

MAINE SCIENCE FESTIVAL

mainesciencefestival.org



March 13-17, 2019

Celebrating 5 years of Maine Science

THANK YOU TO OUR PARTNERS

- 1932 Criterion Theatre
- 19th Century Curran Homestead Village at Fields Pond and Newfield
- Advanced Structures & Composites Center at the University of Maine
 - Aquaculture Research Institute at the University of Maine
- Axiom Education & Training Center
 - Bangor Area Stormwater Group
 - Bangor Greendrinks
 - Bangor Public Library
 - Bangor Symphony Orchestra
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 - Educate Maine
 - Emera Astronomy Center & M.F. Jordan Planetarium
 - Emera Maine
- Foundation Brewing Company
 - Fork & Spoon
 - GE Power
 - Girl Scouts of Maine
- Greater Bangor Convention & Visitors Bureau
- Gulf of Maine Research Institute
 - Habitat for Humanity of Greater Bangor
- Hurricane Island Center for Science and Leadership
- Husson University
 - IDEXX
- The Jackson Laboratory
 - Mad Science Maine
- Maine Discovery Museum
- Maine Invention Convention
- Maine Maritime Academy
- Maine Campus Compact
 - Maine Mathematics & Science Alliance
- Maine Medical Center Research Institute
 - Maine Robotics
- Maine School of Science and Math
 - Maine Sea Grant
- Maine Technology Institute
- Manufacturing Association of Maine
 - MDI Biological Laboratory
 - Nocturnem Draft Haus
- Penobscot Theatre Company
 - Pratt & Whitney
 - Project > Login
- Queen City Cinema Club
 - The Rock & Art Shop
- Schoodic Institute at Acadia National Park
- Senator George J. Mitchell Center for Sustainability Solutions
 - SnowCon
 - The Nature Conservancy
- Union River Center for Innovation
 - University of Maine
- University of Maine College of Engineering
 - University of Maine College of Liberal Arts & Sciences
- University of Maine Cooperative Extension
 - University of Maine Museum of Art
 - University of New England
- UpStart Center for Entrepreneurship
 - WBRC
- Woodard & Curran



Welcome to the 5th Annual Maine Science Festival

An unusual idea I had in 2012 has evolved into the first (and only) science festival in Maine, and is one of the best places in the country to see and celebrate science, engineering, innovation, technology, and partnerships with artists of all media. Thanks to the support of many hundreds of scientists, researchers, practitioners, organizations, educational leaders and institutes, and businesses, we are now celebrating the 5th Maine Science Festival (MSF) in Bangor.

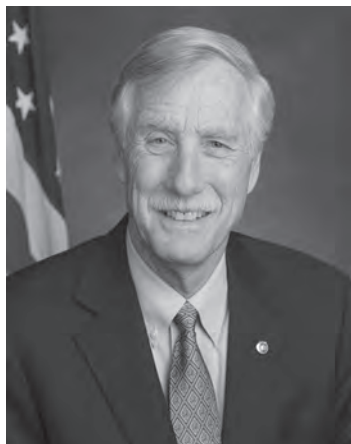
The MSF provides a new way to get Mainers interested in and excited about science, using totally different events than people expect: talks in bars, workshops with artists and scientists together; exhibits; hands-on activities; and films with discussions - more than 70 events and activities in all. The MSF is a chance to not only learn from some of the best Maine has to offer, but also to celebrate them and their work.

Equally important to me is the fact that we are putting a giant spotlight on the remarkable innovation that happens in Maine daily. We want to show Mainers of all ages and interests exactly what is happening in Maine and how we are leading the way in many different areas. Most important, and maybe most surprising to some: you do not have to travel outside of our great state to learn about - and be part of - world-leading work.

Take time with us these five days to celebrate, explore, engage, and learn from the presenters and events that are part of the Maine Science Festival. I hope you are as amazed, impressed, and thrilled to know what is happening in Maine as I am on a daily basis, and I'm grateful you are spending your time and excitement with us as we celebrate what Maine offers the world!

Kate Dickerson, Founder & Director, Maine Science Festival

mainesciencefestival.org
#scienceiseverywhere



The Maine Science Festival is a celebration of the great talent and potential we are cultivating here in the state of Maine. From the world's premier research institutions to its top scientists to dedicated educators throughout the state, Maine is fortunate to have the resources and expertise to explore, discover, and teach the next generation about the both the importance and the excitement of STEM learning.

Science guides our knowledge of the universe, and our understanding of its quirks. Whether your passion is robotics, marine life, or far away galaxies, there is always more to discover; we are living at an exciting time to harness data and intelligence to reach new heights. So as we come together to ring in the 5th Annual Maine Science Festival, let us commit to curiosity and to a lifetime of learning – and celebrate all that Maine has to offer.

Senator Angus S. King Jr.



Welcome!

The City of Bangor is once again thrilled and honored to host the Maine Science Festival as it enters its fifth year! As a community of thinkers, doers, dreamers, and explorers, Bangor is an ideal spot to celebrate the science, mathematics, engineering, and technology happening in Maine and beyond.

The 2019 installment of this annual home-grown festival promises to be its most ambitious yet, with full five days of more than 70 events and activities happening from March 13-17, 2019. From interactive workshops on space farming and soda making to scavenger hunts and board game sessions to a headliner show featuring the Science Vs podcast team, the Maine Science Festival literally has something for everyone, regardless of age or interests. Most events are available free of charge to attendees, ensuring that there are no barriers for Mainers to access all the experiences, education, and innovation on display.

Around 40,000 people have attended the Maine Science Festival since it began in 2015, and it remains the first and only science festival in the state. It leverages the talents of so many local educators, business owners, students, and entrepreneurs, and provides a valuable platform for critical thinking, exploration, and idea sharing.

Bangor is well-poised to host and learn alongside the many presenters, teachers, and speakers at this historic and growing festival. Our city boasts an award-winning public school system that performs well above the state average, as well as numerous colleges and universities preparing students for careers in science and technology. We never stop thinking, doing, dreaming, and exploring – and we hope to never stop growing with the Maine Science Festival for years to come!



Sarah Nichols
Council Chair
City of Bangor, Maine

Table of contents

Welcome	1
General info/FAQ's	5
Wednesday at a Glance	6
Thursday at a Glance	6
Friday at a Glance	7
Saturday at a Glance	8
Sunday at a Glance	10
Wednesday programming	11
Thursday programming	12
Friday programming	14
Saturday programming	23
Science Vs Headliner Event Info	39
Sunday programming	43
Map of our MSF venues	49
Cross Center layout map	50
Information on the 2020 MSF	52

**Follow along with us! Visit us on
Facebook, Twitter, and Instagram
#scienceiseverywhere
#MSF2019**

**To find out more visit:
mainesciencefestival.org**



MAINE SCIENCE FESTIVAL







General Info & FAQ's

EventBrite events. (Those that are outlined in dashes in the Festival at a Glance) Please note that some of our events require pre-registration through EventBrite. There is still no charge for these events (with the exception of our headliner event; see page 34 for more info), but priority will be given to individuals who have pre-registered.

Schedule Changes. Please note that all events are subject to change. Be sure to check our website or social media for the most up-to-date information.

Suitability key:

Families-  Middle School-  Teens-  Adult- 
Within the program event pages we will do our best to note the best suited audience for programming provided. Please reference the graphics above and keep your eyes out for any special delineation like (21+) or (10+).

What is a MSF Showcase Event?



Maine Science Festival Showcase events are events that happen every year, with new presenters, activities, and experiences for festival goers. Showcase events are a mix of dynamic presentations, hands-on activities, and workshops that provide festival goers with a deep dive into the science happening in Maine. If you are able to attend only a few MSF events, the Showcase events are the ones to catch.

Download the MSF App! You can find the full MSF schedule and build your own.

<https://my.yapp.us/MESCIFEST>

FESTIVAL AT A GLANCE

WEDNESDAY, March 13th



River Run Fish Exhibit

10:00am-5:00pm

Main Street Gallery,
Maine Discovery Museum,
74 Main Street

MSF Science Trivia Night

Throughout Maine; check
the MSF App/website for
up-to-date information

FESTIVAL AT A GLANCE

THURSDAY, March 14th



River Run Fish Exhibit

10:00am-5:00pm

Main Street Gallery,
Maine Discovery Museum,
74 Main Street

MSF Partner Event: Penobscot Theatre presents "Ripcord" by David Lindsay-Abaire

7:00pm - TICKETS REQUIRED
Penobscot Theatre Co.

Science on Tap: CRISPR

7:30-9:30pm

Black Bear Brewing
Co., 187 Exchange St.



21+

FESTIVAL AT A GLANCE

FRIDAY, March 15th



Friday Field Trip Day*

**pre-registration only*

Event is FULL

9:00am-12:30pm

Cross Insurance Center

Sponsored by:

University of Maine

River Run Fish Exhibit

10:00am-5:00pm

Main Street Gallery,

Maine Discovery Museum,

74 Main Street

MSF Partner Event:

Penobscot Theatre

presents "Ripcord"

by David Lindsay-Abaire

7:00pm - TICKETS REQUIRED

Penobscot Theatre Co.

Tech Night (For Middle School Students)

4:30-7:00pm

Maine Discovery

Museum



MSF Partner Event:
Emera Astronomy Center
and M. F. Jordan Plan-
etarium presents "MEXICA
ARCHEOASTRONOMY -
Between Space and Time"

7-8pm - TICKETS REQUIRED

Emera Astronomy Center

5 Minute Genius

7:30-9:30pm

Bangor Arts

Exchange

Sponsored by:

Maine Technology Institute



FESTIVAL AT A GLANCE

SATURDAY, March 16th



Exploration Stations

Engage - Examine - Experiment

9:00am-4:00pm

Cross Center Ballroom



River Run Fish Exhibit

10am-5pm

MDM,
74 Main Street

Maine Invention Convention

10am-3pm

CC Pre-function
Area

From Donut Holes to Earmuffs...

10am-11am

CC Mtg Rm A

Sponsored by: MCCS

Science of Aging

11am-12pm

CC Mtg Rm B

Sponsored by: AARP

Fire and Ice Show

11am-12pm

BPL Lecture Hall

Science Writing 101

11:30am-1:30pm

CC Meeting
Room D

Healthcare in ME from the 18th Century to Today

12pm-1pm

CC Mtg Room C

Having Fun with Data - middle school edition

12pm-1pm

CC Meeting
Rooms 1&2

Science of Soda Making

1pm-2pm

Central Street
Farmhouse

Solar Energy in Maine

1pm-2pm

CC Mtg Rm A

*Sponsored by:
Emera Maine*

Earth, Space, & Universe: The science of our home world and beyond!

1pm-4pm

MDM

Science Education from the Beginning

1:30pm-2:30pm

CC Mtg Rm C

FESTIVAL AT A GLANCE

SATURDAY, March 16th



Having Fun with Data - high school + edition

2pm-3pm
CC Meeting
Rooms 1&2

Science Illustration

2pm-3:30pm
CC Meeting
Room D

Ecology of Dis- ease: How the Environment Shapes Human & Animal Health

2:30pm-3:30pm
CC Mtg Rm B

Sponsored by: UMS

Science of Voice

3pm-4pm
CC Meeting
Room A

Sea-run Science: Reconnecting Habitat for Salmon & other Migratory Fish

3:30pm-4:30pm
Nocturnem
Draft Haus

MSF Partner Event: Penobscot Theatre presents "Ripcord" by David Lindsay-Abaire

5:00pm - TICKETS REQUIRED
Penobscot Theatre Co.

Headliner Event: Science Vs UFOs

7:30pm - TICKETS REQUIRED

Gracie Theatre, Husson University, 1 College Circle

Buy tickets online - <https://bit.ly/2QYJejb>



FESTIVAL AT A GLANCE

SUNDAY, March 17th



Science Board Gaming

Fork & Spoon

(short games, 10:30am-2:30pm)

Maine Discovery Museum

(long games, 11:30am-3:30pm)



River Run Fish Exhibit

11am-4pm

MDM,

74 Main Street

Science Scavenger Hunt

12pm-3pm

Downtown

Bangor

MSF Partner Event: Valentine Footware hosts SoulShine Soap Company Pop-Up Shop!

12pm-4:00pm

Valentine Footwear

MSF Partner Event: Emera Astronomy Center and M. F. Jordan Planetarium presents *Phantom of the Universe: The Hunt for Dark Matter*

12:30pm-1:30pm - TICKETS REQUIRED

Emera Astronomy Center

Earth, Space, & Universe: The science of our home world and beyond!

1pm-3pm

MDM

Seeing Sound

1pm-2pm

Queen City

Cinema Club

MSF Films: Student Film Competition

2pm-3pm

Maine Discovery

Museum

Beaver Fever & Swimmers Itch

2:30pm-3:30pm

PTC Dramatic

Academy

Sponsored by: IDEXX

MSF Partner Event: Penobscot Theatre presents "Ripcord" by David Lindsay-Abaire

3:00pm - TICKETS REQ.

Penobscot Theatre Co.

MSF Partner Event: Emera Astronomy Center and M. F. Jordan Planetarium presents *Out There: The Quest for Extrasolar Worlds*

3:30pm-4:30pm - TICKETS REQ.

Emera Astronomy Center

Ripcord Talkback

5pm, Penobscot Theatre Co.

River Run Fish Exhibit

**Main Street Gallery, Maine Discovery Museum,
74 Main Street**

10:00am-5:00pm    

WEDNESDAY, March 13

Diadromous fishes spend part of their life in fresh water and part in salt water. Diadromous fishes are either anadromous or catadromous fish, meaning either they spend most of their lives at sea, returning to freshwater to spawn; or they spend most of their lives in freshwater, returning to the sea to spawn. Historically, diadromous fishes were essential to the sustenance and economic growth of North America. Today many diadromous fishes are in trouble owing primarily to habitat alteration and destruction. Displaying these twelve species together with three other Maine fish species in this gallery show emphasizes the importance of treating these species as a group, as a species-by-species approach to managing and restoring their populations has proved largely ineffective. Maine artist Karen Talbot produced the illustrations in partnership with Maine SeaGrant, NOAA Fisheries Greater Atlantic Regional Office and The Nature Conservancy, with funding from NOAA's Habitat Blueprint for the Penobscot River.

Event type: *art*

Participating MSF Partner: *Maine Discovery Museum*

MSF Science Trivia Night

Locations throughout Maine

Check MSF app or website for up to date locations

New for 2019! To celebrate the 5th Maine Science Festival, we've created a special MSF Science Trivia Night. Join fellow trivia players for a night of science trivia created especially for the Maine Science Festival! MSF Science Trivia will take place at locations throughout the state. Check our schedule on the MSF Website or the MSF App (to download visit <https://my.yapp.us/MESCIFEST> on your mobile device) for the most up-to-date listing of locations.

Event type: *trivia*

River Run Fish Exhibit

**Main Street Gallery, Maine Discovery Museum,
74 Main Street**

10:00am-5:00pm 

Diadromous fishes spend part of their life in fresh water and part in salt water. Diadromous fishes are either anadromous or catadromous fish, meaning either they spend most of their lives at sea, returning to freshwater to spawn; or they spend most of their lives in freshwater, returning to the sea to spawn. Historically, diadromous fishes were essential to the sustenance and economic growth of North America. Today many diadromous fishes are in trouble owing primarily to habitat alteration and destruction. Displaying these twelve species together with three other Maine fish species in this gallery show emphasizes the importance of treating these species as a group, as a species-by-species approach to managing and restoring their populations has proved largely ineffective. Maine artist Karen Talbot produced the illustrations in partnership with Maine SeaGrant, NOAA Fisheries Greater Atlantic Regional Office and The Nature Conservancy, with funding from NOAA's Habitat Blueprint for the Penobscot River.

Event type: art

Participating MSF Partner: Maine Discovery Museum

THURSDAY, March 14

MSF Partner Event:

**Penobscot Theatre presents *Ripcord*
by David Lindsay-Abaire**



Penobscot Theatre Company, 131 Main Street

7:00pm *TICKETS REQUIRED

A sunny room on an upper floor is prime real estate in the Bristol Place Senior Living Facility, so when cantankerous Abby is forced to share her quarters with a new arrival, she determines to get rid of the infuriatingly chipper woman by any means necessary. *The Golden Girls* meets *The Odd Couple* when a seemingly harmless bet between the old women escalates into a dangerous game of one-upmanship that reveals their tenacity and deeper truths that cut to the heart.

Tickets Required: \$28-40/adult, \$15-20/student (up to age 25, with student ID). Purchase online at <https://boxoffice.diamondticketing.com/penobscot/events/ripcord>

Participating MSF Partner: Penobscot Theatre Company

Science On Tap: CRISPR



21+



***Black Bear Brewing Company,
Nichols Block, 187 Exchange St.***

7:30pm-9:30pm

CRISPR stands for *Clustered Regularly Interspaced Short Palindromic Repeats* and is widely recognized as one of the most revolutionary tools in biology in years. At this year's Science on Tap, our presenters will explain CRISPR and how it is being used in their labs.

Event type: presentation/discussion

Presenters: *E. Han Tan*, Assistant Professor of Plant Genetics, School of Biology & Ecology, University of Maine. *Michael Wiles*, Senior Director, Technology Evaluation and Development, The Jackson Laboratory

Moderator: *Kristy Townsend*, Assistant Professor of Neurobiology, Neurobiology & Energy Balance Lab, School of Biology and Ecology & Graduate School of Biomedical Sciences and Engineering (GSBSE), University of Maine

Participating MSF Partners: *University of Maine, The Jackson Laboratory*

THURSDAY, March 14

A few notes of interest!

All MSF events are held in and around Downtown Bangor and Saturday is the only day with events at the Cross Center.

The Cross Center will have food available to purchase during Saturday's events at the Taste of Maine booth.



Friday Field Trip Day

Cross Insurance Center

9:00am-12:30pm

FRIDAY, March 15

Our Friday Field Trip Day is for 7th & 8th grade students from schools in Maine, with the day's programming specifically designed for this age group. These events are limited to those schools who have signed up the previous fall. If you are interested in learning more about the 2020 MSF Friday Field Trip Day, or would like to be notified when sign-ups are open, please send an email to schools@mainesciencefestival.org. The Field Trip Day is provided free-of-charge to the schools who attend.

Presenting organizations: 19th Century Curran Homestead Village at Fields Pond & Newfield, AmeriCorps, Cianbro, GE Power, Maine Maritime Academy, NOAA Fisheries, The Nature Conservancy, Project>Login, University of Maine American Chemistry Society Student Group, University of Maine Center for Cooperative Aquaculture Research, University of Maine College of Engineering, University of Maine School of Marine Sciences, University of New England Chemistry Club, University of Maine Graduate School of Biomedical Science and Engineering; Whole Oceans

Sponsored by



COLLEGE OF ENGINEERING;
COLLEGE OF LIBERAL ARTS & SCIENCES;
COLLEGE OF NATURAL SCIENCES,
FORESTRY & AGRICULTURE;
COOPERATIVE EXTENSION;
DIVISION OF ACADEMIC AFFAIRS;
OFFICE OF THE PRESIDENT.

The 2019 Friday Field Trip Day is full. Sign-ups for 2020 will open up to schools in Fall 2019. Please note: the field trip usually fills up within three weeks. Schools who sign up after it is full are put on a wait list for the following year.

River Run Fish Exhibit

**Main Street Gallery, Maine Discovery Museum,
74 Main Street**

10:00am-5:00pm



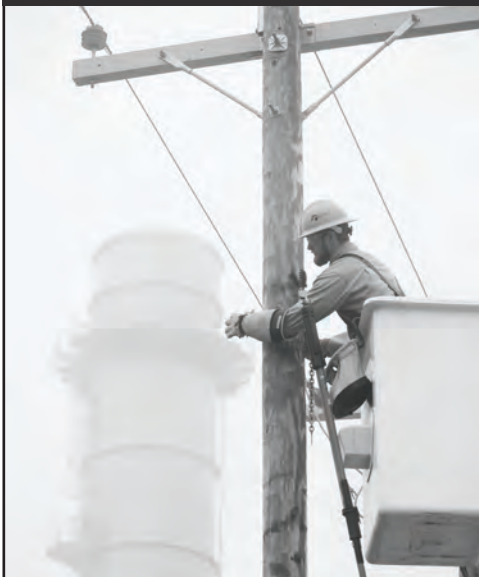
Diadromous fishes spend part of their life in fresh water and part in salt water. Diadromous fishes are either anadromous or catadromous fish, meaning either they spend most of their lives at sea, returning to freshwater to spawn; or they spend most of their lives in freshwater, returning to the sea to spawn. Historically, diadromous fishes were essential to the sustenance and economic growth of North America. Today many diadromous fishes are in trouble owing primarily to habitat alteration and destruction. Displaying these twelve species together with three other Maine fish species in this gallery show emphasizes the importance of treating these species as a group, as a species-by-species approach to managing and restoring their populations has proved largely ineffective. Maine artist Karen Talbot produced the illustrations in partnership with Maine SeaGrant, NOAA Fisheries Greater Atlantic Regional Office and The Nature Conservancy, with funding from NOAA's Habitat Blueprint for the Penobscot River.

Event type: art

Participating MSF Partners: Maine Discovery Museum

FRIDAY, March 15

Believing in the Power of Science



**Be sure to watch
High School Quiz Show Maine
on Maine Public Television!**



**Thursdays and Sundays
this March, April and May!**



www.emeramaine.com



maine public
RADIO · TELEVISION · ONLINE

Tech Night

Maine Discovery Museum
74 Main Street
4:30-7:00pm



Hey middle schoolers - want to find out about the world of computers and information technology? Learn, share, collaborate, and explore cutting-edge software and web-based tools. With workshops and hands-on activities the program is designed for maximum engagement! Participants: please bring a laptop device, or email us at hello@mainesciencefestival.org if you will need to borrow one (we'll have a limited supply for borrowing). Drop-off event; pizza dinner provided for participants.

Produced by Project>Login.

FRIDAY, March 15

Hour of Code Dance Tutorial presented by Project>Login's intern Matt Hartt (4:45-5:45 pm). Students will run through the Hour of Code dance tutorial. Attendees will use basic block coding (java) to complete creativity dance program.

Mystery Tech Workshop (4:45-5:45 pm). Will it be robots? Will it be VR? What do you think it will be? Attendees of this session will be surprised with a cool and fun tech activity.

Creative Coding presented by UMaine's ACM-W chapter (offered twice: 4:45-5:45 pm and 6:00-7:00 pm). Approachable applications to computer programming for any skill level. Whether you're a beginner or an active programmer, we have something for you!

Our workshop is split into three stations. You can choose the one you like best!

1. Scratch - For novice coders who would like to build a simple game and learn the basic building blocks of programming!
2. EarSketch - For those interested in learning to code in JavaScript by making music!
3. Unity - For anyone interested in developing and exploring a 3D virtual landscape!

Please bring a laptop and headphones to this workshop. A limited number may be available to borrow.

Raspberry Pi Tech Jam presented by CGI (offered twice: 4:45-5:45 pm and 6:00-7:00 pm) CGI's Waterville Onshore Delivery Center will conduct a Raspberry Pi Tech Jam, utilizing the Raspberry Pi, which is a tiny and affordable computer that you can use to learn programming through fun, practical projects.

Tech Night, con't

Examining Digital Footprints! presented by Maine CSTA (6:00-7:00 pm). This session is designed to talk about personal information people choose to share digitally. It will begin by discussing what types of information are good to share with other people, then looks at several sample social media pages to see what types of personal information could be shared intentionally or unintentionally. Finally, the participants come up with a set of guidelines to follow when putting information online.

CyberSpace! presented by Mainely Tech Women (6:00-7:00 pm) This interactive session will discuss the online world and explore CyberSpace through games or activity.

Our friends from National Digital Equity Center and Americorps will also have an information table about digital literacy courses at this event. Be sure to check out the resources on the table in the lobby!

Event type: workshops

Participating MSF Partners: Maine Discovery Museum, Project>Login

Space is limited, sign-up required. Eventbrite:
<https://bit.ly/2TR9oXp>

FRIDAY, March 15

MSF Partner Event:

**Penobscot Theatre presents *Ripcord*
by David Lindsay-Abaire**



Penobscot Theatre Company, 131 Main Street
7:00pm *TICKETS REQUIRED

A sunny room on an upper floor is prime real estate in the Bristol Place Senior Living Facility, so when cantankerous Abby is forced to share her quarters with a new arrival, she determines to get rid of the infuriatingly chipper woman by any means necessary. *The Golden Girls* meets *The Odd Couple* when a seemingly harmless bet between the old women escalates into a dangerous game of one-upmanship that reveals their tenacity and deeper truths that cut to the heart.

\$28-40/adult, \$15-20/student (up to age 25, with student ID). Purchase online at <https://boxoffice.diamondticketing.com/penobscot/events/ripcord>

Participating MSF Partner: Penobscot Theatre Company

MSF Partner Event:

Emera Astronomy Center and M. F. Jordan Planetarium presents **MEXICA ARCHEOASTRONOMY -** **Between Space and Time**

*Emera Astronomy Center and M. F. Jordan
Planetarium, University of Maine*

7:00 - 8:00pm *TICKETS REQUIRED

Through impressive immersive scenarios, *Mexica Archaeoastronomy: Between Space and Time* illustrates the important role played by astronomical observation for the evolution of pre-Hispanic cultures in central Mexico. The Mexicas used the calendrical and astronomical knowledge inherited by their predecessor cultures to found the capital of their empire: Tenochtitlan. Vibrant colors, shapes and sounds transport the viewer to one of the most important cultures that, to this day, still lives in the heart and skin of the Mexican people. The program includes a tour of the night sky and an update on latest astronomy news.

*Tickets Required; \$6 for Adults, \$5 for UMaine Students/Veterans/
Senior Citizens, and \$4 for children under 12. Online: <https://goo.gl/SFH4c5>; call 207-581-1341; or at the ticket box office prior to the show.*

Event type: Planetarium Show

Participating MSF Partners: *Emera Astronomy Center,
University of Maine*

FRIDAY, March 16

5 Minute Genius

Bangor Arts Exchange
193 Exchange Street
7:30-9:30pm



Come and join us for the MSF's answer to Ted Talks. 5 Minute Genius features short, sharp talks by some of Maine's finest scientists with 5 minutes per talk, plus 5 minutes for questions. Presenting a sprint through some of the most remarkable, cutting-edge science happening in Maine - you will feel like a genius in no time! Want more? Stick around for a reception after this event.

Presenters: *Sascha Deri*, bluShift; *Jacquelyn Gill*, University of Maine; *Nick Giudice*, University of Maine; *Rafael Grossman*, Healthcare Futurist, Technology Innovator, Surgeon & Educator; *Brian Harris*, MedRhythms; *Raghavendra Yadavalli*, Bigelow Laboratory for Ocean Sciences; *Glenn Stevenson*, University of New England

Event type: presentation

Moderator: *Kate Dickerson*, Maine Science Festival

Participating MSF Partners: *Bigelow Laboratory for Ocean Sciences, The Jackson Laboratory, University of Maine, University of New England*

Sponsored by



FRIDAY, March 16

**END OF DAY 3 OF THE 2019
MAINE SCIENCE FESTIVAL
DAY 4 BEGINS ON PAGE 21**



**NEW HEIGHTS
NEW SCIENCE
NEW
DISCOVERIES**

coming soon!



www.mainediscoverymuseum.org



We need to develop the most efficient and effective American-based manufacturing operation we can, in order to be the most competitive we can. The award from MTI is helping us do just that.

*Dan St. Pierre,
Co-Founder & CFO,
Hyperlite Mountain Gear*



Creating the Future in Maine

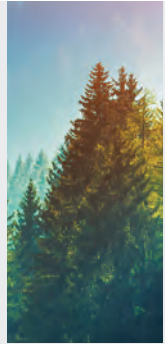
Maine Technology Institute (MTI) helps Mainers build innovative and high-growth businesses. From an idea sparked at the Maine Science Festival to designing better outdoor gear (and beyond!), MTI supports and invests in Maine entrepreneurs. MTI works with innovators and companies to start and grow, creating quality jobs in Maine, and increasing revenues.

Do you have a vision for an innovative business or technology?

Learn more about our funding programs at

www.MaineTechnology.org





We are ND Paper

While our name might be new, the paper products we produce have long set the standard for quality and superior performance.

We are proud to manufacture high-quality coated paper products including **Orion, Vision, Escanaba, Capri, Dependoweb, Consoweb and Rumford Offset** at our integrated paper mills in Biron, Wisconsin and Rumford, Maine. These brands boast a well-earned reputation for durability, dependability and consistent performance for a wide variety of applications.

For those who don't yet know us, ND Paper is a wholly-owned subsidiary of Nine Dragons Paper (Holdings) Limited, a leading global paper product manufacturer and the largest containerboard producer in Asia. We are an environmentally-friendly company that manufactures various types of high-quality pulp, paper and paper-based packing materials. Our mills in Rumford and Biron are integrated paper & pulp facilities, while our Fairmont, West Virginia facility is one of only three in the world that produces air-dried recycled pulp. We are proud of our 1,100 dedicated employees, who together produce more than 1.1 million metric tons of paper annually.

Sustainable paper is our way of life.

For more information on our products, please visit us.ndpaper.com

Exploration Stations

Engage - Examine - Experiment

Cross Center Ballroom

9:00am-4:00pm



SATURDAY, March 16

Roll-up your sleeves and learn through various hands-on activities from scientists and practitioners around the state. Make sure to stop in and visit each activity, and see how science is everywhere!

- *Understanding Weather Extremes in Maine; The Past, The Present and The Future* National Weather Service Caribou Office
- *Marble run engineering and design* Girl Scouts of Maine
- *Stormwater Pollution Demonstration Model* Bangor Area Stormwater Group (BASWG)
- *The exciting world of Diesel Truck and Heavy Equipment Repair Diesel Truck and Heavy Equipment technology* Eastern Maine Community College
- *Ask a Researcher* University of Maine Research
- *Space Farming* Maine Board of Pesticides Control
- *Sea Farm Explorer* Sea Farm Explorer Program & Maine Discovery Museum
- *Mechanics of Walking, Standing, and Taking Care of Your Feet* Winterport Boot Shop
- *Robots with RIM* Robotics Institute of Maine
- *SNAP Dairy Test and Magnetism, Microscopes and Milk* IDEXX Laboratories
- *Make-Your-Own-Lotion and Pill Counting Challenge* The Rho Chi Society (Epsilon Gamma Chapter) of Husson University's School of Pharmacy
- *Hands-on Astronomy* Cornerstones of Science
- *Out of the Blue: Exploring Maine's Edible Seaweeds* Maine Sea Grant
- *Bee Bots* - Challenger Learning Center of Maine
- *From Mouth to Gut-How Science Helps Us Stay Healthy* Husson University College of Science and Humanities and School of Nursing
- *Photograms and Cyanotypes: Creating photos without a camera* University of Maine Museum of Art
- *Build An Insect* Bangor Land Trust
- *Everyday plastics end up everywhere!* Maine Maritime Academy
- *Mixed Reality World* Eastern Maine Community College
- *A Pocket Model of the Solar System* Emera Astronomy Center
- *Crystal radio set* 19th Century Curran Homestead Village at Fields Pond & Newfield

Event type: Hands-on

Participating MSF partners: Bangor Area Stormwater Group, Bangor Land Trust, Challenger Learning Center of Maine, Emera Astronomy Center, Girl Scouts of Maine, Husson University, Maine Maritime Academy, Maine Sea Grant, University of Maine, University of Maine Museum of Art

River Run Fish Exhibit

**Main Street Gallery, Maine Discovery Museum,
74 Main Street**

10:00am-5:00pm    

SATURDAY, March 16

Diadromous fishes spend part of their life in fresh water and part in salt water. Diadromous fishes are either anadromous or catadromous fish, meaning either they spend most of their lives at sea, returning to freshwater to spawn; or they spend most of their lives in freshwater, returning to the sea to spawn. Historically, diadromous fishes were essential to the sustenance and economic growth of North America. Today many diadromous fishes are in trouble owing primarily to habitat alteration and destruction. Displaying these twelve species together with three other Maine fish species in this gallery show emphasizes the importance of treating these species as a group, as a species-by-species approach to managing and restoring their populations has proved largely ineffective. Maine artist Karen Talbot produced the illustrations in partnership with Maine SeaGrant, NOAA Fisheries Greater Atlantic Regional Office and The Nature Conservancy, with funding from NOAA's Habitat Blueprint for the Penobscot River.

Event type: *art*

Participating MSF Partners: *Maine Discovery Museum*

Maine Invention Convention

Cross Center Prefunction Area

10:00am-3:00pm



The Maine Invention Convention is a statewide competition that promotes innovative problem solving and inventing by Maine middle school students. Students work with their peers and teachers to identify and solve problems by using the Innovation Engineering process. At this event, students from each participating school compete for the top invention awards. For more information, see www.maineinvents.org.

Event type: *poster session*

From Donut Holes to Earmuffs: A (quirky) history of inventions from Maine



Cross Center Meeting Room A
10:00am-11:00am

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Inventors have always inspired progress, curiosity, sometimes even intrigue. The stories and patents for those inventions can offer an exciting insight into our cultural history. As part of a Q & A style talk, join us to learn the fascinating history behind some inventions that had their start in Maine. We'll start the talk with a brief introduction into the history of patents, including surprising facts about US issued patents. For example, did you know there were only 3 issued in 1790 and 184,377 issued in 2006! Interesting and fun facts about each inventor/invention will be shared. You'll learn about inventors such as John Blondel, responsible for improvements to "doughnut cutters" and Helen Blanchard, who held 28 patents in her lifetime!! We'll highlight a variety of inventors over the centuries and using details from the inventors' personal history and patent illustrations. We hope this talk will both inspire and entertain.

Event type: *presentation*

Presenters: *Rachel Knapp*, Science and Engineering Librarian, University of Maine; *Renee Kelly*, Assistant Vice President for Innovation and Economic Development, University of Maine

Moderator: *Jonathan Sprague*, Rocky Coast Consulting, MSF Advisor

Science of Aging

Cross Center Meeting Room B
11:00am-12:00pm



Sponsored by



Human life spans have grown enormously in just a few generations, and with that comes some new issues that haven't needed to be addressed on a large scale. In this forum, we'll be looking at the science of aging from a few different areas including cognitive functioning, working professionally in later years, long-term care, and genetics associated with kidney function and aging.

Event type: *forum*

Presenters: *Fayeza Ahmed*, Assistant Professor, Psychology Department, University of Maine; *Danielle Kennedy*, actor; *Ron Korstanje*, Assistant Professor, The Jackson Laboratory; *Lori Parham*, State Director, AARP Maine.

Moderator: *Senator Angus King* *If Senator King is unable to join us (his schedule will not be set until right before the MSF), *Danielle Kennedy* will moderate the forum.

Participating MSF Partner: *The Jackson Laboratory*

SATURDAY, March 16

Fire and Ice Show

**Lecture Hall, Bangor Public Library,
145 Harlow Street**

11:00am-12:00pm



ages
3-10

SATURDAY, March 16

Get ready for some sizzlin' excitement! Join Mad Science of Maine for SAFE and scientific fun with fire and ice! In this show, children will explore the 3 states of matter and learn about the amazing properties of fire and combustion. Children will see how our special Mad Science paper can burn leaving no ash behind and their jaws will drop when they witness our "Swoosh, Whoosh, Aaaah" experiment. After some sizzling chemical reactions heat things up, we will cool off with spectacular demonstrations involving dry ice! We will explore the "Big Burp", the "Sizzling Scissors" and the famous "Mad Science Shower". *Presented by Mad Science of Maine*

**Audience limited to 100; first come-first served*

Event type: show

Participating MSF Partners: Bangor Public Library, Mad Science of Maine

Science Writing 101

Cross Center Meeting Room D



11:30am-1:30pm

Many scientists find it challenging and time-consuming to communicate in clear, simple terms with the average person, while many journalists don't have the interest (or time) to fully understand difficult scientific concepts well enough to report a science story in a general interest publication. We live in a time where data matters and keeping science accessible in the public eye is essential. In this workshop, Ret Talbot will lead participants through reporting a science story in a way that is both clear and compelling.

Event type: workshop

Presenter: Rat Talbot, award-winning freelance journalist

*Space is limited to 15, sign-up required.
Eventbrite: <https://bit.ly/2V3YAp8>*



Suitability key: Families-

Middle School-



Teens-



Adult-



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Healthcare in Maine from the 18th Century to Today



Cross Center Meeting Room C

12:00pm-1:00pm

Medicine is the most human of sciences and reflecting on the history of healthcare in Maine reminds us of both powerful continuities and dramatic changes in medical care over time. Three short presentations will set the stage for an engaging audience discussion: first, about an early manuscript history of Maine medicine, next on the origins of the Mabel Wadsworth Center, concluding with medicine in Bangor today.

Event type: forum

Presenters: Richard Kahn, M.D., M.A.C.P., Tenant's Harbor; Mazie Hough, Associate Professor of History and Women's, Gender, and Sexuality Studies, University of Maine; Donald Krause, M.D., St. Joseph Hospital, Bangor

Moderator: Liam Riordan, Professor of History, University of Maine

Participating MSF Partners: University of Maine

Having Fun with Data - middle school edition



Cross Center Meeting Rooms 1&2

12:00pm-1:00pm

What IS data? How do I get data? How do I analyze data to understand what it means? In this workshop, we will help aspiring scientists answer these burning questions! Using a large dataset of Rotten Tomatoes movie reviews, we will use Python, a common programming language, to search and classify data, make graphs, and draw conclusions to meaningful questions.

PARTICIPANTS HAVE TO BRING THEIR OWN LAPTOPS with Python 3.7.2 loaded on it!

Event type: workshop

Presenter: VEMI Lab, University of Maine

Participating MSF Partners: VEMI Lab, University of Maine

Space is limited to 15, sign-up required.

Eventbrite: <https://bit.ly/2ljYkRx>

Science of Soda Making

**Central Street Farmhouse,
30 Central Street**

1:00pm-2:00pm



SATURDAY, March 16

What makes soda bubble and taste good? How do you keep it fresh? Learn this and more from the folks at Central Street Farmhouse in this drop-in workshop.

Event type: *drop-in workshop*

Presenter: Josh Parda, Central Street Farmhouse

Participating MSF Partner: Central Street Farmhouse

Solar Energy in Maine

Cross Center Meeting Room A

1:00pm-2:00pm



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The sun is the a remarkable source of energy for the earth (even in Maine). From powering our electricity, heating, water and driving needs, to cutting-edge university research on optimizing large scale commercial solar plants, you'll learn about some of the different ways solar energy is being used and researched in Maine.

Event type: *forum*

Presenter: Hans Albee ReVision Energy; Justin Lapp, Assistant Professor Mechanical Engineering, University of Maine

Moderator: Sharon Klein, Associate Professor, School of Economics, University of Maine

Participating MSF Partners: ReVision Energy, University of Maine

Earth, Space, and Universe: The science of our home world and beyond!

**Main Street Gallery, Maine Discovery Museum,
74 Main Street**

1:00pm-4:00pm



**ages
4-14**

Stop by the Maine Discovery Museum to explore Heliophysics, Earth Science, Planetary Science, and Astrophysics at fun, hands-on science stations and mini labs created by the NISE network. Play with paper mountains, mini mars rovers, pack a space telescope to load on a rocket, marvel at polarized light! Lot's of hands-on fun, take home ideas and materials.

Event type: *hands-on*

Participating MSF Partner: Maine Discovery Museum

Science Education from the Beginning



SATURDAY, March 16

Cross Center Meeting Room C

1:30pm-2:30pm

All of our young people should have the opportunity to do real science, problem solve, think critically, and understand how evidence-based decision making in science can influence our communities. Education research has shown that immersive hands-on science learning is essential to inspire an interest in STEM careers, a general sense of wonder about the natural world, and evidence-based decision making. This session will highlight the vision of the next generation science standards and how science learning experiences look in this new paradigm. Attendees will explore different strategies that they can use to highlight the importance of equitable science education for all K-12 students to decision makers in their schools and communities. Participants will walk away with tools that parents, teachers, and administrators can use to advocate for high quality K-12 science education in their communities.

Event type: *forum*

Presenters: *Diana Allen*, Maine Science Teachers Association; *Kate Cook-Whitt*, Assistant Professor, Thomas College; *Shari Templeton*, Maine Department of Education

Moderator: *Ruth Kermish-Allen*, Maine Math and Science Alliance

Participating MSF Partners: *Maine Math and Science Alliance*

Having Fun with Data - high school+ edition

Cross Center Meeting Rooms 1&2



2:00pm-3:00pm

What IS data? How do I get data? How do I analyze data to understand what it means? In this workshop, we will help aspiring scientists answer these burning questions! We will acquire data from Twitter by sifting through 7 days of tweets, and then use Python, a common programming language, to search and classify data, make graphs, and draw conclusions to meaningful questions.

PARTICIPANTS HAVE TO BRING THEIR OWN LAPTOPS with word processing and spreadsheet capability!

Event type: *workshop*

Presenter: *VEMI Lab, University of Maine*

Participating MSF Partner: *VEMI Lab, University of Maine*

*Space is limited to 15, sign-up required.
Eventbrite: <https://bit.ly/2BGE2vx>*

Science Illustration

Cross Center Meeting Room D

2:00pm-3:30pm



SATURDAY, March 16

In this hands-on workshop led by artist Karen Talbot, participants will work from specimens to create their own scientific illustrations. The focus will be on observing closely and both documenting and interpreting those observations through illustration. In the process, participants will learn about the history of scientific illustration and why it is still relevant today. No experience is required.

Event type: *workshop*

Presenters: *Karen Talbot, artist*

*Space is limited to 15, sign-up required.
Eventbrite: <https://bit.ly/2lna0mq>*

Ecology of Disease: How the Environment Shapes Human and Animal Health

Cross Center Meeting Room B

2:30pm-3:30pm



Sponsored by



The majority of emerging diseases originate in animal populations, of which ~70% involve wildlife. Beyond impacts to human health, infectious diseases can result in losses to agricultural production and natural resources, as well as hamper wildlife conservation efforts. The field of infectious disease ecology considers the emergence, persistence, and dynamics of pathogens in the landscape from an ecological perspective and examines the role of natural and anthropogenic environmental processes in shaping the prevalence and distribution of diseases in human and animal populations. In this forum, we will present our recent research in disease ecology focusing on local study systems.

Event type: *forum*

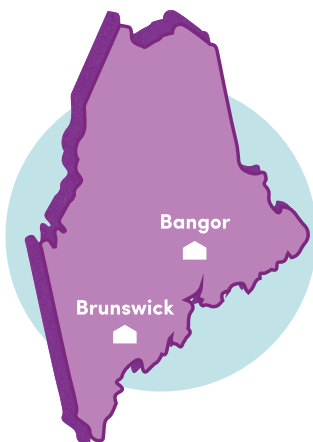
Presenters: *Kristina Cammen*, Assistant Professor, School of Marine Sciences, University of Maine; *Elizabeth Henderson*, Field Biologist, Maine Medical Center Research Institute; *Pauline Kamath*, Assistant Professor, School of Food and Agriculture, University of Maine

Moderator: *Allison Gardner*, Assistant Professor, School of Biology and Ecology, University of Maine

Participating MSF Partners: *Maine Medical Center Research Institute, University of Maine*



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Science of Voice

Cross Center Meeting Room A

3:00pm-4:00pm



SATURDAY, March 16

Voices are like fingerprints; every person's is unique due to the size and shape of their vocal cords as well as the rest of their body. When we speak or sing, we are hearing air moving over the vocal folds, through the throat, and into the mouth where it is shaped into sounds, words, and phrases, all controlled by the intentions of the brain. How are some people able to project their voices much louder than others? How can some people change their voices to mimic others? Join us to explore these fascinating phenomena with a mechanical engineer and two vocal instructors who explore the relationships between acoustics and the vocal cords.

Event type: *forum*

Presenter: *Phil Burns*, Burns Music Studio, *Tina Burns*, Burns Music Studio; *Qian Xue*, Assistant Professor Mechanical Engineering, University of Maine

Presenter: *John Thompson*, Professor, Chair, Department of Physics and Astronomy, University of Maine

Participating MSF Partner: *University of Maine*

Sea-run Science: Reconnecting Habitat for Salmon and other Migratory Fish

Nocturnem Draft Haus, 56 Main Street

3:30pm-4:30pm



Human activities continue to impact salmon, with many stocks now at critical levels – but it's not too late. It will take all of us – Indigenous Peoples, fishers, scientists, governments, concerned citizens – working together to increase understanding, create awareness, and take action. Join The Nature Conservancy and NOAA Fisheries as we explore the science behind restoring Maine's rivers for Atlantic salmon and other species of migratory fish.

Event type: *forum*

Presenters: *Sarah Haggerty*, Maine Audubon; *Sarah Madronal*, Downeast Salmon Federation; *Daniel McCaw*, Penobscot Indian Nation; *Joshua Royte*, The Nature Conservancy; *Rory Saunders*, NOAA's National Marine Fisheries Service

Moderator: *Molly Payne Wynne*, The Nature Conservancy

Participating MSF Partners: *Nocturnem Draft Haus, The Nature Conservancy, University of Maine*

SATURDAY, March 16

MSF Partner Event:

Penobscot Theatre presents *Ripcord* by David Lindsay-Abaire



Penobscot Theatre Company, 131 Main Street
5:00pm *TICKETS REQUIRED

A sunny room on an upper floor is prime real estate in the Bristol Place Senior Living Facility, so when cantankerous Abby is forced to share her quarters with a new arrival, she determines to get rid of the infuriatingly chipper woman by any means necessary. *The Golden Girls* meets *The Odd Couple* when a seemingly harmless bet between the old women escalates into a dangerous game of one-upmanship that reveals their tenacity and deeper truths that cut to the heart.

Tickets Required: \$28-40/adult, \$15-20/student (up to age 25, with student ID). Purchase online at <https://boxoffice.diamondticketing.com/penobscot/events/ripcord>

Participating MSF Partner: Penobscot Theatre Company

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Friday, March 15th

4:30 - 7:00 pm

Maine Discovery Museum

- Raspberry Pi Tech Jam
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- CyberSpace and more
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MSF HEADLINER EVENT

Science Vs UFOs

**Gracie Theatre, Husson University,
1 College Circle**

7:30pm *TICKETS REQUIRED

Join us for 2019 Headliner: a live show from the team that produces Science Vs as they present: Science Vs UFOs! As the Science Vs team says, "There are a lot of strong opinions, but then there's SCIENCE."

Host Wendy Zukerman and senior producer Kaitlyn Sawrey from the Science Vs team will take us through what is known about Unidentified Flying Objects. Zukerman and Sawrey will follow their show with a moderated Q&A with the audience.

This show is brilliant and dead serious about getting to the bottom of its hypotheses. - The Atlantic

Event type: show

Participating MSF Partners: Husson University



**TICKETED EVENT - \$10/students, \$17/general admission in advance;
\$15/\$22 at the door. General seating: <https://bit.ly/2QYJejb>**

**END OF DAY 4 OF THE 2019
MAINE SCIENCE FESTIVAL
DAY 5 BEGINS ON PAGE 43**



SATURDAY, March 16





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Science Board Gaming



Fork & Spoon, 76 Main Street;

Maine Discovery Museum, 74 Main Street

10:30am-3:00pm

What do science, math, innovation, and board games have in common? A lot, actually! Come and enjoy some drop-in gaming at **Fork & Spoon (short games, 10:30am-2:30pm)** and **Maine Discovery Museum (long games, 11:30am-3:30pm)**, hosted by the SnowCon gaming convention crew. From resource management to agriculture to space travel, SnowCon regulars will be available to teach gamers of all ages how to play a curated selection of games to celebrate the Maine Science Festival!

Event type: games

Participating MSF Partners: Fork & Spoon, Maine Discovery Museum, SnowCon

River Run Fish Exhibit

***Main Street Gallery, Maine Discovery Museum,
74 Main Street***

11:00am-4:00pm



Diadromous fishes spend part of their life in fresh water and part in salt water. Diadromous fishes are either anadromous or catadromous fish, meaning either they spend most of their lives at sea, returning to freshwater to spawn; or they spend most of their lives in freshwater, returning to the sea to spawn. Historically, diadromous fishes were essential to the sustenance and economic growth of North America. Today many diadromous fishes are in trouble owing primarily to habitat alteration and destruction. Displaying these twelve species together with three other Maine fish species in this gallery show emphasizes the importance of treating these species as a group, as a species-by-species approach to managing and restoring their populations has proved largely ineffective. Maine artist Karen Talbot produced the illustrations in partnership with Maine SeaGrant, NOAA Fisheries Greater Atlantic Regional Office and The Nature Conservancy, with funding from NOAA's Habitat Blueprint for the Penobscot River.

Event type: art

Participating MSF Partners: Maine Discovery Museum

SUNDAY, March 17

MSF Partner Event:

Valentine Footware hosts SoulShine Soap Company Pop-Up Shop!

Valentine Footwear, 115 Main Street



12:00 - 4:00pm

Valentine Footwear hosts SoulShine Soap Company for a little spring cleaning inspiration! Clean up your act with a beautiful selection of locally handcrafted soap bars, laundry soaps, stain sticks, & solid lotion bars.

SoulShine Soap will be happy to answer questions about how they make their soap, and the experiments/trial and error that they went through to come up with their final products.

Event type: drop in hands-on

Participating MSF Partners: Valentine Footwear

Science Scavenger Hunt

Start and end at the Maine Discovery Museum

74 Main Street

Noon-3:00pm



A downtown science scavenger hunt! Pick up your sheet/information at the Maine Discovery Museum, get it time-stamped, and go find the science the clues lead you to. Once done, return to the Discovery Museum to get your finishing time stamp. The fastest finisher receives a prize, and all who finish will be entered into a drawing for a goodie bag. The hunt has to be completed between 12-3pm.

Event type: games

SUNDAY, March 17

MSF Partner Event:

Emera Astronomy Center and M. F. Jordan Planetarium presents

Phantom of the Universe:



The Hunt for Dark Matter

Emera Astronomy Center and M. F. Jordan Planetarium, University of Maine

12:30 - 1:30pm *TICKETS REQUIRED

From the journey of protons racing through the world's largest particle collider to up-close views of the Big Bang and emergent universe, and the nearly mile-deep descent to an underground experiment, Phantom of the Universe immerses audiences in the search for dark matter. Explore this mysterious matter and how we are using discoveries at the Large Hadron Collider to get closer to discovering the true nature of Dark Matter. View the first hints of its existence through the eyes of Fritz Zwicky, the scientist who coined the term "dark matter." Explore the astral choreography witnessed by Vera Rubin in the Andromeda galaxy, and then plummet deep underground to see the most sensitive dark matter detector on Earth, housed in a former gold mine. Speed alongside particles before they collide in visually stunning explosions of light and sound at Large Hadron Collider at CERN, while learning how scientists around the world are collaborating to track down the constituents of dark matter. Executive Producer Michael Barnett of Lawrence Berkeley National Laboratory served as an advisor to PBS's NOVA series Elegant Universe and the feature film Angels & Demons. Featuring narration by Academy-Award winning actress Tilda Swinton, Phantom of the Universe showcases imagery from CERN's Media Lab.

Tickets Required. \$6 for Adults, \$5 for UMaine Students/Veterans/Senior Citizens, and \$4 for children under 12. Online: <https://goo.gl/SFH4c5>; call 207-581-1341; or at the ticket box office prior to the show

Event type: Planetarium Show

Participating MSF Partners: Emera Astronomy Center, University of Maine

SUNDAY, March 17

Earth, Space, and Universe: The science of our home world and beyond!

***Lobby, Maine Discovery Museum,
74 Main Street***



**ages
4-14**

1:00pm-3:00pm

Stop by the Maine Discovery Museum to explore Heliophysics, Earth Science, Planetary Science, and Astrophysics at fun, hands-on science stations and mini labs created by the NISE network. Play with paper mountains, mini mars rovers, pack a space telescope to load on a rocket, marvel at polarized light! Lot's of hands-on fun, take home ideas and materials.

Event type: hands-on

Participating MSF Partner: Maine Discovery Museum

Seeing Sound

Queen City Cinema Club, 128B Main Street

1:00pm-2:00pm



Seeing Sound will introduce the fundamental physics of sound, and explore the tools audio engineers use to visualize the invisible. Sound production by musical instruments will be demonstrated, and software tools such as waterfall plots, meters, oscilloscopes, and spectrographs will demonstrate concepts such as frequency, amplitude, timbre, envelope, pitch, and rhythm.

Event type: presentation

Presenter: Eric Ferguson, Assistant Professor, New England School of Communications, Husson University

Moderator: Kate Dickerson, Maine Science Festival

Participating MSF Partner: Husson University

MSF Films: Student Film Competition

Maine Discovery Museum, 74 Main Street

2:00pm-3:00pm

Join us for a public screening of the 2019 MSF film contest top finishers, and an unveiling of the winners!



Event type: film

Participating MSF Partner: Maine Discovery Museum

Beaver Fever and Swimmers Itch

Penobscot Theatre Company Dramatic Academy, 51 Main Street

2:30-3:30pm



Join our presenters for a Sunday afternoon conversation about how messing about in water can expose people to some unexpected parasites.

Event type: forum

Presenters: Ian Bricknell, Professor Of Aquaculture Biology, Aquaculture Research Institute & School of Marine Sciences, University of Maine; Anne Lichtenwalner, Associate Professor of Animal and Veterinary Science, Director, UMaine Animal Health Laboratory, University of Maine Cooperative Extension and School of Food and Agriculture

Moderator: Jennifer Fortier, Whole Oceans

Participating MSF Partner: Penobscot Theatre Company, University of Maine

SUNDAY, March 17

Sponsored by **IDEXX**

Sunday MSF Partner Events:

Penobscot Theatre presents *Ripcord* by David Lindsay-Abaire



Penobscot Theatre Company, 131 Main Street

3:00pm *TICKETS REQUIRED

*See full description of *Ripcord* on page 12 - TICKETS REQUIRED

Emera Astronomy Center and M. F. Jordan Planetarium presents

Out There: The Quest for Extrasolar Worlds

*Emera Astronomy Center and M. F. Jordan
Planetarium, University of Maine*

3:30 - 4:30pm *TICKETS REQUIRED



For thousands of years, mankind thought that the Earth was the center of the Universe. Thanks to our curiosity, imagination and urge to explore, we now know that planets like our Earth are nothing special in the cosmos. The Sun is just one ordinary star among hundreds of billions in our galaxy, the Milky Way. With the world's most powerful telescopes, we are able to explore more and more of the Universe. What we have found so far has surpassed even the wildest expectations of scientists as well as authors of science fiction. Most stars have planets — it turns out they are more common than we thought. A huge diversity of different worlds is out there, just waiting to be discovered. Join as we explore these new worlds!

\$6 for Adults, \$5 for UMaine Students/Veterans/Senior Citizens, and \$4 for children under 12. Online: <https://goo.gl/SFH4c5>; call 207-581-1341; or at the ticket box office prior to the show

Event type: Planetarium Show

Participating MSF Partners: Emera Astronomy Center,
University of Maine

***Ripcord* Talkback**

Penobscot Theatre, 131 Main Street



5:00pm (after the show)

Join the cast and artistic crew of *Ripcord*, along with some of our Science of Aging panelists, for a discussion of the play and how it relates to the science of aging.

Event type: discussion

Participating MSF Partner: Penobscot Theatre Company, University of Maine

SUNDAY, March 17

STUDY THE SCIENCES OF THE SEA

MARINE BIOLOGY

learn how organisms live in the ocean by studying anatomy, physiology, behavior, and ecology of marine life

MARINE SCIENCE

learn how chemistry, geology, physics and biology integrate to generate and maintain the diverse ocean ecosystem

OCEAN STUDIES AT MAINE MARITIME ACADEMY

- prepare for your career at MMA, a public co-ed college on the coast of Maine
- study marine science and marine biology to learn about underwater volcanoes, massive ocean currents, shark migration, food from seaweed, and so much more
- prepare for a career in oceanography, aquaculture, environmental science, research, education, and public service
- learn on vessel cruises, in the field, in laboratories, and in research environments

DUAL DEGREE WITH SMALL VESSEL OPERATIONS

pursue the only integrated science/vessel operations program in the country with a dual degree in Marine Biology or Marine Science & Small Vessel Operations; students graduating from the dual-degree program earn both a Bachelor of Science degree and a U.S. Coast Guard license

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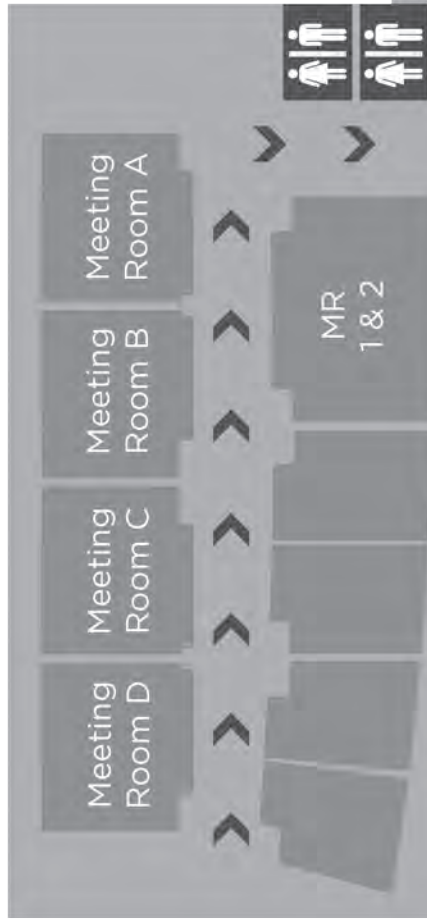
**MAINE MARITIME
ACADEMY**

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Venue Map

Cross Center Map



Exploration Stations
Engage - Examine - Experiment
20+ Activities
Information & Merch

Maine Invention Convention

MAINE SCIENCE FESTIVAL



**Thank you for exploring and
celebrating some of the amazing
Maine science and people who
make it happen. We will see you
next year for the 6th MSF
March 18-22, 2020!**

Be sure to Like and follow us on social media!

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www.twitter.com/MEScienceFest

Instagram:

<https://www.instagram.com/mainesciencefestival/>

Be sure to use our official hashtags:
#scienceiseverywhere and **#MSF2019**

mainesciencefestival.org

MAINE SCIENCE FESTIVAL



In 2020 Maine will be celebrating its Bicentennial and the Maine Science Festival will be shining an even larger spotlight on Maine science for the 2020 Maine Science Festival.

We are thrilled to announce our first ever all-Maine headliner event: a Bangor Symphony Orchestra concert program exploring one of the state's most treasured assets: the ocean.

The Maine Science Festival has commissioned composer Lucas Richman to create a symphonic work that will provide a musical exploration of the climate change happening in the Gulf of Maine, titled *The Warming Sea*.

The Warming Sea will world-premiere as part of the BSO's March 22, 2020 concert that doubles as the Maine Science Festival Headliner event, and is one of the recognized Maine Bicentennial events planned for 2020.



The Maine Science Festival (MSF) is an independently funded program of the Maine Discovery Museum. Launched in 2015, the MSF is a celebration and exploration of Maine science, engineering, technology and innovation. Our largest focus is a five day festival held annually with more than 70 events and activities, including workshops, films, hands-on activities, forums, talks, and exhibits. There are events available for all ages, with all but the headliner free of charge.

In addition to the March festival, we have created a series of events that are significantly smaller than a full festival: MSF Pop-up events. These can be a talk, a presentation, a film screening - something that you would expect to find during the Festival itself, but held in different locations around the state during other months. This allows us to keep a focus on Maine science throughout the year, and encourages people to join us at the full MSF.

The MSF Pop-up events are often done with MSF Partners, and allow us to continue highlighting the remarkable science happening in Maine year round. Some of the MSF Pop-up events double as fundraisers for the MSF, to help us ensure that we can keep the festival weekend available to all. If you're interested in hosting a MSF Pop-up event, or learning more, please send an email to info@mainesciencefestival.org.

The MSF is a chance for Mainers from all over the state to learn from some of the best Maine has to offer, and to celebrate our national and world leading researchers, innovators, and scientists.



MAINE SCIENCE FESTIVAL

The Maine Science Festival's focus is to make sure Mainers know about and celebrate the people and organizations in our state who are using their passion and love of science to make Maine and the world better. Since 2015, we have delighted in bringing the world of science in Maine to Bangor, so we can showcase their work.

This year - for the first time - we are asking festival goers to please consider making a \$5 donation when they attend the MSF. Many science festivals around the country charge anywhere from \$10-30 for just one event like Tech Night or 5 Minute Genius; we do not. We want to do all we can to make sure that Mainers of all ages and incomes have the chance to be inspired by the work being done here, so we don't hide it behind a paywall.

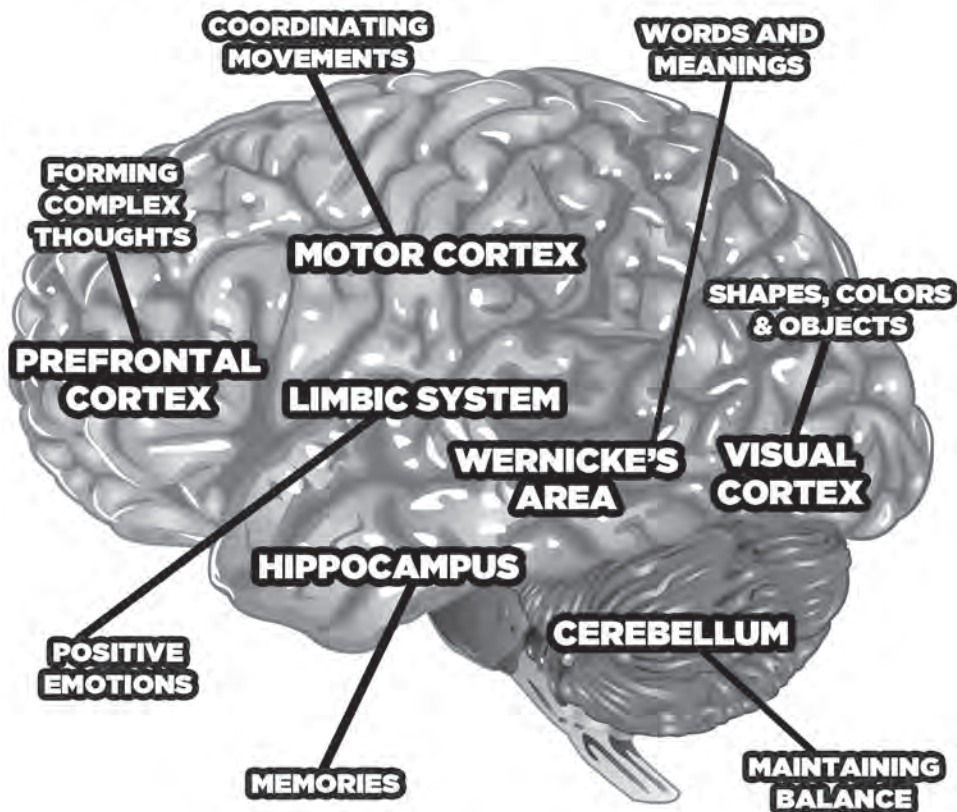
While the MSF does not charge for any event other than the headliner, that doesn't mean there isn't a cost. We raise money all year to keep the MSF available to all. If you would like to help us ensure this model stays in place, please consider making a donation in one of our donation buckets or online at <https://www.mainesciencefestival.org/donate/>.

Thank you!

Use your QR scanner
and DONATE here:



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www.mainesiencefestival.org

**MAINE
SCIENCE
FESTIVAL**



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#SCIENCEISEVERYWHERE

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Open House

Monday, April 8th

Come see why Maine School of Science and Mathematics is ranked in the **top 1% nationally** for STEM schools. Tour the campus, attend classes, learn about the admissions process, talk to students and teachers.

(Registration Required for Open House)

www.mssm.org