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Aim High: Pushing Collaboration and Outreach Limits for the 50th Anniversary of Apollo 11

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AIM HIGH: PUSHING COLLABORATION AND OUTREACH LIMITS FOR THE 50TH ANNIVERSARY OF APOLLO 11

July 20, 2019, marked half a century since Neil Armstrong and Buzz Aldrin had stepped onto the surface of the Moon, the first time humans had walked on another world. This anniversary is globally significant to a breadth of people: For some, the anniversary evokes particular memories of exactly where they were on that momentous day in 1969. For others, it evokes stories heard from their parents or grandparents and a desire to be part of a generation that sees humans return to the Moon. Few anniversaries can generate such universal appeal or speak to such a range of human experience, longing, and knowledge.

To commemorate the fiftieth anniversary of the Apollo 11 Moon landing, the University of Arizona Libraries Special Collections mounted an exhibition titled *Moon*, which showcased a recently acquired archival collection from a noted lunar scientist, rare books published during a pivotal period in early scientific understandings of the Moon, and contemporary science fiction and poetry. Alongside these materials drawn from Special Collections' permanent collection, the exhibit also incorporated items on loan from campus departments including the Lunar and Planetary Laboratory and the University of Arizona Museum of Art; these loaned items provided additional visual interest and historical context for exhibit viewers, while in some cases also providing hands-on opportunities to engage with the materials. This case study focused on *Moon* considers how archives and special collections can use exhibitions as an effective method of outreach, providing viewers with vivid and meaningful points of connection to collection materials associated with a historic anniversary. From exhibit design to event planning and collaboration with other units on campus, this case study demonstrates that sharing expertise and collections can lead to a successful exhibition.

Institutional Context

Located in Tucson, Arizona, the University of Arizona is a public, land-grant university and has long played a prominent role in planetary sciences, including important contributions to NASA's Apollo Program and the programs that led up to it. With connections to the past and present of space sciences through departments across campus, the university holds a distinctive position from which to host a major celebration of the Apollo 11 Moon landing. As part of the University Libraries system, the University of Arizona Libraries Special Collections provides primary source research materials related to the mission, history, and specialties of the university. Special Collections has seven major collecting areas including literature, local and regional history for Arizona and the Southwest, the broader culture and history of the Borderlands, and the History of Science and Technology—one of its fastest growing collecting areas. History of Science and Technology collections include the Pioneers of Planetary Science, which contains materials from notable scientists who worked at the University of Arizona Lunar and Planetary Laboratory (LPL). These include founder Gerard P. Kuiper, who relocated his projects from Chicago to Tucson in 1960 to take advantage of Tucson's plentiful clear skies and mountains on which to build observatories. Kuiper drew other scientists who had worked with him, including Ewen Whitaker and Tom Gehrels, and developed a preeminent department in space science research. Today LPL leads NASA's OSIRIS-REx Asteroid Sample Return Mission with a University of Arizona

professor serving as principal investigator; in 2008 LPL led the Phoenix Mars Mission that discovered water ice on Mars.

The University of Arizona Press, which is also part of the Libraries, publishes numerous books related to space exploration and planetary science. Recent titles in this field include *Beyond Earth's Edge: The Poetry of Spaceflight* (2020), *Gerard P. Kuiper and the Rise of Modern Planetary Science* (2019), *Mars: The Pristine Beauty of the Red Planet* (2017), and *Under Desert Skies: How Tucson Mapped the Way to the Moon and Planets* (2016). Special Collections engages in extensive outreach activities including events, exhibits, and programs related to the History of Science and Technology collection, some in association with the University of Arizona Press. In April 2016, in conjunction with LPL, Special Collections held a panel discussion titled "How Tucson Mapped the Way to the Moon and Planets." Panelists included scientists Peter Smith, Ewen Whitaker, and William K. Hartmann, with moderator Melissa L. Sevigny, National Public Radio science and technology reporter and author of *Under Desert Skies*; LPL Director Tim Swindle provided opening remarks. In spring 2014, Special Collections mounted a rotating exhibit titled *Mars Madness: Sci-Fi, Popular Culture, and Ray Bradbury's Literary Journey to Outer Space*. This exhibit featured photographs of Mars and inspected Bradbury's work through the academic lenses of anthropology, literature, science, media, and education.

A plethora of other campus departments and resources at the University of Arizona set the stage for a successful cross-campus celebration of the fiftieth anniversary of the Apollo 11 Moon landing and a successful rotating exhibit in Special Collections titled *Moon*.

Literature Review

Archives and special collections exhibitions fall under the rubric of outreach, generally intended to increase public knowledge of available collections and to encourage use of library and archival materials. The Society of American Archivists defines outreach as efforts that connect archival collections with constituencies whose needs align with the repository's mission, and those efforts may consist of programming or publications.¹ Increasingly, outreach has become a crucial undertaking for academic libraries, including university archives and special collections: Dorothy Fouracre, for instance, found that resources allocated to exhibitions in the form of staff time, gallery spaces, and funding have increased in recent decades, signaling that exhibitions are a priority for the academic libraries that create and display them.²

University archives and special collections typically have a more limited appeal than other portions of academic libraries, making outreach all the more important for them to undertake. Daniel Traister notes that users experience special collections libraries as distinctly more difficult to navigate due to their closed stacks, extensive rules, and "generally persistent formidability."³ Exhibitions of library materials offer one outreach method that can introduce viewers to the types and range of items that special collections and archives house. The Association of College and

¹ Society of American Archivists, *Dictionary of Archives Terminology*, "outreach," dictionary.archivists.org/entry/outreach.html.

² Dorothy Fouracre, "Making an Exhibition of Ourselves? Academic Libraries and Exhibitions Today," *Journal of Academic Librarianship* 41, no. 4 (2015): 381, 384, <https://doi.org/10.1016/j.acalib.2015.05.008>.

³ Daniel Traister, "Public Services and Outreach in Rare Book, Manuscript, and Special Collections Libraries," *Library Trends* 52, no. 1 (Summer 2003): 87, Gale OneFile.

Research Libraries and Society of American Archivists note that “Placing items on Exhibition can help Repositories to promote their collections to general audiences who might not otherwise consult archival and special collections materials for research in a Reading Room setting.”⁴ Yukako Tatsumi approaches special collections as falling within the “difficult museum” paradigm: when special collections house materials not obviously related to their local setting, they face issues of accessibility and public image.⁵ Tatsumi’s study concludes that outreach in the form of exhibitions can successfully reach new user communities if they are tailored to the interests of those communities, and if those communities are strategically sought out.⁶ Tamar G. Chute frames exhibits as a means of building positive relationships across campus—with administration, faculty, and students—in order to both justify the collection’s existence and to attract new users.⁷ Overall, outreach for university archives and special collections is understood as a necessary undertaking in order to connect collections with users.

The broad question “why exhibit” leads to the more specific question, “what defines a successful exhibition?” For academic library and archives exhibition programs, a primary goal is to create positive experiences for new users. Staff at the University of Florida Health Science Center Libraries have demonstrated that exhibits—particularly those with themes drawn from popular culture, such as a Harry Potter-related exhibit—support engagement of campus and community members with academic libraries and can make the library a more “welcoming, relevant space.”⁸ Valerie A. Harris and Ann C. Weller’s study on the characteristics of successful special collections outreach programs concluded that successful programs involve “pleasant interactions” that help participants feel at ease in what might be an unfamiliar environment.⁹ Both studies implicitly consider special collections’ appeal to a broad assortment of users, both on campus and off, with exhibition and programming attendees including university students, faculty, and staff in addition to community members. University of Florida Health Science Center Libraries staff reported a notable change in exhibit attendees’ attitudes, with 84.4 percent of survey respondents who attended an exhibit or exhibition-related programming reporting a positive change to their perceptions of the library.¹⁰ Harris and Weller also indicated a positive correlation between outreach programming and increased visits to the reading room by researchers of all varieties.¹¹

In *Exhibits in Archives and Special Collections Libraries*, Jessica Lacher-Feldman defines exhibit success as audience engagement, which includes physical, intellectual, and emotional engagement;

⁴ Association of College and Research Libraries Rare Books and Manuscripts Section/Society of American Archivists, *Standardized Statistical Measures and Metrics for Public Services in Archival Repositories and Special Collections Libraries* (Association of College and Research Libraries, 2018), 51, <http://www.ala.org/acrl/sites/ala.org.acrl/files/content/standards/statmeasures2018.pdf>.

⁵ Yukako Tatsumi, “Making a Case for Local Relevance: Strategic Exhibition Planning for the Gordon W. Prange Collection,” *Journal of East Asian Libraries* 168 (2019): 4, <https://scholarsarchive.byu.edu/jeal/vol2019/iss168/2>.

⁶ Tatsumi, “Making a Case,” 16–17.

⁷ Tamar G. Chute, “Selling the College and University Archives: Current Outreach Perspectives,” *Archival Issues* 25, no. 1/2 (2000): 45–46, JSTOR.

⁸ Beth Auten et al., “Using NLM Exhibits and Events to Engage Library Users and Reach the Community,” *Medical Reference Services Quarterly* 32, no.3 (2013): 276–78, 267, <https://doi.org/10.1080/02763869.2013.806861>.

⁹ Valerie A. Harris and Ann C. Weller, “Use of Special Collections as an Opportunity for Outreach in the Academic Library,” *Journal of Library Administration* 52, no. 3/4 (2012): 302, <https://doi.org/10.1080/01930826.2012.684508>.

¹⁰ Auten et al., “Using NLM Exhibits,” 279.

¹¹ Harris and Weller, “Use of Special Collections,” 301.

this type of success can be measured through both qualitative feedback (viewer anecdotes, guest books, comment boxes) and quantitative feedback (tracking the numbers of visitors).¹² Lacher-Feldman additionally provides an outline for what makes a “good” exhibit: such an exhibit “reaches out to individuals and gives them an opportunity for *spontaneous learning*,” while simultaneously promoting the work and collections of the repository itself and building a new audience of users. No matter how briefly a viewer engages with the exhibit, any engagement at all has the potential to yield both learning for the viewer and increased support for and knowledge of the repository from the general public, researchers, donors, and institutional administrators.¹³ Amy Chen, Sarah Pickle, and Heather Waldroup similarly define successful exhibits as “academically rigorous, visually pleasing, and well-attended or well-viewed,” although they note that this requires significant staff time and resources beyond what many academic libraries currently commit to exhibits.¹⁴

Existing literature underscores that staff knowledge, time, and effort are essential for exhibit success. As Laurence Ward notes in his review article of Lacher-Feldman’s *Exhibits in Archives and Special Collections Libraries*, literature related specifically to developing exhibits in archives is rare; it is usually the task of archivists to adapt content created for museums to suit their purposes.¹⁵ In another review of Lacher-Feldman’s work, Andrew Cook praises Lacher-Feldman for acknowledging that while some archivists and librarians jump for joy at the opportunity to curate an exhibit, others experience it as a dreaded toil.¹⁶ For many it is not a matter of whether or not they enjoy the work but the simple factor of the quantity of work entailed. The time and effort required to curate exhibits additionally comes at the expense of other activities. If archives and special collections aim to truly value the benefits of well-researched and carefully developed exhibits, then it goes to reason that the work should count as scholarship for the purposes of promotion and tenure. This issue is explored by Elizabeth A. Novara and Vincent J. Novara in their 2017 article “Exhibits as Scholarship: Strategies for Acceptance, Documentation, and Evaluation in Academic Libraries.” Novara and Novara found that exhibits are viewed as less intellectually rigorous than other forms of scholarship, a view reflected in the tenure policies of many institutions within the Association of Research Libraries with faculty status for librarians. A primary objection to exhibits as scholarship is the difficulty of incorporating peer-review into the exhibit design process; lack of understanding from administrators of the rigors involved in curating exhibits presents a further challenge for advocates of exhibits as scholarship.¹⁷

¹² Jessica Lacher-Feldman, *Exhibits in Archives and Special Collections Libraries* (Chicago: Society of American Archivists, 2013), 119.

¹³ Lacher-Feldman, *Exhibits in Archives*, 109.

¹⁴ Amy Chen, Sarah Pickle, and Heather Waldroup, “Changing and Expanding Libraries: Exhibitions, Institutional Repositories, and the Future of Academia,” in *The Process of Discovery: The CLIR Postdoctoral Fellowship Program and the Future of the Academy*, ed. John C. Maclachlan, Elizabeth A. Waraksa, and Christa Williford (Washington, DC: Council on Library and Information Resources, 2015): 66–67, <http://www.clir.org/pubs/reports/pub167>.

¹⁵ Laurence Ward, review of *Exhibits in Archives and Special Collections Libraries*, by Jessica Lacher-Feldman, *Archives and Records* 35, no. 2 (2014): 182, <https://doi.org/10.1080/23257962.2014.942617>.

¹⁶ Andrew Cook, review of *Exhibits in Archives and Special Collections Libraries*, by Jessica Lacher-Feldman, *Archives and Manuscripts* 43, no. 1 (2015): 76, <https://doi.org/10.1080/01576895.2014.1000809>.

¹⁷ Elizabeth A. Novara and Vincent J. Novara, “Exhibits as Scholarship: Strategies for Acceptance, Documentation, and Evaluation in Academic Libraries,” *American Archivist* 80, no. 2 (2016): 362–64, <https://doi.org/10.17723/0360-9081-80.2.355>.

Further time and staff skill are required to develop partnerships that can greatly support an exhibition's success through potential loans of material, expertise in relevant disciplines, and broader audiences. The potential for exhibits to both create and build on partnerships recurs throughout the literature on university archives and special collections exhibits. In her case study on book displays at the University of the Pacific's library that highlight diversity and inclusivity, Michelle M. Maloney suggests that academic library exhibits can "build goodwill" and facilitate relationships with academic units across campus.¹⁸ Beth Hildebrandt, Stacey Knight-Davis, J. J. Pionke, and Andrew Cougill demonstrate that academic library exhibits can highlight institutional connections to regional history or regional issues while also inspiring related programming and fostering relationships on and off campus.¹⁹ Their case study considers an exhibit focused on service members' tattoos, which the University of Illinois at Urbana-Champaign and Eastern Illinois University created and later shared with regional public libraries. Hildebrandt et al. conclude that the "work, time, and dedication" of staff members at multiple institutions ultimately made the exhibit successful, as it created connections between both academic and public libraries across Illinois, received a high level of media coverage in both local and national print outlets, and prompted a positive public response.²⁰

Lacher-Feldman notes that anniversaries of notable historic events constitute a fruitful starting point for developing exhibits.²¹ The fiftieth anniversary of the Apollo 11 Moon landing prompted celebrations around the globe, including at the Smithsonian National Air and Space Museum, which launched a two-year tour of the Apollo 11 command module *Columbia* as part of a traveling exhibit titled *Destination Moon*.²² The National Air and Space Museum undertook the ambitious tour, which brought *Columbia* to five major U.S. cities, partly because the museum's Washington, D.C., building was undergoing monumental facilities and exhibits renovation.²³ The museum also unveiled Neil Armstrong's space suit to the public again after it underwent a thorough thirteen years of restoration.²⁴ A major motion picture, *Apollo 11*, premiered in January of the anniversary year, composed entirely from archival footage. Director Todd Douglas Miller worked extensively with the National Archives and Records Administration (NARA) and archivist Dan Rooney to locate this never-before-seen footage; filmed in a legacy 70-millimeter Todd-AO format, the film became unplayable as NARA had long ceased to have playback equipment.²⁵ The film project presented a mutually beneficial opportunity for the filmmakers to underwrite the digitization of the footage—an example of the possibilities opened up by collaboration.

¹⁸ Michelle M. Maloney, "Cultivating Community, Promoting Inclusivity: Collections as Fulcrum for Targeted Outreach," *New Library World* 113, no. 5/6 (2012): 281, <https://doi.org/10.1108/03074801211226364>.

¹⁹ Beth Hildebrandt et al., "Designs of Duty: Using Exhibits to Build Partnerships," *College & Undergraduate Libraries* 26, no. 1 (2019): 53, <https://doi.org/10.1080/10691316.2019.1582394>.

²⁰ Hildebrandt et al., "Designs of Duty," 63, 60–61.

²¹ Lacher-Feldman, *Exhibits in Archives*, 34.

²² "Destination Moon," National Air and Space Museum, <https://airandspace.si.edu/exhibitions/destination-moon>.

²³ National Air and Space Museum, "National Air and Space Museum Renovation Update (Press Release)," August 20, 2019, <https://airandspace.si.edu/newsroom/press-releases/national-air-and-space-museum-renovation-update>.

²⁴ Jay Bennett, "Neil Armstrong's Restored Spacesuit Put Back on Display at the Smithsonian's National Air and Space Museum," *Smithsonian Magazine*, July 16, 2019, <https://www.smithsonianmag.com/smart-news/neil-armstrongs-restored-spacesuit-put-back-display-smithsonians-national-air-and-space-museum-180972654>.

²⁵ David Kamp, "The Found Footage That Provides a Whole New Look at the Apollo 11 Moon Landing," *Vanity Fair*, December 14, 2018, <https://www.vanityfair.com/hollywood/2018/12/apollo-11-50th-year-anniversary>.

The University of Arizona Libraries Special Collections has a legacy of creating exhibits that highlight rich and diverse collections while also incorporating collaborative work with campus partners. *The Life and Legacy of the USS Arizona*, curated by Trent Purdy in 2016, launched a successful partnership with entities both on campus and off, including University of Arizona Athletics and the National Park Service. Timed to commemorate the seventy-fifth anniversary of the attack on Pearl Harbor, this exhibit highlighted materials from the extensive USS Arizona Collection and provided numerous points of access for community members through unique forms of outreach. These included a custom football uniform that incorporated images and motifs drawn from primary source material from the archives, and an exhibit panel for display at the USS Arizona Memorial, part of the Valor in the Pacific National Monument in Honolulu.²⁶ The exhibit fostered positive relationships and goodwill with groups outside the typical range of Special Collections users, including local military personnel at Davis-Monthan Air Force Base and UA Arizona Athletics fans.²⁷ *The Life and Legacy of the USS Arizona* set a record for exhibit attendance and, as Purdy writes, “yielded significant intangible results that elevated awareness in the value of UA Special Collections amongst campus and community audiences.”²⁸ Through collaboration and the dedication and expertise of Special Collections staff, this exhibit yielded positive, impactful engagements with a wide range of viewers.

Case Study

Moon opened in Special Collections’ rotating exhibit space on July 20, 2019, the fiftieth anniversary of the Apollo 11 Moon landing, and remained on display through December of that year. Adjacent to the main campus library and next to a Starbucks, Special Collections is open to the public Monday through Friday from 9 a.m. to 6 p.m. and draws foot traffic with a large banner advertising its current exhibit over the entryway. *Moon* was curated by Molly Stothert-Maurer, Archivist & History of Science Curator at Special Collections, and Christopher Cokinos, Associate Professor of English; the exhibit also incorporated input from Lunar and Planetary Laboratory faculty and staff including Director Tim Swindle; Mary Guerrieri, Manager, Academic Affairs; and Maria Schuchardt, Program Coordinator of the Space Imagery Center.

The exhibit.

Moon invited visitors to explore the science, history, and culture of the Moon and how we view it. Visitors learned about the early art of mapping the Moon from sketches to photography, saw early books by Copernicus and Galileo, and explored Moon themes in science fiction books and poetry. Exhibited materials drew heavily from a recent acquisition of the personal papers of Ewen Whitaker, Associate Research Scientist at LPL and expert on the surface and physical features of the Moon. The Ewen Whitaker Papers feature extensive maps, photographs, books, correspondence, and other academic works related to lunar studies. The exhibit also featured items on loan from LPL, the Museum of Optics at the University of Arizona College of Optical Sciences, University of Arizona Museum of Art, and the Learning Games Initiative Research Archive.

²⁶ Trent S. Purdy, “Case Studies in Campus and Community Outreach: The Life and Legacy of the USS Arizona Exhibit and the 75th Anniversary of the Bombing of Pearl Harbor,” *Journal of Western Archives* 9, no. 1 (2018): 7–9, 12, <https://doi.org/10.26077/d8fb-ce15>.

²⁷ Purdy, “Case Studies,” 10.

²⁸ Purdy, “Case Studies,” 15.

The strong relationship Special Collections has with LPL builds upon a legacy of accomplishments in processing collections and making them available to researchers thanks to former Archivists Crystal Carpenter and Maurita Baldock and Library Information Associate Deborah Weller. The relationships also go back directly to Kuiper and Whitaker. When Kuiper passed away suddenly in 1973, he left an extensive archive containing unpublished scientific research and a wealth of correspondence, audiovisual materials, reports, and notes dating back to his work at Yerkes Observatory at the University of Chicago where, among other achievements, he was PhD advisor to Carl Sagan. Whitaker rose to the challenge to steward Kuiper's papers: he became an amateur archivist, joined archival organizations, and did his best to organize, describe, and provide access to the collection. Whitaker invested a good deal of his time, even in retirement, to this endeavor, additionally acting as unofficial LPL historian. Written in 1985, his lengthy and detailed definitive history of the lab, titled "LPL: Its Founding and Early Years," continues to hold a prominent place on LPL's website.

Many ideas for the exhibit, as well as selections for display, were generated while curator Stothert-Maurer processed the Whitaker collection in the year and a half leading up to the exhibit. During that time, Cokinos, an English professor and science writer, discovered that Special Collections had the Whitaker papers; deep in the midst of Moon-related research for a forthcoming book, he was eager to explore the papers and help with their organization. Working alongside a researcher brought the collection to life in a new way: excited by something he had found, Cokinos would bring it to the attention of Stothert-Maurer, such as a folder titled "Crank Science" with a lengthy article about termites on the Moon. Cokinos agreed to help curate the exhibit and contributed a brief essay as an introduction to the materials on display. He also wrote a detailed lunar timeline that masterfully wove together cultural and scientific milestones, helping to place exhibit items into a historical context for viewers.

Developing the exhibition included advocating for improvements to Special Collections' gallery space and increased collaboration with University Libraries marketing staff. The value, age, and rarity of many of the items on display necessitated modifications to the gallery space focused on improving preservation and security conditions as well as visitors' experience. Preservation improvements, although specifically made for this exhibit, provided lasting benefits for future exhibits as well. Staff borrowed a light meter from the University of Arizona Museum of Art to test UV levels in the gallery and retrofitted display cases with non-UV-emitting LED lights. Facilities staff performed additional electrical work, including the installation of outlets on one side of the gallery to bring power to existing display cases, providing the best possible viewing conditions. Staff undertook extensive work with facilities to remove a legacy monitor stand that crowded the space. To improve security conditions, staff worked with campus locksmiths to secure the display cases and communicated to campus police that a high-value item was on display, which resulted in increased foot patrols around the building. With an eye toward increased publicity for the exhibit, Special Collections collaborated early in the process with colleagues across the University Libraries, including a graphic designer and marketing and communications staff, to get the exhibit and programming onto calendars and events bulletins and to create exhibit panels, other signage, and a large banner to hang outside the exhibit space. This phase necessitated selecting and digitizing items from the collections and requesting high-resolution photographs from NASA.

Moon drew upon an important collection of early texts authored by giants in scientific understandings of the Moon, including Galileo and Copernicus, and printed around the dawn of modern science. The books, purchased in the early 1970s through the University of Arizona Foundation by then-University President John P. Schaefer, had last been displayed in 2000, when Special Collections held the exhibit *Heavenly Manuscripts: The Renaissance of Astronomy*. Included among these books was Galileo's *Sidereus Nuncius*, the text that announces his discoveries in 1609 and 1610 made with the newly invented telescope, including mountains and valleys on the face of the Moon, the four satellites of Jupiter, and the stars of the Milky Way. Galileo was not the first but by far the most notable person to observe the Moon with a telescope and sketch what he saw. The book was displayed alongside a telescope from the early 1700s borrowed from the Museum of Optics at the University of Arizona College of Optical Sciences (see figure 1). This loan happened serendipitously when Stothert-Maurer contacted Prof. John Greivenkamp, Curator of the Museum of Optics, while on a quest to find a large format camera for a different part of the exhibit. While hearing about the nuts and bolts of the exhibit, Greivenkamp became excited about the Galileo book (how could one not?) and how it ties in with

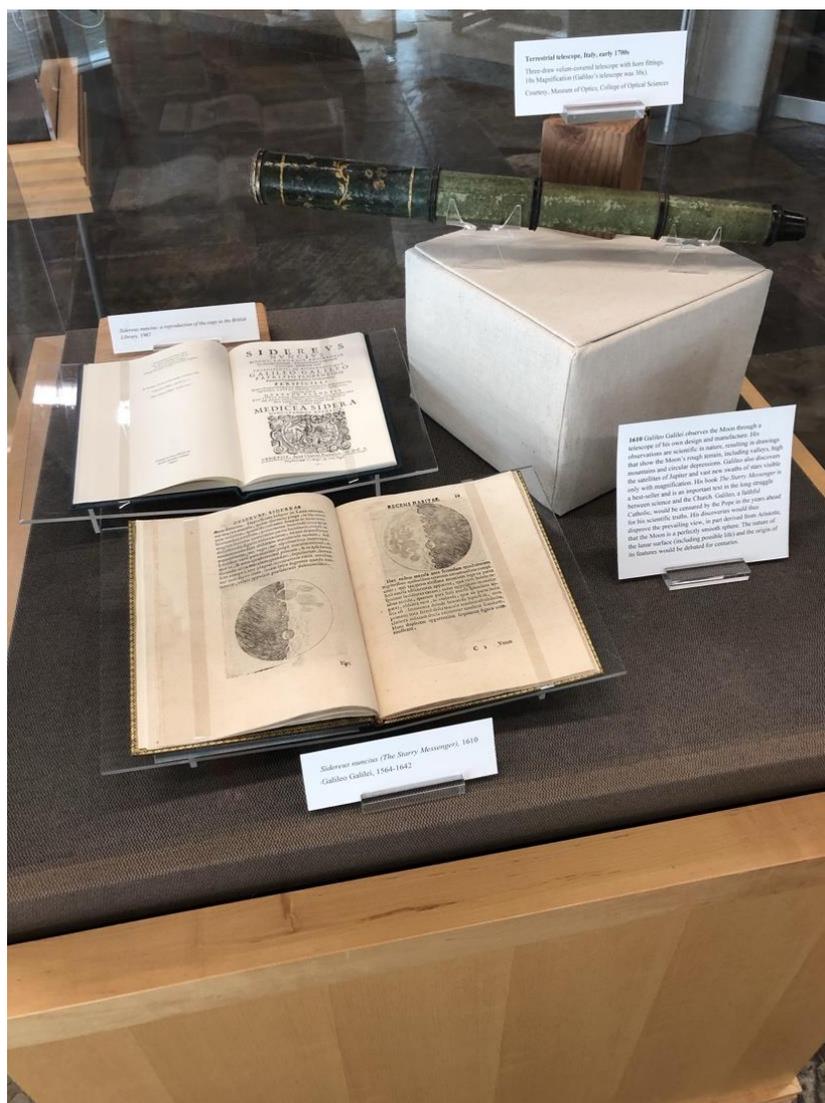


Figure 1. Exhibit case with Galileo's *Sidereus Nuncius* (1610), alongside a 1987 copy open to a different page and an Italian terrestrial telescope from the early 1700s, on loan from the Museum of Optics at the University of Arizona.

the extensive collection of telescopes at his institution. After an impromptu tour of the Museum of Optics collections, Greivenkamp invited Stohtert-Maurer to choose any telescope she wished for the exhibit. She chose an Italian terrestrial telescope based on its age and a basic construction similar to Galileo's telescope. Loans of such unique items can require extensive communication and paperwork, but placing period objects beside rare, historical texts can help bring those texts to life for viewers, elevating them beyond static books under glass.

The exhibit also featured Copernicus' *De Revolutionibus Orbium Coelestium*, printed in 1543, which contains the earliest representation showing the sun as the center of the solar system. Other early printed books included a revised Ptolemy text printed in 1496, *Epitoma in Almagestum Ptolemaei*, a treatise begun by the Austrian astronomer and mathematician Georg von Peurbach and completed by his student Johannes Regiomontanus. This text provides a Latin abridgment, with important corrections, of the original Greek *Almagest* by renowned astronomical authority Claudius Ptolemy of Alexandria (circa AD 100–170). Most notably the book calls Ptolemy's position that the Moon sometimes appears up to four times larger than its usual size a fantasy. Copernicus later used his own copy of this edition in rejecting Ptolemy's lunar and geocentric theories. The display of these pivotal books was held open to a woodblock print featuring portraits of both authors, a sun, and the Moon. Two of the Moon's impact craters, named Purbach and Regiomontanus, commemorate this book's authors.

Alongside these early works of scientific discovery, *Moon* also paired much more recent scientific instruments for mapping the Moon with items from the Ewen Whitaker Papers. In 1955 at the Ninth General Assembly of the International Astronomical Union in Dublin, Ireland, Gerard Kuiper circulated an unusual memo asking if anyone wanted to help him create an atlas of the Moon. *Moon* presented the letter from Whitaker to Kuiper expressing his eager desire to work on the atlas project, with Kuiper's equally enthusiastic reply displayed directly next to it. The letters served as a springboard for the working relationship that led to the scientific achievements in Moon mapping at LPL. Moon mapping is more properly termed *selenography*—the study of the surface and physical features of the Moon—from the Greek *Selene*, goddess of the Moon. Whitaker's scientific work resulted in the first compositional maps of lava flows on the Moon and played a critical role in early lunar missions including Ranger, Surveyor, and Lunar Orbiter. Whitaker famously pinpointed the location of the Surveyor III landing site and chose the Apollo 12 landing site adjacent to it so that astronauts could retrieve the precious equipment.

Whitaker's maps of the Moon cover the largest wall in the exhibit space from knee height to the ceiling (see figure 2). Whitaker's original lunar drawings, with features he carefully labeled, appear in the exhibit as well. The curators wanted to make sure that the materials appealed to a broad audience and, to that end, included a collage Whitaker made of Kuiper debating his rival Harold Urey on the origins of the Moon. It includes portraits of both men with speech bubbles arguing back and forth, demonstrating Whitaker's sense of humor. In the middle of the Moon maps, viewers also encountered a humorous cartoon about "luna-sea" that Whitaker included in his book *Mapping and Naming the Moon* (1999).

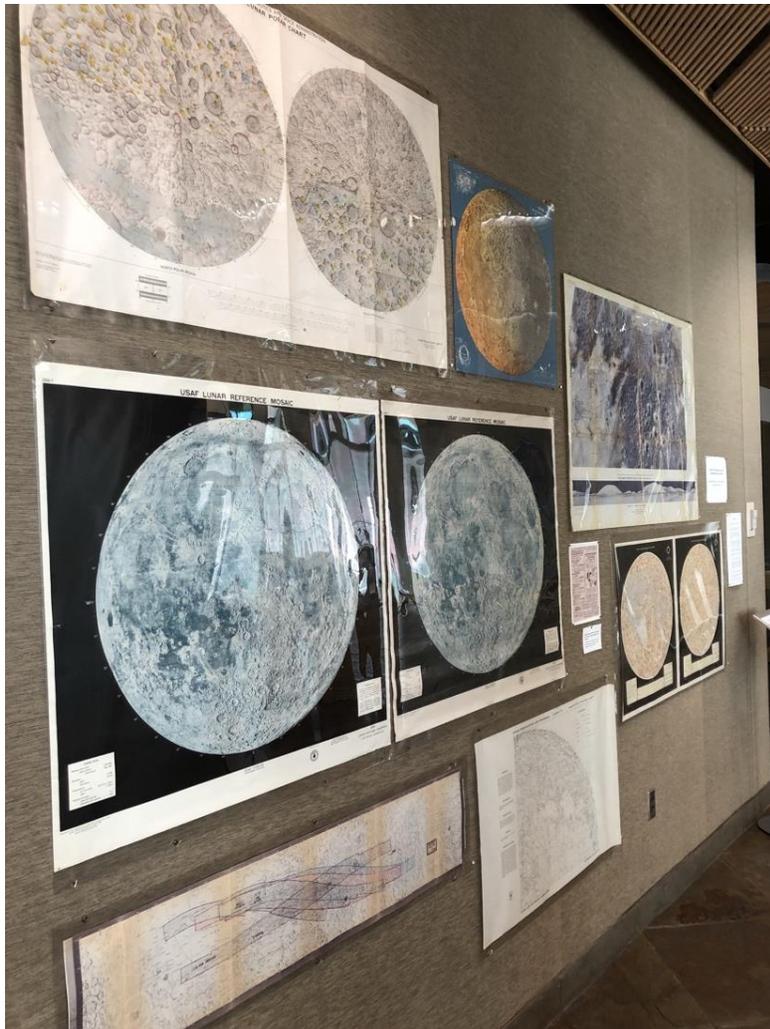


Figure 2. Wall of maps in the *Moon* exhibit, from the Ewen Whitaker Papers, 2019. Note that originals in protective sleeves are mounted using metal grommets and T-pins.

Most strikingly, the exhibit incorporated a distinctive original artifact on loan from LPL: a precision hemisphere used to create the *Rectified Lunar Atlas* in the 1960s. This series of maps played a crucial role in human exploration of the Moon, with all of the maps included based on photographs taken with the precision hemisphere. The precision hemisphere itself looks like a strange white ball or egg, but with the press of a button on a projector, it transforms suddenly and fancifully into the surface of the near side of the Moon (see figure 3). The projected image is a ground-based telescope photograph from 1946 taken by the Lick Observatory on Mount Hamilton, California. Part of Kuiper's Moon-mapping program of the late 1950s and 1960s, the *Rectified Lunar Atlas* was created in collaboration with Whitaker, William K. Hartmann, and L. H. Spradley. This large format, bound atlas shows each limb area of the Moon as seen from directly overhead. Since it was made before lunar orbiters flew, it was necessary to create it by projecting telescopic images of the Moon onto a large white sphere (the precision hemisphere) and then rephotographing the sphere from directly over the area of interest. This corrected the distortion that happens when a round object is captured in a flat photograph. In doing this photographic work, Hartmann discovered the multi-ring structure of Mare Orientale and other basins which shaped his theories around the origins of the Moon. In 1974, Hartmann and Davis proposed that the Moon formed

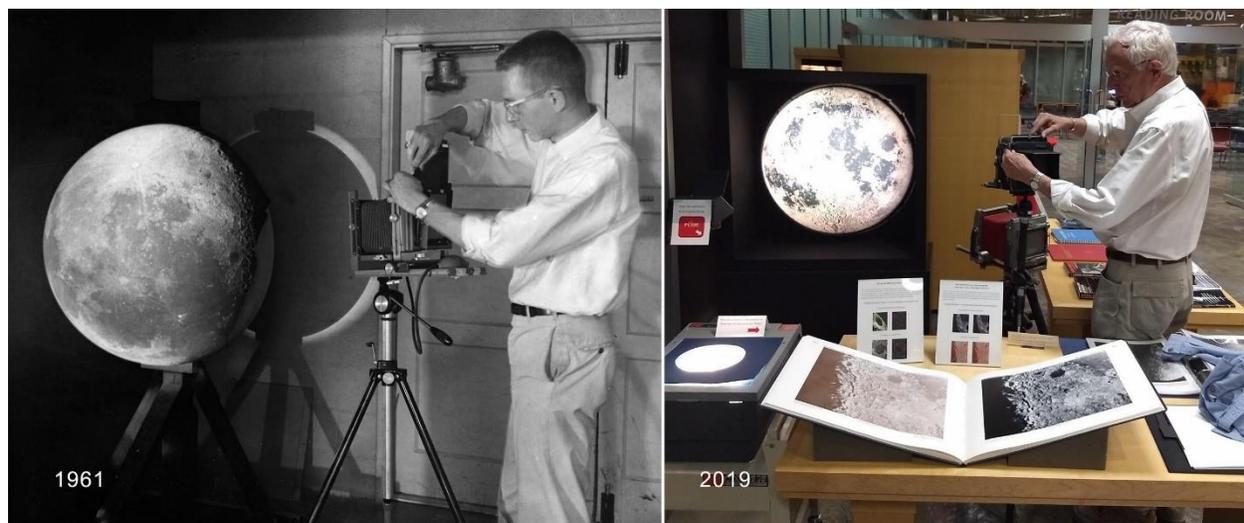


Figure 3. On the left, William K. Hartmann with the precision hemisphere taking photographs for the *Rectified Lunar Atlas*, 1961. On the right, Hartmann re-creates the image with the display in the *Moon* exhibit in Special Collections, 2019.

when a Mars-sized planet struck Earth and flung the top layer of the Earth into space, where the debris recombined to form the Moon. The Giant Impact Theory withstood forty-five years of scientific scrutiny and is currently in flux with several modified scenarios.

For years, the precision hemisphere was stored in a shipping crate in the basement of the Space Sciences Building on campus. During the earliest phase of exhibit planning, Stohtert-Maurer was in a meeting with Tim Swindle, Director of LPL, when he mentioned quite casually that they still had the artifact in their possession; Stohtert-Maurer quickly asked to borrow it. The task of mounting the hemisphere for exhibit was not an easy one. Cast in metal nearly three inches thick, the artifact weighs almost three-hundred pounds. Extensive coordination with LPL staff and the university's Carpentry Shop resulted in a custom display box supporting the artifact upright.

Stohtert-Maurer felt strongly about the inclusion of interactive components in the exhibit, as they allow viewers of many ages and interests to engage with exhibit items in tactile, revelatory ways. The precision hemisphere presented a unique opportunity for engagement that also solved a technical challenge related to its display over the entire exhibit period. Constant lighting of the hemisphere using a projector and computer would require staff to frequently replace expensive digital projector bulbs and troubleshoot computer issues. Use of an old-fashioned overhead projector and signage that invited participants to turn the projector on to see the precision hemisphere in action not only mitigated these issues but allowed viewers to interact with the precision hemisphere in a memorable way. With a push of a button, the sphere suddenly transformed from a strange egg in a box into the Moon. Kids enjoyed wiggling their fingers and creating snakes on the Moon. Two tables surrounding the precision hemisphere offered viewers further interactive items to enjoy, including a copy of the *Rectified Lunar Atlas* on book supports and a collection of other lunar-themed books and atlases. A binder included additional information such as a list of LPL's contributions to lunar science, poems from the forthcoming anthology *Beyond Earth's Edge: The Poetry of Spaceflight*, and interesting illustrations and correspondence

from the Whitaker Papers. The lunar timeline with cultural and scientific events in the history of the Moon that Cokinos put together was thirteen pages long—too long to use as a wall panel—but an iPad secured on a stand with kiosk software allowed visitors to flip through the timeline in a PDF format. The kiosk software locked the iPad to the file and reset back to the front page of the document after a set period of time.

The exhibit also featured a treasure trove of Moon-themed video game ephemera including *Moon Tycoon*, *Lunar Pool*, *Lunar Lander*, *Moon Patrol*, *Lunar Golf*, and *Lunar Rescue*. All of these items were borrowed from a specialized archive on campus, the Learning Games Initiative Research Archive (LGIRA). The Archive also loaned a miniature replica arcade game and two Nintendo controllers made out of cast cement. This collaboration resulted from casual conversation about the upcoming exhibit between LGIRA Curator and Professor Ken McAllister and Stothert-Maurer at a meeting of the University of Arizona Software Preservation Interest Group.

Finally, *Moon* incorporated two large-scale visual elements to attract viewers' attention and provide further cultural and artistic context for human understanding of the Moon. The back wall of the gallery space featured a fantastical painting by renowned space artist Robert McCall, whose personal papers, sketchbooks, paintings, and drawings are held by the University of Arizona Museum of Art (UAMA). Emboldened by the willingness of other campus entities to collaborate, Stothert-Maurer reached out to Jill McCleary, interim Director of UAMA, whom she had been in touch with recently to borrow a light meter, and asked flat out if Special Collections might also borrow a painting. The response was affirmative, and Stothert-Maurer was directed to UAMA's online catalog to make a selection. At first glance, *Visitation* appears to present a futuristic Tucson replete with saguaros and floating space stations under the embrace of a giant Moon. Looking closer, the viewer finds that they are standing on the future state of Mars, Earth floating in the sky above with our familiar Moon tucked neatly behind at the left like a small ear. McCall—an artist and illustrator for NASA also known for his work for films including *2001: A Space Odyssey* and *Star Trek: The Motion Picture*—created iconic visions of humanity's future in space that hold a distinctive place in the broader cultural understanding of space exploration. The exhibit also incorporated a looping video on a large screen with directional speakers. Created by Aengus Anderson, videographer and oral historian on staff at the University Libraries, the video featured interviews with lunar scientists, graduate students, the Director of LPL, and curator Christopher Cokinos. It additionally incorporated photographs and videos of the Moon including powerful high-resolution graphics. Written and narrated by Anderson, the video brought together the cultural and scientific themes of the exhibit and captured the passion the Moon invokes for poets and scientists alike.

Events.

To commemorate the fiftieth anniversary of the Apollo 11 Moon landing, the University of Arizona undertook a cross-campus initiative branded *moonfest*, which included the *Moon* exhibit and related events.²⁹ The University of Arizona plays a notable role in contemporary space science and exploration, and Southern Arizona is home to a large community of planetary scientists and amateur astronomers; interest in space exploration history is thus particularly high both on campus and off. The Apollo 11 anniversary evoked intense excitement, with units across campus eager to

²⁹ "50th Anniversary of Apollo 11," Flandrau Science Center & Planetarium, <https://flandrau.org/apollo>.

participate. This widespread interest naturally evolved into larger events, increased collaboration, and the overarching branding of the collection of events. Campus collaborators in *moonfest* included the College of Science, the Lunar and Planetary Lab, the Richard F. Caris Mirror Lab, University Libraries, Marketing & Communications, the Flandrau Science Center & Planetarium, Alumni Affairs, the Museum of Art, and the University of Arizona Press. Excitement extended well off campus and prompted collaborations with a wide range of organizations, businesses, and cultural institutions across Tucson including the Pima Air and Space Museum, Arizona-Sonora Desert Museum, Major League Baseball's Arizona Diamondbacks, Kitt Peak National Observatory, Tucson Children's Museum, Raytheon, Dark Sky Alliance, SpaceFest, the Planetary Science Institute, and local businesses including an independent cinema, bookstores, and an astronomy-themed bar. Over the course of the summer and fall, *moonfest* brought together these collaborators to present more than twenty-six events including lectures, open houses, film screenings, art exhibits, museum exhibits, curated tours, author talks, lunar observation, laboratory tours, and large-scale celebrations on July 20, 2019—the anniversary day itself. University of Arizona-related media coverage appeared in 577 news articles including NBC News, CNN, United Press International, *The Arizona Republic*, *Nature*, *The Conversation*, and *Forbes* in addition to campus news outlets.³⁰

The anniversary day itself, which luckily fell on a Saturday, featured four major campus events open to the public, including the opening day for the *Moon* exhibition. LPL hosted their annual open house known as Summer Science Saturday, with bigger-than-usual festivities to commemorate the Moon landing, highlight the university's involvement in the Space Race, and showcase other lunar research happening at the university. LPL hosted lecture presentations, exhibits, and book sales, with lectures given by distinguished lunar scientists Robert Strom, Jeffrey Andrews-Hanna, and William K. Hartmann. Congruently, Special Collections held the *Moon* exhibit opening, which included a virtual reality outer space experience with VR gear and demonstrations provided by the University Libraries staff. The demonstration was held in an adjacent instruction room, which turned into an ad hoc family space where small children could run a bit more freely while parents took turns viewing the exhibit. Appropriately, iconic MoonPies were served as a snack. Special Collections saw a record 539 attendees at these opening events between 10 a.m. and 4 p.m. The Flandrau Science Center & Planetarium on campus held *One Giant Leap Day!* with family-friendly Moon activities and special planetarium shows. The Richard F. Caris Mirror Lab conducted special half-hour tours of its facilities where innovative engineering and optical technology meld with manufacturing techniques to produce the largest and most advanced giant telescope mirrors in the world. For all four July 20 events, LPL co-funded the production of hundreds of Moon balloons using the finest high-resolution images of both the near and far sides of the Moon printed on mylar. The balloons were anchored and used as visual markers to guide visitors along a path to the four campus events. LPL drew over seven hundred attendees to their events, while Flandrau Science Center & Planetarium sold out of all shows and had over eight hundred attendees. Through the efforts of all four campus partners, these anniversary events created points of connection, spontaneous learning, and fun for public attendees, highlighting the university's crucial work and unique collections related to the Moon landings and space exploration.

³⁰ Pam Scott, email message to Stohtert-Maurer, July 22, 2019.

More traditional evening events at Special Collections associated with the *Moon* exhibit continued past the anniversary celebration. On October 2, 2019, Special Collections hosted “The Moon Is Still as Bright,” an evening of lunar poetry curated and shared by exhibit co-curator Christopher Cokinos and Julie Swarstad Johnson, Senior Library Specialist at the University of Arizona Poetry Center. Cokinos and Johnson presented poems focused on the Moon written across human history, from an ancient Sumerian epic to work by contemporary American poets including Robert Hayden, Anne Sexton, Archibald MacLeish, and Elizabeth Alexander. The contemporary poems, drawn from *Beyond Earth’s Edge: The Poetry of Spaceflight*, an anthology edited by Johnson and Cokinos and published by the University of Arizona Press in 2020, offered diverse perspectives on the Apollo Moon landings—diverse both in terms of the writers’ identities and their stance towards the Moon landings. These responses ranged from enthusiasm to outright skepticism about what it means for humans to “land upon a dream,” as poet May Swenson writes. The event brought poetry included in the exhibit to life through public reading and commentary, further linking the exhibit to contemporary voices in literature and providing another lens for understanding the Moon in cultural contexts. A reception following the event encouraged attendees to linger with the exhibition, connecting the poetry and discussion they had just heard with the materials on display.

On November 7, 2019, Special Collections and the University of Arizona Press co-sponsored “Kuiper and Apollo,” an event with author Derek Sears who presented his new biography *Gerard P. Kuiper and the Rise of Modern Planetary Science*, published by the University of Arizona Press in 2019. Sears describes Kuiper as a man who lived through some of the most dramatic events of the twentieth century and ended up creating a new field of scientific research—planetary science. Sears notes that as NASA and other space agencies explore the solar system, they take with them many of the ideas and concepts first described by Kuiper. The lecture was followed by an author signing and book sale. At the beginning of most lectures in Special Collections, the audience is asked for a show of hands to indicate first-time visitors; this event produced a large quantity of first timers indicating successful outreach to a new community. It was also at this lecture that attendee William Hartmann agreed to pose for the before-and-after shot with the precision hemisphere (see figure 3). The image was shared on the Special Collections Facebook page.

Other outreach activities included special tours of the *Moon* exhibit given by Stothert-Maurer to groups from other University Libraries departments including Access & Information Services and the University of Arizona Press, the LPL external advisory group, a bus full of visitors from a retirement community, and two large public tours organized through the University of Arizona Alumni Association during homecoming.

Conclusion

In line with definitions of successful exhibitions, *Moon* provided viewers with opportunities for spontaneous learning, promoted unique archival collections and rare books, and built and strengthened relationships with partners across campus. The exhibit accomplished these goals through collaborative curation that drew on the expertise of Special Collections staff and colleagues across campus. Historically relevant and visually engaging materials on loan from campus partners, together with thoughtfully developed exhibit text, signage, and interactive elements, invited viewers to linger and engage deeply with the materials on display. A variety of events offered at different times of day and in tandem with campus partners throughout the

exhibit's run provided opportunities for audiences of all ages and various interests to learn more about Apollo 11, the history of scientific understandings of the Moon, and the University of Arizona's vital connection to space exploration and space sciences. By focusing on a historic anniversary with broad appeal, and by timing the exhibition and events to coincide with other celebrations on campus, *Moon* reached new and wider audiences, introducing first-time viewers to the wealth of archival materials and rare books available to them through Special Collections.

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