizona Science Center

Overview

Welcome and introductions (5 min)

Project presentations (30 min total)

- Jeannie and Sari: Earth and space
- Paul and Rae: Sustainable futures
- Darrell and Jayatri: Brain science

Rapid prototyping activity (35 min)

Wrap up (5 min)

GOAL: Develop and share a set of concepts for “moonshot” projects.

PRESENTATIONS

Exploring Earth and Space

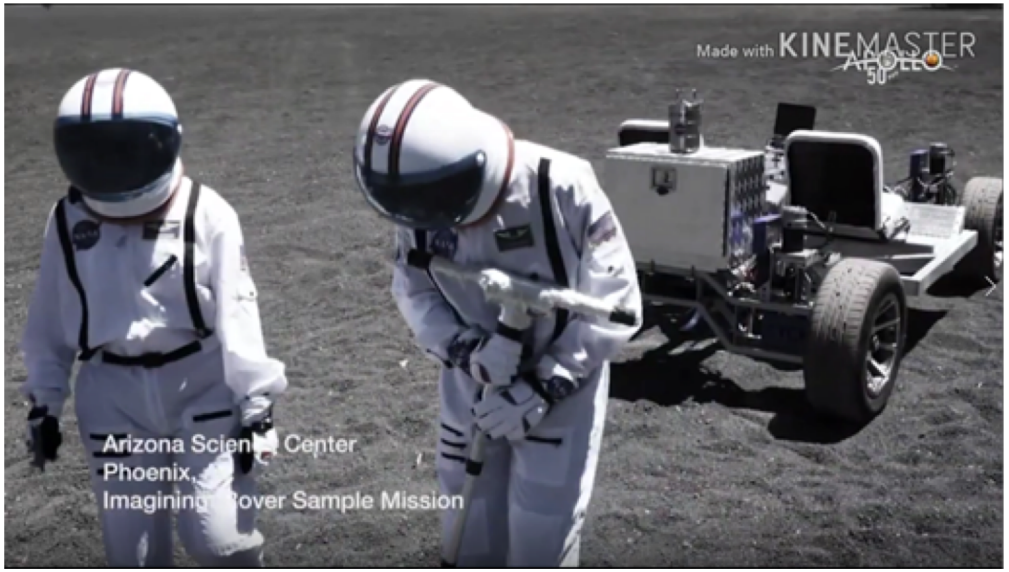
Sari Custer
Jeannie Colton

Apollo 11 50th Anniversary Celebration

NISE Net shares a variety of programming ideas, activities, and resources: https://www.nisenet.org/moon50

ARTEMIS

- First woman and next man on the Moon by 2024
- Sustainable presence on the Moon by 2028



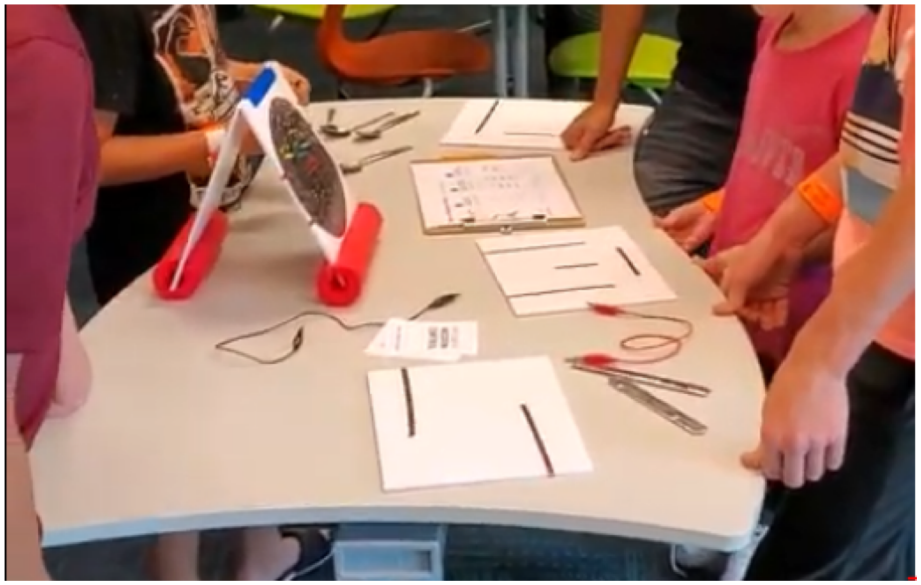
Moon and Beyond: An Immersive Game for STEM Learning in Museums and Planetariums

AKA **Moon Adventure Game**

- A STEM educational game that immerses players in a scenario related to NASA lunar missions.
- The primary learning objectives for participants are related to STEM processes and STEM identity. Learners will:
  - work together in groups to accomplish goals and solve problems
  - identify as someone who can learn about and sometimes participate in Earth and space exploration

Challenges

- Game play time
- Physical space
- Materials



Looking Ahead...

NISE
NATIONAL INFORMAL
STEM EDUCATION
NETWORK

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SUSTAINABLE FUTURES

Rae Ostman and Paul Martin

ASU Center for Innovation in Informal STEM Learning
Arizona State University

NISE NATIONAL INFORMAL STEM EDUCATION NETWORK

SUSTAINABLE
FUTURES

Purpose: Support museums and similar cultural organizations in their efforts to integrate sustainability into their program and operations.

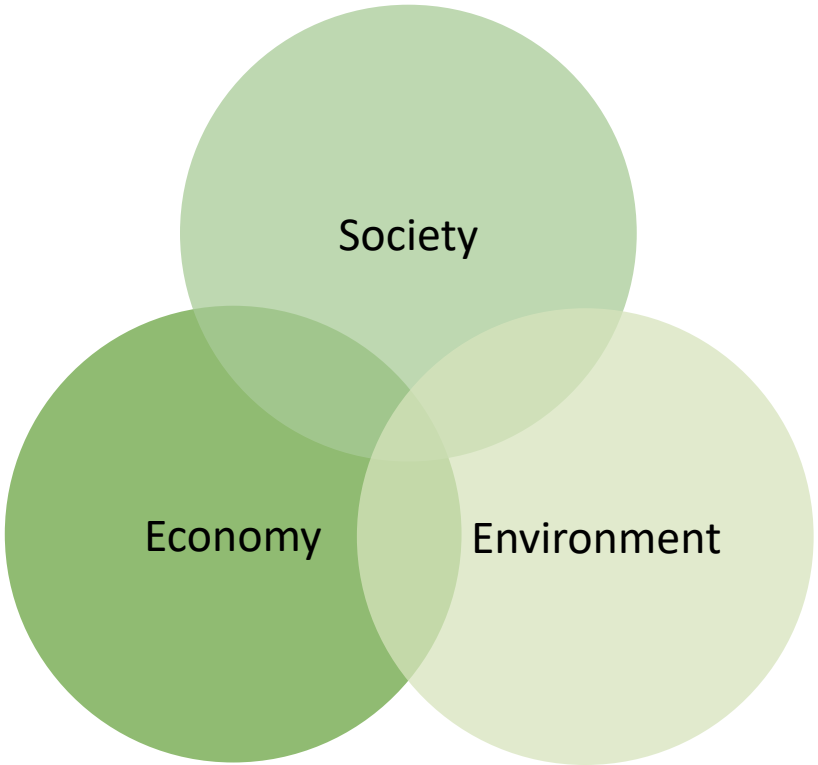
Approach: Provide professional development and programmatic resources that share and develop sustainability science and practice.

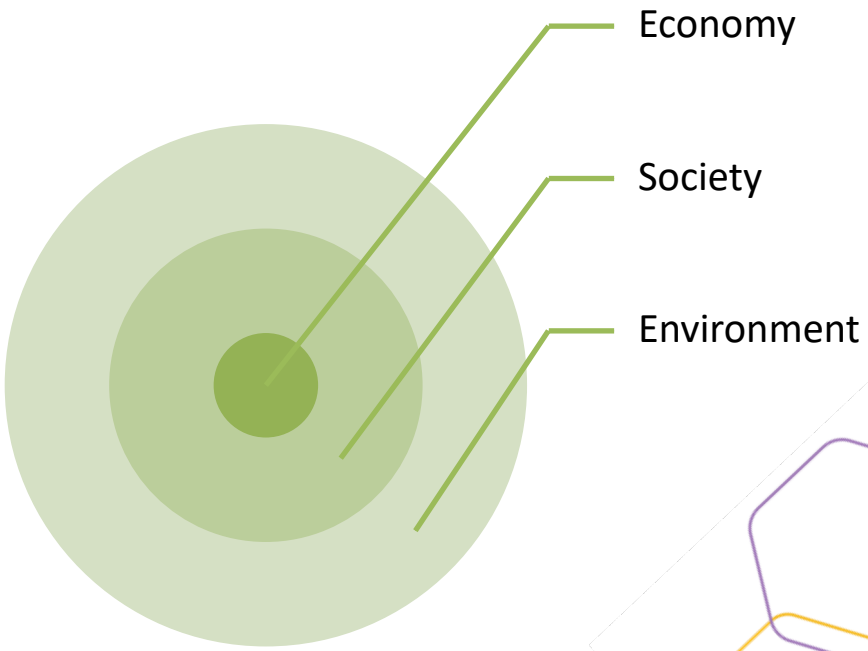
Strategic outcome: Leverage the power of museums around the world to help millions of people understand the social, environmental, and economic impact of human behavior on the planet's future.

Sustainability

"meets the needs of the present without compromising the ability of future generations to meet their own needs."

United Nations. Our common future, *Brundtland Report,* (1987).





United Nations Sustainable Development Goals

Project examples

- Projects by participants in the Sustainability Fellowship program
- Projects include public engagement, professional development, museum operations, community partnerships, and other efforts
- Projects address different elements of the UN Sustainable Development Goals

Children Science Center, Kenya
Sustainable Agriculture Garden

Parque Explora, Colombia

Community science

Science Museum of Western Virginia, USA

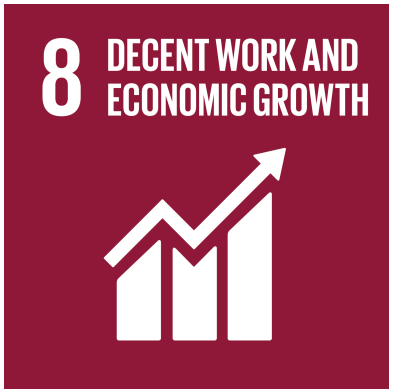
Universal design

TELUS Spark Science Centre, Canada

Energy transitions

Espace des Sciences Pierre-Gilles de Gennes, France

Training on digital fabrication



Ontario Science Center, Canada

Community partnerships

Museo Nacional de Historia Natural, Chile

Ecosystem research and education

Long Island Children's Museum, USA

Citizen science

Challenge

Help us brainstorm new ideas for **public programs that address the SDGs** and can be implemented broadly.

Public learning objectives:

- Understanding of big ideas related to sustainability
- Awareness of the relevance of sustainability
- Sense of self-efficacy related to sustainability

Acknowledgements

The *Rob and Melani Walton Sustainability in Science and Technology Museums* program is supported through funding from The Rob and Melani Walton Foundation.

Global challenges in neuroscience public engagement

Jayatri Das, Ph.D. & Darrell Porcello, Ph.D.
National Informal STEM Education Network

THE FRANKLIN INSTITUTE

NISE NATIONAL INFORMAL STEM EDUCATION NETWORK

CHILDREN'S CREATIVITY MUSEUM

Stand Up
Sit Down

Stand for any types of neuroscience public engagement have you participated in.

A. Structured discussion through a deliberative dialogue or citizen jury
B. Interactive exhibits at a museum or in the public space of a research center
C. Inspirational art like an art exhibition or a film
D. Expert-driven presentation or panel discussion in front of public audiences
E. Patient collaboration, advocacy group meeting, or outreach event
F. Blog, website, or other online forum

Are you still you? Sit down when you aren't sure.

A. You are fitted with a prosthetic arm with fine control through nerve impulses.
B. You are implanted deep brain stimulation system that stop tremors but also causes a personality change.
C. You used a neuroenhancement device that dramatically boosts their memory well beyond human capacity.
D. You are in a coma on life support and can only only communicate through a neuroimaging device that interprets live data through a population-level dataset.
E. Your tissue is used to grow a human brain organoid that to be implanted in a host animal for long-term observation.

Advanced facial recognition technology is installed in your local grocery store. Sit down when the application feels uncomfortable.

A. When you enter, the daily count of return visitors goes up by 1.

B. As you walk by products you have bought in the past, a text message alerts you to a discount.

C. If you look confused, an employee is sent to your location to ask if you require assistance.

D. The camera assesses you are happy and nearby video screens play fun ads for sweets and fancy food products.

E. The camera assesses you are sad and you get a text message asking if you are ok and would like suggestions on products to pick up your mood.

Stand up for nonhuman primate research you support.

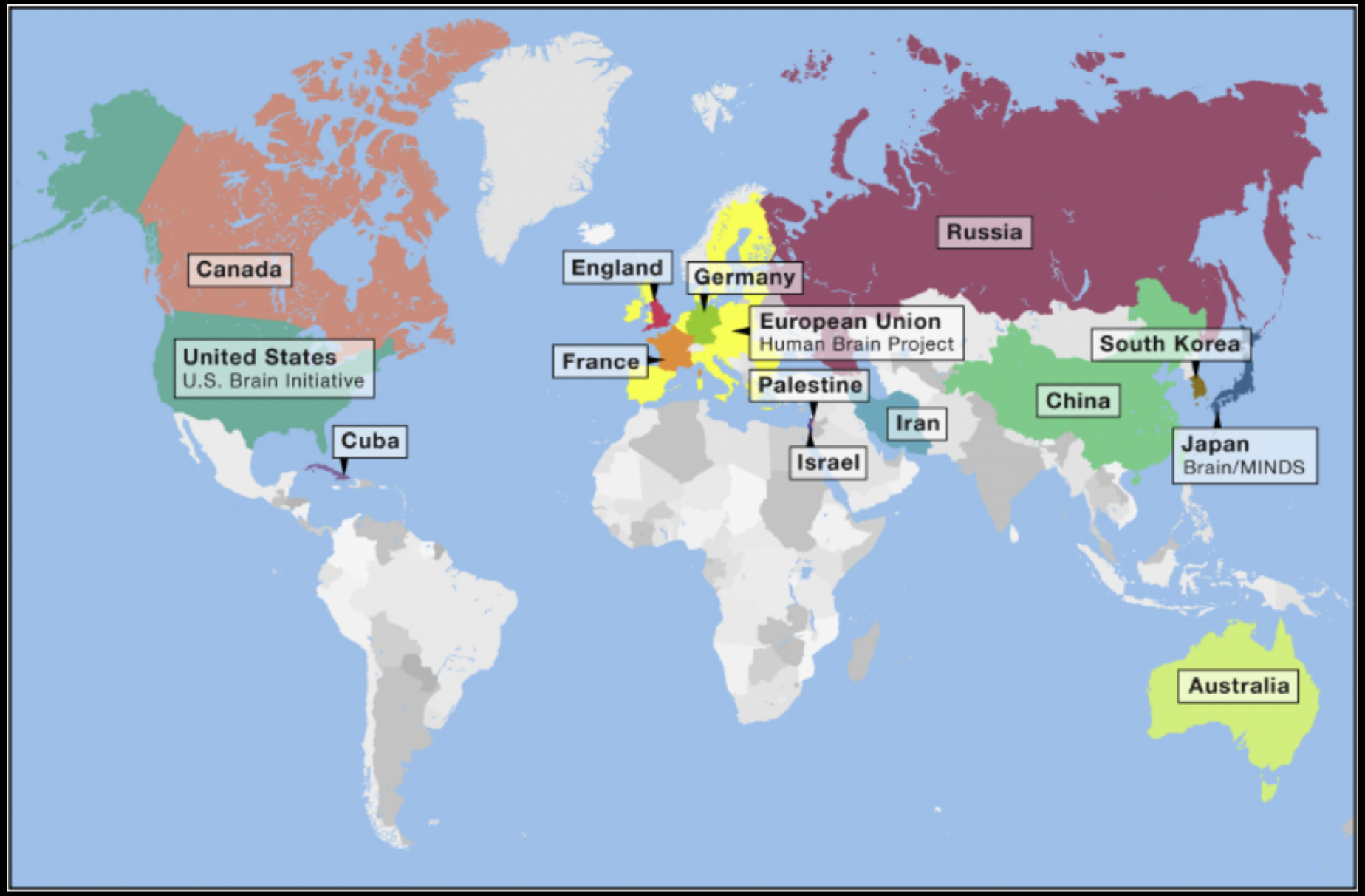
A. Testing the safety of future human brain-computer interface products.

B. Creating models of psychiatric disorders that may cause suffering.

C. Cognitive enhancements for nonhuman primates to better understand human brain development.

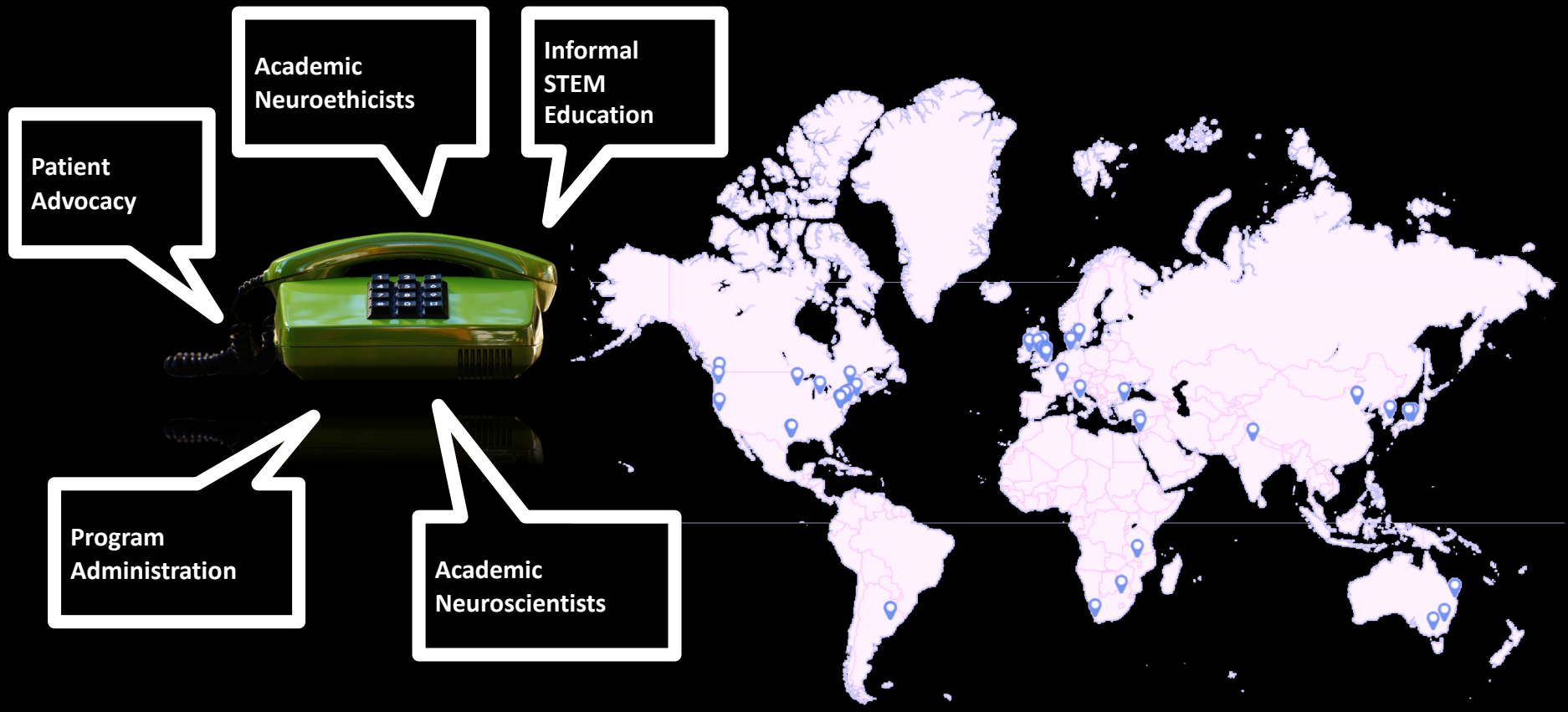
D. Causing movement disorders to examine new pharmacologic treatments.

E. Human tissue integrated into nonhuman primate brains.



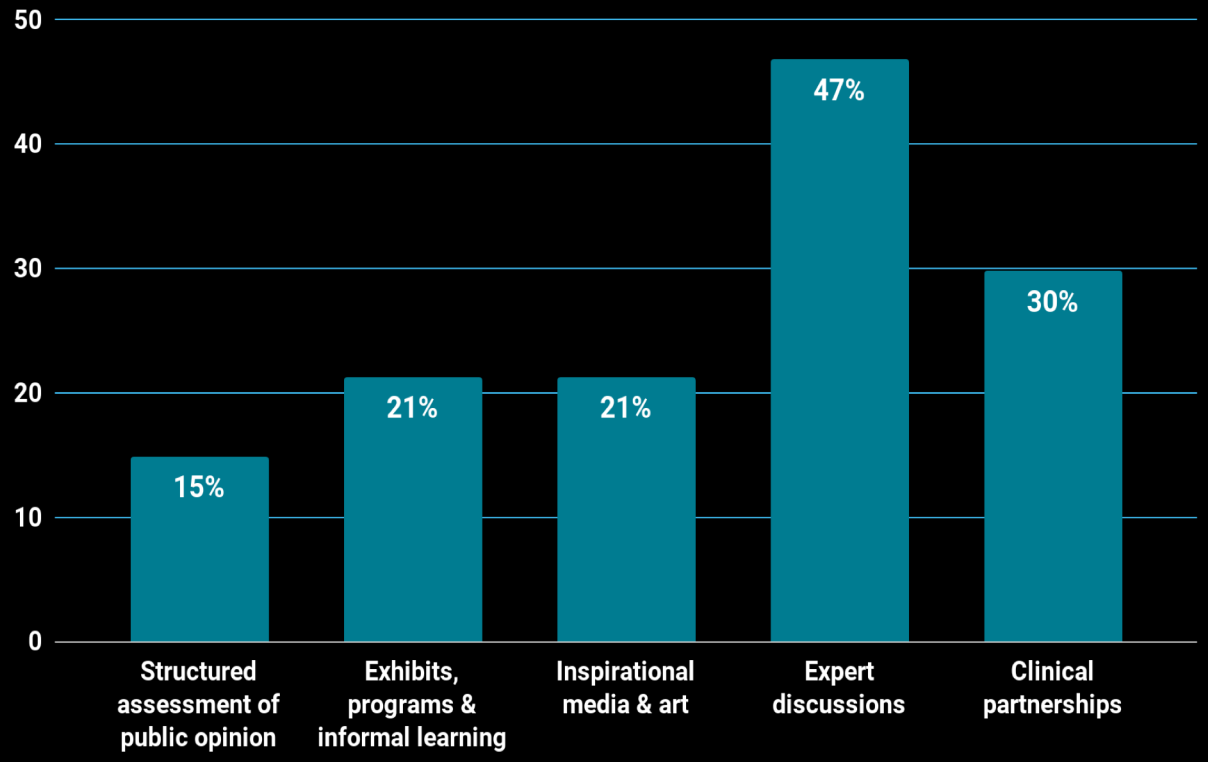
IBI INTERNATIONAL BRAIN INITIATIVE

Let's talk...about neuroscience public engagement



Emerging trends in neuroscience public engagement

- Structured assessment of public opinions & attitudes
- Interactive exhibits, public programs & informal STEM learning
- Inspirational media through partnerships with artists
- Expert discussions for public audiences
- Partnerships for clinical applications



Common Challenges

Pockets of innovation in public engagement are inconsistent

Academic culture is not optimally aligned to support public engagement

NeQNs are not prioritized equally by public engagement practitioners

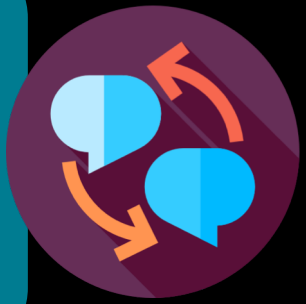
Opportunities for Global Public Engagement

Foster collaborations between scientists, ethicists, and experts in other fields

Expand training resources, especially for early career professionals

Support local networks with community perspectives

Create shared resources for facilitating dialogue and mutual learning



CHANGING
BRAINS

Look for reports and resources at
https://www.nisenet.org/brain

Thank you

International Brain Initiative
Global Neuroethics Working Group

RAPID PROTOTYPING

Develop a “moonshot” idea

Work in small groups to develop a concept for a “moonshot” museum experience related to:

- MARS EXPLORATION
- SUSTAINABLE FUTURES
- NEUROSCIENCE

At 4:20, we will interview 2-3 future visitors to your experience. Our correspondent from the future will ask:

- What did you just participate in? What was it called and what did you do?
- What did you like best?
- What did you learn?

THANK YOU!