INSIDE: Ingenuity Takes Flight on Mars
ARTS&SCIENCES

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ON THE COVER

NASA’s Perseverance Mars rover took a selfie with the Ingenuity helicopter, seen here about 13 feet (3.9 meters) from the rover in this image taken April 6, 2021, the 46th Martian day, or sol, of the mission by the WATSON (Wide Angle Topographic Sensor for Operations and eNgineering) camera on the SHERLOC (Scanning Habitable Environments with Raman and Luminescence for Organics and Chemicals) instrument, located at the end of the rover’s long robotic arm. Credit: NASA/JPL-Caltech/MSSS
What a gift it is to be moving into the summer with the Museum so busy! Many of our friends and family are busy too to see the response from the community since we reopened, and in recent months having so many of our volunteers coming back to work alongside us has been a real shot in the arm – alongside the literal shots in the arm many of us have been getting!

We have been taking things slowly and safely over the last couple of months as the vaccination numbers have been rising, but the difference is already noticeable. Our wonderful Guild has held some fantastic events before taking their break for the summer, and I know the Halifax Art Festival will be just amazing this year, as will all our events after its brief hiatus in 2020. Our ever-popular Summer Learning Institute summer camps have filled up at a record pace, and we have been able to offer more in-person classes than we predicted when we first started putting that program together. And even with increased capacity for our social events now, it is proving important to sign up as quickly as possible for programs like our regular Cocktails & Creations events or our recent Succulent Social to ensure you get a seat.

The Museum will be busier than ever this fall thanks to the incredible generosity of our friends Lowell and Nancy Lohman, who recently announced their donation to Volusia County Schools that will allow every 5th and 8th grader in Volusia County to visit MOAS and enjoy a full field study day with us, including a program in the Lohman Planetarium. Long time members of the Museum may remember that for a while there was a program place that saw the Museum collaborating with Volusia County Schools to provide science enrichment programs to local students. Sadly, this program fell by the wayside in the early 2000s due to budget pressures. It is so wonderful that thanks to the foresight and philanthropy of the Lohmans, so many students will be able to come to the Museum and participate in our educational programs as we know from experience how inspirational enrichment programs outside the classroom are to a student’s progress.

Initiatives like this are a great way to help us build and improve our region and we are blessed with so many passionate volunteers, donors, and advocates that share our belief in the importance of a museum within our local community. The slow but steady rise in attendance and the demand for spaces at our programs gives me great optimism that people did not forget us during the last 12 months when everyone had much more on their minds, and what we are seeing with a rise in new memberships suggests that what we offered online during the pandemic made a new, larger audience aware of what we have to offer.

We are excited to be bringing back more and more of our in-person programs, but can promise you that many of the online and virtual programs will be here to stay thanks to your feedback letting us know how much you enjoy them. I know many people across the country would be heartbroken if the weekly Sky Tonight shows that the staff of the Lohman Planetarium have been putting on our social media pages every Monday were to suddenly disappear! But as we continue to move forward with expanding our programming and exhibits back to where they were before, please keep checking with us regularly to see what we are scheduling. There are lots of great things in the pipeline that we can not wait to share with you all soon!
Jean-Bertrand Andrieu (1761-1822) was a French engraver who came of age as an artist under Louis XVI but after the Revolution turned to designing medals and medallions when Napoleon I revived the demand for this type of commemorative art. He was entrusted with important commissions by the government and the Emperor and is responsible for commemorating many of the most important official moments for Napoleon I and the French State in bronze relief.

The Bapteme du Roi de Rome (Fig. 2) is perhaps Andrieu’s most famous medallion and it depicts the Emperor with laurel crown lifting his son Napoleon II (1811-1832) high as he about to be baptized. The baptismal font has an ewer with a fragrant myrtle branch atop it and a Bible leaning against it at its base. Napoleon I, in full Imperial dress, raises his son for all the world to see as if to proclaim that the future of the Holy Roman Empire is personified in the figure of his successor. Napoleon I is assured, through his son, that his legacy and authority will be secured (this wasn’t to be, however, as Napoleon II never succeeded his father after his death).

Further emphasizing Napoleon’s status in this medallion, is the addition of the chair of authority behind him. This chair, with prominent lion-headed griffin arms, was carefully chosen to symbolize that quite literally Napoleon I is the “seat of authority” in France during this era. Napoleon was careful to make sure he was not represented with a throne, which would have aligned him too closely with the corrupt ancien régime which preceded him. He wanted to make sure he is shown here as the ruler of the Holy Roman Empire but not a King.

Griffins are creatures of legend that are a hybrid of the body parts of a lion and eagle. Since ancient times, this mythical figure represented supreme authority as both these animals are considered the masters of their respective realms – the lion rules the land and the eagle, the skies. Since classical antiquity, griffins were known for guarding treasures and priceless possessions. The griffin-legged barrel chair behind Napoleon in the medallion appears very similar to a Neoclassical chair in the MOAS collection (Fig. 1), except that the lion head is replaced with that of an eagle. Both of the chairs have the wings of a eagle and the legs of a lion finished with paw feet. The top of the barrel back of the MOAS chair and the top of the armrests are adorned with the Fasces, a Roman symbol of the power of unity represented by a bound bundle of stalks.

Our MOAS Swan armchair (Fig. 3) is similar to a chair attributed to Charles Percier (1764-1838) and Pierre François Léonard Fontaine (1762-1853). These two were the most influential figures in the field of Empire architecture, decoration, and furnishings. They were the official architects to the court of Napoleon and designed many of the most famous monuments in Paris, including the Arc de Triomphe

The top of the barrel back of the MOAS collection is another barrel-back chair with golden swans for the arms. The swan was a symbol that became popular during the Napoleonic era as Napoleon’s first wife, Josephine, adopted it as a symbol of elegance and fidelity. Instead of a laurel wreath, the back of this chair and the top of the armrests are adorned with the swans, a Roman symbol of the power of unity represented by a bound bundle of stalks.

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The pair to this griffin-legged chair in the MOAS collection is another barrel-back chair with golden swans for the arms. The swan was a symbol that became popular during the Napoleonic era as Napoleon’s first wife, Josephine, adopted it as a symbol of elegance and fidelity. Instead of a laurel wreath, the back of this chair and the top of the armrests are adorned with the Fasces, a Roman symbol of the power of unity represented by a bound bundle of stalks.

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de l’Étoile. In addition, they were responsible for the renovation of the various royal residences and they designed whole interiors for Napoleon I and Josephine, including everything from furniture and wall treatments to drapes and small decorative arts. Highly-detailed sketches remain showing their attention to every detail in these interiors and their complete devotion to the Neoclassical style.

For the manufacture of their designs, Percier and Fontaine most often turned to the firm of Jacob Frères which was a duo of the brothers Georges II (1768-1803) and Francois-Honore Jacob (1770-1841). The Jacob brothers originally gained prominence producing luxury furnishings under Louis XVI but, after the Revolution, they became some of the leading manufacturers of the Neoclassical furnishings desired by Napoleon, Josephine, and their circles. This Percier and Fontaine swan chair [Fig. 4] was created for Josephine’s boudoir at the Châteaux de Malmaison and is one of the most famous collaborations between the two firms.

Through his favorite Neoclassical artists, designers, and manufacturers such as Andrieu, Percier and Fontaine, and Jacob Frères, Napoleon I was able to complete a thorough saturation of imagery reflecting his authority as the Holy Roman Emperor throughout France and beyond. His stamp of approval for every detail related to the symbols, color scheme, chair type, design, and upholstery fabric was necessary before any of the elegant furnishings were created for his many residences. He was conscious of his own “brand” before there was this contemporary term for it. It is for this reason that the chair in Bertrand Andrieu’s medallion is important historically. If not actually specified by Napoleon himself for depiction in this very significant medallion, this chair was certainly approved by the Emperor as part of the symbolism meant to proclaim Napoleon’s legacy through the birth and baptism of his son. So, by extension, we can safely say that, if the chair in Andrieu’s medallion was preferred by Napoleon, then our similar chairs in the MOAS collection dated 1815 were as well. And if they were not present in his actual residences, they were at least present in those of the many privileged families in Napoleon’s circle and those who wished to be. Therefore, a label of “Circle of” Charles Percier and Pierre François Fontaine, designers, and manufacture by Jacob Frères (attributed to) is appropriate. This represents a new attribution for these fine Neoclassical chairs in the MOAS collection and a new understanding of their place within the world of Napoleon I.
This summer, check out our new exhibit skulls: From Ancient Beasts to Modern Giants, running from August 7, 2021 through October 31, 2021. All vertebrate animals have skulls, and the Museum has a nice collection of fossilized skulls from the last ice age, the Mesozoic Era, and currently living animals. Skulls can tell us a great deal of anatomical information, such as how an animal chewed its food, the type of vision the animal had, and whether it was a mammal or reptile. This biology exhibit will showcase the morphology of mammal and reptile skulls. Visitors can learn how to read a skull by some basic observation.

Are you predator or prey? Skulls can tell us the role animals play in an ecosystem. The key is the location of the eye sockets. Prey animals, like antelope, tend to have eyes placed on opposite sides of their heads. This provides a wide field of view close to 360 degrees. This allows them to survey a large swath of the landscape as they graze to detect any possible threats that might be moving towards them. In contrast, carnivores, like lions, have eye sockets placed in the front of the skull facing forward. This limits the field of view but what each eye sees overlaps with the other. Although this seems redundant, it allows the animal to have excellent depth perception with highly defined visual details. The predator brain more accurately perceives depth and distance which gives the carnivore a huge advantage when pursuing prey at a breakneck speed.

Teeth, jaws, and other skull features provide another visual clue about an animal's diet and how it captured its meals. Most carnivores have long dagger-like teeth in the front, usually called canines, that help capture, hold, and puncture the flesh of their prey. They have top and bottom premolars that are adapted to function like scissors that slice the meat and muscle they consume. Animals like alligators and other reptiles have rows of teeth of varying sizes throughout their jaw which allows them to grasp their prey, but they have a difficult time disassembling their food. These animals tend to gulp their food down in large chunks with no chewing. Crocodiles, alligators, and Tyrannosaurus Rex are excellent examples of these animals.

Block-like teeth can be seen in the skulls of herbivores. These teeth have a high crown above the gum line and are called "hypsodont" teeth. Herbivores primarily chew grasses which is a relatively new adaptation in the fossil record. Because grasses tend to have a low nutrient value and are abrasive, they lead to extreme wear on the teeth. Evolution's remedy for this is to have the herbivore teeth continuously grow throughout the animal's life. The modern and ice age horse is an excellent example of this as well as most elephant species living or extinct. At some point, the tooth wears down below the gum line and the animal can no longer feed and it dies. The visual clue in the skull of plant eaters is that they usually have very flat teeth.

Animals known as browsers evolved teeth to better process heavier plant material like leaves, bark, and twigs. Although it seems this material should be tougher, the vegetation is far above the ground. It does not contain the abrasive silica that grazers deal with. In the skull, you can identify these browsing teeth (molars) with high rounded cusps or crescent shaped teeth. The extinct mastodon molar is an excellent example of this. Browsers have different types of hypsodont tooth levels such as deer, antelope, camel, and llamas which differ from rhinoceros, humans, pigs, and other animals. One interesting observation is...
to look for the wear patterns on the teeth. If they are very worn, it is usually an older adult animal.

Omnivores like most bears, humans, opossums, and skunks have a more complex dental makeup of teeth. These animals tend to have a full complement of canines, incisors, premolars, and molars. It is hard to determine whether an animal is an omnivore based on a single tooth. Finding a complete or almost complete set of teeth gives a much better indication of the animal's diet. Omnivores are able to eat a greater range of food which allows the animal to live in a larger variety of environments. Observing the teeth of a skull and looking for sharp canines or a set of flat grinding teeth can tell a great deal about the diet and age of an animal.

Another interesting feature to look for is the openings on each side of the skull. These openings, called fenestrae, are where the jaw muscles attach to the skull and enable the jaw to open and close. This is important for chewing. A skull with one opening or fenestra on each side of the skull is a mammal skull or synapsid animal. Remarkably, animals with this type of skull date back as far as the Permian Age, over 300 million years ago, long before the time of dinosaurs. A reptile skull has two holes or fenestra on each side of the skull which is called a diapsid animal. Only turtles have no holes or fenestra on each side of the skull. They are called anapsid animals. These animals are very ancient indeed and date back to a time before dinosaurs. Most animals that have fenestra or openings in the skull can be found behind the eye sockets, but some have openings in front of the eye sockets as well. These are usually carnivorous reptiles. There are always exceptions found in the fossil record and in evolution in regard to teeth, fenestra, and eye socket placement.

This August come to the Museum to see an unusual exhibit of skulls and discover our amazing natural world. Learn how the skulls of vertebrate animals have adapted and how they eat. This exhibit will showcase skulls like a velociraptor, sperm whale, saber tooth cat, cave bear, manatee, and more. Seeing all these skulls together will make your jaw drop!
Weddings
at the MUSEUM OF ARTS & SCIENCES

Your dream wedding awaits with your dream venue. The Museum of Arts & Sciences and the Ciel and Hyatt Brown Museum of Art in Daytona Beach feature a variety of truly unique settings for a wedding ceremony. Our venues offer a modern-day twist to the prestige of an artistic aesthetic while embracing the beauty of an endless color palette to play with.

From rustic elegance to contemporary sophistication and classic traditions to refined intimacy, the Museum of Arts & Sciences’ stunning ceremony and reception locations offer you the wedding day backdrop that you have always wanted.

Book your walk-through today!
Please contact rentals@moas.org to schedule your tour today!

Yoga in the Gallery
at the Ciel and Hyatt Brown Museum of Art
Every Wednesday, 7:30-8:30pm

Take a break from your week and explore the world of yoga at the Museum!
Join registered yoga instructor Ashley Brooks of Holistic Movements in our new monthly yoga series held every Wednesday at the Ciel and Hyatt Brown Museum of Art. This hour-long session will provide an opportunity to practice a series of gentle yoga poses. Class is open to all levels.
Materials Needed: Mat, Towel, Water
Price: $3 for members, $4 for future members
Space is limited.
Please RSVP to 386-255-9085

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Daytona Beach Symphony Society
Celebrating 70 Years 1952-2022

2021-2022 SEASON
Season Subscriptions available.
Single Tickets on sale September 1.

JACKSONVILLE SYMPHONY
“Messiah”
FRIDAY, DECEMBER 17, 2021

POLAND PHILHARMONIC ORCHESTRA
Agata Szymczewska, violin
SATURDAY, JANUARY 15, 2022

TENORS & DIVAS
Teatro Lirico D’Europa
SATURDAY, JANUARY 29, 2022

RIGOLETTO
Teatro Lirico D’Europa
FRIDAY, FEBRUARY 4, 2022

RUSSIAN NATIONAL ORCHESTRA
Alexander Malofeev, piano
FRIDAY, FEBRUARY 11, 2022

SIBERIAN VIRTUOSI
State Ensemble of the Republic of Sakha
SUNDAY, MARCH 27, 2022

386.253.2901 OR VISIT DBSS.ORG
SKULLS FROM ANCIENT BEASTS TO MODERN GIANTS
OPEN AUGUST 7, 2021 THROUGH NOVEMBER 3, 2021
FORD GALLERY
All vertebrate animals have skulls, and the Muscogee (Creek) have a collection of fossilized skulls from the last ice age, the Mesoic Era, and the living and recent past. But what does a skull tell us? This exhibit will showcase the morphology of mammal and reptile skulls. Visitors can learn how to read a skull by some basic observation. Discover such as ice age cave bear, velociraptor, saber tooth cat, extinct American lion, manatee, coyote, primates, and more. Image Credit: North American Beaver (Castor Canadensis)

THE LATEST NEWS FROM FLORIDA: WOOD ENGRAVINGS FROM 19TH CENTURY TO MODERN TIMES
Willing the Florida Keys, 1935
A. WORLEY BROWN & FAMILY GALLERY
Wood engravings from 19th century through journals, documenting events in the remote land of Florida - a state that few northerners knew much about only a short time ago. Painted by James F. Hutchinson; Seminole Man, 1992

FLORIDA WEATHER: FRANCE FAMILY GALLERY
Experience a view of Florida weather from satellite images captured by the polar orbiting satellites of the polar orbiting satellites of the POES ( NOAA-11) system. It's a daily weather forecast,...
**Museum Notice:** Please note that any of these events are subject to change or cancellation. Please check the event calendar at MOAS.org for the latest updates on these upcoming events.

**Ongoing Events**

**Wednesday, Yoga in the Gallery**
Wednesday, 5:30pm-7:00pm
Join a break from your busy day and enjoy weekly yoga in the Gallery at the Cox and Hyatt Brown Museum of Art. Meet in the lobby to join registered yoga instructor, Ashley Blake of Holistic Movements, for an hour-long session that will provide you with an opportunity to practice a series of gentle yoga poses. Class is open to all levels, please bring a mat, towel, and water. Space is limited and registration is required. RSVP to the Museum at 386-255-0285. $5.00 for members, $10.00 for future members.

**July**

**Tuesday, 7:00pm**
**VIRTUAL:** Florida Vistas Books Club: Florida's Soldiers in the Sunny State by Robert D. Billinger, Jr.
Join us for next Florida history book club meeting virtually on Zoom where we will be discussing Hitler's Soldiers in the Sunny State. In this book, Billinger takes the reader on a journey through World War II, Florida and the conflict was taking place in Spain’s Florida. The book offers a unique perspective of the contributions of Florida’s soldiers and shares the experiences of those who served.
Free for members or with paid museum admission.

**Thursday, July 8, 11:00am-12:00pm**
**VIRTUAL LECTURE:** Members-Only Coffee with a Curator | Tuscawilla Nature Preserve
Join us at the Museum of Arts & Sciences for a quarterly wine tasting series with S.R. E. J. Watson on the wild Florida frontier at the Tuscawilla Nature Preserve. Kelsey will tour you through the Preserve and discuss the importance of the Tuscawilla Nature Preserve, as well as the many animals and plants that can be found. Register online at MOAS.org or by calling the Museum at 386-255-0285 ext. 315.
Free for MOAS members. Must be a MOAS member to attend.

**Saturday, July 10, 7:00pm-9:00pm**
**Saturday Second Laser Rock Concert**
7:00pm: Laser Vinyl
8:00pm Pink Floyd – The Wall
9:00pm Pink Floyd – The Dark Side of the Moon
*Subject to change. Tickets are $9.00 for three shows. Seating for these concerts is very limited to allow for proper social distancing. Advanced purchase of tickets is recommended by calling the Museum at 386-255-0285.

**Sunday, July 11, 2:00pm**
**Lecture:** Eyes in the Sky: The World of Aerial Drones by ERAU graduate student of Aerospace Engineering, Eduardo Morillo E. J. Watson on the wild Florida frontier at the Tuscawilla Nature Preserve. Kelsey will tour you through the Preserve and discuss the importance of the Tuscawilla Nature Preserve, as well as the many animals and plants that can be found. Register online at MOAS.org or by calling the Museum at 386-255-0285 ext. 315.
Free for members or with paid museum admission.

**August**

**Thursday, August 12, 10:00am**
**Virtual Lecture:** Ask our Curator of Astronomy to Modern Giants
Join MOAS Curator of Astronomy, Seth Mayo, digitally on Zoom for this audience guided show that can take you anywhere in the universe that you would like to go. Come with your questions, curiosities, and interests, as we navigate freely through this universe.
Lecture is $5.00 plus the price of paid lunch for future members.

**Saturday, August 28, 10:00am**
**MOAS Brunch Social:** Meters & Mimosas
Join us in the Root Family Museum Train Station for a brunch social featuring various brunch cuisines and a create your own mimosa bar, catered by Ambers Jewels. Following brunch, create your own mimosa to take with you on a journey in our “Lohman Planetarium Spacecraft” MOAS Curator of Astronomy, Seth Mayo, will virtually fly you through the universe. The trip will take a curious journey through diverse destinations within our solar system, the colorful nebula many light years away, and all the way to the furthest reaches of outer space. Admission includes brunch, two complimentary mimosas and admission to the Museum for the rest of the afternoon to enjoy the galleries. Seating is limited and admission must be purchased in advance. Event attendees must be 21 or older. Register by calling the Museum at 386-255-0285. No refunds after August 24.
$25.00 for members, $30.00 for future members.
Florida boasts mysterious tales that stretch back more than twelve thousand years. Dive into the lives of the proud Wahulla, Pocahontas and the Ghost of Bellamy Bridge. Most local laubraekers like John Ashley, as well as transplants like Ma Barker and Al Capone, stalk stumpy gators or Hogzilla as they prowl as transplants like Ma Barker and Al Capone. Join us for our next Florida history book club Florida Vistas Book Club: Florida Lore.

**Film Class: Filming with Digital Devices**

1:00pm-3:00pm

**Second Saturday Laser Rock Concert**

7:00pm Laser Spirit
8:00pm Laser Queen
9:00pm Laser Zeppelin
5:00 for one show, $7.00 for two shows, and $9.00 for three shows. Seating for these concerts is very limited to allow for proper social distancing. Advanced purchase of tickets is recommended by calling the Museum at 386-255-0285.

Monday, September 27

5:00pm-7:00pm

**MOAS After Hours**

Join us at the Museum of Arts & Sciences for exclusive after-hour access to all galleries, happy hour drink specials, and live jazz music by the Cody McCafferty Quartet, a group of young local musicians who are passionate to keep the jazz spirit alive in upcoming generations. Guests can also enjoy a special talk and tour with MOAS Curator of Astronomy, Seth Mayo, of the new exhibit, Dare Mighty Things: Exploring Mars with Perseverance. Explore the high resolution imagery that was captured by the Perseverance rover since its Mars landing on February 18, 2021. Seth will explain why the rover was sent to a dried-up river delta in the Jezero Crater on Mars, the science behind the mission’s search for ancient microbial life, the technology demonstration flights of its Ingenuity Helicopter drone, and how this research is preparing the way for future human exploration. Free for members, $5.00 for future members.

Sunday, September 19

10:00am-12:00pm

**Smithsonian Magazine Museum Day**

Enjoy free Museum admission when you present a Museum Day ticket! Visit Smithsonianmag.com/museumday for details and to download your ticket. Tickets will be available to download beginning at midnight on Wednesday, August 18, 2021. Ticket does not include planetarium admission. Free with Museum Day ticket.

Saturday, September 18

2:00pm-3:00pm

**Talk and Walk | Skulls: From Ancient Beasts to Modern Day Giants**

Join MOAS Senior Curator of Education and History, Zach Zacharias at the Cici and Hyatt Brown Museum of Art for a walkthrough of the exhibition, Skulls: From Ancient Beasts to Modern Day Giants. This exhibit features skulls from crocodiles, extinct Florida rhino, ice age cave bears, various primates, and more. Free for members with paid museum admission.

Saturday, September 18

11:00am-12:00pm

**Lunch and Learn Local Flavor**

Join Senior Curator of Education and History, Zach Zacharias at the Cici and Hyatt Brown Museum of Art and learn about the paintings of Volusia County. Many famous artist made their way to the Volusia County area to paint the many landmarks, vistas, and people who make up the history of our county. Call the Museum at 386-255-0285 to RSVP and place your lunch order. Lecture is free plus the price of paid lunch for members. Lecture is $5.00 plus the price of paid lunch for future members.

Saturday, September 18

10:00am-5:00pm

**Florida Today at MOAS**

Free for members, $5.00 for future members.

Saturday, September 18

11:00am-12:00pm

**VIRTUAL LECTURE: Members-Only Coffee with a Curator | American Empire**

Grab your coffee and join Chief Curator/Gary Libby of the Museum at 386-255-0285 to RSVP and place your lunch order. Space is limited and advanced registration is required by calling the Museum at 386-255-0285.

Saturday, September 18

6:00pm-9:00pm

**Hollywood Nights**

9:00pm Laser Queen
8:00pm Laser Spirit
7:00pm-9:45pm

Saturday, September 11

2:00pm-3:00pm

**Back by popular demand! Join award-winning filmmaker, Gary Libby at the Museum of Arts & Sciences to learn how to maximize video shoot capabilities on various devices such as smart phones, tablets, and iPads. Topics covered include shot composition, the best kinds of lighting, and what to do with the footage once it has been shot. Space is limited and advanced registration is required by calling the Museum at 386-255-0285. $15.00 for members, $20.00 for future members.

Saturday, September 11

7:00pm-9:45pm

**Second Saturday Rock Concert**

7:00pm Laser Spirit
8:00pm Laser Queen
9:00pm Laser Zeppelin
5:00 for one show, $7.00 for two shows, and $9.00 for three shows. Seating for these concerts is very limited to allow for proper social distancing. Advanced purchase of tickets is recommended by calling the Museum at 386-255-0285.

Saturday, September 11

6:00pm-9:00pm

**Florida Today at MOAS**

Free for members, $5.00 for future members.

Saturday, September 11

2:00pm-3:00pm

**VIRTUAL Florida Vistas Book Club: Florida Lore.**

by Caren Schnur

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**Florida Today at MOAS**

Free for members, $5.00 for future members.

Saturday, September 11

2:00pm-3:00pm

**VIRTUAL Florida Vistas Book Club: Florida Lore.**

by Caren Schnur

Florida boasts mysterious tales that stretch back more than twelve thousand years. Dive into the lives of the proud Wahulla, Pocahontas and the Ghost of Bellamy Bridge. Most local laubraekers like John Ashley, as well as transplants like Ma Barker and Al Capone, stalk stumpy gators or Hogzilla as they prowl as transplants like Ma Barker and Al Capone. Join us for our next Florida history book club Florida Vistas Book Club: Florida Lore.

**Film Class: Filming with Digital Devices**

1:00pm-3:00pm

**Second Saturday Laser Rock Concert**

7:00pm Laser Spirit
8:00pm Laser Queen
9:00pm Laser Zeppelin
5:00 for one show, $7.00 for two shows, and $9.00 for three shows. Seating for these concerts is very limited to allow for proper social distancing. Advanced purchase of tickets is recommended by calling the Museum at 386-255-0285.

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As we move into the summer months we are looking forward to restful days ahead. We will enjoy this time off as the fall months feature our largest fundraisers!

If you did not attend our High Society Garden Party Luncheon in April, you missed a beautiful occasion to meet members of the Guild and make new friends. A special thank you to LC Tobey who hosted this event along with her outstanding committee of Sandy Buckley, Sue Kim, Kathy Wilson, Sherry Erbe, Zayna Gibson, and Karrie Houlton.

This fall is shaping up to be an exciting time for the Guild. Starting in September, our meetings will be held at the Cici and Hyatt Brown Museum of Art at 10:00 am on the second Tuesday of the month. Our meetings will continue to include social time, guest speakers, and announcements to keep you up to date on all of our activities. On Tuesday, September 14th our guest speaker will be businesswoman and philanthropist Nancy Lohman, who will be sharing her new book “Blossom: Cultivating More Joy and Success in Life and Business.” Come and meet this very special woman who is a great supporter of our museum. September is also our membership month when we will be collecting dues of $40 for your 2022 membership. Please plan to join our terrific team.

See you in September!
Diane Rogers | President
To honor the legacy of the first powered flight on Earth, a small piece of cloth from the Wright Flyer is attached to Ingenuity, underneath the solar panel. “This fabric is from the original aircraft that flew at Kitty Hawk,” said Bob Balaram, chief engineer and designer of NASA’s Ingenuity helicopter. “With all our high tech materials and carbon fiber skins and exotic metals, we’re very proud to honor that experimental aircraft from long ago by carrying a small piece of its fabric.” The patch of material from the Wright brothers’ first airplane was donated by the Carillon Historical Park, in Dayton, Ohio - home to the Wright Brothers National Museum. One could only guess at the exhilaration the Wright Brothers would feel if they knew their Flyer had a role in the first ever powered flights on Earth and Mars, a mere 118 years apart.

While Ingenuity does have a Chief Pilot, nobody actually operates the helicopter in real time like drone pilots using remote controls on Earth. Live control requires constant feedback of information and the ability to quickly adapt to the situation. Operating an aircraft on Mars is a very different story. Because of the great distance between Earth and Mars, varying between a minimum of 34 million miles and a maximum of 249 million miles, there is an inherent lag time for any communication. Even though radio signals transmitted through NASA’s Deep Space Network travel at the speed of light, the fastest possible speed, they are still limited to a finite velocity. The shortest travel time for a radio signal from Earth to Mars is about 5 minutes; the longest is about 20 minutes. That’s for one way travel. Imagine trying to have a conversation in which you have to wait 10 to 40 minutes for an answer. Now imagine trying to remotely fly a helicopter in those conditions. It’s simply impossible. Instead, preprogrammed instructions are sent to Ingenuity.

Before each of Ingenuity’s test flights, the JPL team uploads instructions that describe precisely what the flight should look like. When it comes time to fly, the helicopter is on its own and relies on a set of flight control algorithms that were developed on Earth before Ingenuity was even launched to Mars. To develop those algorithms, they performed detailed modeling and computer simulations in order to understand how a helicopter would behave in a Martian atmosphere.
In the ancient past, the atmosphere may have been relatively thick with hydrogen, oxygen and carbon dioxide. There would have been enough water to cover the planet with an ocean 75 feet deep. Today, the atmosphere of Mars is dry and very thin: less than 1% the density of Earth’s air.

This is equivalent to flying 87,000 feet above the surface of Earth, an altitude not yet reached by helicopters. This poses quite a challenge for powered flight then.

To fly, any aircraft must move air from one side of itself to the other. This “pulls” the aircraft through the medium. In a thick atmosphere, this is easy. The rotor blades have lots of available air molecules to displace and therefore propel the aircraft. In a thin atmosphere, with few available air molecules, the aircraft must then displace the air much faster to achieve the same result. Ingenuity must spin its rotor blades at 2,400 rpm (revolutions per minute), about five times what is needed to stay aloft on Earth.

Ingenuity uses a solar panel to capture and transfer energy to its six lithium-ion batteries, which can store enough to illuminate a 35-40 watt light bulb for one hour. This is not much electricity. Flight duration is not constrained by the wattage available, though, but rather the large quantity of heat generated during flight. The motor for those high speed helicopter blades could overheat if it runs for more than a few minutes at a time.

As a proof of concept for flight on another world, Ingenuity’s team scheduled five technology demonstration phase attempts. Here are the flight statistics so far:

<table>
<thead>
<tr>
<th>FLIGHT</th>
<th>DATE</th>
<th>DURATION (SECONDS)</th>
<th>PEAK ALTITUDE</th>
<th>TOTAL DISTANCE</th>
<th>FLIGHT ROUTE</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4/19/21</td>
<td>39.1</td>
<td>9.8 FT</td>
<td>0</td>
<td>Vertical takeoff, hover, land</td>
<td>Success</td>
</tr>
<tr>
<td>2</td>
<td>4/22/21</td>
<td>51.9</td>
<td>16 FT</td>
<td>14 FT</td>
<td>Vertical takeoff, hover, shift, Westward, hover, return, land</td>
<td>Success</td>
</tr>
<tr>
<td>3</td>
<td>4/25/21</td>
<td>80</td>
<td>16 FT</td>
<td>328 FT</td>
<td>Vertical takeoff, hover, shift, Northward at 6.6 ft/s, hover, return, land</td>
<td>Success</td>
</tr>
<tr>
<td>4</td>
<td>4/30/21</td>
<td>117</td>
<td>16 FT</td>
<td>873 FT</td>
<td>Vertical takeoff, hover, shift, Southward at 11.5 ft/s, hover, land</td>
<td>Success</td>
</tr>
<tr>
<td>5</td>
<td>5/7/21</td>
<td>108</td>
<td>33 FT</td>
<td>423 FT</td>
<td>Vertical takeoff, hover, shift, Southward at 11.5 ft/s, hover, land</td>
<td>Success</td>
</tr>
</tbody>
</table>

With the first five flights triumphantly completed from Wright Brothers Field, Ingenuity has finished the demonstration phase. “The Ingenuity technology demonstration has been a resounding success,” said Thomas Zurbuchen, associate administrator for NASA’s Science Mission Directorate. “Since ingenuity remains in excellent health, we plan to use it to benefit future aerial platforms while prioritizing and moving forward with the Perseverance rover team’s near-term science goals.”

Having proven that powered, controlled flight is possible on the Red Planet, the Ingenuity experiment will transition to a new operations demonstration phase, exploring how aerial scouting and other functions could benefit future exploration of Mars and other worlds. Increasingly bold operation demonstration phase flights are scheduled for every two to three weeks through the end of August, 2021, pushing Ingenuity to its limits.

Leveraging the now proven rotorcraft systems and technologies from Ingenuity, NASA plans to launch the Dragonfly spacecraft in 2027. Following nine years of orbital travel to reach the outer parts of the solar system, Dragonfly will land in the Shangri-La dune fields of Saturn’s largest moon, Titan, in 2036. There, it will study the carbon-rich chemistry and abundant water, similar to the conditions found on a prehistoric Earth, to better understand the origins of life on our planet.

While Dragonfly will surely be an exciting future mission, Ingenuity will continue to provide astonishing sights and extraordinary feats on an alien world in the near term, with the JPL team giving it more and more daring flight instructions. In a few months, with its full mission completed, perhaps Ingenuity can fly off into the mild blue yonder of the Martian sunset.