



**NISE**  
NATIONAL INFORMAL  
STEM EDUCATION  
NETWORK

Programs and Resources  
to Engage Teens and Adults

# Presenters

**Host:** Frank Kusiak, Lawrence Hall of Science, Berkeley, CA

- **Derrick Pitts, The Franklin Institute, [dpitts@fi.edu](mailto:dpitts@fi.edu)**
- **Hardin Engelhardt, Marbles Kids Museum, [HEngelhardt@marbleskidsmuseum.org](mailto:HEngelhardt@marbleskidsmuseum.org)**
- **Brian Levine, American Museum of Natural History (AMNH), [blevine@amnh.org](mailto:blevine@amnh.org)**
- **Michael “Josh” Roberts, Morrison Planetarium, Cal Academy, [mroberts@calacademy.org](mailto:mroberts@calacademy.org)**
- **Lucien Scott, Creative Discovery Museum, [lgs@cdmfun.org](mailto:lgs@cdmfun.org)**
- **Marcos Stafne, Montshire Museum of Science, [marcos.stafne@montshire.org](mailto:marcos.stafne@montshire.org)**



# NIGHT SKIES AT THE OBSERVATORY

Derrick H. Pitts, Sc.D.  
Chief Astronomer  
Fels Planetarium Director

The Franklin Institute  
Philadelphia

# The Franklin Institute Science Museum and Fels Planetarium Philadelphia Since 1824

- 11 Core Exhibits, Traveling Exhibits, Historic Collections
- IMAX, Planetarium, Musser Theater, Franklin Theater

- Demos, workshops, Speakers' Series, special events, outreach, professional development, NSO, SAH, PSF.



**TFI Size: 453K sf.; Annual Attendance: 985k +150K outreach**

# NIGHT SKIES AT THE OBSERVATORY

- Monthly
- Telescope views from CC
- Gen Pub Audience
- Planetarium presentations
- Space Science 'lecture'
- Activities
- Cash Bar



# NIGHT SKIES AT THE OBSERVATORY



# NISENet Programming at Marbles Kids Museum, Raleigh, NC





Marbles sparks imagination, discovery, and learning through play.





## On Beyond Kits

- STEM Events
- Daily Programs
- Field Trip Programs
- Community Presence
- Special Events



## Engaging Partners and Volunteers

- Share activities and training videos ahead of time
- Host a pre-event training
- Allow partners to bring their own activities



## Marbles Teen Play Corps

- 7<sup>th</sup>-10<sup>th</sup> graders
- Volunteer leading exhibit and programs play, camps, special events, community presence
- Leadership and workforce development opportunity

# Physical Science Youth Programs at AMNH

Brian Levine

[blevine@amnh.org](mailto:blevine@amnh.org)

Manager of Youth Programs  
AMNH, Education Department



STATE OF NEW YORK (EMERALD TO  
STATE THEODORE ROOSEVELT  
"TO ALL AMERICANS IN THE ARMS OF THE  
IN THE COURSE OF THE RESISTANCE OF THE PEOPLE  
AND OF THE DEEDS IN THE AND IN THE

VISION

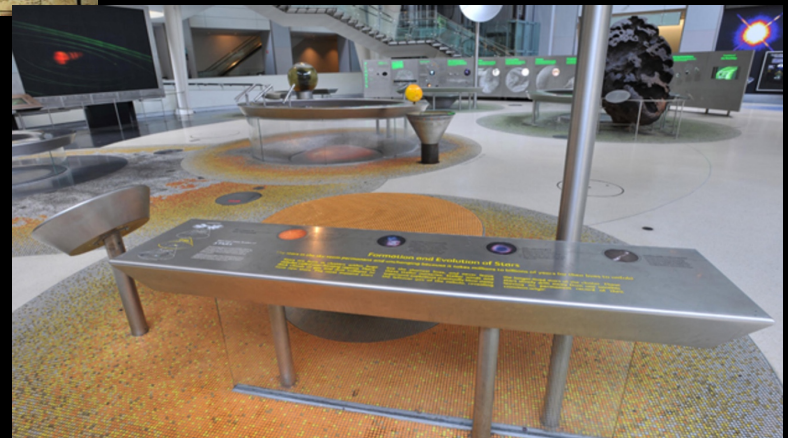
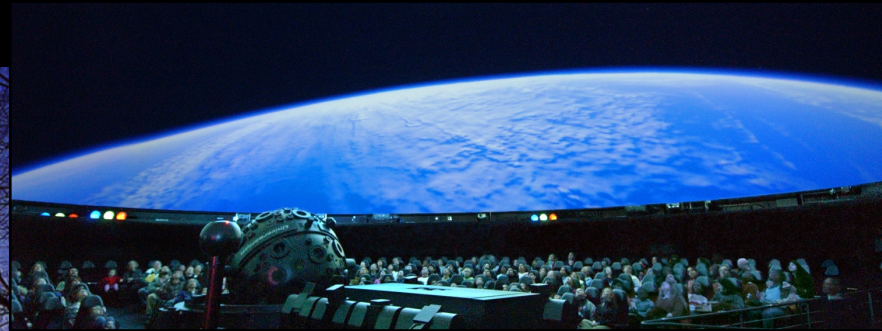
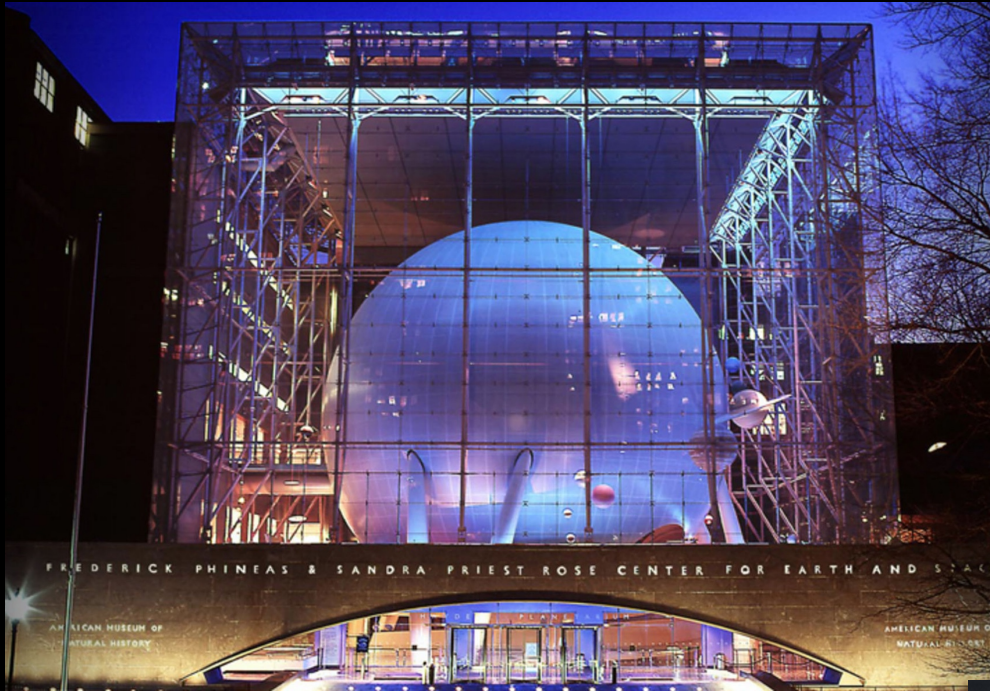
KNOWLEDGE

Visit  
Kendall

MTO

STATE AUTHOR

# Astronomy Exhibits



# Earth/Planetary Halls



Major renovation, re-opening, Fall 2019



# Center for Lifelong Learning





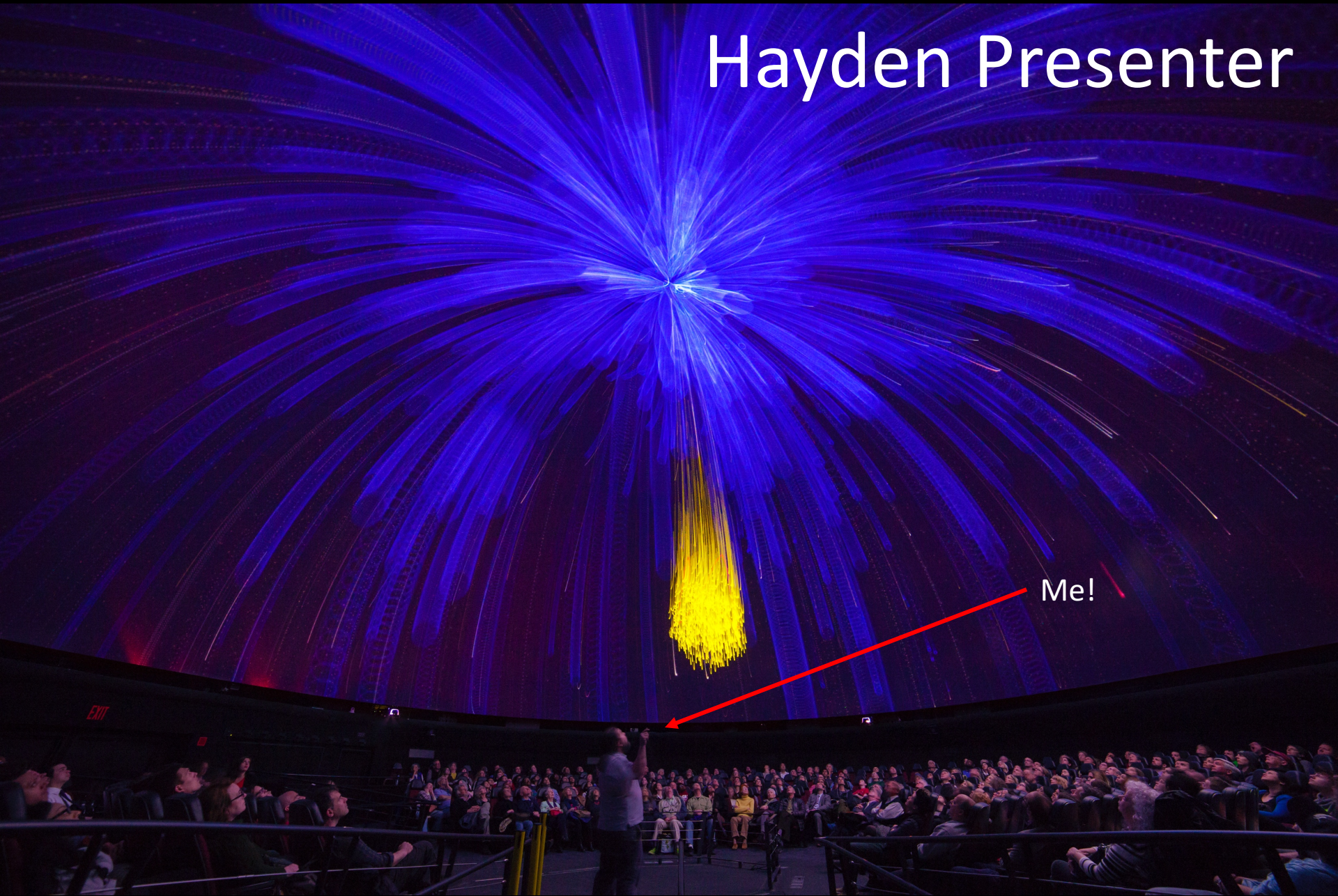
# Manager of Youth Programs

Me!



# Hayden Presenter

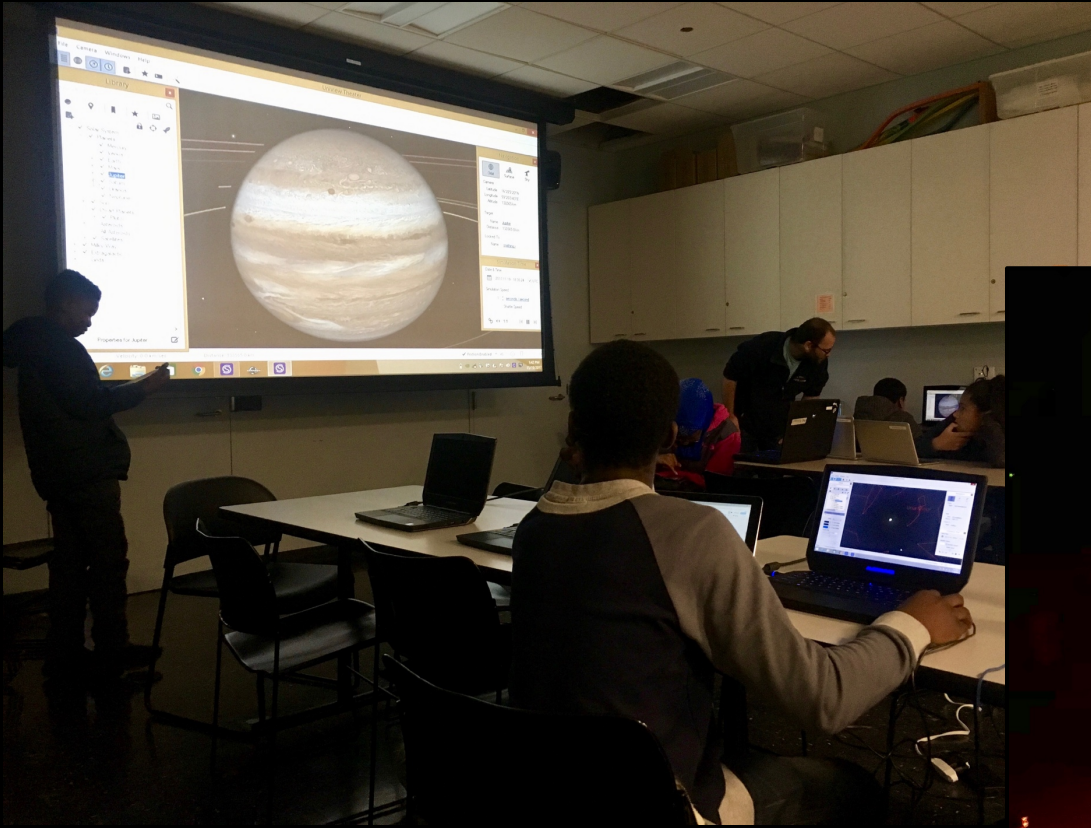
Me!



# What does YI do?

- Courses
  - Middle School Institutes
  - After School Program
  - (Summer Science)
  - (School Partnerships)
- Multi-year Programs
  - Science Alliance Program
  - Lang Science Program
- Internships
  - Science Research Mentoring Program (SRMP)
  - Saltz Internship Program
  - Museum Education Experience Program (MEEP)
  - Grand Ronde
- ...and a few more things.

# Middle School Institutes





ASP



# SRMP



**Searching for Active M-Stars**  
Myrka Cuji, Shadia Farah, Khadijah Patterson  
Bayside High School, Brooklyn Technical High School, LaGuardia for the Performing Arts  
Advisor: Matt Wilde

**Abstract**  
Using a variety of computer programs, we looked through SRMP north of 6000 M and K class stars. We found 6000 stars, 776 were active.

**What exactly is Activity?**  
Activity is defined as an H alpha emission line often found in a spectrum of a star. This H alpha emission line represents a massive emission of hydrogen-alpha (H-alpha) light. An example would be a solar flare.

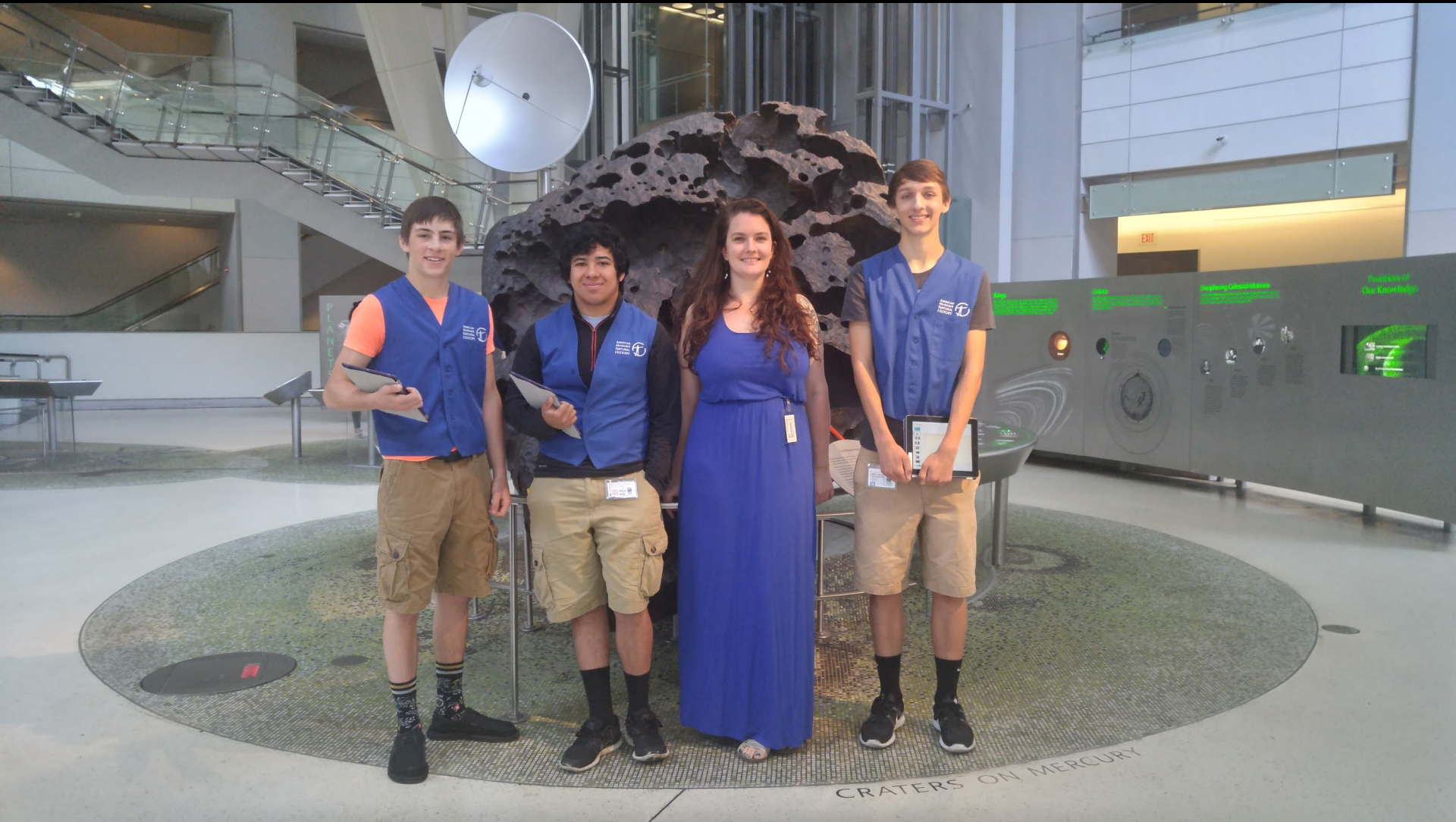
**Percent Active vs. Star Type**  
The percent of active stars per spectral type is as follows: K: 10%, M: 15%, L: 20%, T: 30%, Y: 40%, D: 50%.



# Saltz/MEEP



# Grand Ronde

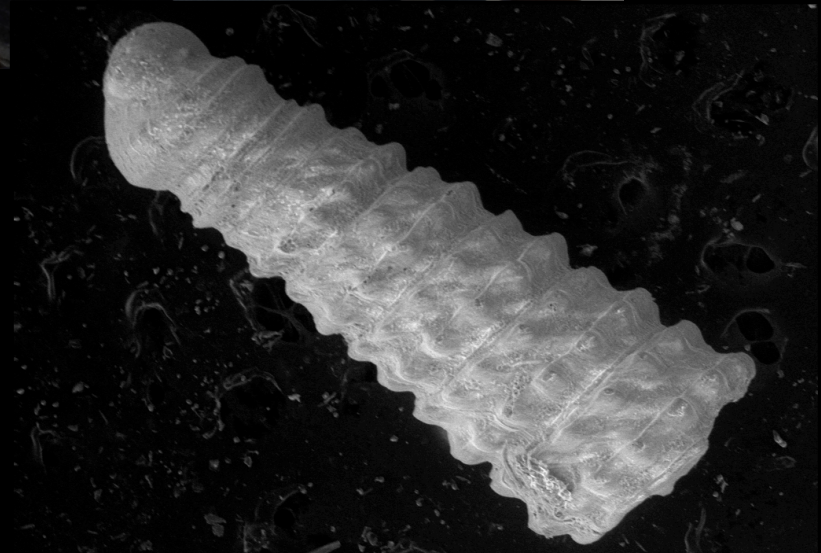




# Science Alliance



# Lang Science Program



200  $\mu$ m

EHT = 15.00 KV WD = 17.0 mm Mag = 51 X

File Name = Foram 5.tif

Date :27 Oct 2018

# After Hours



# Free Public Events



ATE  
NGE?

# OUR CHANGING CLIMATE

# Climate Wall

276 ppm  
AD 1

The rapid rise in CO<sub>2</sub> levels caused by human activity, is warming our climate.

## CONSEQUENCES OF CLIMATE CHANGE

### Before and after

Droughts, floods, severe storms and other events leave their mark.

### Climate Change in New York City

New York and other cities are experiencing changes in weather patterns.

### How Will Our Climate Change?

### WARMING WORLD

### HOW CLIMATE WORKS

### Consequences of Warming

Human activity has added about 2.5 billion metric tons of carbon dioxide to the atmosphere since 1750. In response, the planet is warming. Change is already visible. Severe weather events are becoming more frequent. Global sea level is rising. The ocean is warming and ice sheets are melting, leading to more coastal flooding. Climate is changing, and we are seeing the consequences.

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<http://bit.ly/ClimateWall-TEMP>

# But wait, there's more!

- Family workshops starting at age 2
- Elementary-age camps
- Coding for girls
- SRMP Consortium including LDEO and NOAA Crest
- Teacher PDs
- Urban Advantage
- Annual hackathon (2019 – Hack the Solar System)
- School visit drop-in days (NISENet kits!!)
- Discovery Room (5 – 12 year old interactive space)

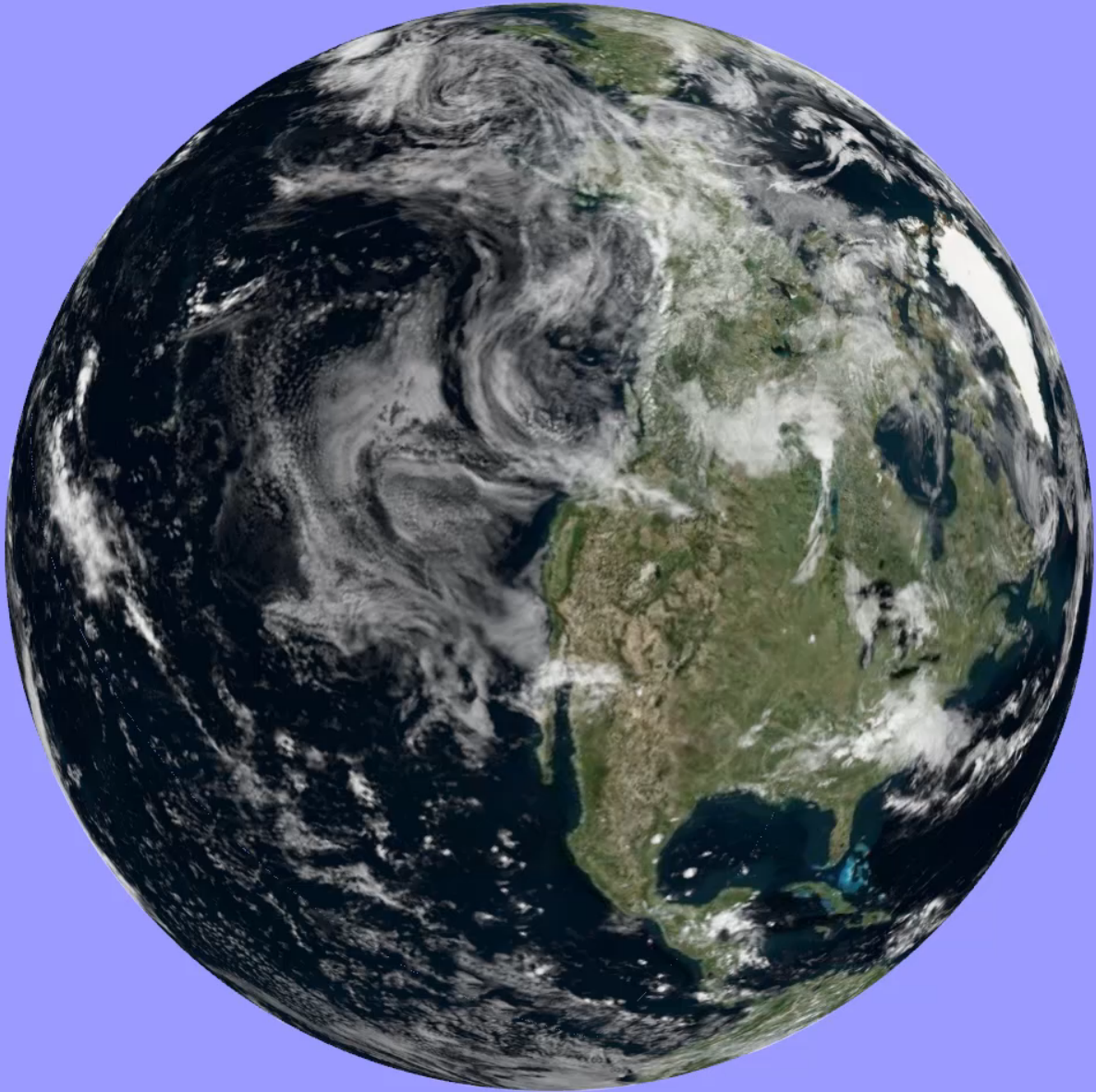
Brian Levine  
AMNH Education  
[blevine@amnh.org](mailto:blevine@amnh.org)

M. Josh Roberts

Supervisor of Planetarium Programs – Morrison Planetarium







# Morrison Planetarium

Huge space - 290 seats, 30° tilt, rear control booth.



# Hohfeld Hall

Smaller space – capacity of around 100, 30' wide screen, controlled from a console



# Digital enhancement

Providing another avenue for exploration

- » Augmented reality
  - Feature ID
  - Uses commonly available tech, often within reach of classrooms
  - Requires clear objectives and expectations – but still have fun with it!
- » Planetarium software
  - Widely applicable in terms of content
  - Requires projection/computers
  - Adults/children have different challenges.



# Rotation vs. Revolution

»ro·ta·tion

»/rō'tāSH(ə)n/

»*noun*

»the action of rotating  
around an axis or center.

»rev·o·lu·tion

»/ˌrevə'loōSH(ə)n/

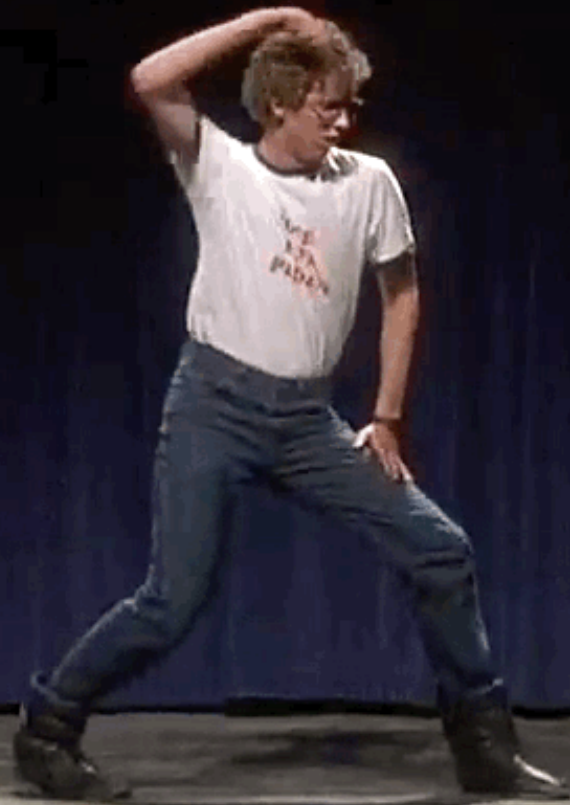
»*noun*

»noun: **revolution**; plural  
noun: **revolutions**

»the movement of an object in a  
circular or elliptical course around  
another or about an axis or center.

»a single orbit of one object around  
another or about an axis or center.

# ASTRONOMER DANCES!



# Kinesthetic/Body movement astronomy



Image credit ASP

# Digital enhancement

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# Guest led exploration



TRAPPIST-1 announcement



## NISE kits

Amazing kits we wanted to build upon



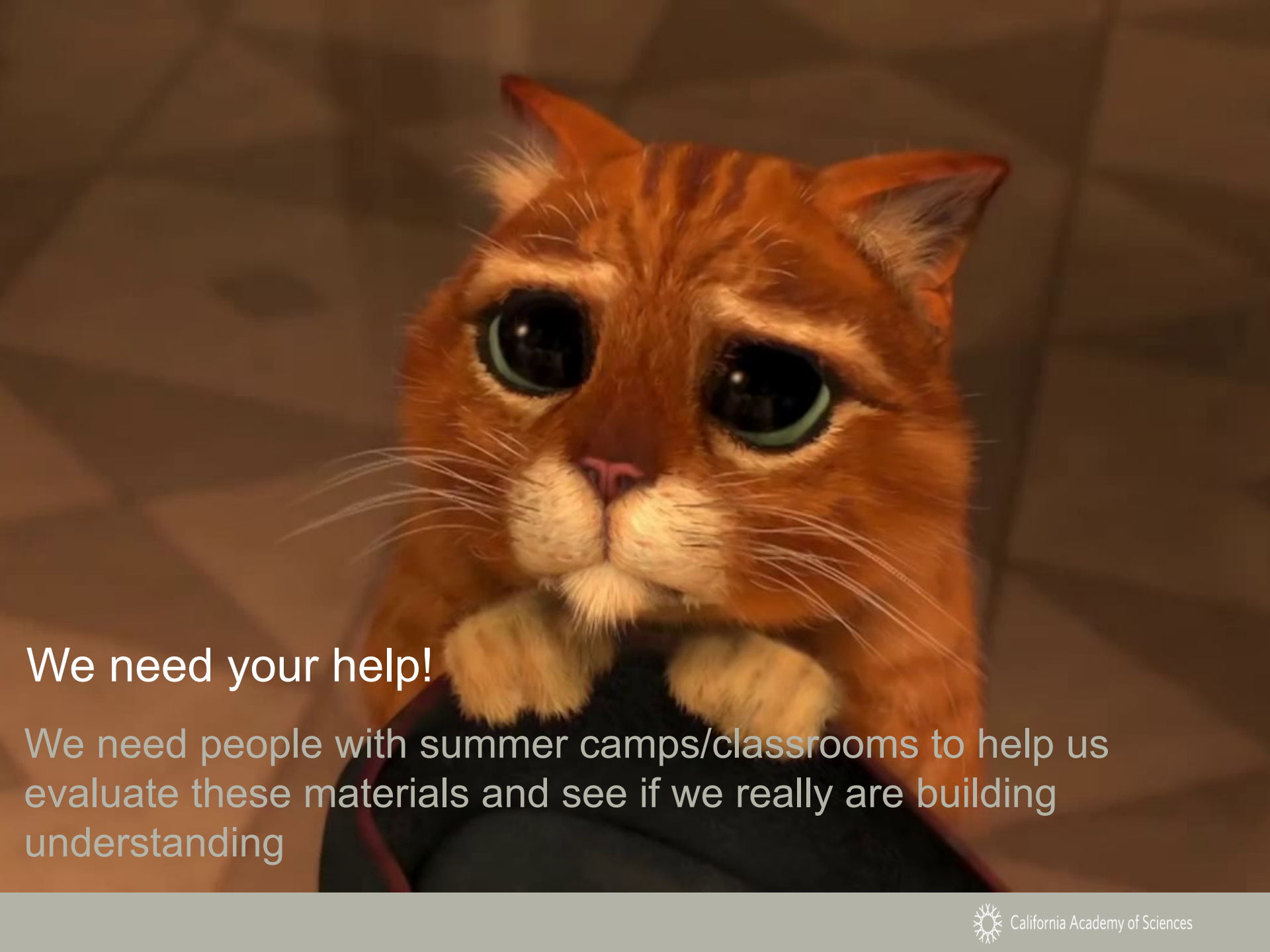
# Imagining Life



# Craters



# Orbiting Objects



**We need your help!**

We need people with summer camps/classrooms to help us evaluate these materials and see if we really are building understanding



and the  
**Creative Discovery Museum**  
Chattanooga, TN





CREATIVE  
CHILDREN'S  
MUSEUM

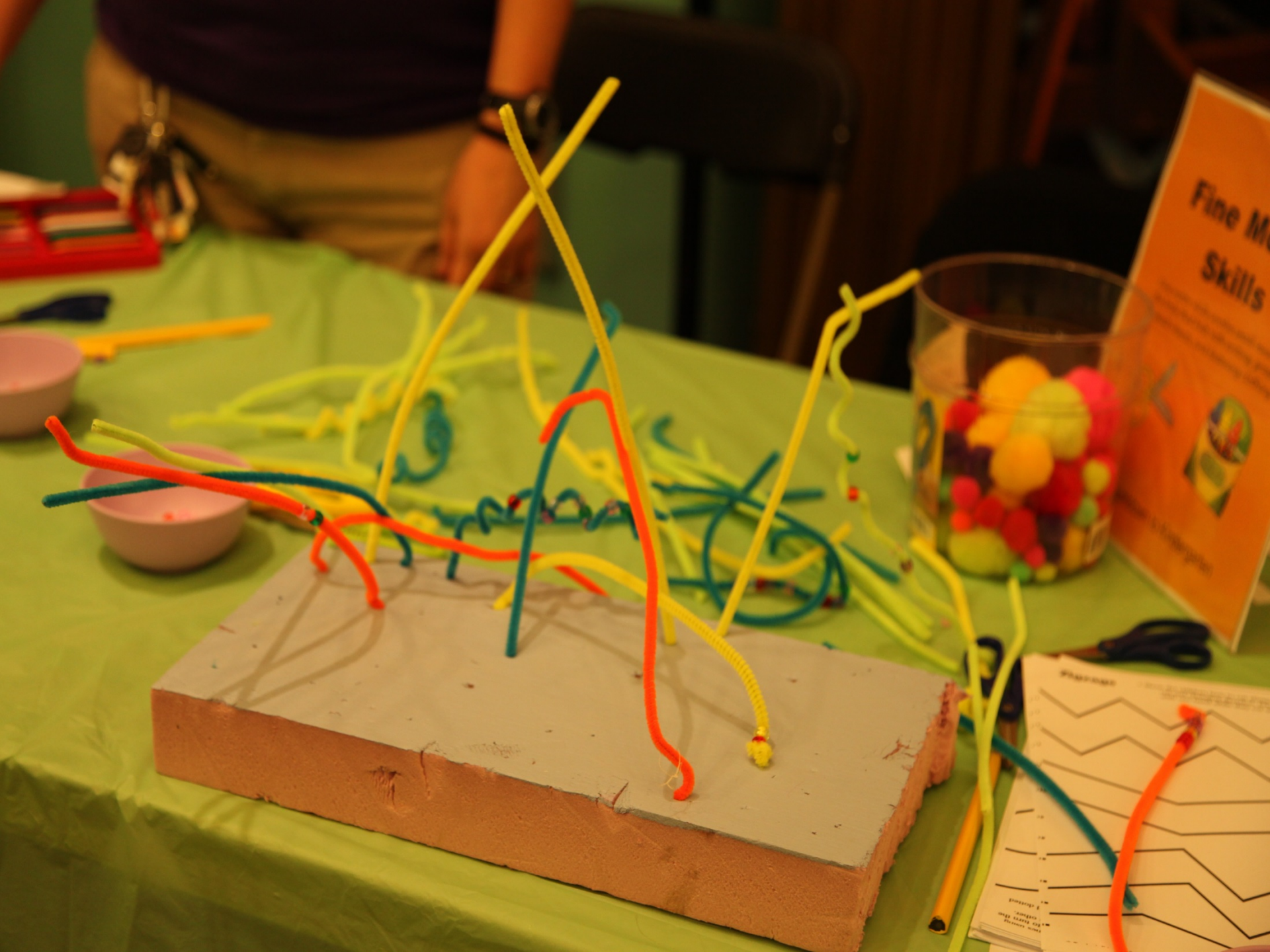
**Our mission is to  
inspire all children to  
explore, innovate,  
create and play.**

# CDM programs using NISE Net

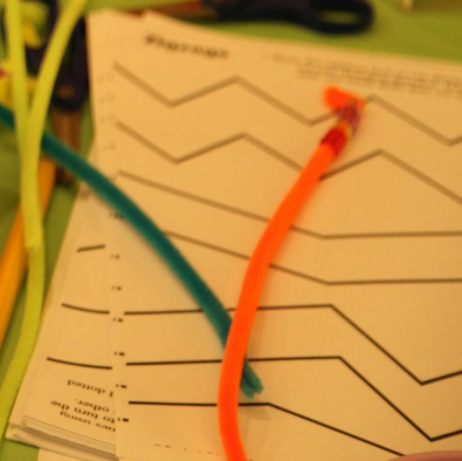
- STEAM Club
- Outreach
- Teen Nights
- Camps
- Afterschool
- Club Discovery
- Bus Lessons
- Walkups
- Member Events
- Family Free Nights
- Early Childhood
- Drink and Discover
- Distance Learning
- Volunteers
- Themed Events
- Science theater







# Fine Motor Skills







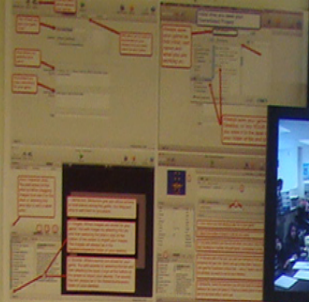












Fossil	Plant	Animal	Human

Fossil	Plant	Animal	Human





WORKSHOP



RIVERPLAY

SECTION OF RIVERHEAD  
3 RANE

SS DIVERSITY

24  
ONLY →

For more information please visit:

**[cdmfun.org](http://cdmfun.org)**



**MONTSHIRE**  
MUSEUM OF  
SCIENCE

WHAT WILL YOU DISCOVER?

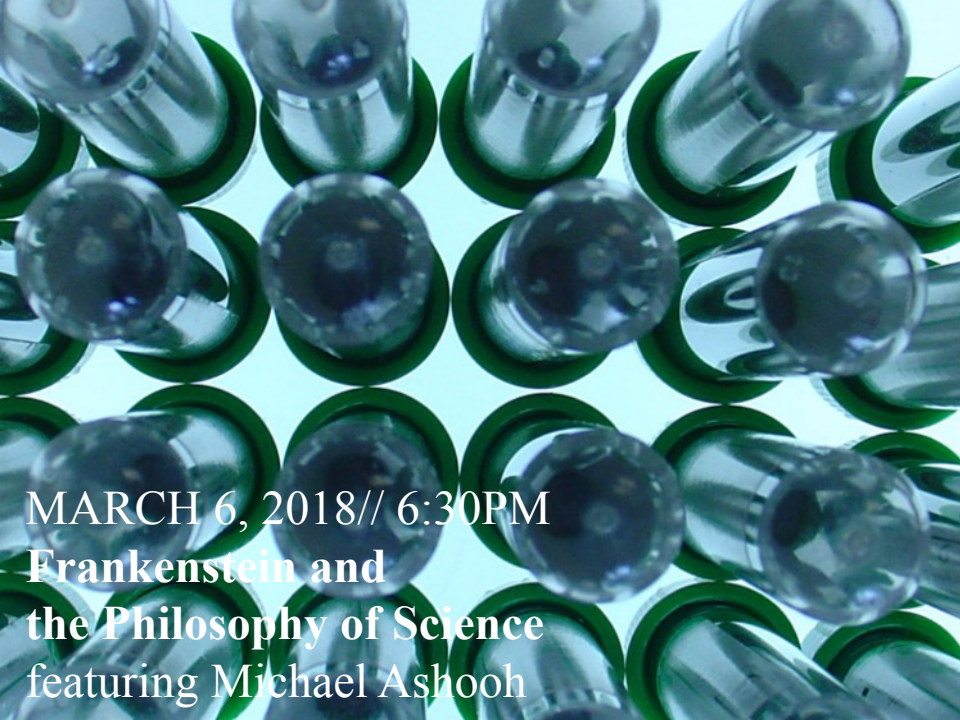




MONTSHIRE TALKS  
**FRANKENSTEIN 200**

sponsored by Ledyard Bank





**MARCH 6, 2018 // 6:30PM**  
**Frankenstein and**  
**the Philosophy of Science**  
featuring Michael Ashooh



**MARCH 13 , 2018 // 6:30PM**  
**Fining Frankenstein:**  
**In Search of Mary Shelley**  
featuring Amanda Rafuse



**MARCH 27 , 2018 // 6:30PM**  
**Artificial Intelligence and**  
**Responsible Design**  
featuring Eugene Santos



**MARCH 20 , 2018 // 2 & 6:30PM**  
**Frankenstein in Text and Image**  
featuring Morgan Swan



The Philosophy and Science of Frankenstein

- Mary Shelley was posing a series of questions about what it means to be human and she was framing these questions in light of the then current debates in the sciences.
- Are we just flesh and bone? Can this flesh and bone be infused with a mechanical force of life? What would happen if we could do this?

MONTSHIRE MUSEUM OF SCIENCE

30:03 / 42:39

CC Settings Full Screen

The video player displays a presentation slide with the title "The Philosophy and Science of Frankenstein" and two bullet points. The first bullet point discusses Mary Shelley's questions about humanity in the context of 19th-century science. The second bullet point asks whether flesh and bone can be infused with a mechanical force of life. The slide also features a historical illustration of a laboratory or workshop. In the top right corner of the video frame, the Montshire Museum of Science logo is visible. A smaller inset video shows a man in a light-colored shirt speaking and gesturing. The video player interface includes a progress bar at 30:03 / 42:39 and standard playback controls.

### Montshire Talks - Frankenstein and the Philosophy of Science

131 views

👍 1    💬 0    ➦ SHARE    ≡+ SAVE    ⋮

# ONE GIANT LEAP

The Moon Landing's 50<sup>th</sup> Anniversary

### Jovian Cloud Tops

Experiment with turbulence

- Look for the vortex
- Measure the rotation
- Measure the turbulence
- Measure the energy

Atmospheric storms such as Jupiter's Great Red Spot and other vortices of other planets are the result of turbulent flows.



### Dust Devils

Measure velocity

Measure diameter



### Sea Clou

Clouds above turbu

the atmosphere





**TEST PRUEBA**

Test your robotcraft. Pass all **THREE TESTS** and it's ready for **LAUNCH!**

Prueba tu robotcraft. Si pasa los **TRÉS PRUEBAS**, está listo para el **LANZAMIENTO!**

**CHECK IT**  
Does it stay in motion? Does it spin? Does it go in a circle? All of the tests prove that your robotcraft is ready to launch. Are you missing something? If you are, you can always go back to the design phase to make improvements. It's called **iterate**.  
¡Pasa el primer test!  
¿Se queda en movimiento? ¿Gira? ¿Va en círculo? Todas las pruebas demuestran que tu robotcraft está listo para el lanzamiento. ¿Te falta algo? Si lo hay, siempre puedes volver a la fase de diseño para hacer mejoras. Eso se llama **iterar**.

**REVISAR**  
Si no pasa el primer test, puedes volver a la fase de diseño para hacer mejoras. Eso se llama **iterar**.  
Si no pasa el primer test, puedes volver a la fase de diseño para hacer mejoras. Eso se llama **iterar**.

**SPIN IT**  
A perfectly balanced robotcraft will spin in a circle. If it doesn't, it's not ready for launch. Try adjusting the weight of the robotcraft. It's called **balance**.  
¡Gira!  
Un robotcraft perfectamente equilibrado girará en un círculo. Si no lo hace, no está listo para el lanzamiento. Intenta ajustar el peso del robotcraft. Eso se llama **equilibrar**.

**HAZLA GIRAR**  
Un robotcraft perfectamente equilibrado girará en un círculo. Si no lo hace, no está listo para el lanzamiento. Intenta ajustar el peso del robotcraft. Eso se llama **equilibrar**.

**SHAKE IT**  
Does your robotcraft vibrate? If it does, it's not ready for launch. Try adjusting the weight of the robotcraft. It's called **balance**.  
¿Tu robotcraft vibra? Si vibra, no está listo para el lanzamiento. Intenta ajustar el peso del robotcraft. Eso se llama **equilibrar**.

**HAZLA VIBRAR**  
¿Tu robotcraft vibra? Si vibra, no está listo para el lanzamiento. Intenta ajustar el peso del robotcraft. Eso se llama **equilibrar**.

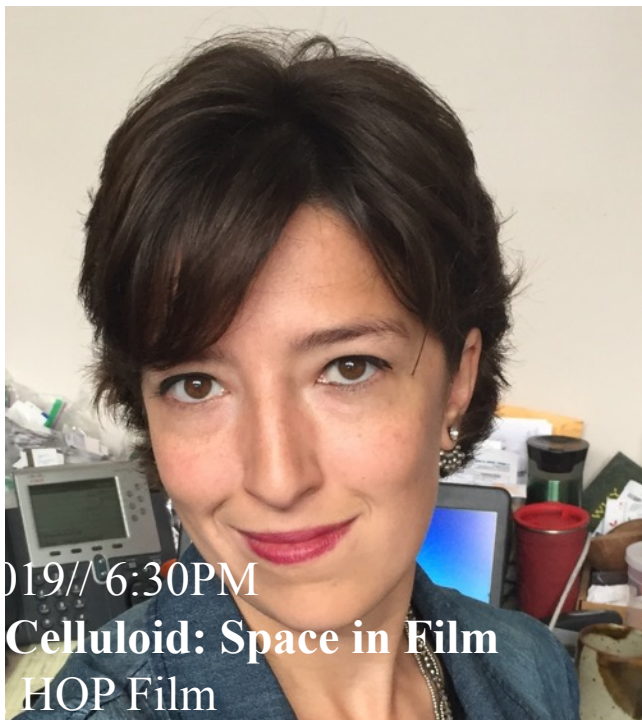




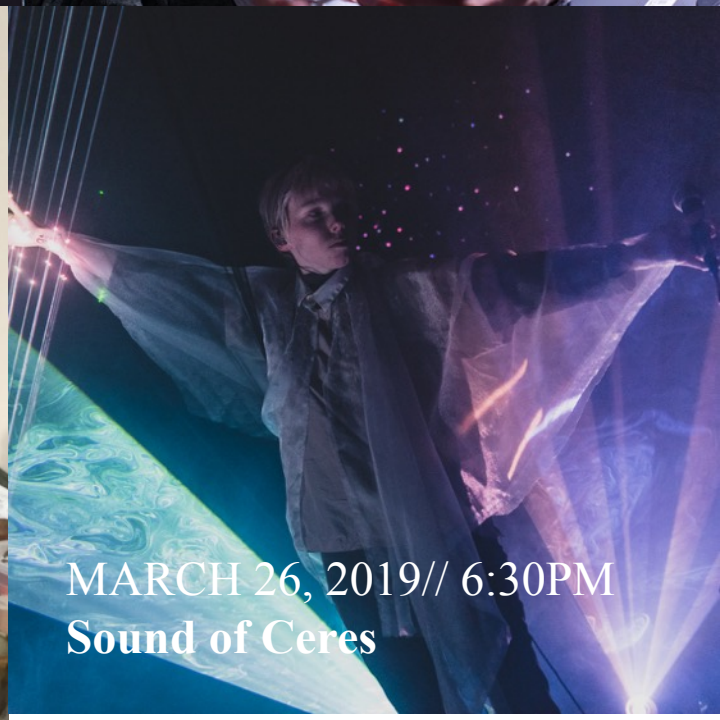
6:30PM  
**The Next Steps**



MARCH 19, 2019// 6:30PM  
**CubeSat**  
Carl Brandon, PjD



2019// 6:30PM  
**Celluloid: Space in Film**  
HOP Film



MARCH 26, 2019// 6:30PM  
**Sound of Ceres**

# Thank You



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