ANNUAL REPORT 2023

Smithsonian

DIGITIZATION PROGRAM OFFICE

FROM THE DIRECTOR

Platygonus intermedius Gidley, a fossil specimen of a Cenozoic era peccary from the National Museum of Natural History, and the first Smithsonian object to be 3D captured, processed and made available to the public in 24 hours.

Cultural heritage digitization is subject to methodologies-of-the-moment that often align as contrasts: you can be agile or methodical; experimental or strategic. The Digitization Program Office's work in 2023 highlights how mistaken such dichotomies can be. A combination of agility and strategy, and methodological and experimental work, helped our programs meet short- and long-term digitization needs across the Smithsonian.

For example, our 3D team experimented with several features – such as accessibility functions in the Voyager 3D viewer – to help visually impaired, deaf and/or hard-of-hearing users interact with Smithsonian 3D models. They also used technically challenging 3D capture projects to drive innovation in user interface and delivery of 3D models. But it was the team's long-term strategy and methodological approach to scaling up the creation, storage, and delivery of 3D models that resulted in a milestone achievement this year: the first item ever to be 3D captured, processed, and made available to the public within 24 hours (a peccary from the Cenozoic era, *Platygonus intermedius Gidley*).

Our Collections Digitization team, known for its methodical approach to mass digitization, brought its decade-long experience to bear in digitizing the Johnson Publishing Company Archive. But it also brought nimble thinking to the issues of tracking and transparency for our digitization projects (via the Osprey dashboard) and of the need for new delivery pathways that move data from Smithsonian information systems into the information ecosystem of The Getty Research Institute, our Johnson Publishing Company Archive partner.

Our Policy and Analysis team continued its annual assessment of digitization across the Smithsonian, this year adding the review of unit digitization plans to their activities. They also led a significant software upgrade project that brought added security and administrative features to the primary assessment tool (the "Collections & Digitization Reporting System" or CDRS) used by units for reporting digitization work. And responding to requests for training in areas such as data management and ChatGPT, they organized several Digital Foundations webinars around these topics.

This year's annual report highlights all these efforts and more. If you are interested in a short, visual overview of DPO's work, our newly released, three-minute video summarizes our programs and aspirations and offers a quick complement to the work detailed in this report.

As always, we owe a debt of gratitude to the colleagues in our home base in the Office of the Chief Information Officer. We also are indebted to our close partners, the National Collections Program, the Office of Digital Transformation, and the Smithsonian collecting units who work with us to digitize collections. Their expertise, insights, and collaboration are foundational to our work.

Diane Zorich
Director, Digitization Program Office, OCIO

COLLECTIONS DIGITIZATION

Collections Digitization - Highlights

Summary | Mass Digitization | Imaging Services | Informatics

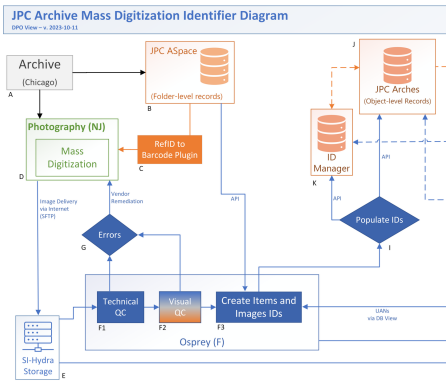
Specimens/Objects Digitized:	Images Captured:	Digitization Projects:	Active Projects:
5,459,750	4,998,329	46	7

In 2023, the Digitization Program Office's (DPO) Collections Digitization (CD) Program marked its 10th year of Smithsonian-wide digitization! From our very first pilot projects in 2013 (with Smithsonian Gardens and a nascent National Museum of African American History & Culture (NMAAHC)) the Collections Digitization Program has executed over 46 large-scale projects digitizing 5.5 million objects and specimens across 15 museums and archives.

The Mass Digitization Team continued to balance collections record digitization and transcription and object digitization. In addition to ongoing capture and transcription of over 60,000 catalog cards at the Cooper Hewitt Smithsonian Design Museum (CHSDM), we moved forward with two projects delayed by the pandemic: digitizing freshwater mussels (over 50,000 digitized to date) for the National Museum of Natural History's Invertebrate Zoology Department, and planning for the digitization of 12,800 additional marine invertebrate fossils for the museum's Paleobiology Department. The team also continued the digitization of 150,000 35 mm. slides with the Human Studies Film Archive (HSFA) in the museum's Anthropology Department. Additionally, 2023 was an important year for our work on the Johnson Publishing Company Archive project. In collaboration with our partners The Getty Trust and NMAAHC, we successfully completed the pilot project phase for this photographic archive, capturing 9,409 archival objects documenting Black American life in the 20th century. The Mass Digitization Team also shared its work with the wider cultural heritage community by hosting colleagues from The George Washington University and Stanford University and by giving presentations on our work at the Rochester Institute of Technology, The George Washington University, and the Society of Imaging Science & Technology annual Archiving conference in Oslo, Norway.

The Informatics Team streamlined the processing and tracking of all Collections Digitization projects with the creation of the Osprey dashboard. Osprey tracks our projects, identifies any issues that arise with the images or the data, and provides 100% transparency to project stakeholders. To support Osprey, we moved the processing of the digitized images to the Smithsonian's High-Performance Cluster (Hydra), which allowed us to process over 95,000 images this year without investing resources in managing additional servers. In collaboration with other SI partners, the Informatics team also explored AI tools and the ethics around their use, co-authoring a publication on this topic entitled, Developing responsible AI practices at the Smithsonian Institution. Finally, in our most complex project to date, the Informatics Team designed the universal identifiers, data links, and data paths for the digitization of the Johnson Publishing Company Archive. The team verified and processed 25,050 images for the pilot phase of the project using automated tools that delivered the images to SI's Digital Asset Management System (DAMS) and wrote identifiers to the systems of record for both the SI's and The Getty's informatics ecosystems.

Our newest team, Imaging Services, digitized approximately 25,000 new images in its inaugural year. This team provides crucial digitalization support for new and small collections to Smithsonian museums lacking photographic resources and this year supported Smithsonian Gardens, Anacostia Community Museum, and the National Postal Museum. Additionally, ongoing efforts with annual accession digitization continue with NMNH's Botany and Paleobiology departments. The Imaging Services Team also secured a prestigious year-long grant from the Smithsonian American Woman's History Museum for a dedicated contract photographer to digitize materials in support of women's history.



3D DIGITIZATION

2023 was a banner year for the Digitization Program Office's 3D Program. We surpassed 3,000 models hosted on the Smithsonian 3D viewer; expanded the team to include two new 3D technicians; and significantly increased automation throughput, accomplishing an important milestone by achieving scan-to-online 3D model publication within 24 hours. Adding two new staff members dedicated to 3D capture allowed us to scan more objects than ever in a single year.

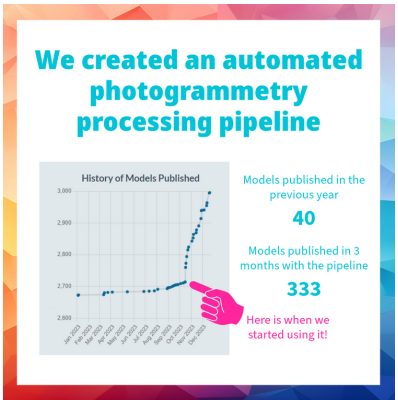
This year's numbers were driven by several projects, including two at the National Museum of Natural History (NMNH): a hands-on project with the Paleobiology team and a capacity building project with the Invertebrate Zoology department. The Paleobiology project represents the culmination of seven years of dedicated research and development of the Smithsonian 3D Pipeline. This in-house developed software suite made it possible to automate significant portions of our capture and processing pipeline, which enabled the digitization of an unprecedented 370 specimens in 32 working days. Our collaboration with the museum's Invertebrate Zoology (IZ) department also proved a notable success. In partnership with department staff, we helped create a 3D digitization studio within the department, equipped with the necessary tools and expertise to capture over 300 specimens in 2023. Using Packrat, the DPO-developed SI system of record for 3D data, the Invertebrate Zoology department seamlessly published its models online without needing labor-intensive and time-consuming scene preparation.

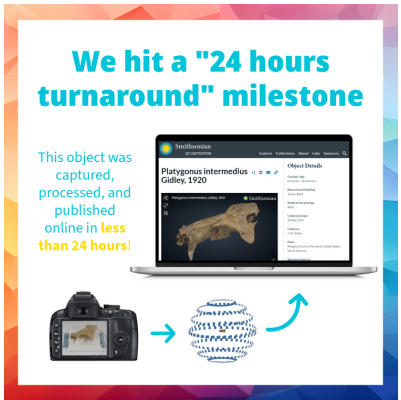
The 3D team also collaborated with Adobe Research in Paris, taking advantage of Adobe's cutting-edge AI tools to improve the visualization and material properties of the 3D model of Alan Shepard's Mercury space suit. The results of this successful collaboration were presented at SIGGRAPH 2023, a major visual effects conference.

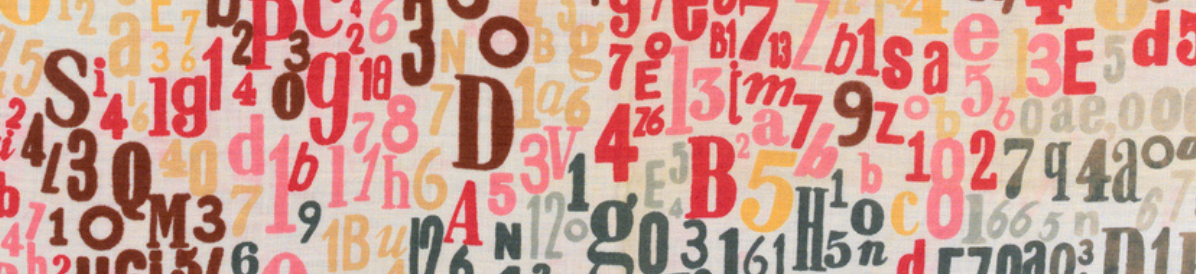
The 3D team continued to build pan-institutional technical capacity through its SI-wide 3D interest group. In one collaborative session with this group, developed in partnership with Meta, the team organized a workshop on the SparkAR platform. This powerful tool is used to create augmented reality filters tailored for Instagram, amplifying the rich repository of Smithsonian 3D content.

Additionally, the 3D team launched a collection of immersive 3D content, funded by a donation from Verizon, to support the Smithsonian-wide platform *Our Shared Future: Reckoning with Our Racial Past*. The 3D collection published under this initiative includes objects from six of the Smithsonian museums, with six additional museums nominating objects for the second round of the project in 2024. Each 3D experience created under this initiative includes interactive content (such as articles, audio narration, videos, annotations, and guided tours authored by subject matter experts) that provide context for a scanned object and use it as a framework for discussing a complex racial theme.

The 3D team also worked with the National Museum of Asian Art (NMAA) on its exhibit Anyang: Chinese Ancient City of Kings, supporting the creation of an interactive 3D print, an immersive 3D animation, and an in-gallery touchscreen where visitors can virtually explore 3D objects. Our work on this exhibit also included a custom online interactive that visually walks users through the complex workings of mold making and casting ancient Chinese bronze vessels.







POLICY & ANALYSIS

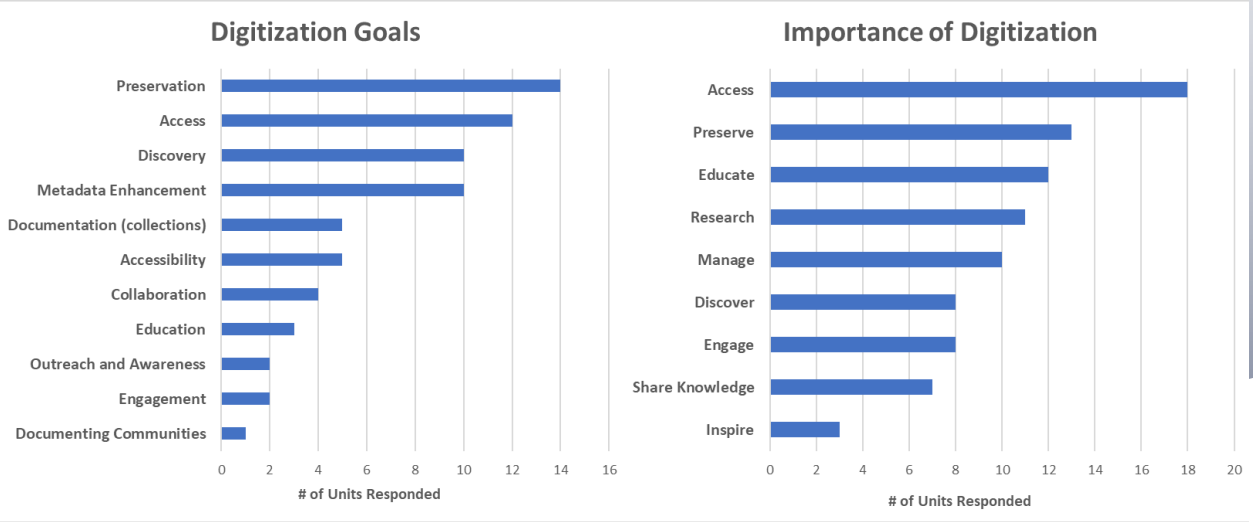
Every year the Digitization Program Office's Policy and Analysis Program works with the Smithsonian's National Collections Program (NCP) to collect information from the Smithsonian's museums, libraries, and archives (called "collecting units") about the state of their collections and digitization. This Annual Collections Statistics and Collections & Digitization Assessment quantifies the Smithsonian's objects/ specimens, archives, and libraries holdings and characterizes the physical and digital state of the collections. We report the findings to the Office of Planning, Management, & Budget (OPMB), which includes them in the Smithsonian's key performance indicators that OPMB shares with Smithsonian stakeholders, including Congress. The information collected reflects the situation from the previous fiscal year; thus, the numbers reported in 2023 reflect Fiscal Year 2022.

The digitization portion of the assessments show that as of September 30, 2022, the museums, archives, and libraries have created over 13 million standard digital records that describe and make the collections discoverable. They have also created over 14 million standard digital surrogates out of 23.2 million collections currently prioritized for digitization. ("Surrogates" refer to digital representations such as digital images, audiovisual files, or 3D renderings.) For more details about the digitization assessment, please visit the Smithsonian Dashboard.

In 2023, the DPO and NCP worked with a developer to upgrade the Collections & Digitization Reporting System (CDRS), the software system used by Smithsonian units to report these annual metrics. CDRS 3.0 enhancements have improved the system's administrative and management functions so we can better serve the units throughout the annual Collections and Digitization data call.

In partnership with colleagues around the Smithsonian, the Policy and Analysis Program continues to coordinate and host events for the DPO Digital Foundations webinar series to develop and deepen digital literacy, competency, and capacity building for all staff. The 2023 series addressed a variety of topics, including how to streamline work and increase productivity using M365 applications, the opportunities and challenges of working with Chat GPT at the Smithsonian, and policies and best practices for managing business records produced by Smithsonian staff.

In the fall of 2022, DPO announced the triennial call to Smithsonian museums, libraries, and archives for their 2023-2025 Unit Digitization Plans (UDP). These plans address various topics, such as the unit's digitization goals and priorities for the future, and challenges and risks related to funding, staff, and infrastructure. After reviewing the results in the summer of 2023, DPO will publish a summary report on the 2023-2025 UDP findings in early 2024.



DEVELOPMENT

In 2023 we focused our development activities on partnerships and collaborations that invest in scaling up 3D capture of Smithsonian collections and creating opportunities for more virtual engagement with these collections. The Smithsonian is an attractive partner for world-class technology companies because of our brand and our interest in experimenting with innovative solutions in digitization.

One such partner is Verizon, who provided major support for the Smithsonian's *Our Shared Future: Reckoning with our Racial Past* platform, allowing us to 3D scan collections objects that tell stories about race and our history. This multi-year initiative will result in several hundred new 3D models of collections from across the Institution.

We also partnered with technology companies to help us solve technical challenges that arise around the capture and processing of certain collections objects. For example, DPO's 3D team digitized astronaut Alan Shepard's 1961 Mercury space suit as part of the National Air and Space Museum's "Reboot the Suit" campaign. Because the suit's metallic shine and texture presented technical challenges for 3D capture and processing, we partnered with Adobe Research, who processed the 3D data and produced a digital double of the suit in remarkable detail using newly developed AI technology. DPO and Adobe Research jointly presented the results at SIGGRAPH, the leading computer graphics and interactive techniques conference. Epic Games also is supporting us in capturing milestones in aerospace history by processing the complicated 3D dataset of the Space Shuttle Discovery's interior into a fully rendered 3D model.

Looking ahead, The Crowley Company, a digital imaging company, agreed to provide the Collections Digitization program with a substantial discount for a new transcription pilot program. The Collections Digitization program also was awarded funds this year through an internal grant program to hire a digital imaging specialist who will help us capture images of collections highlighting the history and successes of American women. And Darmstadt Graphics Group (DGG) has offered to donate an enterprise license for their 3D optimization software, RapidCompact, enhancing our 3D processing capabilities.

DPO Development's work would not be possible without support from many of our colleagues, especially at OCIO's Finance and Administration Office and the Smithsonian's Office of Advancement. Thank you!

STAFF UPDATES

NEW STAFF

Joseph Campbell

3D Digitization Technician

Joseph obtained his B.F.A in Photography from Indiana University in 2010. With more than a decade of experience in the cultural heritage and arts sector, he has demonstrated expertise in advanced 3D capture, processing, and lighting. In addition, he possesses extensive knowledge in 2D imaging science, color science, and coding for cultural heritage. Joseph embarked on his journey with the Smithsonian in 2011 at the National Portrait Gallery, and has since contributed his skills to various institutions including the Chicago History Museum, National Gallery of Art, the National Museum of Natural History, and the National Museum of African American History and Culture.

Katie Wolfe

3D Digitization Technician

Since April 2023, Katie Wolfe has worked as a scanning technician on the DPO's 3D team, where she works to grow the amount of 3D digitized assets from the Smithsonian's collection. Prior to coming to the Smithsonian, Katie worked for a 3D scanning company and specialized in 3D digitization for museums, high-profile artists, and the VFX industry. She has worked on hundreds of 3D scanning projects varying from capturing fingerprint ridges to entire city blocks. Katie studied at the Maryland Institute College of Art where she focused on wood working, porcelain slip casting, and bronze casting. She has worked in museum education at the Baltimore Museum of Art and the Walters Art Museum and is a deep believer in the power of 3D content to engage a wide variety of audiences. In her free time, she flies her drone around Baltimore to capture photogrammetry of historic architecture and sculpture.

New Opportunities....

In 2023 we said farewell to **Sara Goodhand**, Informatics Program Officer on the Collections Digitization team. Sara took a new position at the National Archives and Records Administration (NARA).

COMMITTEES & SUBCOMMITTEES

Digitization Program Advisory Committee (DPAC)

Members advise the DPO about its programs and plans and serve as conduits of information from DPO to their units. Members serve three-year terms and are drawn from across the Smithsonian, representing the many diverse units and professions that exist in the Institution.

We thank the following individuals who completed their terms in 2023:

- Dave Walker, Audiovisual Archivist, Center for Folklife and Cultural Heritage

We also welcome three new members to the Committee, who will serve through 2025

- Laura Coyle, Assistant Director for Collection Cataloging and Digitization National Museum of African American History and Culture
- Kara Lewis, CIS Administrator, National Museum of the American Indian
- Kira Sobers, Media Digitization Manager, Smithsonian Libraries and Archives

DPO staff served on the following committees:

Internal

- Collections Information Management Committee (CIMC)
- IRM Pool Fund Allocation Committee
- National Museum for the American Latino Digital Collections and Metadata Working Group and Advisory Committee
- OCIO Inclusion, Diversity, Equity and Access Committee (OCIO-IDEA)
- Smithsonian Data Governance Committee, Collections Data Working Group (Co-Lead)
- Strategic Priorities Digital Team D5 (digitization prioritization, preservation and funding) (Co-Lead)

External

- Khronos 3D Formats Advisory Panel

AWARDS

Jeanine Nault, Team Lead for Mass Digitization, received a 2023 Service Award from the Society for Imaging Science and Technology, for her leadership as the Series Chair for IS&T's 2022 DigiTIPS webinar series in Oslo Norway.

PUBLICATIONS

Gimme Three Steps: A Mass Digitization Method at the Smithsonian
Nathan Ian Anderson, Jeanine Nault, Luis J. Villanueva, Society for Imaging Science and Technology, Archiving Conference, 2023, pp 172 - 176, Link

Out of this World:
New Image Capturing Technique Replicates Space Exploration
Jon Blundell, Tamy Boubekeur, Roman Rouffet, ACM Siggraph, Online Blog, Link

Let the Records Show:
Attribution of Scientific Credit in Natural History Collections.
Rebecca B. Dikow, Jenna T. B. Ekwealor, William J. B. Mattingly, Michael G. Trizna, Elizabeth Harmon, Torsten Dikow, Carlos F. Arias, Richard G. J. Hodel, Jennifer Spillane, Mirian T. N. Tsuchiya, Luis Villanueva, Alexander E. White, Madeline G. Bursell, Tiana Curry, Christelle Inema, and Kayla Geronimo-Anctil. 2023. International Journal of Plant Sciences 184:5, 392-404. Link

Developing responsible AI practices at the Smithsonian Institution.
Research Ideas and Outcomes
Dikow RB, DiPietro C, Trizna MG, BredenbeckCorp H, Bursell MG, Ekwealor JTB, Hodel RGJ, Lopez N, Mattingly WJB, Munro J, Naples RM, Oubre C, Robarge D, Snyder S, Spillane JL, Tomerlin MJ, Villanueva LJ, White AE (2023) 9: e113334. Link

OUTREACH

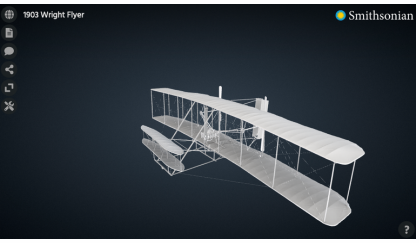
- Nathan Anderson, DigiTips 2023. Item Driven Image Fidelity—Capturing the 'Sweet Spot'
- Jeanine Nault guest lectured at the George Washington University Museum Studies graduate class on Digitization and Digital Asset Management
- Jeanine Nault, Luis Villanueva, Gimme Three Steps: A Mass Digitization Method at the Smithsonian, IS&T Archiving Oslo Conference
- Erin Mazzei, Poster at the 7th Annual Collections Share Fair, Preventing specular Highlights in IZ Mass Digitization
- Jamie Cope, Megan Dattoria, Vince Rossi, presented by Jon Blundell, SIGGRAPH 2023 - https://research.adobe.com/publication/making-a-digital-double-of-alan-shepards-space-suit/
- Jamie Cope, Digital Humanities 2023 - https://dh-abstracts.library.virginia.edu/works/12508
- Megan Dattoria, Museweb 2023
- Jamie Cope, Megan Dattoria, Vince Rossi, UMBC/SI Storytelling conference
- Nathan Anderson, hosted the biennial 2-day 'Digital Transitions: PhaseOne & CaptureOne Workshop for Smithsonian and DC area federal photographers - *see image lower right.*

SOCIAL MEDIA

Website Visitors:
29,878
3D Model Views:
1,587,374

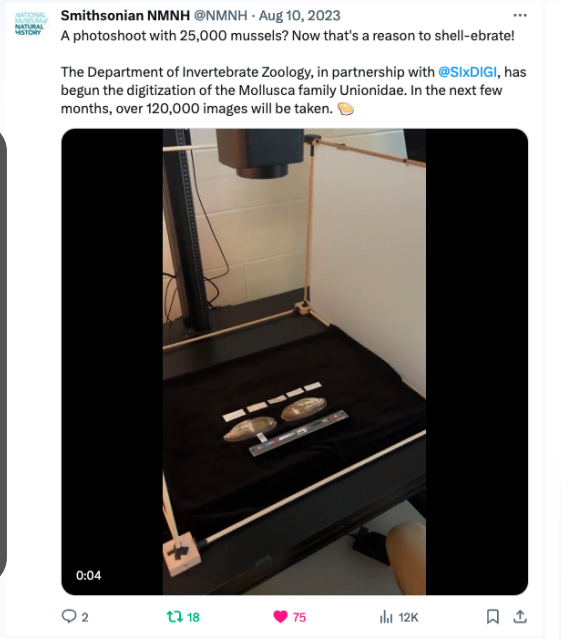
Followers	Followers	Followers	Views
14,981	10,338	13,981	603,978

Top Viewed Model



248,023
Views

Top CD Digitization X Post

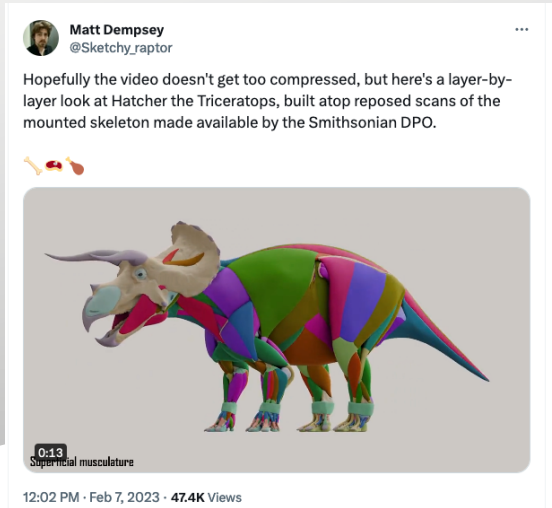


Top 3D Digitization X Post

DPO IN THE NEWS

JALOPNIK

09/29/2023. Jalopnik,
The Smithsonian Is Scanning Its Exhibits So You Can 3D-Print Your Own Space Shuttle, Steve DaSilva. Link



The Digitization Program Office would like to give special recognition to the Smithsonian's collecting units. Their expertise and commitment to Smithsonian's collections are a source of inspiration and help improve our programs and processes. We are grateful for their generosity in working with us: they are critical partners every step of the way.

Digitization Program Office Staff

Diane Zorich
Director, Digitization Program Office

Nathan Ian Anderson
Collections Digitization, Imaging Services Team Lead

Jon Blundell
3D Program Officer

Joseph Campbell
3D Digitization Technician

Jamie Cope
3D Program Lead Developer

Megan Dattoria
3D Program Officer

Keturah Kiehl Pratt
Policy & Analysis Support

Eric Maslowski
3D Program Product Lead (Packrat)

Erin Mazzei
Collections Digitization, Mass Digitization Program Officer

Jeanine Nault
Collections Digitization, Mass Digitization Team Lead

Jaap Otte
Director of Development, OCIO

Ken Rahaim
Supervisor, Collections Digitization Program

Vincent Rossi
Supervisor, 3D Program

Luis J. Villanueva
Collections Digitization, Informatics Team Lead

Jessica Warner
Senior Policy & Analysis Program Officer

Katie Wolfe
3D Digitization Technician

Additional Image Credits

Cover: Top row of images from left; Chuck Adkins, Olympic gold medal champion boxer; from Jet Magazine, 1953. Hank Aaron, Baseball legend relaxing at home, from Ebony Magazine, 1956. Madame Eunice Adabunu, President of the Lome section of the Togolese Woman's Union, from Ebony Magazine, 1963. All three images courtesy the Johnson Publishing Company Archive. Bottom row: 3D rendering of space suit worn by Alan Shepard courtesy Adobe Research and Smithsonian Institution.
Page 3: Right row of images from top, Kal Muller films of Jalisco, Human Studies Film Archives, Smithsonian Institution, HSFA.1989.03. Digitization of Invertebrate Zoology specimen, courtesy the National Museum of Natural History. Detail showing systems integration between SI and Getty for the Informatics Workflow in the Johnson Publishing Company Archive project. Tulips, by Irene Jeruss, courtesy Smithsonian Gardens and DPO Imaging Services.
Page 4: 3D models of allegorical figures of the "Four Continents" from the Cooper Hewitt Smithsonian Design Museum. Record id 1960-1-51 a, b, c, and d
Page 5: Image upper left, detail of a scarf made by Olivetti c.1970; courtesy Cooper Hewitt Design Museum. Bottom charts from the 2023-2025 Unit Digitization Plans.
Page 6: Images from left: Portrait of Alan Shepard, NASA, Public Domain. Mercury spacesuit capture setup, Digitization Program Office, OCIO, Smithsonian Institution.
Annual Report Design: Nathan Ian Anderson