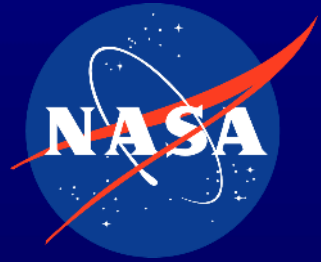


National Aeronautics and
Space Administration



Exploring the Moon:

Preserving the Legacy Through Spacesuit Knowledge Capture and Strategic Communication

Cinda Chullen: NASA/EC5 · Timothy Hall: NASA/AD · Vladenka Oliva: Jacobs/X14 ·
Gordon Andrews: Jacobs/EA13 · Diana Rodgers: Jacobs/EC511 · Jessica Krenzel:
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Overview



- SKC and Strategic Communications Team
- 17 Years of SKC Evolution
- Embedded Approach
- Program Accomplishments
- Challenges
- New Initiatives: Knowledge Centralization
- New Initiatives: Collaboration and Knowledge Sharing
- New Initiatives: Examples of Future Initiatives
- Focus: Fiscal Year 2024
- Conclusion
- Acknowledgements

SKC and Strategic Communication Team



Cinda Chullen Manager

Vladenka Oliva Administrator

Zoe Nuhfer Administrative Specialist

Gordon Andrews Producer

Diana Rodgers Multimedia Coordinator

Jessica Krenzel Multimedia Editor

Robert Ibanez Multimedia Developer

By preserving the knowledge and legacy of the gloves, spacesuits, tools, and rovers that make space exploration possible, the SKC and Strat Comm team will support humanity's giant leap to the Moon and beyond.

17 Years of SKC Evolution



Formation
of the SKC
Program

Foundations of
Knowledge Capture

Focus on
xEMU

Archiving
videos
with NESC

Inheriting
legacy
knowledge

Refining the
Approach

Inventory
of suit relics

Scope
expansion
and changes

Team
growth

Support
for EHP

Support for
EC- Lessons
Learned

Major
media
productions

2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024

17 Years of SKC Evolution



Formation of the SKC Program

A grassroots effort seeking to augment the education of NASA's spacesuit community, fill knowledge gaps and secure knowledge from those retiring or anticipating retirement.

Focus on developing approach, building relationships, capturing knowledge.

2007

2008

2009

2010

2011

2012

2013

17 Years of SKC Evolution



Focus on xEMU

The SKC Program began to focus on Advanced Extravehicular Mobility Unit (AEMU) (later known as the Exploration Extravehicular Mobility Unit (xEMU)).



Inheriting Legacy Knowledge



2012

2013

2014

2015

2016

2017

2018

2019

2020

17 Years of SKC Evolution



Archiving Videos with NESC

The SKC Program began archiving videos on the NASA Engineering and Safety Center (NESC) Academy website.



www.nescacademy.nasa.gov/catalogs/spacesuit



2012

2013

2014

2015

2016

2017

2018

2019

2020

17 Years of SKC Evolution



Scope Expansion and Changes

The SKC Program scope expanded to include xEMU buildup. COVID-19 presented challenges and an opportunity for a new approach (e.g., virtual training and knowledge capture).



Inventory of Spacesuit Relics

The SKC Program began inventorying suit relics stored at JSC.



17 Years of SKC Evolution



Team Growth

Over 100 years of combined NASA experience:
technical knowledge, knowledge capture, strategic communications, multimedia production, technical editing and writing, export control



14

2015

2016

2017

2018

2019

2020

2021

2022

2023

17 Years of SKC Evolution



Support for EC

Crew and Thermal Systems Division (EC) asked SKC to begin hosting lessons learned for NASA's Safety & Health Day and Day of Remembrance.



Support for EHP

SKC began supporting its new main customer, the new Extravehicular Activity and Human Surface Mobility Program (EHP), expanded scope to capture knowledge on tools and rovers, and developed a strategic communications component.



2016

2017

2018

2019

2020

2021

2022

2023

2024

17 Years of SKC Evolution



Major Media Productions

The first *What's Behind This Door* video was released on social media, *Exploring the Moon* to be released.



Search “What’s Behind This Door? Neutral Buoyancy Lab”



Continued growth and new initiatives!

2016

2017

2018

2019

2020

2021

2022

2023

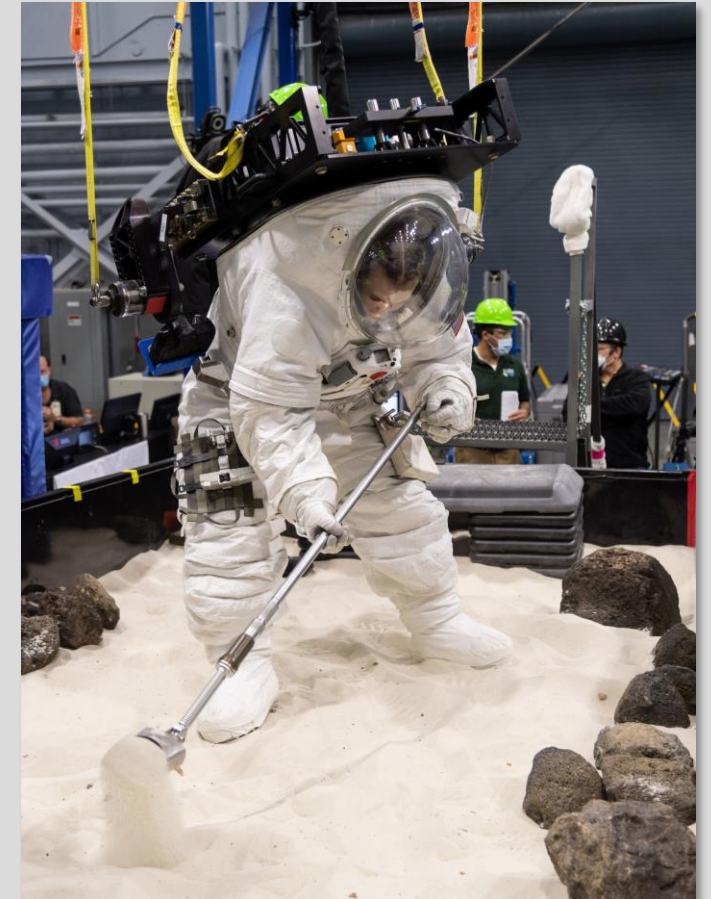
2024

Embedded Approach



- **Unique capabilities:**

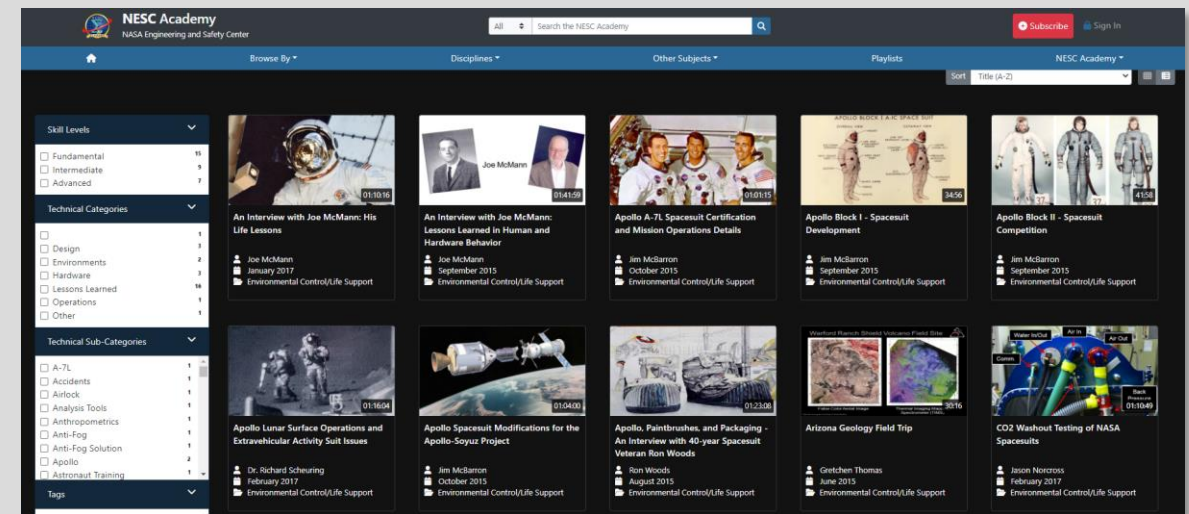
- Embedded in the technical organization, the team:
 - Facilitates knowledge transfer through SME presentations
 - Collaborates across the NASA agency to capture human surface mobility knowledge
 - Produces multimedia content for internal and external audiences
 - Captures photographs and videos of facilities, components, spacesuit systems and subsystems, human surface mobility systems, and test environments



Program Accomplishments



- **Over 260 recordings:** SME presentations, narrative vignettes, interviews, training modules, hardware buildup, and multimedia products
- **Thousands of still photographs:** 57 photoshoots in FY 2023 and FY 2024 Q1 and Q2
- **Working to share and transfer this knowledge to the widest extent possible:** Videos are available publicly or internally via the NESC Academy



Program Accomplishments (cont'd)



Product Category	Number of Products
Available- Public	74
Available- Restricted	103
<i>Includes 69 xEMU modules*</i>	
By request only	24
<i>Includes 18 Spacesuit Spotlights**</i>	
Not yet available †	48
<i>Includes 1 xEMU module*</i>	
Will not be distributed † †	12
<i>Includes 1 xEMU module*</i>	
Total Products	261
Strat Comm Photo and Video Shoots ‡	58

* xEMU modules are not planned for agency-wide release.

** Spacesuit Spotlights are planned for NASA internal use only.

† 15 products have been approved in STRIVES for public or restricted release but are not yet available on the NESC Academy website. The remaining products have not yet been submitted to STRIVES.

†† These products will not be distributed due to sensitive personal information, students present in the video, etc.

‡ This includes photo shoots and video shoots from FY 2023 and FY 2024.

Challenges



- **Maintaining a Multi-format Content Inventory**
 - Difficult to maintain an accurate inventory of available products - Content is spread across multiple platforms and storage locations
 - Products risk being lost if platforms become obsolete
- **Reaching Users and Audiences**
 - Export control review allows for expanded reach - but the process is arduous
 - Decentralized products are not easily discovered by potential users
 - Users may not realize how much knowledge is available to them

New Initiatives: Knowledge Centralization



- **Online Learning Hub**

- Enable greater access to knowledge as the primary resource for information about human surface mobility
- Create a single connection point for knowledge transfer to drive collaboration
- Complement onboarding resources and connect to internal wikis
- Serve as an example and roadmap for similar programs
- Increase SKC efficiency by streamlining workflow

Multiple Markets:

**Agency-wide Technical
Community**

Commercial Partners

Academia

Community Organizations

General Public

New Initiatives: Collaboration and Knowledge Sharing



- **Database of lessons learned from SKC video recordings**
 - 2024 ICES paper “Transitioning Sixty Years of NASA Spacesuit Knowledge Capture Lessons Learned to Searchable Knowledge Transfer Databases,” Tom Reuland, session 401
- **Collaborations with JSC’s Office of Science, Technology, Engineering and Math (STEM) Engagement (OSTEM) & Public Affairs Office (PAO)**
 - Leverage OSTEM and PAO networks to reach schools, universities, camps, and community partners
 - Provide content like *Exploring the Moon* and *What’s Behind This Door?* to OSTEM to pair with existing educational materials

New Initiatives: Examples of Future Initiatives



- **Spacesuit Knowledge Curriculum**

- A structured and targeted learning path for new hires
- Need a survey to determine how engineers are currently using knowledge capture products to support their learning

- **“Andi the Astronaut” Mascot**

- A tool for children to create their own stories about lunar exploration and see themselves as part of the Artemis team
- Intended materials may include coloring books, puzzles, and other age-appropriate activities



Focus: Fiscal Year 2024



- **Stakeholders:** EHP, NESC, EA Directorate, EC Division, and EC5 Branch
- **Knowledge Capture Events**
 - Build on successful knowledge sharing model
 - “Avoiding Plumbing Failures in Space” – 70 attendees at a 3-hour, in-person class. Requests for the recording and a second virtual course
 - Expand the availability and variety of events
 - Courses, workshops, interviews, panel discussions, vignettes
 - Spacesuits, tools, rovers, other human surface mobility topics
- **Lessons Learned Presentations**
 - Safety and Health Day, NASA Day of Remembrance
 - Provide a venue for organic and candid discussion about safety

SKC Event: Lunar Dust Mitigation



324 attendees (94% online)
8 NASA Centers, 47 NASA Divisions
+ External orgs

Focus: Fiscal Year 2024 (cont'd)



- **New Media Productions**

- ***Exploring the Moon***

- Provide high-quality educational content about human surface mobility

- ***What's Behind this Door?***

- Engage the public in a behind-the-scenes look at NASA capabilities

- **Spotlight Series** (*internal*)

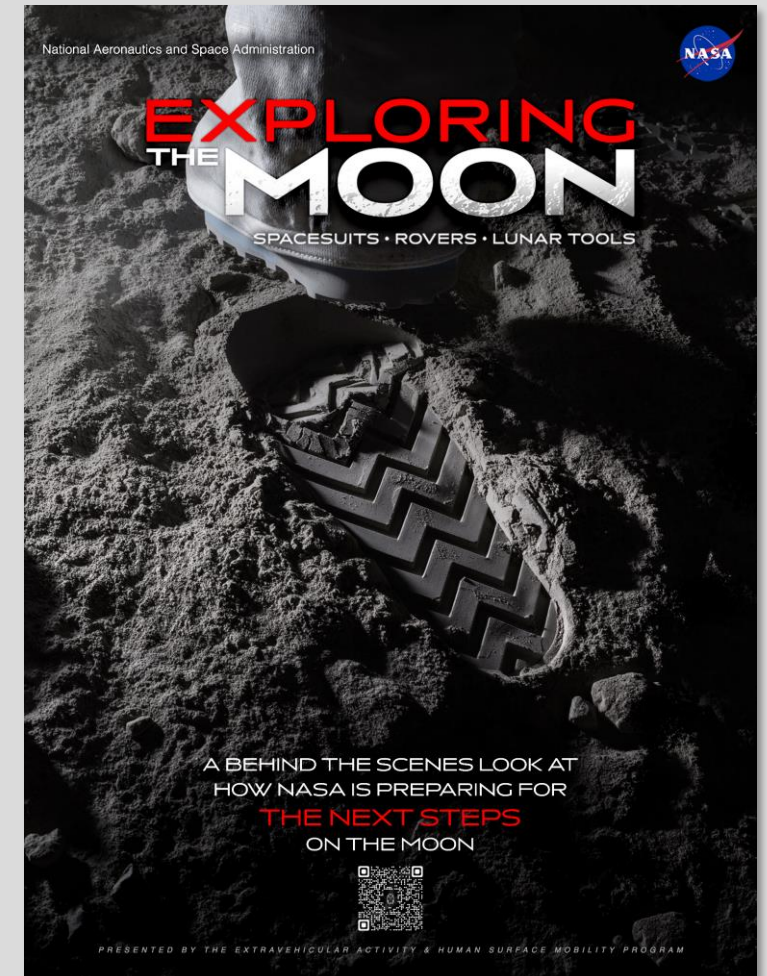
- Build an oral history and introduce SMEs to technical community

- **Summary Videos** (*internal*)

- Celebrate NASA technical community accomplishments

- **EHP 101** (*internal*)

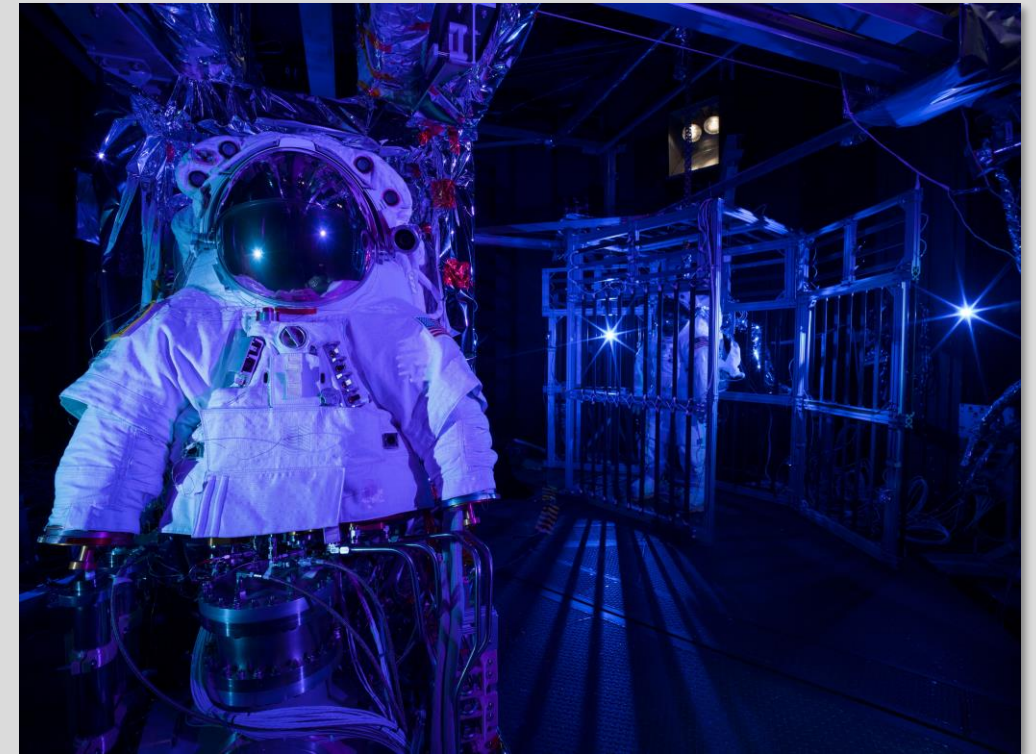
- Develop EHP identity and onboard new hires



Conclusion



- **Capture, dissemination, and use** of knowledge is important to every aspect of human spaceflight
- The **knowledge capture and transfer** approach must be **diverse, impactful, and embedded** in the technical community it serves
- The expertise, lessons learned, and experiences captured by the SKC and Strat Comm team provide a link between the pioneers of human spaceflight and the generation embarking on a new era of exploration



Acknowledgments



EVA Office, EHP (funding source)	Michael Mankin
NESC	Morgan Abney
EC	Teresa Shurtz
EC5	Kevin Wells, Jeff Loechel
Imagery Online Information Technology specialist	Maura White
Videographers	Jim Hansen, Matthew McGee, Clayton Urbanick, Jason Stember, Roman Rama
NESC Academy professionals	Daniel Hoffpauir, Alexandra Walker, & Ricardo Major
Scientific photographers	Bill Stafford, Josh Valcarcel, Robert Markowitz, Charles Clendaniel, James Blair
Coordination support	John Stoll & Mark Sowa
Audio services	Daniel Tohill, Gregory Wiseman
Graphic designers	Jeannie Corte, Logan Goodson
IT support	John Springhetti
Lessons Learned database	Tom Reuland
Export Control support	JSC Scientific and Technical Information office & STRIVES approvers
Media production collaborators	JSC Crew Office, PAO, and OSTEM
Subject-matter experts	Each presenter who has shared their time and knowledge