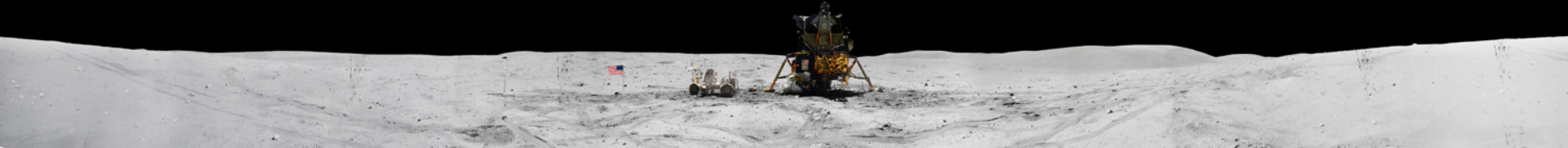


# Honoring the Carolinas Space Heritage

Presented by Michael P. O'Hara

Updated June 2020



# Preserving a Rich Heritage

The Carolinas Aviation Museum, NASCAR Hall of Fame, Charlotte Museum of History, New Museum of the South, and the Mint Museum all sought to preserve the rich heritage of our region.

There is another untold story, another legacy in which the Carolinas played a prominent role –

## Space Exploration

# The Charlotte Airport is the Perfect Venue to Tell the Story of the Carolinas and Space

- The story of the Carolinas connection to the history of human spaceflight is an untold and unrecognized story.
- Space Exploration inspires youth and captivates those that lived through the space age.
- Space exploration has universal appeal that crosses a diverse population from across the country and the world.
- We need to recognize the contributions of Carolinians to the space program.
- As the Charlotte Airport terminal undergoes major improvements, a space exhibit could be a major centerpiece of the redesigned terminal entrance.

# The Untold Story




# The Carolina's Made a Key Contribution to Space Exploration

- One Moonwalker - Charles Duke, Jr. (NC/SC).
- Two NASA Administrators – James Webb (NC), The first African-American NASA Administrator, Charles Bolden (SC).
- Two Astronauts lost aboard Challenger during the accident- Michael Smith (NC), Ron McNair (SC).
- Fifteen Astronauts representing all areas of both states (9 from NC), (5 from SC).
- In February of 2020, North Carolinian Christina Koch broke the record for the longest time in space by a woman.
- The Morehead Planetarium at UNC Chapel Hill was used to train astronauts on celestial navigation from 1959-1975. Nearly every Mercury, Gemini, Apollo, Skylab, and Apollo-Soyuz astronaut received training at that facility.

# The Carolinas and Space Exploration



A photograph of astronaut Charles Duke, Jr. walking on the moon. He is wearing a white spacesuit and is using a long, thin probe to touch down on the lunar surface. In the background, the lunar rover is visible on the horizon. The sky is dark, and the sun is visible as a bright, circular object. The ground is covered in lunar dust and rocks.

Charlotte-born astronaut Charles Duke, Jr.  
walks on the moon.

April 22, 1972



Charlotte-born astronaut Charles Duke, Jr. places a family photo on the moon. On the back of the photo are the words:



"This is the family of astronaut Charlie Duke from planet Earth who landed on the moon on April 20, 1972."

Charlie Duke, Apollo 16

# Charles Duke, Jr. – Carolinian on the Moon

Charlie Duke, born in Charlotte, North Carolina and raised in Lancaster, South Carolina, was the 10<sup>th</sup> human to set foot on the moon. Duke was the Lunar Module Pilot on Apollo 16.

Duke was selected by NASA in April 1966. He served as CAPCOM for Apollo 11, the first landing on the Moon, and as the backup lunar module pilot on the ill-fated Apollo 13 flight before taking his historic steps in the Descartes region of the rugged lunar highlands.

Duke later served as the backup Lunar Module Pilot on the Apollo 17 mission.



Charlie Duke spent 71 hours and 14 minutes on the lunar surface of which 20 hours and 15 minutes were spent walking on its surface

# James Webb - The Man Who Ran the Moon

James E. Webb was NASA's second Administrator and the man called to answer the challenge of President Kennedy to put a man on the moon and return him safely to the Earth before the end of the decade. At the time of the challenge, the U.S. has a total time in space of just 15 minutes and had yet to put a human in orbit.

Webb was born in Tally Ho, North Carolina. He graduated from the University of North Carolina and led NASA from 1961 to 1968.





# Charles Bolden – Astronaut and Administrator That Led NASA Through Transition

Charles Bolden was born in Columbia, South Carolina. He flew on four Space Shuttle missions and served as Commander on two of those missions. He became NASA's twelfth Administrator and led the transition from the Space Shuttle to the commercial transport of astronauts as well as charting NASA's future in deep space exploration.



# Service and Sacrifice – Challenger

Two Carolinians along with five of their crew members were lost when the Space Shuttle Challenger exploded 73 seconds after launch on January 28, 1986.



Michael J. Smith  
Pilot  
Beaufort, North Carolina



Ronald E. McNair  
Mission Specialist  
Lake City, South Carolina  
Graduated from NC A&T





# Carolina Women in Space

Since Russian Cosmonaut Valentina Tereshkova became the first woman in space 55 women, 49 of those Americans flew into space. Three of those women hailed from the Carolinas including the first woman to serve as a member of the International Space Station.



Susan Helms  
First Woman Expedition  
Member of the ISS  
STS-54, STS-64, STS-78,  
STS-101, STS-102/105  
Born in Charlotte, NC



Catherine Coleman  
Member of the Expedition 26  
Crew  
STS-73, STS-93  
Born in Charleston, SC



Ellen Baker  
STS-34, STS-50, STS-71  
Born in Fayetteville, NC



Christina Koch  
Expedition 59, 60 and  
upcoming Expedition 61  
Born in Michigan, raised in  
Jacksonville, North Carolina.

# The Charlotte Area's Role in Space Exploration



Charlie Duke  
Apollo 16  
10<sup>th</sup> man to walk on the moon.  
Born in Charlotte  
Raised in Lancaster, South Carolina



Susan Helms  
STS-54, STS-64,  
STS-78, STS-101,  
STS-102/105  
First Woman  
Expedition Member  
of the ISS  
Born in Charlotte



Thomas Marshburn  
STS-127  
Born in Statesville, NC  
Graduated from Davidson College just north of Charlotte

# Vision

# Vision

Recognize the untold story that the Carolinas played in building and maintaining America's Space Program while providing access to the general public to appreciate and be inspired by the dreams of spaceflight.

# Mission

Create a key centerpiece of the new airport main terminal entrance that will awe and inspire visitors and recognize the contribution of the Carolinas to America's Space Program.

# The Space Museum

# Core Areas of Focus

- Space Race and History
  - America and the Soviet Union
- Carolinians in Space
- Moonwalking (Webb and Duke)
- Space Shuttle Era (Carolina Shuttle Astronauts / Challenger Accident)
- Next Steps in Space

# Carolínians in Space Exhibit

- Recognizing the past and present Carolínians who have participated in the space program is an important part of the exhibit.
- This area of the museum would contain photos, biographies, footage, and artifacts from each astronaut.
- Future space-bound Carolínians would automatically be added to the exhibit each year following their recognition.

# Marquis Exhibits

Every museum needs to have prominent exhibits in addition to just informative displays. The Carolina Space Museum “marquis” exhibits would target acquisition and display of the following:

1. Full Scale Replica of the Apollo 16 Lunar Module
2. Actual Rocket Booster (SpaceX or NASA)
3. Apollo 16 Moon Rock



# Key Exhibits

## Major Exhibits

- Full Scale Replica of the Apollo 16 Lunar Module
- Apollo 16 Moon Rock
- Rocket (SpaceX Booster or Shuttle Solid Rocket Booster)
- Space Shuttle External Fuel Tank
- Challenger Artifact
- Space Suit

## Minor Exhibits

- Space Shuttle Tile
- Space Shuttle Drag Chute
- Space Shuttle Tire
- Models and Displays

# By the Numbers

# Exhibits – Lunar Module

Arizona Aircraft Modelers has built an actual size replica of the Lunar Module on display at the National Naval Aviation Museum in Pensacola, Florida



# Exhibits - Purchase

Norton Sales, Inc. is technically a supplier of Aerospace and Industrial supplies, but its proximity to Hollywood makes it a popular place for prop, FX and stunt techs as well. FX artists and Aerospace professionals alike can browse the vast aisles of bins and barrels digging for that perfect pressure relief valve or elusive thrust chamber to make whatever they're working on GO. A fairly well-kept industry secret but open to the general public, Norton Sales, Inc. is essentially a "Space Junkyard", a treasure trove of lunar module program pressure regulators, bits and pieces of titanium, and countless other doodads for all of your experimental engineering needs.



Norton Sales Inc.

**N.S. Aerospace Props**  
Norton Sales, Inc.

Email: [nortonsalesm@aol.com](mailto:nortonsalesm@aol.com)

7429 Laurel Canyon Blvd.  
North Hollywood, CA 91605  
Phone: (818) 765- 1087  
Fax: (818) 765- 8969

NS AEROSPACE PROPS

ROCKETRY

PIPES & HOSES

RETRO TEST EQUIPMENT

MARINE ELECTRICAL

PANELS

GAUGES

VALVES

TANKS

AN FITTINGS (MS)

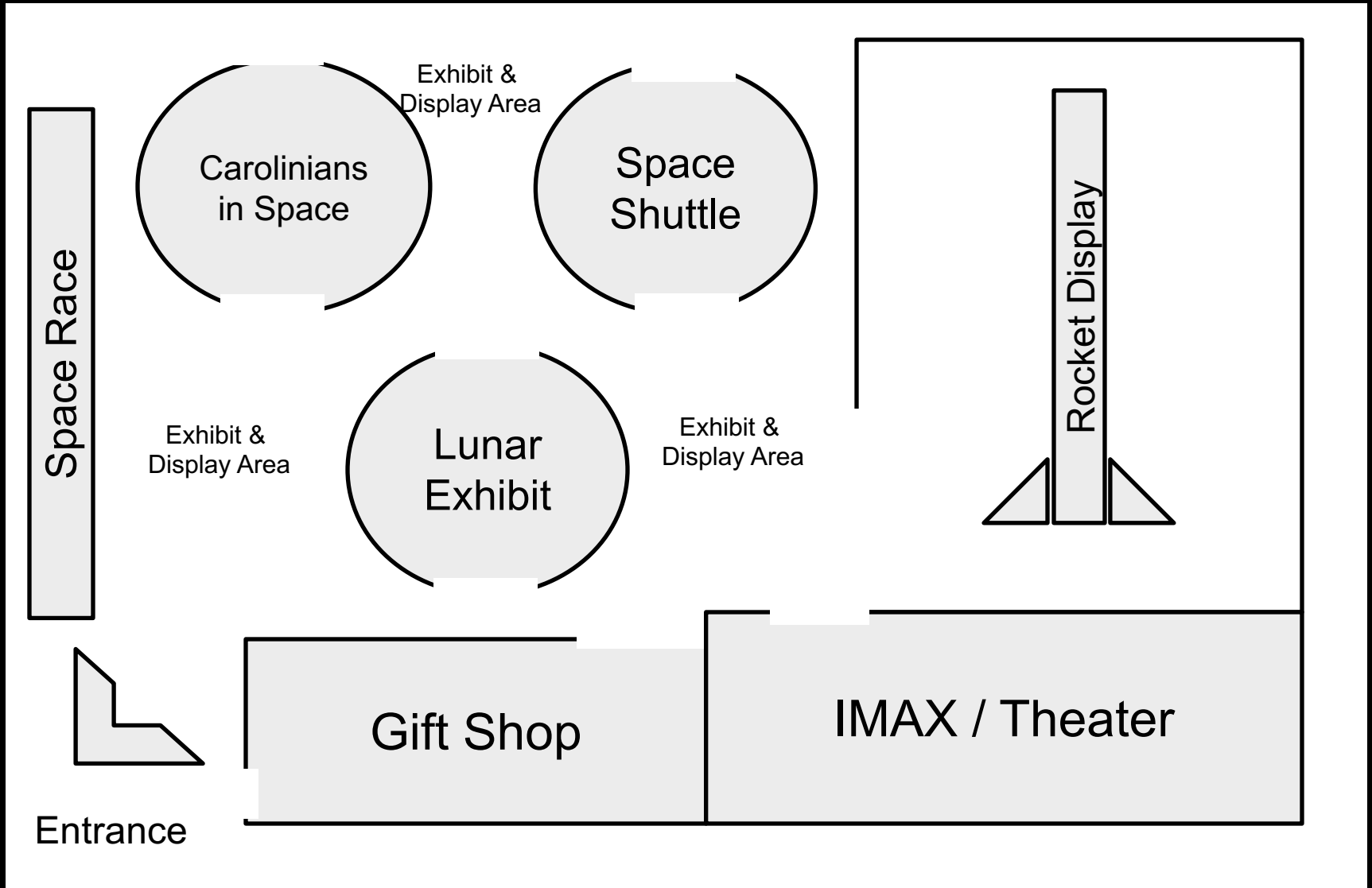
MOVIE SETS AND SHELVING

Filters



# Proposed Layout

# Proposed Layout



# Getting Started

# Small Steps - Do the homework.

- Start with a six month feasibility analysis.
  - Six Month budget for discovery work
  - Artist Renderings of the Museum
  - Meet with political leaders, NASA, and SpaceX
  - Meet with local political leaders (appetite for incentives, tax breaks)
  - Meet with Carolina born astronauts and families
  - Meet with potential exhibitors and sponsors
  - Gauge key artifact potential
  - Meet with and visit other museums and museum directors
  - Refine startup cost, revenue, and operating expense models.



# Approach and Landing

Build Support	Build Public Awareness Leverage Social Media	Outreach to Partners Do our “Homework”
Build Relationships	Business Community NASA	Astronauts Astronaut Families
Plan	Sponsors / Design Exhibits	Artifacts Logistics
Execute	Facility Acquire Exhibits	Build Exhibits and Displays Launch

# Giant Leaps (six months through completion)

- Acquire temporary display venue
- Acquire exhibits (NASA/DoD/Third Parties)
- Build Partnerships
- Architectural Work
- Construction Work
- Marketing and Media
- Plan Launch
- Launch

# Build Support Through Social Media & Political Connections

# Leveraging the Power of Social Media



The universal appeal of space exploration opens the museum to a world-wide audience by leveraging technology

# Political Support

Leverage the current political landscape in the Carolinas

- Four Republican Senators representing both Carolinas
- Republican President
- Previous NASA Administrator from South Carolina
- Current NASA Administrator is a former Republican Congressman, and Director of the Tulsa Air and Space Museum & Planetarium

# Summary

- We have a story to tell. SMI is the perfect fit to tell that story.
- Charlotte needs to continue to establish diversity and critical mass in its museum offerings to the public.
- Space exploration has universal appeal.
- We can do this cost-effectively and earn a return on investment leveraging SMI expertise.
- We have the ability to build the top attraction in the Charlotte region and the Carolinas.

**We can do this! Failure is not an option.**

# Contact Information

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www: <http://www.carolinaspace.org>



# Appendix

# Mike O'Hara Bio

- 30 year career in financial services holding key senior leadership positions in two of the nation's largest banks
- 25 year resident of the Charlotte Area
- Former Candidate for Charlotte City Council, District 4
- Father of four children, all served, or are currently serving in the United States Air Force
- Bachelor of Science Degree with Honors in Aerospace Studies
- Written extensively about the little known history of the space program
- Access to behind the scenes at NASA
- VIP Guest of NASA at several launches and landings
- Maintain a wealth of historical documentation on the early space program
- Continue to educate through social media on developments in the space program

# Examples: Full Museum Startup Costs

# Virginia Air and Space Museum

- Capital construction cost \$30 million.
- Developed through the joint efforts of the City of Hampton and NASA Langley Research Center.
- Initially funded through a combination of city funds, state grants and private philanthropy.
- Current operations funded primarily through earned revenue, with additional support from NASA Langley Research Center and private philanthropy

Opened: April 5, 1992

Size: 110,000 square feet; nine stories high on 2.2 acres

Organization: A non-profit 501-C-3 corporation governed by a Board of Directors