

# CATALYST

DENVER MUSEUM OF NATURE & SCIENCE MAGAZINE  
SUMMER 2017

## INSIDE ///

NATURE'S AMAZING MACHINES  
VIKINGS: BEYOND THE LEGEND  
NEW IMAX 3D FILMS





BEHOLD THE SECRETS  
OF A FORGOTTEN TIME.

# MYSTERIES OF CHINA 3D



NARRATED BY AVERY BROOKS

GIANT SCREEN FILMS PRESENTS A GIANT SCREEN FILMS TOP PRODUCTION & EXPANDED EYE ENTERTAINMENT PRODUCTION  
DIRECTED BY BRIAN CINCER  
EXECUTIVE PRODUCERS JEFF XU  
PRODUCED BY RICK GORDON  
WRITTEN BY HARRY MILLER III, ACE  
EDITED BY SAM CARBON  
CINEMATOGRAPHY BY REED SMOOL, ASC  
MUSIC BY MOSE RICHARDS & KEITH MELTON  
EXECUTIVE PRODUCERS ANDY WOOD  
PRODUCED BY FERNANDO WANG  
EDITED BY DON KEMPP  
CASTING BY KEITH MELTON  
EXECUTIVE PRODUCERS THEMU JIN, HUIKING LI  
PRODUCED BY KEITH MELTON

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Expanded Eye  
Entertainment



THE HUNT IS ON.

# INCREDIBLE PREDATORS 3D



BBC EARTH PRESENTS A SILVERBACK FILMS AND BBC EARTH CO-PRODUCTION IN ASSOCIATION WITH GIANT SCREEN FILMS "INCREDIBLE PREDATORS"  
PRODUCED BY BBC EARTH AND GIANT SCREEN FILMS  
WRITTEN BY ADEWALE AKINWUYE-AGBAJE  
EDITED BY GEORGE FENTON  
EXECUTIVE PRODUCERS ANDY NETLEY  
PRODUCED BY NEIL NIGHTINGALE AND HUW CORDEY  
CINEMATOGRAPHY BY MAYLES CONNOLLY  
CASTING BY FIONA CHARLTON  
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BBCEarth.com/IncrediblePredators

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Dear Members,

There was much to celebrate in 2016, such as serving 1.9 million people, including you, our treasured members! You played a big part in our success. You boost our mission with your membership support and are our greatest champions, sharing your appreciation for the Museum, nature, and science with your friends and family.



Another highlight was the official kickoff of the Community Collaboration Project. This continues our commitment to cultivating new relationships with communities around the metro area to receive their insights and ideas for relevant and engaging events, exhibits, programs, and experiences for everyone to enjoy. The strengths and successes of our past are our foundation, and the new perspectives help identify and develop fresh possibilities for the future as we ensure the community's needs are at the heart of what we do.

I am continually inspired by the insights of our community collaborators and honored by the time they are willing to share with us. A common theme that has emerged has been people's connection to the natural world and the awareness that being outside and immersed in nature often leads to curiosity, inquiry, and discovery. This connection to nature will be a guidepost for innovation as we move forward—from permanent exhibits to locations outside our walls.

From simple changes, such as creating welcoming areas in the building where guests can gather, to larger efforts, such as updating our signage with English and Spanish, to grander scale projects, such as reimagining offsite school offerings with the help of urban and rural teachers and students, we are engaging our community early and often in planning and development so their goals and needs are the focus.

This collaborative mindset is stretching our organization and leading us in wonderful directions. We appreciate your support, year in and year out, as together we encourage people of all ages and interests to ignite their passion for nature and science, wherever they may be.

George Sparks  
President and CEO  
president@dmns.org

Find out more @ [dmns.org/communitycollaborationproject](http://dmns.org/communitycollaborationproject).

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## FIND IT @ DMNS.ORG

- Print-at-home tickets for surcharged exhibitions, Planetarium and IMAX shows, lectures, and programs
- Reservations for members events
- Hours and showtimes
- Museum scientists
- Museum blog
- Today's Weather at the Museum
- Heavens Above sky information
- Membership renewals and purchases

Join Our Community:



### ON THE COVER

From the Museum collections

Campbell Island diorama  
Erect-crested penguin (*Eudyptes sclateri*)  
Australia and South Pacific Hall, Level 2  
Installed in 1965

Find out more about this diorama on p. 3.





## HEAVENS ABOVE

Perhaps you've heard that on Monday, August 21, a total eclipse will be visible from America's lower 48 states for the first time in 38 years. It has already received much media coverage because it is so infrequent. The total eclipse will be visible within a narrow corridor coast-to-coast, beginning in the Pacific Northwest to the southeast, crossing Oregon, Idaho, Wyoming, Nebraska, Kansas, Missouri, Illinois, Kentucky, Tennessee, Georgia, and the Carolinas.

Even the partial eclipse will be an impressive sight. In Denver, the moon will cover 92 percent of the sun, and observers as far south as Miami will see coverage of more than 50 percent. The Museum will be a viewing site.

These are the local times for Denver:

Eclipse begins: 10:23 a.m., moon touches the sun's edge

Maximum: 11:47 a.m., moon is closest to the sun's center

Eclipse ends: 1:15 p.m., moon leaves the sun's edge

A solar eclipse occurs when the moon, in its orbit around Earth, comes between Earth and the sun. During an eclipse, the moon casts its shadow upon Earth. Total solar eclipses are possible only on Earth because of a cosmic quirk of geometry: the sun's diameter is 400 times wider than the moon, but it is also 400 times farther away. The result is the sun and moon appear to be the same size from our perspective.

Total solar eclipses are more than spectacles; they provide unique opportunities for science. Milestones in eclipse science include confirming the theory of general relativity over classical Newtonian physics, the first report of coronal mass ejections like solar flares, and the origin of solar wind. It is also vital for understanding the space environment our satellites and astronauts must travel through for current and future exploration.

Safety is paramount during any solar eclipse no matter where you're watching it! Never look directly at the sun without special solar filters. UV radiation can burn your retinas and cause permanent damage. Use only eclipse glasses designed for solar observing. Look for them in the Museum Shop.

## DISCOVER MORE

Find out more about the viewing at the Museum @ [dmns.org/eclipse](http://dmns.org/eclipse), and about the summer sky @ [dmns.org/heavensabove](http://dmns.org/heavensabove).

## MEMBERS TIPS FOR SUMMER

We expect it to be a busy summer at the Museum!

- *Nature's Amazing Machines* is free for members and opens with Members Preview Day on Thursday, June 15. *Vikings: Beyond the Legend* requires a timed ticket and will be open until Sunday, August 13.

- Weekday late afternoons and weekend early mornings tend to be less busy in our temporary exhibitions. Organized youth groups generally visit during weekday mornings.

- Please allow time for parking or consider alternative transportation when you visit the Museum.

- For *Vikings*, we recommend you purchase print-at-home tickets at [dmns.org/vikings](http://dmns.org/vikings) and avoid a handling fee. An audio guide is available for an additional fee.

- Reservations for *Vikings* are also available at 303.370.6000 (daily, 9–5). There is a \$2 fee per ticket by phone. Afternoon is the best time to call.

- Find out more about these two exhibitions at [dmns.org/exhibitions/current-exhibitions](http://dmns.org/exhibitions/current-exhibitions).

- Also, don't miss the annual Members Open House on Wednesday, July 26! Find out more on the back cover. Other fun events include Summertime Overnight for Families and the annual Sci Fi Film Series. Find out more in the program insert.



## COLLECT ALL SIX!

The Museum has added a fun feature to *Nature's Amazing Machines*—collectible trading cards! The cards feature six different animals from the exhibition, with fun facts and activities to try at home. They will be printed in both English and Spanish. The June/July card will be available in the exhibition when it opens, continuing with a new one at the beginning of each month until the exhibition closes on Monday, January 1, while supplies last.





## MORE ABOUT THE COVER

The Campbell Island diorama features penguins, an animal you will learn more about in the new temporary exhibition *Nature's Amazing Machines*. Campbell Island is located about 400 miles south of New Zealand and is noted for its concentration of sea mammals and bird life.

The dioramas in Australia and South Pacific Hall resulted from multiple expeditions by the Museum to the other side of the world during the 1950s. Because of its remote location, the fieldwork on Campbell Island had to be completed in one trip. In early 1958, the Museum's five-person party sailed from New Zealand aboard a U.S. Navy destroyer escort ship, the only transportation available. At the time, 10 meteorologists were the sole

human inhabitants. For six cold, wet weeks, the crew photographed and collected birds, mammals, plant life, and rocks, and sketched wildlife and scenery. The fruits of their work have been enjoyed by millions of Museum guests since the dioramas were installed in the 1960s. Today, Campbell Island is uninhabited because the weather station was automated years ago.

In addition to the penguins, this diorama contains elephant seals. The Museum had permission to bring only one seal back to the states, so in the diorama only one bull is real. The other is a fiberglass model. Next time you visit, see if you can guess which is which!



## NEW DINOSAUR FOSSILS ON EXHIBIT

Meet *Majungasaurus* and *Dahalokely*, two new kids on the Cretaceous block. The exhibit cases across from the Earth Sciences Lab in *Prehistoric Journey* will soon feature some newly displayed fossils introducing you to these and other dinosaurs from Madagascar. Our paleontologists have been conducting fieldwork on this remote island nation, which has become a hotbed for new discoveries in recent years.

You will also have a chance to see these illustrations by Andrey Atuchin, which reconstruct the island during the Cretaceous Period. Top: The red-crested *Majungasaurus* was the dominant predator in this ecosystem 67 million years ago. Bottom: *Dahalokely*, "little bandit," stands beside a stream 85 million years ago. The larger sauropod dinosaur has yet to be named, and its fossils are being prepped in the Earth Sciences Lab.

The new display will whet your appetite for the temporary exhibition *Ultimate Dinosaurs*, opening at the Museum in October, which will showcase some of the most spectacular fossils unearthed in recent years, from Madagascar, Africa, and South America.

# Nature's AMAZING MACHINES

Discover how every living thing is built to move and survive.

Ever wondered how a giraffe's heart pumps blood up to its brain, or how a cheetah is so fast? How a toucan stays cool in the jungle, or how insects breathe without lungs? The "biomechanics" of how animals and plants stay in one piece despite what appear to be insurmountable challenges are fascinating. Using their biological pumps, pipes, insulation, motors, and springs, these creatures endure extreme temperatures, find food against fierce competition, circulate their own life-sustaining fluids, and defend against external pressures, such as the forces of wind and water and the pull of gravity.

The new temporary exhibition *Nature's Amazing Machines*, opening to members on Thursday, June 15, uses a fun approach to explaining these phenomena with lots of real objects, scientific models, and engaging activities. It is presented in English and Spanish.

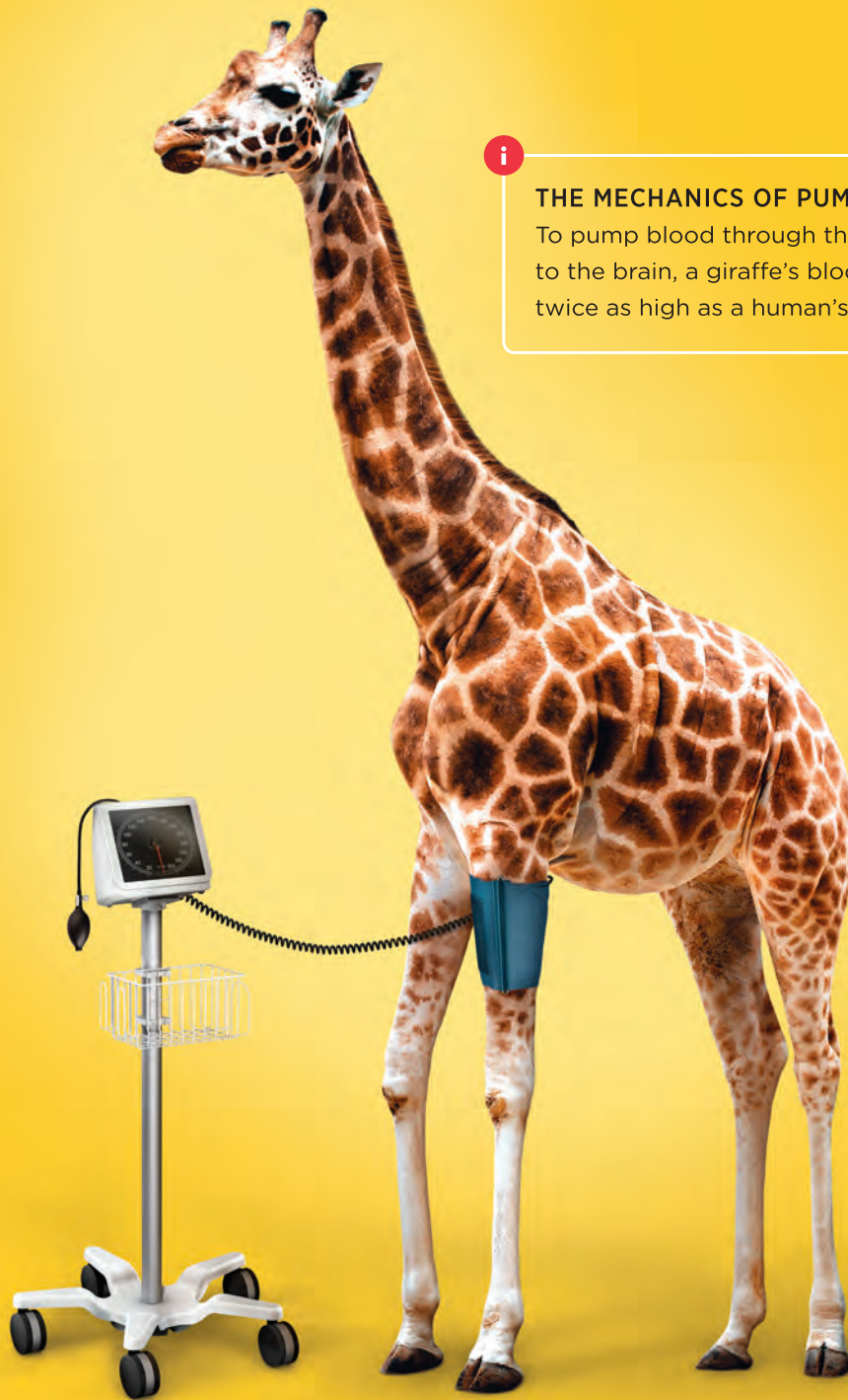


Here are just some of the fun things to do:

- Try for yourself how hard a giraffe's heart works to pump blood up its long neck.
- Learn to "fly" using two different types of wings.
- Study the many different ways creatures jump, gallop, slither, and swim.
- Discover technological breakthroughs inspired by nature's ingenuity—called biomimicry—such as Velcro, wind turbines, and chainsaws. (Find out more on p. 8.)
- See the mechanics of how cheetahs run so fast.
- Compare life-like models of animal hearts, including those of a fish, frog, turtle, eagle, and human.
- See an array of diverse rigid structures, such as bones and shells that demonstrate how the dome shape provides ideal protection.
- Test out a thermal camera to learn how much heat your body loses compared to animals covered in fur, blubber, or feathery down.
- Find out how toucan beaks and fox ears act as radiators to regulate temperature.
- Consider the complexities of how humans walk as you watch a two-legged robot try to walk.
- Collect animal trading cards. (Find out more on p. 2.)

"Ever feel weighted down? Like you can't catch your breath? Dizzy from standing too quickly? Hot? Cold?" said Dr. Garth Spellman, the Denver Museum's curator of ornithology and curatorial advisor for *Nature's Amazing Machines*. "Life on Earth is constantly struggling to counter natural physical forces that are trying to drag us down. This exhibition reveals a myriad of incredible adaptations that have evolved in animals to combat nature's constant assault."





### THE MECHANICS OF PUMPING BLOOD:

To pump blood through their long necks to the brain, a giraffe's blood pressure is twice as high as a human's (280/180).

## DISCOVER MORE

*Nature's Amazing Machines* opens to the public on Friday, June 16, through Monday, January 1. Admission is free for members. Find out more @ [dmns.org/NAM](http://dmns.org/NAM).

At press time, reservations were still available for the *Nature's Amazing Machines* members-only events, including Members Preview Day on Thursday, June 15. Find out more @ [dmns.org/memberevents](http://dmns.org/memberevents).

Major Support From  
 COLORADO STATE UNIVERSITY

This exhibition was developed by The Field Museum, Chicago, in partnership with the Denver Museum of Nature & Science, with generous support provided by the Searle Funds at The Chicago Community Trust and ITW.

## MEET THE VIKINGS

Specially trained actors bring the exhibition to life.

It is not every day that job training includes trying on chain mail, blacksmithing, learning the appropriate way to chop wood in cold weather, *nålbinding* homespun socks and mittens, and wielding a sword without hurting anyone, including yourself!

The Museum's dynamic historical enactors go through weeks of preparation before debuting their roles in our temporary exhibitions. *Vikings: Beyond the Legend* is designed to make guests feel as if they are stepping back in time to Sweden in about CE 850 near the trading port of Birka. Museum educators and professional local actors worked together to create characters that represent this point in time and bring a personal perspective to the story of the Vikings.

The enactors spent hours conducting extensive research to develop their roles, grounding the experience in historical accuracy. They met with the local Fjellborg Viking Reenactor Society and a Nordic studies expert from the University of Colorado-Boulder. They read books and scrutinized scenes from films about Vikings. They collaborated with a seamstress to create accurately depicted tunics, cloaks, underdresses, and apron dresses. They scoured the internet for accessories from the Czech Republic, Germany, and England, such as beard beads, turtle broaches, ear picks, tweezers, and snips. They wrote sagas and stories about Thor, Skaldi, Freya, dwarves, and giants to share with guests in dramatic performances.







Facing page: “Ingibjorg,” a talented weaver, shows guests some of her textiles. Above, left: “Tofa the Fair-Minded” shares a saga. Right: “Odinkarr Thorbjornson” is a noble. Pictured behind him is the “ghost ship,” a sculpture of iron rivets from an authentic aristocratic burial ship.

The result is seven well-developed characters. Get to know them because you never know who you might encounter while you are in the exhibition. The actors who portray them are noted in parentheses.

**Finnbjorn the Skald** (Grant Goble) is a court poet who records the proceedings and adventures of Halfdan the Black, the king of Westfold. He keeps the culture and oral traditions alive through poetic sagas and tales. Born to a fishing family along the western fjords of Norway, Finnbjorn gained fortune with the king whilst out on a “viking.”

**Tofa the Fair-Minded** (Janice Estey) is the matriarch of a large extended agrarian family. Overseeing the work of the farm and household, she has knowledge of crops and husbandry and is an expert in all household duties. Although she enjoys the responsibility and prestige of her station, she also loves sitting in the sun in the company of a good cat.

**Odinkarr Thorbjornson** (Jose Zuniga) is a jarl, a landed noble, who has taken his late father’s place as head of the clan. He rules on his family land near Uppsala in Sweden. He settles disputes, maintains alliances and his army, oversees the Thing (court), and is a master politician.

**Ingibjorg** (Amelia Wagner) is a talented weaver from Birka. Though she has felt the cost of war, a strong spirit has earned her the name Dagny (New Day). She is now the second wife of the heir to a small but efficient farm. When she is not working in the weaving hut she

delights in tending to her four surviving children and the farm’s many animals.

**Einarr Shield-Breaker** (Andrew Parker) is a warrior from Denmark, whose raiding career has brought him through Ireland to Iceland, and now to Sweden. Though he has long sought the honor of a glorious death in battle and a seat in Valhalla, his faith has expanded to incorporate aspects of Christianity due to the influence of his Irish wife, Guyda.

**Gudrun the Far-Seeing** (Erin Prestia-Robins) is a *völva*, a seeress, and a religious leader. Since her birth among the ancient trees of the sacred grove in Uppsala, she has been an initiate of Seidr. The embodiment of Freya and a descendent of Thor (as evidenced by her flaming red hair), Gudrun is thus doubly gifted in the art of divination.

**Gudmund the Red** (Michael A. Parker) is the younger brother of Rurik, first ruler of the Rus. After a successful stint as a mercenary with his brothers, he turned his attention to the art of trade. He has developed a strong relationship with the Sogdian traders along the Volga River to the Caspian Sea, exchanging ivory, furs, and honey for glass and silver coins.

## DISCOVER MORE

*Vikings: Beyond the Legend* is open until Sunday, August 13. A special ticket is required for admission. Find out more @ dmns.org/vikings.



## THE NATURE OF BIOMIMICRY

Explore biology-inspired engineering in *Nature's Amazing Machines*.

BY GARTH SPELLMAN, PhD




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**“Name the greatest of all inventors: Accident.”—Mark Twain’s Notebook**

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It may seem obvious that airplane design was inspired by bird wings, but how about a surgical glue inspired by a worm? For centuries humans have looked to biology to solve complex problems because life on Earth has been the most productive and enduring biological study, reaching back at least 3.77 billion years, or 151 million human generations! This has been plenty of time for nature to experiment and capitalize on the “accidents” that have allowed life to diversify and thrive in nearly every environment on our planet.

Scientists have already described about 1.5 million species and estimate there may be upward of 10 million. Each species is an exquisite natural invention forged by two powerful tools: time and accidents, or mutations, which are small changes that occur in an organism’s DNA when it copies its DNA to reproduce. These mutations can be detrimental, neutral, or advantageous to the organism’s offspring. If detrimental, nature weeds them out. If neutral, nature may not see them. If advantageous, nature selects in favor of them. This natural selection process is the cornerstone of the evolution of life on Earth.

When humans first turned to biology to solve complex problems, they borrowed solely from what was easily observed. For example, dome-shaped features—such as shells, carapaces, and eggs—have evolved across the tree of life because these shapes offer incredible strength as they distribute force uniformly across their surface. Humans have mimicked dome shapes for centuries, in helmets and architectural designs.

Bird wings have also long been the inspiration for advances in aeronautics, extending back to when Leonardo DaVinci closely studied and sketched birds and bats hoping to unlock the secrets to flying. Early aeronautic engineers quickly realized that we lacked the technology to construct flexible flappable wings for powered flight. However, upon closer study, they recognized that the physics of bird flight relied on different wing shapes to produce lift with or without flapping. This is epitomized in ultralight glider wings that mimic the long thin wings of albatrosses or frigate birds that stay aloft without the need to flap.



Today, biology-inspired engineering—known as biomimicry—is very sophisticated. Modern advances in a wide variety of sciences and technologies are moving this field into a golden age. New species with fascinating adaptations are being discovered at a rapid pace, and new adaptations in known species are enhancing our ability to understand how their function might contribute to invention. Some examples:

- Biodegradable surgical glue inspired by the sandcastle worm, which uses a glue-like substance to construct its home, is in clinical trials, with the potential to transform surgical procedures and speed recovery.
- Bullet trains with noses designed to mimic kingfisher beaks reduce noise pollution in Japan.
- Clothes inspired by bird feathers and beetle shells are colored with materials that produce beautiful hues by bending and refracting light, which may eliminate the need to use toxic dyes and transform the global textile industry.
- Materials with microscopic textures, inspired by desert beetles that draw water vapor out of air and channel it into droplets, may soon coat structures in desert cities to quench our thirst in an increasingly arid world.
- Special collars mimicking the structure and function of woodpecker tongues and designed to prevent concussions may soon be standard equipment for football players.
- Computer models of adaptive biological systems, from organisms to whole ecosystems, are helping to design and create more sustainable and smart cities.

Engineers often turn to museum collections for inspiration during product design. Scientific study of a series of specimens from the same species or an array of closely related species can reveal how certain

adaptations evolved. Since natural selection acts only on mistakes, it is not a perfect process. Species that may appear to be a near perfect fit for their environment are upon closer inspection actually full of imperfections. Biomimicry engineers keep these limitations in mind as they examine specimens and experiment with designs because they would prefer to avoid these imperfections in their products.

Biomimicry is a wonderful example of how humans have benefitted greatly from biodiversity, but we may be borrowing from biology on borrowed time. We have transformed the planet like no other species in the history of life, and scientific studies show species going extinct at a rate faster than ever. In fact, biologists estimate we stand to lose half of the planet's current species within a single human generation. With 8 million species still to be discovered, imagine how many could be the inspiration for solving some of the greatest challenges still ahead of us.

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## DISCOVER MORE

Dr. Garth Spellman is curator of ornithology. Learn more about his research @ [dmns.org/science/museum-scientists](https://dmns.org/science/museum-scientists).

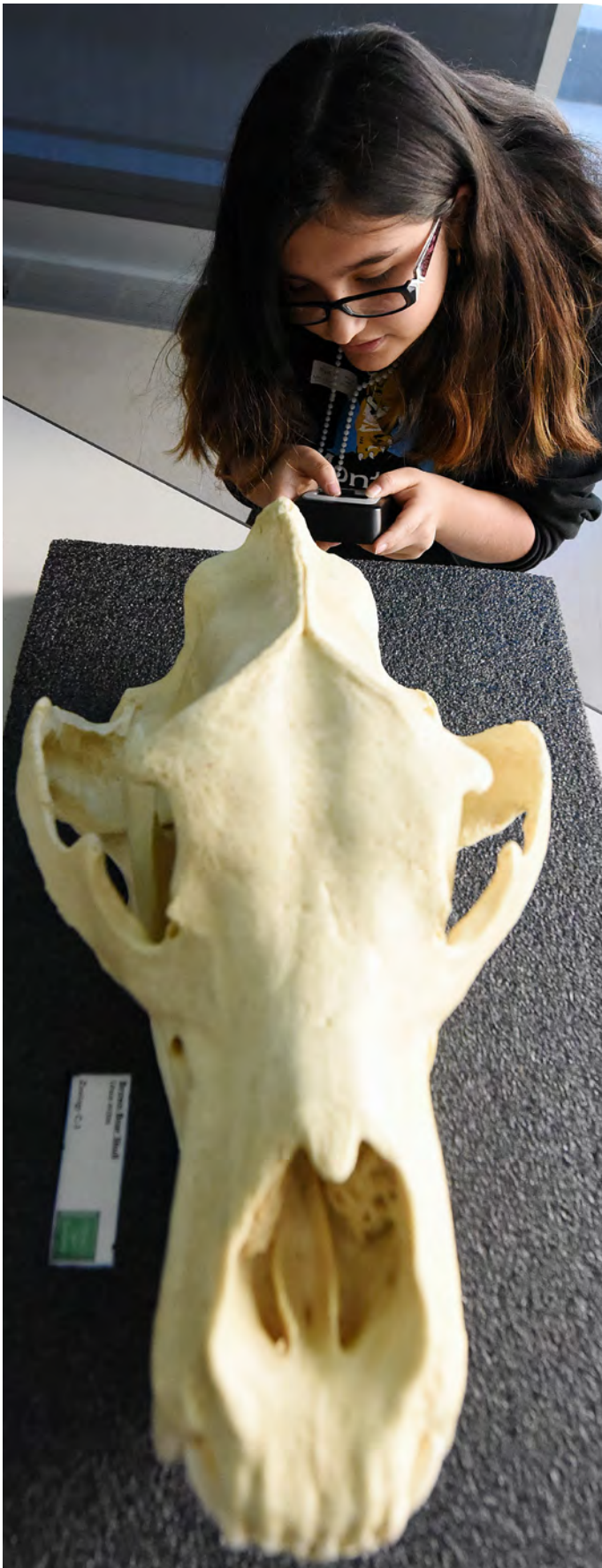
See examples of biomimicry in *Nature's Amazing Machines*, opening on June 16. Learn more on p. 4.

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From the zoology collections, facing page, from left: long-horned beetles (*Plinthocoelium suaveolens*, ZE.15402, Texas, and *Rosalia batesi*, ZE.15403, Japan) and a lilac-breasted roller (*Coracias caudatus*, ZB.36380, Botswana) demonstrate structural coloration that has inspired new textiles. Below: This white-throated kingfisher (*Halcyon smyrnensis*, ZB.6759) from China shows the similarity between the bird's bill shape and bullet trains.







## PLAN NOW FOR AN ENDURING FUTURE

Since its founding, vital community and individual support has allowed the Museum to grow into a thriving institution. By planning now for the future, you have the opportunity to ensure that the Museum's mission endures for generations to come. There are many options for creating a planned gift that will meet your needs while supporting the Museum. Find downloadable brochures and a free Estate Planning Kit to help you get started or evaluate your current plan @ [dmns.planmylegacy.org](https://dmns.planmylegacy.org).

**FUEL  
YOUR MUSEUM**

Support the artifacts, exhibits, and experiences you love by donating your car, boat, motorcycle, truck, or RV to the Museum! Donating is quick and easy, and provides you with a charitable tax deduction. Find out more or schedule a pickup at [dmns.org/give/vehicle-donation](https://dmns.org/give/vehicle-donation) or 866.697.0697.

## SCIENCE ON TAP

Become a Young Professional member today so you don't miss out on Science on Tap on Thursday, October 5, at Mile High Spirits. Vertebrate zoologist Dr. John Demboski and ornithologist Dr. Garth Spellman are developing a fun program about animal intoxication, details to come. There will also be a special cocktail to highlight the event. Mingle with fellow Young Professionals and maybe even learn something!

The Young Professionals are metro-area leaders who not only support the Museum's mission but also receive a full year of benefits designed specifically for them. Join today to gain access to Science on Tap as well as the many benefits available to all Museum members. Find out more @ [dmns.org/YP](https://dmns.org/YP).



## GET THE ULTIMATE MUSEUM EXPERIENCE

We invite you to upgrade your membership today and join the Giving Club at \$300 or above. You will receive invitations to customized events and other exclusive benefits!

- IMAX Family Night, Wednesday, July 19: Go to the movies, IMAX style with complimentary snacks.

- Behind-the-Scenes Night, Thursday, October 12: An evening planned just for you and your family as you meet Museum scientists, explore treasures not on public display, and enjoy fun snacks and cash bar.

- Free IMAX and Planetarium tickets: Members of the Giving Club receive free tickets to these venues. You may use the tickets for yourself or share them with friends and family.

- Anytime tickets: All Giving Club members receive free anytime tickets to all surcharged exhibitions—including *Vikings: Beyond the Legend*, open through Sunday, August 13—guaranteeing quick and easy access to temporary exhibitions.

- One free add-on member, perfect for a nanny or grandparent. A \$50 value!

- Free general admission to the Fort Collins Museum of Discovery, in addition to 330 science centers and museums around the country.

It is easier and more affordable than ever to become a Giving Club member with monthly installments of as little as \$25 per month! Find out more about levels and benefits @ [dmns.org/givingclub](http://dmns.org/givingclub).

## THANK YOU FOR YOUR SUPPORT IN 2016

Members helped make 2016 another memorable year! Please take a moment to read our 2016 Annual Report at [dmns.org/annualreport](http://dmns.org/annualreport). Our commitment to igniting a passion for nature and science in all Coloradans wouldn't be possible without you.



NEARLY **1,900,000** PEOPLE TOTAL

ONSITE: **1.47 MILLION PEOPLE** + OFFSITE: **116,000** IN EDUCATIONAL PROGRAMS + **300,000** AT DINOSAUR GULCH  
 ↳ 1/3 OF GUESTS SERVED FREE!

**300,000** PARTICIPANTS } **90%** FREE OR REDUCED COST  
 IN SCHOOL GROUPS/ORGANIZED YOUTH GROUPS

**56,300** RECEIVED BUS FUEL FUNDS

**9,500** teachers participated in PROFESSIONAL DEVELOPMENT

**\$5 MILLION** IN REVENUE  
**65,600** MEMBER HOUSEHOLDS

**1,756** VOLUNTEERS = **238,000** HRS

**2,595** ROCKETS launched in Rocket Works

**4,860** AT CAMP-INS

**37** RESEARCH FIELD EXCURSIONS OVER 315 DAYS

**1 MILLION** CITIZENS VOTED

**31** SCIENTIFIC PUBLICATIONS  
 196,000 NEW OBJECTS IN THE COLLECTIONS

**SCFD** Scientific & Cultural Foundation of Discovery  
 CITIZENS MAKING IT POSSIBLE

**Yes!** FOR **SCFD**

**104,865** GUESTS CAME TO SCFD COMMUNITY FREE DAYS!

## DID YOU KNOW?

Your employer may be one of 10,000 companies that match employee donations to nonprofits such as the Museum. Find out if your employer will match your membership purchase, donation, or volunteer time @ [dmns.org/matchinggifts](http://dmns.org/matchinggifts).



## THE MYSTERY OF MAGIC MOUNTAIN

BY MICHELE KOONS, PhD

Picture a scene from CE 900 near what we know as Golden, Colorado: The autumn leaves are just beginning to change. You emerge from the pit house into the crisp morning. The sun rising over the plains electrifies the sandstone hogback and foothills to your west and glistens off the dewy golden grass. Smoke fills the air from the burning hearths, and the smell of campfire and meat stew tickles your nose. Yesterday was a good day; the guys brought two elk into camp for the upcoming months of cold weather. Today you will prepare the hides and butcher the meat. You walk over to the nearby spring-fed stream to splash water on your face and take a drink. In the distance you hear the last of elk bugles of season, almost in a cry of desperation. Winter is coming.

In 2017 this location is known as Magic Mountain, located near a popular trailhead and nicknamed for the theme park that later became Heritage Square. It is also one of the most important archaeological sites along Colorado's Front Range. The earliest artifacts unearthed so far date back to 5000 BCE, when the site would have served as camping grounds for mobile hunter-gatherer groups passing through the region. It is quite possible that even earlier artifacts dating to the Paleoindian period are deeply buried at the site. Later remains, such as ceramics and stone structures, indicate that through time it became a semipermanent residence that was inhabited until about CE 1000.

Portions of Magic Mountain were excavated twice in the past; first in the late 1950s by Denver native Cynthia Irwin-Williams, then a PhD student at Harvard University, and second in the 1990s by the Cultural Resource Management firm Centennial Archaeology, Inc. The Museum houses the artifacts from the latter excavation, such as stone tools, bones, and grinding stones for processing food, including the point pictured here (Late Archaic Period, 1000 BCE–700 CE, AN-2001-133.2865, actual size about 5 cm).

Although Magic Mountain is very important to Colorado's past, no popular literature exists and it is not well-known to the local population. The Museum intends to change this by reviving investigations using a community-based effort. The goal is to tell the human-environmental history over the last 7,000 years, if not more. This new research will make Colorado archaeology more accessible to the public and foster a better appreciation of what life was like long ago along the Front Range.

Since the excavation in the 1990s, there have been huge advances in archaeological technology. In August 2016, we began the first phase of work. This consisted of UAV photogrammetry to create 3D topographic maps and geophysical surveys, using ground-penetrating radar (GPR) and magnetometry, to understand what is underground. Magnetometry detects subtle changes in the magnetic properties of the soil. Areas that were burned or disturbed in the past will have different properties from the surrounding matrix. Ground-penetrating radar is a technique that uses electromagnetic energy to map features and structures below the surface in three dimensions. Both of these techniques are noninvasive and ideal for scoping and understanding large areas in a short amount of time. The results of these surveys indicate that there are likely many cultural features still intact at this site, including two potential pit houses.

In June, a Museum team will return to the site to excavate these areas of interest. We are not yet sure what we will find, but we are excited about expanding our knowledge about the important cultural heritage and history right in our own beloved backyard.



### DISCOVER MORE

Dr. Michele Koons is curator of archaeology. Find out more about her research @ [dmns.org/science/museum-scientists](https://dmns.org/science/museum-scientists). Enjoy a tour of the Magic Mountain site! Find out more @ [dmns.org/magicmountain](https://dmns.org/magicmountain).

## GET THE MOST FROM YOUR MEMBERSHIP

- Visit anytime for free 364 days a year!
- Read the monthly eNews with members-only news, tips, and special offers. Not receiving eNews or advance notifications? Send your email address to [members@dmns.org](mailto:members@dmns.org).
- Keep your membership current with Auto-Renew, an easy automatic renewal process. Enroll @ 303.370.6306 (daily, 9–5) and get a free gift. Your expiration date is printed on the mail label on the back of this magazine.
- Add another adult to your membership for just \$50. This is a great option for nannies and grandparents, and the add-on member enjoys many benefits! Not valid on Individual level memberships.
- Upgrade to the Family Plus level or higher and enjoy free admission at the Fort Collins Museum of Discovery.

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## MEMBERS APPRECIATION DAY Sunday, August 13

Enjoy these special discounts just for you!

- 20% off on select items\* in the Museum Shop
- 20% off in the T-Rex Cafe and Grab & Go
- 10% off gift memberships
- 50% off IMAX and Planetarium tickets

\*Extra 10% discount does not apply to DVDs, CDs, and books. Special offers are valid in person only and must be used on August 13, 2017, and are not redeemable over the phone or online.



## PACK YOUR MEMBERSHIP CARD

Visit 360 science centers and museums using your free admission through the ASTC Passport Program. Free admission begins outside a 90-mile radius of Denver and your residence. Find out more @ [astc.org/passport](http://astc.org/passport).

## MUSEUM GIFT CARDS ARE NOW AVAILABLE

Gift cards make great gifts because the recipients can choose their own adventure! The cards may be redeemed for admission tickets, programs and lectures, memberships, and in the shops operated by the Museum. The cards are available in amounts from \$25 to \$250, and they never expire. You may purchase a gift card onsite at the Members Lane, online at [dmns.org](http://dmns.org), or by phone at 303.370.6000.

## WE'RE HERE FOR YOU

- 303.370.6306 (daily, 9–5)
- [members@dmns.org](mailto:members@dmns.org)
- [www.dmns.org/members](http://www.dmns.org/members)
- Members Lane at Ticketing

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## THANK YOU FOR YOUR SUPPORT!

Your membership helps us provide outstanding science education programs, exhibitions, and research.





## **MEMBERS-ONLY OPEN HOUSE**

WEDNESDAY, JULY 26 • 6–9 P.M.

You are invited to an exclusive Open House just for members during an evening for the whole family!

- Explore your favorite exhibits throughout the Museum. The IMAX Theater, *Vikings*, and *Nature's Amazing Machines* will be closed so you can particularly enjoy the Museum's own unique exhibitions, programs, and collections.
- Play in the *Discovery Zone* (especially for families with young children).
- Admire the skies through telescopes (weather permitting).
- See Museum treasures behind the scenes in the Avenir Collections Center.
- Learn something new from space scientists and educators.
- Enjoy the best view in Denver from the Anschutz Family Sky Terrace.
- Experience the wonders of the cosmos in Gates Planetarium.
- Meet Mr. Bones, the dinosaur puppeteer.

A pre-purchased dinner is available, with reservations due by Wednesday, July 12.  
\$13 adult, senior, junior member; \$8 child member  
Enjoy dinner anytime between 6 and 8 p.m. Menu at [dmns.org/memberevents](https://dmns.org/memberevents).



This evening is free for all members, and advance reservations are required.  
RSVP at 303.370.6306 (daily, 9–5) or [dmns.org/memberevents](https://dmns.org/memberevents).  
Event entry will be every 15 minutes beginning at 6 p.m. through 7:45 p.m.  
The event ends at 9 p.m.

# DISCOVER

ADULTS | CHILDREN | FAMILIES | TEENS

SUMMER 2017







EVERY 3RD THURSDAY  
*The* SCIENCE  
Lounge



## JUNE 15: SPACE ODDITY

The Greeks and Romans were no strangers to adult encounters. Go “stargazing” in Gates Planetarium as you delve into the myths behind constellations. Explore sex and gender in the ancient world and end the night by viewing celestial bodies through telescopes on our Anschutz Family Sky Terrace. Presented in partnership with the GLBT Community Center of Colorado as part of Denver PrideFest Week.

## JULY 20: YOUR MACHINE INSIDE

Work it! Solve engineering challenges with insight from living machines in the temporary exhibition *Nature's Amazing Machines*. You'll experience the ingenuity of the natural world that humans have mimed and mimicked to create solutions for everyday problems. Invent your own machines based on the mechanics of animals with a drink in hand.

## AUGUST 17: TOTAL ECLIPSE

The moon will be throwing some serious shade on Earth, so let's prepare for a total eclipse of the heart, or sun. Find out what causes an eclipse and get the lowdown on safely viewing the big event (which will happen Monday, August 21). View the sun with solar telescopes, then explore orbits in *Space Odyssey* while sipping a dark cocktail from the bar.

MEDIA SPONSORS

BUY TICKETS AT [DMNS.ORG/SCIENCELOUNGE](http://DMNS.ORG/SCIENCELOUNGE)  
\$13 MUSEUM MEMBER, \$15 NONMEMBER

5280  
MAGAZINE

Westword

# SUMMER 2017

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## EXHIBITIONS

### Vikings: Beyond the Legend

Open through August 13 • Phipps Gallery • special ticket required  
Fresh insights revealed through new archaeological discoveries and more than 500 treasures show why the Vikings will always capture our imagination.

### Nature's Amazing Machines

June 16–January 1 • Anschutz Gallery • free for members  
Real objects, scientific models, and fun activities show you the marvels of natural engineering. Discover how a giraffe's heart pumps blood to its brain, how a toucan stays cool in the jungle, and how it might feel to fly.

### Ultimate Dinosaurs

October 6–January 15 • Phipps Gallery • free for members  
Meet *T. rex*'s biggest, baddest, newest members of the family! This experience goes beyond familiar dinosaurs to showcase some of the most spectacular fossils unearthed in recent years.

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## PHIPPS IMAX 3D THEATER

*Dream Big 3D: The Science of Engineering* • Now showing

*Extreme Weather 3D* • Closes June 15

*Incredible Predators 3D* • Opens June 16

*Mysteries of China 3D* • Opens June 16

*Wild Africa 3D* • Closes June 15

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## GATES PLANETARIUM • Now showing

*Black Holes: The Other Side of Infinity*

*Cosmic Journey*

*Destination Solar System*

*One World, One Sky: Big Bird's Adventure*

*Space Tours Live*

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## ADMISSION

Museum admission is free for members every day! Special ticket required for *Vikings: Beyond the Legend*.


	MUSEUM	IMAX	PLANETARIUM
Adult member	FREE	\$7	\$5
Senior member (65+)	FREE	\$6	\$4
Child/Junior member (3–18)	FREE	\$6	\$4

The Museum is open daily 9 a.m.–5 p.m., with extended hours at various times. Dates, times, prices, and schedules subject to change. Find more ways to discover @ dmns.org.

On the cover: Kenneth V. Bigwood photographing a penguin in New Zealand during one of the Museum's field expeditions to the South Pacific in the 1950s.



# JUNE

SUN	MON	TUE	WED	THU	FRI	SAT
					Viking Bash, p. 5	
<i>Discover more @ dmns.org</i>				1	2	3
<b>Summer Camps</b>						
SCFD Community Free Day 					Museum After Dark gala	
4	5	6	7	8	9	10
<b>Summer Camps</b>						
			Indigenous Film, p. 5 Incredible Predators, p. 5	Nature's Amazing Machines members preview Science Lounge, inside cover	Nature's Amazing Machines opens Two new films open in IMAX 3D	
11	12	13	14	15	16	17
<b>Summer Camps</b>						
	Summer solstice			Bird Walk, p. 8		
18	19	20	21	22	23	24
<b>Summer Camps</b>						
			60 Minutes in Space, p. 6			
25	26	27	28	29	30	

# JULY

SUN	MON	TUE	WED	THU	FRI	SAT
<i>Members events @ dmns.org/members</i>						1
					Overnight for Families, p. 11	
2	3	4	5	6	7	8
<b>Summer Camps</b>						
			Indigenous Film, p. 5  Sci Fi Film Series, p. 6	Nature's Amazing Machines for members  Bird Walk, p. 8 Insect Collecting course, p. 9		
9	10	11	12	13	14	15
<b>Summer Camps</b>						
			Sci Fi Film Series, p. 6	Science Lounge, inside cover		
16	17	18	19	20	21	22
<b>Summer Camps</b>						
23	24 Great Eclipses, p. 6	60 Minutes in Space, p. 6	Members-Only Open House  Sci Fi Film Series, p. 6	Teen Lounge, p. 11		
30	31	25	26	27	28	29



# AUGUST

SUN MON TUE WED THU FRI SAT

## Summer Camps

Sci Fi Film Series,  
p. 6

1 2 3 4 5

## Summer Camps

SCFD Community

Free Day



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*Nature's Amazing Machines* for members (21+)  
Indigenous Film,  
p. 5  
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Viking Religion and Christianity,  
p. 7

*Vikings: Beyond the Legend* closes

Members Appreciation Day

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Science Lounge, inside cover

Bird Walk,  
p. 9

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SCFD Community Free Day



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Inside Your Outside course,  
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Digital Earth,  
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# A F T E R H U R S

AT THE MUSEUM

Encounter new ideas, cutting-edge science, and captivating individuals.



## Viking Bash

Back by popular demand! Revel, imbibe, bust myths, see replica ships, and explore a Viking camp with the local Fjellborg Viking Reenactor Society, including wild steel weapon combat! Travel to distant lands and times in the temporary exhibition, *Vikings: Beyond the Legend*. Costumes are encouraged! Please register for a timed ticket to the exhibition between 7:10 and 8:30 p.m. Ticket also includes one drink and appetizers. Ages 21+ Friday, June 2 • 7 p.m. • \$38 member, \$43 nonmember

## Indigenous Film

The Museum is pleased to partner with the International Institute for Indigenous Resource Management and the Denver American Indian Commission to present Indigenous Films, a monthly series. Join us for a variety of offerings, from documentaries to feature films to youth film showcases, and participate in a discussion with members of the Denver American Indian Commission and other special guests. Film titles at [dmns.org/learn/adults](http://dmns.org/learn/adults).

Wednesdays, June 14 and July 12 in Ricketson, August 9 in Phipps Theater • 6:30 p.m. • free

## Incredible Predators

This special screening of the IMAX film *Incredible Predators 3D* looks at the world of major predators as never before, providing insight into the remarkable strategies they use to succeed. Spectacular scenic views and aerials take you into the action as you examine incredible animal behaviors and how the unique relationship between predators and prey is a fundamental building block of ecology. After the film, Chris Pague, senior conservation ecologist with The Nature Conservancy, will discuss the major predators in Colorado. Enjoy a coffee and dessert reception following the presentation. Cosponsored by The Nature Conservancy Colorado.

Wednesday, June 14 • 7 p.m. • Phipps IMAX Theater • \$12 Museum or TNC member, \$15 nonmember





## 60 Minutes in Space

Go “behind the stories” with space scientists who use the best images and animation available to help you understand new developments in space exploration. No reservations required; seating is first come, first served.

Wednesday, June 28, Tuesday, July 26, and Wednesday, August 30 • 7 p.m. • Gates Planetarium • free

## Sci Fi Film Series

A summertime favorite is back! Science fiction feeds the imagination and helps us to explore possible futures, our hopes and fears, and the unfolding of technologies. Various Museum scientists and Vincent Piturro, associate professor of film and media studies at Metropolitan State University of Denver, host screenings of famous sci fi films and lead discussions to break down the science behind these alternative possibilities. Tickets at [dmns.org/scififilmseries](http://dmns.org/scififilmseries).

Wednesdays, July 12–August 9 • 7 p.m. • \$12 Museum or DFS member, \$15 nonmember, \$8 student (per film)

July 12 • *2001: A Space Odyssey* with space scientist Steve Lee • Phipps Theater

July 19 • *The Lobster* with archaeologist Steve Nash • Ricketson Auditorium

July 26 • *The Host* (Korea, 2006) with zoologist Frank Krell • Sie Film Center

August 2 • *Arrival* with space scientist Ka Chun Yu and Andrew Pantos, associate professor of English & linguistics • Phipps Theater

August 9 • *A Scanner Darkly* with health scientist Nicole Garneau • Sie Film Center

## America's Great Eclipses: 1878 and 2017

On August 21, a total solar eclipse will cross the United States from coast to coast for the first time in 99 years. As you prepare for this rare celestial spectacle, join Boulder author David Baron to hear the story of another great American eclipse, which traversed Colorado in 1878 and lured the era's preeminent scientists to the Wild West. Among the eclipse chasers were Vassar astronomer Maria Mitchell, who assembled an all-female expedition to Denver to show what women could do in science (pictured below), and a young Thomas Edison, who shortly thereafter lit the world with his most famous invention. Baron will also provide tips on viewing this summer's eclipse, which will be easiest to see north of Colorado, where the moon's shadow will darken a narrow path across Wyoming and Nebraska. Baron is the author of *American Eclipse: A Nation's Epic Race to Catch the Shadow of the Moon and Win the Glory of the World*.

Monday, July 24 • 7 p.m. • Ricketson Auditorium • \$12 member, \$15 nonmember • book sale & signing



## Viking Religion and Christianity

Folklorist Thomas DuBois will unravel the history of Nordic religions from the Viking Age and show how these ancient beliefs incorporated local and foreign influences. DuBois examines Anglo-Saxon, Celtic, and Mediterranean traditions and has found Nordic parallels in concepts of supernatural beings, cults of the dead, beliefs in ghosts, and magical practices. These views were actively held alongside Christianity for many years and eventually incorporated into the vernacular religious practice. The Icelandic sagas are an example of this complex process incorporating both Christian and pagan details. DuBois is the Halls-Bascom professor of Scandinavian studies, folklore, and religious studies at the University of Wisconsin-Madison.



Thursday, August 10 • 7 p.m. • Phipps Theater • \$12 member, \$15 nonmember



## Wolves of Yellowstone

Uncover the complex lives of gray wolves with Museum instructor Sue Ware as your guide. Rooted in firsthand research from six years as a contributor to the Wolf Recovery Project in Yellowstone National Park, Ware will highlight the work she does with deceased wolves in order to determine the age at death, trauma, disease, and cause of death. Learn what the physical remains of these gray wolves are teaching researchers about the evolution, behavior, and success of the reintroduction of this apex predator

back into Yellowstone's modern ecosystem. Also examine how these findings benefit other wildlife studies being conducted in Yellowstone.

Wednesday, August 30 • 7 p.m. • Phipps Theater • \$8 member, \$10 nonmember

## Digital Earth: Warming Poles

With immersive satellite images, soar beyond the headlines with Ted Scambos, lead scientist for the National Snow and Ice Data Center, and Ka Chun Yu, space sciences curator, to investigate dramatic changes in sea ice, glaciers, and snow cover in Earth's remote polar regions. Journey over the Arctic and Antarctica to track sea ice melt, the breakup of ice shelves, and the acceleration of massive glaciers. The poles are a harbinger of future changes, and a critical part of our planet's weather balance. Scambos will illustrate the transformation of these areas using breathtaking imagery captured from some of Earth's most remote locations.

Thursday, August 31 • 7 p.m. • Gates Planetarium • \$8 member, \$10 nonmember





### Sea Turtle Race to Salvation

Despite having been on the planet for more than 100 million years and outliving the dinosaurs, nearly all seven sea turtle species are now on the brink of extinction. During this special screening of the film *Saving Sea Turtles*, narrated by legendary marine biologist Sylvia Earle, you will discover the courageous collaborative efforts of scientists and citizens to save the Kemp's ridley sea turtle. Tyler Lyson, curator of vertebrate paleontology and turtle evolution expert, will set the stage as you consider the turtle's ancient past, and filmmakers Jenny Ting and Michele Gomes will share behind-the-scenes stories and more insight into the efforts to protect these animals from habitat fragmentation and other related issues of endangerment caused by humans.

Wednesday, September 6 • 7 p.m. • Phipps Theater • \$12 member, \$15 nonmember

## BIRD WALKS AND TRIPS

Explore with expert bird guide Norm Lewis, Zoology Department associate.

### Stanton State Park

Visit Colorado's newest state park, featuring a variety of foothills habitats and nesting summer resident species. Sightings may include nuthatches, woodpeckers, vireos, warblers, flycatchers, red crossbills, Steller's jays, and many others. This excursion involves a considerable amount of walking on smooth trails with some elevation gain.

Thursday, June 22 • 6:30 a.m.–5 p.m. • \$27 member, \$35 nonmember

### Summit County and Bailey Nesting Area

Visit the Alfred Bailey Nesting Area in the Eagle's Nest Wilderness above Silverthorne. This area hosts a stunning variety of nesting mountain species, including MacGillivray's and Wilson's warblers, dusky and Hammond's flycatchers, warbling vireos, olive-sided flycatchers, and pine grosbeaks. After spending the morning in the foothills of the Gore Range, explore other Summit County localities for additional species, such as water birds.

Thursday, July 13 • 8 a.m.–6 p.m. • \$27 member, \$35 nonmember



### Foothills Birding

As summer begins its slow fade, the vibrancy of the foothills is on the rise! In the coniferous forest of Genesee, nesting birds have fledged their young. The trees and meadows are abuzz with broad-tailed hummingbirds. Nuthatches abound, swallows work the treetops for flying insects, and warblers and tanagers arrive from the mountains. Lair o' the Bear Park attracts waxwings, sparrow fledglings, lesser goldfinches, gnatcatchers, towhees, and more.

Thursday, August 17 • 6:30 a.m.–5 p.m. • \$27 member, \$35 nonmember

### Eastern Plains Fall Migrants

As summer draws to a close, the eastern plains of Colorado come alive with southbound migrants, including shorebirds that recently departed their Arctic nesting grounds. The mudflats host thousands of sandpipers, plovers, and dowitchers. Songbirds are in the woodlands and the prairie, Swainson's hawks form their migratory "kettles," and lark buntings and longspurs move south in large flocks.

Thursday, August 31 • 6:30 a.m.–6 p.m. • \$27 member, \$35 nonmember

### Sandhill Cranes: Bosque del Apache

Bosque del Apache Wildlife Refuge in New Mexico truly comes to life during the return of the sandhill cranes each year. With expert birder Norm Lewis, experience the spectacle of the cranes and look for snow and Ross's geese, bald eagles, roadrunners, and waterfowl that fill the area with sights and sound. This wildlife refuge is popularly known as a wintering site for sandhill cranes and snow geese, and rightfully so; by November its marshes and prairies are festooned with thousands of cranes and geese. This adventure will include many more beautiful bird sites in the state, such as Las Vegas National Wildlife Refuge, a major wintering area for waterfowl, and the Rio Grande Nature Center in Albuquerque. With a variety of exciting destinations and a long list of potential birds to sight, this will be a southwestern experience not soon forgotten!



Tuesday–Sunday, November 7–12 • double occupancy, \$1,495; single occupancy, \$1,845

Reservations and information: [www.dmns.org/travel](http://www.dmns.org/travel) or Leisure West Tours: 303.659.4858 / [lwt@leisurewesttours.com](mailto:lwt@leisurewesttours.com)

## COURSES

### Insect Collecting for the Everyday Entomologist

Bugged by how little time you spend outside inspecting insects? Dig deep into the wild world of Colorado insects with Frank Krell, curator of entomology, and Jeff Stephenson, zoology collections manager, as your seasoned guides. Venture into the field to find out bug best practices. You'll uncover how to collect, what to look for, and the art of mounting specimens.

Thursday & Tuesday, July 13 & 18 • 6:30–8:30 p.m. • Field trip: Saturday, July 15 • \$75 member, \$100 nonmember



## Inside Your Outside: Biomechanics & the Anatomy of Movement

Over time, plants and animals have evolved into utterly amazing, heart pumping, bone stretching, biomechanical machines. We live in extreme environments, in groups, or alone, but one thing we all have in common is the ability to utilize an efficient physical body. The science of biomechanics shows us how giant redwood trees pump water hundreds of feet upward to their leaves, how naked mole rats survive and move underground, how a giraffe is able to pump blood to its brain, how sloths hang upside down, and how wolves can trot for a hundred miles without fatigue. Join Museum instructor Sue Ware for a look at the tools and techniques plants and animals use to live. The last class will be taught inside *Nature's Amazing Machines*, an exclusive opportunity to receive a private tour of the temporary exhibition.

Tuesdays & Thursdays, August 29–September 14 • 6:30–9:30 p.m. • \$150 member, \$180 nonmember

## CANOE TRIPS

Paddle along scenic rivers while soaking in the sun and gaining new knowledge about geology, wildlife, astronomy, and dinosaurs.

Reservations and information: 720.283.0553 • [www.CentennialCanoe.com](http://www.CentennialCanoe.com)



## Archaeology and Western History on the Gunnison River

Let the magical waters of the Gunnison River whisk you away through the high red sandstone canyon walls of the Colorado Plateau. Museum educator Jennifer Moss Logan shares stories of those who left their mark on the local landscape, from ancient native peoples to the colorful characters whose adventures brought them westward. For both the adventurer and the historian at heart.

Friday–Sunday, July 14–16 • \$436 adult, \$406 child (6–12 years)

## Stargazing by Canoe on the Colorado River

Embark on a memorable weekend with astronomer Naomi Pequette as you revel in both earthbound scenery and the breathtaking skies above. Without the interference of city lights, learn about planets, constellations, and deep space. This is spectacular canyon country of the Colorado Plateau, including Ruby and Horsethief Canyons, where you will float past stands of shiny granite sculpted by water through the ages.

Saturday–Monday, July 22–24 • \$436 adult, \$406 child (6–12 years)

## Dinosaurs by Canoe on the Colorado River

Experience fascinating rock formations from the age of the dinosaurs, and paddle your way along the Colorado River with educator Samantha Sands as your time travel guide. Camping along the river's banks and exploring a deep box canyon will leave you in awe of the immensity of geologic time.

Saturday–Monday, July 29–31 • \$436 adult, \$406 child (6–12 years)

## Geology and Archaeology by Canoe on the Upper Gunnison River

With geologist Bob Reynolds, marvel at colorful sandstone walls hundreds of feet high and explore canyons and ancient rock art. During this five-day journey, canoe down this epic stretch of river, hike and explore the Dominguez Canyon Wilderness Area with waterfalls and petroglyphs, and camp along the river's edge.

Wednesday–Sunday, August 9–13 • \$691 adult, \$661 child (6–12 years)

## FAMILIES, TEENS, AND CHILDREN

### Discovery Zone Fun

Enjoy a special guest during your visit to the *Discovery Zone*. Check [dmns.org/dz](http://dmns.org/dz) for more information.

Third Mondays • 10 a.m.–2 p.m. • free with general admission

### Summertime Overnight for Families • Grades K–8

Spend a memorable night experiencing the magic of the Museum with your whole family! Experiment, explore, and engage in hands-on fun for everyone, then sleep among the animals in our renowned diorama wildlife halls. Includes dinner, bedtime snack, and hot breakfast.

Friday–Saturday, July 7–8 • 6 p.m.–11 a.m. • member: \$65 adult, \$55 child/junior • nonmember: \$80 adult, \$70 child/junior

### Teen Lounge

Teens take over the Museum at this totally free, unique event. Venture through Museum exhibits, get hands-on with entertaining activities, jam to live music, and win awesome giveaways. Chill with friends and eat free snacks after hours in the Museum! Check out [dmns.org](http://dmns.org) for details. Reservations required.

Thursday, July 27 • 7–10 p.m. • free



### Conquer the Skies for Families

Soar through the air with your whole family during this evening all about flight! Start with a pizza dinner and a chance to build, experiment, and explore, learning how flight works. Then head over to the Phipps IMAX Theater for a sneak peek screening of *Conquest of the Skies 3D*, which uses the very latest science and stunning special effects to uncover the 300-million-year story of flight as never before.

Thursday, September 7 • 6–8 p.m. • member: \$20 adult, \$15 child/junior • nonmember: \$25 adult, \$20 child/junior



## **RESERVATIONS AND GENERAL INFORMATION**

303.370.6000, daily, 9 a.m.–5 p.m., or [dmns.org](mailto:dmns.org)

## **MEMBERSHIP OFFICE**

303.370.6306 or [members@dmns.org](mailto:members@dmns.org)

## **RENEW YOUR MEMBERSHIP ONLINE**

[dmns.org/members](https://dmns.org/members)

## **PRINT-AT-HOME TICKETS**

Print-at-home tickets are available for exhibitions, IMAX and Planetarium shows, and lectures and programs, and there's no handling fee! When you arrive at the Museum, proceed directly to the ticket takers or to your program. Please always bring your membership card and photo ID when you visit the Museum. There is a \$2 handling fee per ticket for surcharged exhibitions reserved by phone.

## **E-CARD: BENEFITS AT YOUR FINGERTIPS**

The free eCard app is so much more than just a convenient way to store your member number! You'll receive instant access to your members perks and benefits. Find out more @ [dmns.org/ecard](https://dmns.org/ecard).

## **E-COMMUNICATIONS**

Receive a monthly newsletter with updates and special offers as well as advance notices and other insider information when you share your e-mail address with us at [members@dmns.org](mailto:members@dmns.org).

## **CONFIRMATION**

For After Hours programs, classes, field trips, and programs for families and teens, you will receive a reminder e-mail with directions for entering the Museum.

## **REFUND POLICY**

Sales are final on all tickets unless the Museum cancels the event.

Published by the Denver Museum of Nature & Science © 2017

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## **USE YOUR MEMBERSHIP OFTEN! WE'RE OPEN 364 DAYS A YEAR!**

# THE VIKING SHOP

LEVEL 3



MEMBERS SAVE 10% EVERYDAY



T-REX  
CAFE

SALAD BAR, GRILL, KIDS MEALS – LEVEL 1  
11 a.m.–2 p.m.

GRAB & GO SANDWICHES, SNACKS – LEVEL 1  
COFFEE LAB – LEVEL 3  
9 a.m.–5 p.m.

Proudly serving locally sourced Colorado products.

