Space Museums: Technical and Cultural Considerations

by

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Abstract

This thesis uses Alice Gorman's Space Race Model as a starting point for assessing how space heritage is narrativized in two national museums. The Space Race Model privileges the heroic actions of a small set of people and risks eclipsing alternative historical narratives, whether from marginalized communities, opposing standpoints, or feminist standpoints. Research was conducted at the Smithsonian National Air and Space Museum and the Canadian Aviation and Space Museum. Through the examination of text panels, object placement and exhibit context, this thesis shows that the Space Race Model is not the only way in which space is communicated to the museum visitor. These museums rely on internationalist narratives that disturb the traditional rhetoric of space flight and highlight international co-operation in space exploration and travel. There is extensive evidence of gender neutral language, and content that draws attention to histories of inequality and violence within space history.
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1 Introduction: Outer Space and Museum Narrative

On October 4, 1957, the USSR satellite Sputnik was launched. The launch of this satellite set off a chain of events that has shaped human space flight to this day. The American reaction to Sputnik reflected an ideology shaped by Cold War\textsuperscript{1} anxieties and a fundamental belief in the superiority of capitalism over communism (Gorman 2005: 86). This battle was manifest in the actions of space agencies and governments, and the language and rhetoric they used to convey an urgent necessity for space missions. The resulting "Space Race Model" of space narrative\textsuperscript{2} has shaped Western rhetoric surrounding outer space travel since the Cold War (Gorman 2005: 86). The USSR started out ahead of America in the race, claiming the first satellite in space, the first person in space, the first orbit of the Earth, and the first woman in space. However, Americans were the first to step foot on the moon. The moon became the finish line in which all other space achievements were measured against. Thus, the Space Race\textsuperscript{3} was won, and the Americans claimed superiority in outer space.

\textsuperscript{1} The Cold War refers to tensions between the United States and USSR from the late 1940’s to the early 1990’s. This period was so named as it is characterized not by on the ground fighting but by the stockpiling of weapons on both sides of the conflict.

\textsuperscript{2} Narrative is employed in this thesis to mean a story or overarching connection of events through story telling.

\textsuperscript{3} The Space Race refers to the competition which the United States and the USSR engaged in from 1957 to 1969 to prove technological and ideological superiority in the new realm of space flight. The Space Race ended when the United States landed on the moon successfully.
The Cold War has long since ended, yet the rhetoric that was used to motivate space travel in the 1960's is still currently prevalent in popular discourse (Tyson 2012, Aldrin 2012). However, space missions and space travel have changed since the 1960's and are now largely the joint effort of several different nations. The most striking example of this is the International Space Station (ISS). NASA characterizes the ISS as "as much a human achievement as it is a technological one" (NASA 2016). The ISS has drawn on the technical and human expertise of eighteen different countries since its launch (NASA 2016). Collaboration has become a hallmark of space exploration.

Human missions into outer space have produced material culture that are synonymous with the building of national identities, and are reproduced in national museums. However, museum visitors will have different cultural, historical, and personal views surrounding space missions that will also influence the interpretation of space artifacts. This thesis seeks to ascertain how such material culture and histories are exhibited in national museums in North America and how these institutions support or subvert the Space Race Model in displaying space heritage artifacts.

The Smithsonian National Air and Space Museum (NASM) and the Canadian Aviation and Space Museum (CASM) provide the locations for this critical analysis. The Smithsonian is one of the most famous and well-attended museums in the world (smithsonian.edu 2016), and boasts a large collection of artifacts pertaining to outer space. Many of the objects on display relate to the time of the Space Race, however there are also exhibits looking towards the present and future of space travel. I examined text panels, floor plans and object selection to determine what narrative or narratives prevail at NASM and CASM.
Alice Gorman offers a prevailing theory of the influence that the Space Race Model has had on different “spacescapes” on Earth (2005:85). In her article "The Cultural Landscape of Interplanetary Space", Gorman examines three different spacescapes, two on Earth and one on the moon, that provide evidence that the Space Race Model is the most prominent way in which space exploration is communicated at space heritage sites. When applying Gorman's model to NASM and CASM, it becomes clear that the Space Race Model is not the only way in which space exploration is communicated, and that, there are other modes of communication that nuance the story of human space flight.

Alice Gorman examines three different spacescapes outside the United States to prove that the Space Race Model is employed as a narrative tactic within countries that did not directly participate in the Space Race itself. In this vein, the second cultural institution I collected data in was CASM. Canada has a different relationship to space than America. Canada was not involved in the Space Race, nor has it competed to be superior to other nations in outer space. Nevertheless, Canada was the third space-faring nation in the world, and its robotic achievements have shaped the history of space exploration. The display strategies of CASM provide an example of a space narrative that exists outside the Space Race Model. This is not to suggest that CASM and NASM do not share methods of representation in the presentation of heritage objects in outer space, but that the methods that are used are nuanced and do not fit neatly into Gorman's Space Race Model. CASM’s exhibitionary narratives do not reproduce a competitive, race-between-nations rhetoric. Rather, CASM’s space narratives prioritize the

4 Gorman defines spacescape as “The places associated with space exploration…from designed space landscapes on Earth (launch facilities, tracking stations, etc.), organic landscapes in orbit and on the surface of celestial bodies (satellites, rocket stages, landers, debris), and beyond the solar system where only the Voyager space craft have yet ventured” (2005: 88).
internationalism of space exploration and the accumulation of achievements. Although exceptional objects and individuals are on display, little attention is drawn to their exceptionalism; these objects and persons are acknowledged for their contributions to society, or larger endeavours.

This thesis seeks to ascertain how the material culture and histories of space are exhibited in national museums in North America and how these institutions support or subvert the Space Race Model when displaying space artifacts and summarizing them in accompanying text panels.

1.1 The Importance of Space Narrative

Space travel is returning to prominence in global conversations. Whereas space travel was driven by national agendas during the Cold War and race to the moon, today space travel is being pursued by corporations and speculated to become an activity, if not a necessity, for mass numbers of human beings. How space is narrativized in public, political, and commercial spheres influences individual, national, and corporate imaginations of humans’ rights and responsibilities toward outer space. Museums have long played an important role in shaping public reception of colonial and imperial projects, initially as sites justifying expansion but more recently as sites for enacting post-colonial relations. This thesis contributes to on-going research interested in decolonizing space narratives in order to intervene in the construction of space heritage.

The genesis of the human space program is steeped in the competitive elements of the Cold War. This discursive strategy is at odds with the current international climate of space exploration. The object placement, object selection and text panel narratives at NASM and CASM communicate information about outer space material culture to the public daily. However, the
communication strategies of these heritage institutions suggest that the Space Race Model is not the only way that space heritage is displayed.

How humans come to conceive of the histories and current practices of space exploration will influence how space continues to be explored. In the age of space tourism, this conception of space narrative will also affect how outer space heritage sites are determined, preserved, and conserved. A precedent exists demonstrating how museums have been used to justify imperial and colonial projects and naturalize colonial identities. Recently, museums that purport both national and universal, or international, modes of display are actively participating in a decolonization process in order to create post-colonial identities. Academic literature surrounding this process is usually weighted towards discussing these trends in social, cultural, or natural history museums. That this is a process that exists in science and technology museums as well is largely underrepresented. The Space Race Model and the ideological and cultural assumptions that go along with it suggest that space objects are also representative of a historically situated cultural construction similar to any ethnographic object.

1.2 Literature Review and Framework

1.2.1 Popular Space Narratives

Neil deGrasse Tyson is a science and space popularizer and has been called the “(Carl) Sagan of this generation” (Achenbach 2014). Tyson is an American astrophysicist and the director of the Hayden Planetarium in New York City. He has written multiple essays and books about astrophysics and space travel. Throughout his writing, he has an awareness that space travel is not just a problem for engineers or physicists; it is laden with cultural values and ideology as
well. Tyson draws on the American space program of the 1960’s to prove this point. While many people can remember John F. Kennedy’s Rice University speech from 1961, Tyson quotes a part of Kennedy’s speech that is suggestive of the ideology behind the Space Race (and also appears on a text panel in NASM’s *Space Race* exhibit):

> If we are to win the battle that is now going on around the world between freedom and tyranny, the dramatic achievements in space which have occurred in recent weeks should have made it clear to us all, as did Sputnik in 1957, the impact of this adventure on the minds of men everywhere who are attempting to make a determination of which road they should take. (Kennedy, quoted in Tyson 2012: 192)

Tyson suggests that it is the political landscape that spurred the American government into action, not the idea of biological imperative or manifest destiny to reach the moon as the Apollo program cost “4 percent of the country’s budget” (2012: 192). However, within the same essay, Tyson falls into the trap that so many popularizers do by invoking, uncritically, explorers from the past as an example of when exploration is taken up purely for exploration’s sake. Tyson draws on Gonzalo Pizzaro to illustrate how difficult exploration was in 1540 and then how much more difficult space exploration will be in the future. He writes that: “hostile planets tend to be considerably more dangerous than hostile natives” (2012: 197). What is left out of Tyson’s equation is ethics and morality around colonization. Pizzaro was not exploring just to explore, but in hopes of gaining resources and wealth for himself and his country.

Space exploration may not be an exact 1:1 comparison to past exploratory efforts on Earth. However, the rhetoric that is employed to describe space exploration is certainly the same as the exploits of Magellan, Pizzaro, and Columbus. In this short chapter, Tyson at once shows an
awareness of the constructed, cultural narrative of space exploration. Yet, he simultaneously reinforces the overarching colonial narrative of space travel that has become common place.

Popular space narrative in the West draws on the powerful emotional connections to heroic and selfless explorers who act in the best interests of the entire world. Tom Wolf’s *The Right Stuff* (1979) exemplifies, to mimic Wolf’s writing style, good ol’ boys who are down at the cape tryin’ to reach the top by becoming the best damn pilot that anyone had ever saw. The source material for Wolf’s book *We Seven* (1962) collects the stories of the Mercury astronauts themselves and tells the heroic tales of these seven intrepid explorers who put it all on the line to achieve the dreams of a nation. Thus, the rhetoric around the American space program is that this was indeed an event of universal value that meant something equally to all Americans, and perhaps, the world. More recently, this rhetorical trend can be seen in movies like *Apollo 13* (1995) and *The Martian* (2015). These movies are twenty years apart but still employ the rhetoric of a male dominated industry where the best and brightest rely on their skills as heroes of the space age to make it back home.

There are examples of fictional works that try to take a more inclusive approach to space exploration. *Race to Mars* was a 2007 made for television series that had a crew comprised of astronauts from Canada, America, Russia, Japan, and France. When they reach the planet all the astronauts link arms and step out of their craft together. They are all the first people on Mars. However, the title is still *Race to Mars* and pits this international team of astronauts against a Chinese team who are hoping to get there first. Even when trying to present a more international perspective, space travel is still framed as adversarial. It is a competition to be won.
This rhetoric can be seen in the work of another popularizer of space: Buzz Aldrin, the second person on the moon. Aldrin has been quite vocal about the necessary direction he perceives the American space program must take. He has popularized the Twitter hashtag #GYATM (Get Your Ass to Mars) and has written a book entitled *Mission to Mars: My Vision for Space Exploration* (2013). In this book, he writes: “Many decades have passed since I climbed out of the cockpit of a supersonic F-100 armed with nuclear weapons, became an MIT egghead, and then a space traveler. Nowadays, my dedication, indeed my passion, is focused on forging America’s future in space” (2013: 17). Aldrin goes on to state that one of his main focuses is for America to continue “global leadership in space” (2013: 17). He then lays out how to use international connections in order to catapult America back to dominance in space. Most interestingly, Aldrin’s reasoning for not going back to the moon is: “We’ve done that, and to restart that engine is to rerun a race we won. Let’s take a pass on that one. Do not put NASA astronauts on the moon. They have other places to go” (2013:18). Aldrin does not think that another moon landing is necessary for America. Other countries can waste time doing something America did in the 1960s. For Aldrin, dominance is asserted by moving forward and continuing to achieve firsts within this competitive model of space rhetoric.

1.2.2 Academic Space Narratives

Alice Gorman is one of the current leading experts in the field of space archaeology. Her research ranges from highly technical papers on the debris in lower Earth orbit to articles that examine the social and political impact of material culture in outer space. For the purposes of this thesis, I will be using the latter to draw a parallel between Gorman's research of outer space objects and Earth based spacescapes and how space objects are treated in museums on Earth.
Gorman's most influential article, “The Cultural Landscape of Interplanetary Space” (2005), examines three cultural spacescapes and their significance within the dominant narrative of the American space program. Gorman determines that "The significance of space exploration is usually understood within a 'Space Race' model with a strong focus on the technological achievement of the USA and the Cold War relationship between the USA and the USSR" (2005:86). Gorman looks at Peenemünde in Germany, the Woomera rocket range and Tranquility base where the first moon landing took place.

Gorman takes a cultural landscape approach to discussing these spacescapes. The change in heritage management to include "heritage places, objects and values as embedded in a cultural landscape" (2005: 87) allows for the inclusion of these sites to be examined under the guidelines of the UNESCO World Heritage Convention that was expanded in 1992 to include cultural landscapes in the definition for protected sites (Cleere 1995: 63). This approach troubles the notion of wilderness within a colonial discourse. "A principle aspect of the cultural landscape approach is the reformulation of the notion of wilderness, the idea that a landscape can be untouched by the ravages of modern industrial society, virgin and pristine, and is worth preserving precisely because there has been no human interaction with it" (Gorman 2005: 87). The notion of the pristine wilderness directly ties into a predominant colonial discourse. Gorman uses this to examine how space exploration is generally thought of as 'for all mankind'. "If space exploration is an achievement to be celebrated for its global relevance, as the space industry believes, it is important to understand its significance for those outside the spacefaring elites" (2005: 88).
The three sites that Gorman examines exemplify the tension between outer space as an endeavour for everyone and the interest of first world nations. "In this popular and compelling version of space history, the interests of largely white male American astronauts, space administrators, scientists and politicians are presented as universal human values" (2005: 86). Peenemünde, Germany was the site of a warehouse that used concentration camp labour to create the V2 rocket. The forced labour camp was overseen by Wernher von Braun (2005: 89). The V2 was then co opted for the American space program and eventually was the rocket that made it possible for the United States to land on the moon. Peenemünde is now a tourist destination that has been redeveloped after accusations of white washing (2005:92). Gorman quotes Roland Speth at length as he recounts his visitor experience at Peenemünde:

Wandering from one exhibit to the next, the visitor is being dragged back and forth between admiration for the technical solutions already developed in the 1940's and the disgust of the objectives they were supposed to achieve and of the means by which they were put into reality involving the forced labour of captives... Sometimes you can read about Peenemünde being the birth place of rocketry for the exploration of outer space – and in the end, this is perhaps true. But the spirit in which this development was performed, was very much a military, i.e. a destructive one. (2005: 92)

Gorman's second example is the Woomera rocket range in South Australia. This space was used to launch missiles for the US, UK, Australia and Europe beginning in 1949 (2005: 93). However, the use of this land saw the indigenous people of the area under pressure to leave their territory (2005: 95). "A number of factors made Woomera a good choice for a rocket range in 1947. Not least among them was the perception of the area as remote, arid and devoid of people" (2005: 94). The colonial impetus to expand and to perceive land as for the taking contributed to the displacement of the Kokatha and the taking of land to further military interests.
Gorman's third example is Tranquility Base, the site of the first lunar landing. Again, this site is heavily tied to colonial intentions, the concept of wilderness and an uncritical employment to frontierism and American exceptionalism. Conquering space became a priority after the USSR launch of Sputnik in 1947. An ideological war began over who would reign supreme in the cosmos. "Space was often referred to as the 'high frontier' in the USA and the parallels with the conquest of the American West were explicitly drawn. It was new untamed wilderness, a virgin landscape, a 'moral vacuum' waiting to be filled with value" (2005: 99). The unprecedented interest and money that was focused on NASA is evidence that that 'moral vacuum' should be filled by a capitalist country. This site also exemplifies the tension between an endeavour that has been seemingly undertaken for the good of the entire world and that the reality falls far short of the ideal.

In “The Cultural Landscape of Interplanetary Space” Gorman's treatment of these three spacescapes is instructive to this research in the following ways:

1) The tension of space being an effort taken up on behalf of everyone on the planet is not without critique. I examine how this is reflected in museums that display space artifacts.

2) Colonial rhetoric is a common theme in both museums and space exploration. It is tied to both frontierism and exceptionalism as well. I examine whether this is evident in the display of space objects in museums.

3) The example of Tranquility Base gives insight into the potential for off – world world heritage. Using examples of current space object display techniques I look at the potential for
how future space tourists may encounter cultural heritage objects beyond Earth in an inclusive way.

Other scholars have drawn attention to the ideological interplay of space flight, especially during the Cold War. Andrew Chaikin examines the social impact of the Apollo program. He investigates how the moon missions were framed and the effect this had on society. "Apollo was set in motion by geopolitical, cold war concerns that had little to do with exploration: President John F. Kennedy saw the lunar landing challenge as a way to best the Soviet Union and show the world the strength of a free society" (2007: 53). The assumed universal nature of the achievements of Apollo are summed up by Chaikin in the use of opposing popular compositions of the time. "American Moon" performed by Bobby Dimple and the Lunar Ladies presents a typically nationalistic tone:

Apollo Eleven delivered our heavenly right to say,  
'The man in the moon is a citizen of the USA'  
Stand up and brag for your grand old flag  
Waving on the moon tonight, oh yes,  
Waving on the moon tonight. (2007: 57)

Chaikin juxtaposes this song with a poem by Gil Scott-Heron, who highlights the racial inequalities going on in America during the time of the lunar landing:

A rat done bit my sister Nell.  
(with Whitey on the moon)  
Her face and arms began to swell.  
(and Whitey's on the moon)  
I can't pay no doctor bill (but Whitey's on the moon)  
Ten years from now I'll be payin' still.  
(while Whitey's on the moon.) (2007:57)

Chaikin’s juxtaposition between these two works highlights the problematic nature of assuming that the Apollo 11 moon landing was an event that had universal value. Even within America,
landing on the moon was not perceived to have the same impact on all peoples. Gil Scott-Heron’s poem draws attention an alternative perspective of American minority feelings towards the moon landing in the 1960s. Ultimately, Chaikin’s article is optimistic about the overall impact of the Apollo program, and suggests that the moon landing missions will serve as a first chapter to exploration beyond Earth (2007: 65).

As national museums in settler-colonial countries, both CASM and NASM present opportunities to investigate the ways space narratives uphold, deny, complicate, or ignore colonial narratives. Linda Billings, a research professor at the George Washington University School of Media and Public Affairs echoes Gorman’s sentiment: "The rhetoric of space advocacy exalts those enduring American values of pioneering, progress, enterprise, freedom, and rugged individualism, and it advances the causes of capitalist democracy" (2007: 484). In this way space flight is framed as a "necessary, even biologically driven, enterprise" (2007:488).

Billings also draws attention to space advocates who draw on this language to represent space flight as an imperative that must not be ignored. Gerard K. O'Neill of Space Studies Institute stated one of the reasons to explore space is "our spiritual need for an open frontier. The ultimate purpose is to bring humanity.... a real expansion of our spirit" (O'Neill quoted in Billings 2007: 491). Linda Billings highlights the rampant "Americanism" (2007: 484) that is prevalent in the rhetoric of space and examines the relationship between narrative and spaceflight in her paper "Overview: Ideology, Advocacy, and Spaceflight – Evolution of a Cultural Narrative". Billings discusses American exceptionalism and the influence this has on an overarching cultural narrative of outer space missions. "According to this ideology, the United States is and must remain 'Number One' in the world community, playing the role of political, economic, scientific,
technological and moral leader. That is, the United States is and must be exceptional" (2007: 483). Billings draws on anthropologist Clifford Geertz and his concept of thick description to investigate the symbolic meaning of language used to describe endeavours in outer space. She problematizes the notion of biologically driven imperatives to explore (2007: 488) and that progress itself is directly tied to exceptionalism, colonialism, and frontierism. She quotes Patricia Nelson Limerck stating: "Space advocates cling to the frontier metaphor, conceiving 'American history [as] a straight line, a vector of inevitability and manifest destiny linking the westward expansion of Anglo-Americans directly to the exploration and colonization of space'" (2007: 487). Billings ties space rhetoric to a moral choice that reinforces a cultural myth. "This rhetoric conveys an ideology of spaceflight that could be described, at its worst, as a sort of space fundamentalism: an exclusive belief system that rejects as unenlightened those who do not advocate the colonization, exploitation, and development of space" (2007: 495).

It is the contention of this thesis that the Space Race Model is the prevalent discourse through which the Western public has come to understand crewed missions in outer space. The Cold War rhetoric that this type of discourse evokes is steeped in competition and American exceptionalism. Even seemingly innocuous literature that draws on "human spirit" or a need for "heroes" in space (Billings 2007: 491, Miller 2007: 512) convey the notion that it is the destiny of humankind to travel to the stars. Moreover, it is the destiny of America to be there first.

Legacies of the Space Race Model can be seen in fiction author Ron Miller's reasoning for why the public is no longer as interested in space as they were in the 1950's and 1960's: "I believe this is largely due to the fact that we *are* in the midst of the Space Age and no longer at its threshold. There are few great 'firsts' any more to claim newspaper headlines. There is no race upon which
to base national pride" (2007: 512). That success in space is tied to competition is a common theme that continues to prevail.

It is also the contention of this thesis that space travel is as much a cultural construction as it is anything else. The type of language that is used to describe space both in popular and academic circles in the West points to one way in which museum visitors can come to understand and engage in the conversations surrounding outer space missions. Therefore, space objects that are housed in museums can be looked at through the lens of ethnographic museology. This is a lens that is largely ignored when discussing science and technology museums. The following section draws on an ethnographic museum framework to suggest that space museums engage in the politics and poetics of representation just as much as any traditional history or ethnographic museum. Space objects cannot be discounted from the group of museum objects traditionally referred to as ethnographic. These objects carry cultural meaning, are symbolic, and create a narrative when juxtaposed against other space objects in a museum setting.

1.2.3 The Poetics and Politics of Display

To understand how the Space Race Model intersects with space museums, I have drawn on Henrietta Lidchi's "The Poetics and Politics of Exhibiting Other Cultures." Lidchi is speaking to ethnographic museums in her work; however, this framework can be applied to aviation and space museums as well. Lidchi's constructionist view of display mechanisms borrows from semiotics to expose how the use of specific display methods in museums creates meaning. Lidchi defines the poetics of exhibiting as "the practice of producing meaning through the internal ordering and conjugation of the separate but related components of the exhibit" (2013: 168). She
defines the politics of display as "the role of exhibitions/museums in the production of social knowledge" (2013: 185).

I employ Lidchi's frame to examine the poetics and politics that are represented at both NASM and CASM through the display of space artifacts. The traditional Space Race Model cannot account for the display techniques at both institutions or even within each institution. What these exhibits denote and connote is more nuanced and does not have a master narrative.

Lidchi's framework is also aware of the power relations that are present in displaying objects and providing text about them in museums. She writes: "Museums do not simply issue objective descriptions or form logical assemblages; they generate representations and attribute value and meaning in line with certain perspectives or classificatory schemas which are historically specific" (2013: 160). These assemblages create ways of knowing objects and relating to them in a curated and specific way based on the institutional mandate of the museum, the curator's influence, the relationship to other objects and the text that has been chosen to represent that particular object.

The influence of the Space Race Model on space objects then, can shape the way that the public comes to understand space travel. For an examination of the influence of museum exhibits on visitors and how they consume them Falk and Dierking's seminal text *The Museum Experience Revisited* provides a framework for how visitors engage with museums using the Contextual Model of Learning (figure 1). Their analysis is based on three forms of visitor engagement, the personal context, the sociocultural context and the physical context (2013: 26).
The personal context encompasses the identity related motivations for visitors to go to a museum. Falk and Dierking have identified seven different groups of people who are most likely to visit a museum and what their motivations are for visiting (2013: 62). Each group of visitor is representative of a different reason for engaging with museums. Falk and Dierking show that there are diverse and intersecting motivations that people may choose to attend a museum and why museum going may fulfill a specific identity related need.

The sociocultural context takes into consideration all the previous experiences and knowledge a visitor is walking into the museum with. Museums do not exist in a vacuum and the visitor brings with them all of their own prior experiences when engaging with a museum exhibit. Further, museum professionals do not create an exhibit in a vacuum either. Their own biases, knowledge, and experiences play into how an exhibit is formed.

The notion of a societal view of museums likely does not come as a surprise.
As we commented earlier, people grow and develop within a cultural milieu that influences their language, customs, values, and thought process. Historically, museums were created to preserve things deemed by dominant members of society as valuable and precious, worthy of keeping and caring for. From early on in history, museums also have played learning and educational functions in societies; that is, society deemed the contents of museums worth knowing and learning about. (2013: 66)

Therefore, museum visitors may have different perceptions of museum exhibits based on their own situated knowledge (2013: 66). Like culture itself, this knowledge is always in flux. A tension can be created when a museum is looked at as an authoritative institution that deals in facts; these facts can be at odds with a personal view/knowledge. "Not only do visitors arrive at museums with clear interests, museum visitors are also not blank slates with regard to knowledge. Visitors arrive with expectations and identity – related motivations for a visit, they arrive with interest, and they also arrive with a wealth of previously acquired knowledge, skills, beliefs and attitudes" (2013: 94).

The physical context encompasses the actual museum and how visitors engage with it. "The physical context factors strongly influence how visitors move through the museum, what they observe, and what they remember" (2013: 28). Here Falk and Dierking use their immense amount of visitor research to examine how visitors interact with exhibits and objects on display. Some key points include how the expectation of seeing stuff is still the primary motivation for visiting a museum. Also, that it is rare for a visitor to view every exhibit or even everything in a single exhibit. They also find that while visitors do read text panels, they by no means read all of them (2013: 128). "Visitors utilize their entering experience, interests, expectations, and knowledge to actively choose what to see and do and why" (2013: 128).
The authors' research shows a trend towards museum patrons attending exhibits that reinforce preconceived notions on the visitor's part and that visitors will tend towards visiting museums/exhibits where they have some prior knowledge or interest (2013:94). The Contextual Model of Learning reinforces that identity related motivations for visiting a museum are always in flux and are constantly being negotiated. Therefore, a curator can no more anticipate the reaction to an exhibit than they can produce an exhibit that will have the same effect on everyone. The notion of visitor expectation subverts this, in that museums strive towards the fulfilment of anticipated visitor needs and/or goals. Breaking down personal, sociocultural, and physical contexts within the museum facilitates a broader understanding of varied ways in which patrons consume an exhibit. "All museum visits, as well as the meaning brought to and taken away from them, can be understood as occurring at the intersection of these three contexts" (2013: 26).

It is outside the scope of this thesis to examine visitor studies at NASM and CASM. I am drawing in Falk and Dierking's considerable visitor research to server here has a guidepost to acknowledge the situated nature of the visitor's engagement with museum exhibits and as a means for critically engaging with Lidchi’s poetics and politics of display. Curatorial intention is but one part of a museums shape public understanding. In this vein the use of Falk and Dierking seeks to provide a lens through which to examine visitor interactions. Throughout the thesis. I return to Falk and Dierking to examine how visitors might be interacting with the exhibitions they are visiting.

Ivan Karp and Steven D. Levine, who come to museological studies from the world of fine art discuss the negotiated nature of museum exhibits in *Exhibiting Cultures: The Poetics and*
Politics of Museum Display. This book is a collection of articles from a conference that included panels on culture and representation. Karp and Levine explore museums as a Western tradition and the power dynamic that that creates. "The multiple gazes found within and among cultures make far more complicated the great debates of the museum world" (1990:12). Therefore, the meaning of an object is not inherent in its objectness Lidchi describes. There is no stability of meaning simply because the object itself is stable in that it exists and is on display (2012:162). Karp and Levine speak to Lidchi and Falk and Dierking by writing: "All exhibitions are inevitably organized on the basis of assumptions about the intentions of the objects' producers, the cultural skills and qualifications of the audience, the claims to authoritativeness made by the exhibition, and the judgements of the aesthetic merit or authenticity of the objects or settings exhibited" (1990: 12).

Steven Greenblatt, an English professor at Harvard University, speaks to the resonance and wonder of objects and the effect this creates on museum visitors. In his article “Resonance and Wonder” (1990) Greenblatt speaks specifically about exhibition methods surrounding fine art. Greenblatt defines resonance as: “the power of the displayed object to reach out beyond its formal boundaries to a larger world to invoke in the view the complex, dynamic cultural forces from which it has emerged” and wonder as: “the power of the object to stop the viewer in his or her tracks, to convey an arresting sense of uniqueness, to invoke an exalted attention” (1990: 42). Greenblatt’s ideas of resonance and wonder can be employed when the visitor encounters space objects. At the outset of this research, the overarching goal was to determine how narrative is employed to reinforce preconceived notions of space travel. However, after visiting both NASM and CASM, it was found that there is largely an absence of narrative on the text panels in both museums. This does not imply that a narrative does not exist. An absence can be just as revealing
as the presence of narrative. Greenblatt can speak to the display strategies within these institutions as they often invoke wonder; the power of being in the presence of a space object. On a few occasions, resonance can also be seen, like in NASM’s *Space Race* exhibit (see Chapter 2).

The absence of narrative and the invocation of awe speaks to Gorman’s Space Race Model and to an assumption of the preconceived notions of the visitors who enter the museum. A lack of narrative suggests that the visitor already has a concept of the significance of the museum object.

The Space Race Model finds an opposite in what I have termed the Internationalist Model\(^5\). This model divests itself of the national, exceptional rhetoric and assumptions of the Space Race Model. However, like the Space Race Model, there is a homogenizing of intentions that assume concepts like universal value can speak to all the people of Earth equally. John Merryman provides a look at cultural property through both international and national lenses (1986, 2005). Merryman writes that the concept of internationalism can be just as limiting as a national rhetoric. Often, cultural property that is deemed international or institutions that subscribe to an international model use this as a stand in for universal value. Merryman’s look at international cultural property highlights a different and possibly problematic notion that internationalism can also create a grand narrative, similar to a Space Race Model. Merryman draws on UNESCO rhetoric to expand on the concept of the perceived universal value of cultural property. This research shows that the internationalist model that exists at NASM and CASM generally works to subvert a nationalist master narrative.

\(^5\) The Internationalist Model/ Internationalism seeks to privilege the accomplishments of all nations and decenters a United States based rhetoric.
1.3 Methodology

To ascertain the presence or absence of the Space Race Model within NASM and CASM I have drawn on a Foucaultian analysis which recognizes power dynamics that are situated historically within a dominant narrative (1969). Foucault speaks to how dominant, or master, narratives can be reinforced by governmental power structures which in turn is inscribed on the public, who then reinforce this dominant discourse on their own. This mirrors the museum visitor’s experience within a national museum that is potentially reinforcing a dominant narrative upon the museological exhibits on display. However, this narrative can also be reinscribed by the visitor who seeks out museum exhibits that reinforce their preconceived notions on a subject (Falk and Dierking 2013:94).

1.3.1 Selection of Museums

The NASM, including the Udvar Hazy satellite site, and CASM were selected for this research based on several criteria. NASM is a national museum created by one of the two nations that engaged in the Space Race. The American space program actively shaped the rhetoric of the Space Race Model. NASM has an unrivalled collection of space objects and leads in visitor attendance for any air and space museum in North America.

The analysis of a Russian museum may have played the most direct counterpart to this research however; language barriers prevent the author from fairly assessing Russian text panels for their narrative structure as well as assessing those structures within a larger Russian museological structure. This is a site for future, more expansive, research on this topic.
CASM was selected in order to assess whether the Space Race Model is actively engaged in outside of the United States. Canada’s space program has its own set of firsts and is the third space faring country in the world. However, Canada did not actively participate in the Space Race. Alice Gorman, when developing her Space Race Model looks to areas outside the United States where this type of narrative exists. Her sites Peenemünde, Woomera and Tranquility Base have all been inscribed with the Space Race Model in a dominant narrative of space exploration. It is therefore instructive to look at a Canadian museum in order to determine the prevalence of the Space Race Model and to determine if other narrative models for space exploration exist.

1.3.2 Data Collection
I conducted data collection for this research in two national museums: the Smithsonian National Air and Space Museum (including the satellite site in Virginia, the Udvar Hazy Center) and the Canadian Aviation and Space Museum. Data collection at NASM and Udvar Hazy took place over three days, from October 15 to 17th, 2015. Data collection at CASM took place on November 15th, 2015. In both museums, I took extensive photographs of objects and text panels. I also worked with the floor plans of each museum to see which objects were highlighted and to assess the overall lay out of the objects. During data collection I focused specifically on exhibits that had objects from crewed missions in outer space, but I also took account of the unpiloted missions as well as the aviation exhibits. I analysed 232 photographs that I took from CASM and 496 photographs from NASM (inclusive of both text panels and object photographs). Text panel and object photographs were printed in hard copy for analysis.
1.3.3 Data Analysis

Text panels were initially assessed for broad significance. I looked at whether the text privileged a historical, technological or social context. These broad categories were sorted into piles and colour coded. Then I coded for more specific concepts and terms. These concepts included: exceptionalism (first, fastest, powerful); frontierism (pioneer, destiny, uncharted); colonialism (colony, conquer, inhabit); internationalism (international, collaboration, co-operation); inclusivity (manned, mankind, humanity); corporatization (corporate, logos, company names); militarization (army, war, weapon). (for a full list of terms and concepts used see Appendix A). Each occurrence was colour coded as well (for an example of colour coding see Appendix B). The text panels were taken as a whole in that, if there were two instances of colonial language on one panel, it was only counted as one occurrence. Length of text panel was not assessed. Occurrences of each category were counted up and compared to the total number of text panels that were assessed in each museum respectively. This provided an estimation of how often each term and concept were used and what type language was prioritized on each text panel. It also produced initial patterns and insights warranting further investigation.

The use of inclusive language, such as “crewed” rather than “manned” was initially investigated as potential evidence of de-colonizing and inclusive museum practice. Gender neutral language is also privileged by NASA within their own communications, indicating a need to more carefully narrate humans’ voyages into space so as not to occlude or elide the role of women in those stories. Determining how often these narratives tropes are present in the museums’ text allowed for comparison of the ways the two museums convey space missions to the museum visitor, and also to look for patterns related to the age of exhibitions, curatorial decisions, spatial
distribution, or other potential factors. For example, of the 164 text panels that I analysed at the National Air and Space Museum (including the Udvar Hazy site) I determined that there were fifty four instances of exceptionalist language; 33% of text panels reflected the first, fastest, or best type of object according to the museum curators. This language most frequently occurred around the Space Race and Apollo to the Moon exhibits. This is indicative that, while Gorman's Space Race Model may be present in some exhibits at NASM, it is not the only way that space is conveyed to the public. The Canadian Aviation and Space Museum has a much smaller exhibit on space, however, of the 50 text panels analysed only five had occurrences of exceptionalist language. This preliminary finding prompted the question: If CASM is not focused on the best achievements, how is outer space communicated to the visitor? The analysis of the text was an important means of understanding the “politics” of the exhibition and the creation of social knowledge as described by Lidchi. To this end, I also noted the choice of topics presented in the exhibitions and how they were framed using specific kinds of language.

The layout of the museum was analysed to see if the position of objects in the museum was relational to their importance within the Space Race Model narrative. The objects were also examined in relation to each other to see what type of narrative was being crafted through exhibiting objects together. This analysis was achieved by examining the photographs taken of the exhibits in relation to their positioning on the floor map. Pictures that showed the exhibit as a whole were used as guides to put individual pictures of objects in the context that they would be see in the museum. One of the immediate findings was that an object considered of great importance to the exhibit would usually be featured in a place that could not be missed by the visitor. This is an indication of the “poetics” of the exhibition as described by Lidchi. The spatial qualities of the exhibitions are also central to imagining how various visitors might interact with the exhibition as a whole and its component parts.
1.3.4 Thesis Findings

The findings of this research indicate that, while Gorman’s Space Race Model certainly exists in
the narrative of both NASM and CASM, it is by no means the only way in which space is
communicated to visitors throughout either museum. The most surprising finding was that the
Space Race Model was communicated through a lack of narrative as opposed to a discursive
method of communication. Most text panels analysed at both museums had little to no narrative.
The lack of narrative suggests an assumption on the museum’s part that these space objects can
speak for themselves and that the visitor will have some prior knowledge of the cultural context
that these space objects are situated in. The text panels consisted of facts like height, power,
weight, capabilities, dates of use etc. Rarely did text panels convey a story behind the technology
that it represented.

Most interestingly, when a story was conveyed it usually subverted the Space Race Model,
connecting alternative histories to the technology or event that was being described. For
example, at NASM, the V2 rocket was not just touted as the technology that won the moon race.
There were text panels that acknowledged the V2’s history as a result of concentration camp
labour and as a weapon of war used to bomb Allied countries during World War II (See Chapter
2). CASM likewise has exceptionalist moments within the display of their space objects, but this
is largely subverted by an internationalist perspective that privileges Canada’s cooperative
efforts in space as opposed to singular achievements.
This suggests that while the Space Race Model is dominant in popular discourse and prevalent in certain cultural landscapes throughout the world, NASM and CASM both nuance this model by providing alternative discursive methods to subvert the master narrative of the Space Race Model.

In Chapter 2, NASM and the Udvar Hazy Center are looked at in depth. After a brief historical introduction to the museum, several exhibits are spoken about in depth for their contribution to, or subversion of the Space Race Model. Further, the poetics and politics of the display methods at NASM are explored at length. NASM’s engagement with the objects from the Space Race initially suggests that Gorman’s model might be prevalent throughout the museum in communicating an overarching story of space flight. This, however was not the case and this research finds that there are nuances to NASM’s space exhibits that provide a more holistic view of America’s engagement with outer space from 1957 onward. Certainly, there was evidence of the Space Race Model; a privileging of American achievements, downplaying of setbacks/disasters and a highlighting of the Apollo program as the pinnacle of space flight achievement. This is not the only narrative at NASM and therefore it must be taken into consideration that the Smithsonian engages in several different narrative strategies that both enforce and subvert the Space Race Model.

Chapter 3 looks at CASM to determine if the Space Race Model is present in a cultural institution whose country did not participate in the Space Race. A brief introduction is followed by an in depth look at several objects and small exhibits, framed by the poetics and politics of exhibiting to determine how Canada’s space program is presented to museum visitors. Largely, an internationalist model is employed to highlight cooperation with other nations aboard the ISS.
There is a de-prioritizing of Canadian space history in favour of this international narrative. This can be seen most evidently in that the history of Canada in space is told through only text panels after the visitor exits the main exhibit. There are no objects associated with this portion of the exhibit and, as the main exhibit is over, one could conceivably imagine these text panels being skipped over by visitors. CASM does present evidence of an exceptionalist narrative in the highlighting of Chris Hadfield over all other astronauts in the exhibit.

Chapter 4 is a speculative look to the future of space museology. With the knowledge of a more nuanced narrative of space exploration from these two national museums, how does this affect the display of space objects moving forward? Further, this chapter looks to the age of space tourism and the potential for heritage spaces off Earth. In the near future, space tourism will become a part of life and it will be necessary to examine what and if space objects should be protected. This chapter examines how current and evolving space narratives can and will speak to the future of museology in outer space.
Chapter 2  
The Smithsonian National Air and Space Museum

2 Background

NASM houses one of the largest collections of aviation and space artifacts in the world. The museum is one of the most visited in the Smithsonian complex, reporting 3.5 million visits from January to June 2016 (newsdesk.si.edu 2016). Since the museum opened the museum has had an estimated quarter of a billion visitors from around the world (Smithsonian 2009:1). Situated on the historic Mall in Washington, DC, the building consists of four marble cube structures connected by three large glass atria (Figure 2). This design facilitates the accommodation of some of the larger artifacts on display.

![Figure 2 NASM (© airandspace.si.edu)](image)

NASM opened on July 1, 1976, three days before America's bicentennial. The timing was also precipitated by the launch of the Viking space craft. Viking's mission was to give the world its first glimpse of the surface of Mars. At the opening ceremony for NASM, the Viking space craft
sent a signal from space to a robotic arm holding scissors that actually cut the ribbon and signified the opening of the museum (Smithsonian 2009: 4). The museum received a record amount of visitors in the first month and continues to this day to be one of the most popular museums globally (2009: 4). One can imagine the technological wow factor of having a spacecraft, currently on its way to a different planet, open a museum. According to NASM director, John R. Dailey, the museum's purpose is to "commemorate, educate and inspire" (2009: 1). Dailey further elaborates the museum's mission:

Our official purpose, to paraphrase the law that established the Museum, is to memorialize the national development of aviation and space by collecting, preserving, and displaying historical artifacts, engaging in historical and scientific research, and providing educational opportunities for the public. (2009:1)

On December 15 2003, two days before the 100th anniversary of the Wright Brother's first flight (2009: 11), NASM opened a secondary site in Chantilly, Virginia (Figure 3). The Udvar Hazy Centre deemed America's Hanger eclipses the museum on the Mall in size, displaying over one hundred different airplanes as well as rockets, missiles, and the space shuttle Discovery. With the opening of the Udvar Hazy Centre, NASM was able to display more of their collection than at any given time. The Centre also features a catwalk where visitors can look in on conservators who are working to fix, restore and/or preserve museum artifacts.
NASM puts emphasis not only on public displays of artifacts, but on research as well. The institution has five major divisions which represent the collections, preservation, archives, history and research focus of the museum. These departments consist of an aeronautics division, a space history division, the centre for Earth and planetary studies, a collection division and archives. NASM is concerned not only with the preservation of past space and aviation history, but also research on future and current space science. The museum has an annual budget of $26.7 million which is made up of both federal funds and the Smithsonian trust (newsdesk.si.edu 2016). The excitement and interest which NASM inspires is directly tied to their large collection of impressive artifacts which represent aviation and space history in America. NASM has over 63,000 artifacts (newsdesk.si.edu 2016) and features everything from Orville and Wilbur Wright's airplane to a lunar excursion module and beyond. The collection is representative of the
American efforts in air and space and with nods to British, French, German, and Soviet influence throughout the museum.

2.1 The Poetics and Politics of NASM

Five exhibit spaces were analysed in depth at NASM: *Milestones of Flight, The Space Race, Apollo to the Moon, Moving Beyond Earth*, and *The Space Hanger*. Analysis of these exhibits suggest that there is a presence of the Space Race Model in the form of frontierism and exceptionalism. However, there are many display strategies that subvert the Space Race Model as well and present a more nuanced, heterogenous, Internationalist narrative.

Upon entering the museum, a visitor first encounters a hall entitled *Milestones of Flight* (Figure 4). The objects housed here are examples of many of the aviation and space firsts which have been achieved by America. As explained by NASM, the space was designed so that,

> the aircraft and spacecraft representing these and other epic achievements from the first century of flight surround you when you enter this gallery from the National Mall. No other exhibition space in any museum in the world conveys so powerfully how far we've come – and how fast – in the realms of aviation and space of features as many historic icons of flight as this, the National Air and Space Museum's grand entrance hall, *Milestones of Flight*. (Smithsonian 2009: 18)

This description from the museum's guidebook epitomizes the heavy emphasis on the best and most iconic examples of human flight.
The objects in this gallery all represent the first and the fastest. Generally, these objects are considered great leaps forward in space and aviation capabilities from an American perspective. This exhibit also seeks to demonstrate the relatively short time in which these advances in flight have occurred. From solo transatlantic flights to the face of the moon in forty-two years is an impressive and sublime feat. This is the first gallery that a visitor walks into, regardless of which of the two entrances to the building is used. The information desk is situated in the middle of the gallery so there is little chance that a visitor will miss these specific objects. This deliberate display method speaks to a curatorial desire that the visitor experience these objects which are representative of (mostly) American achievement. Objects in this gallery include Chuck Yeager’s Bell X-1, Charles Lindbergh’s *Spirit of St. Louis* and John Glenn’s Friendship 7 capsule from the Mercury program.
The Columbia command module is the most iconic object in an exhibit of iconic objects. Columbia is the command module that Michael Collins piloted during the Apollo 11 moon landing mission. Due to the way the Saturn V rocket jettisons its stages, the command module is the only part of the spacecraft that returned to Earth. Columbia sits in the middle of the Milestones of Flight gallery. Recall that this gallery is the first one that visitors enter. You cannot enter into the museum without passing through this area. If the visitor enters from the National Mall, Columbia is one of the first objects encountered. The command module sits on a pedestal, balanced on the tip of one edge so that the visitor has an unobstructed view of the heat shield and can walk around the entire module. There is a Plexiglas window where the visitor can look in and see the exceptionally cramped quarters that brought the three Apollo 11 astronauts home from the moon. The Columbia command module text panel is unlike any other text panel in the museum. Stylistically, the text panel mirrors the plaque that the astronauts left on the moon. It is basic black, with stark white writing. There are two panels that are gold in colour that edge the entire text panel. The text itself is a description of the essential information of the mission: the astronauts involved, the length of time, and that it was the first mission that landed on the moon.

To examine the narrative that Columbia creates for the visitor, Falk and Dierking would point to the previous knowledge that museum visitors have when they enter the museum. There is little information communicated about what actually happened on the Apollo 11 mission, the importance of the Apollo program or the meaning that this object carries to be discerned from the text panel. Because this is the first object of Apollo history that is encountered, the visitor would not yet have learned anything else about these moon missions. There is an assumption on the part

6 While this stylistic choice may not be apparent to every visitor, evoking the style of the moon plaque would potentially be apparent to space history buffs.
of the museum that this item is of such historical importance that (aside from some basic notes about the mission) the value and significance of this object is already present in the mind of the visitor and is inherent in the object itself.

The isolation of this object from other moon mission objects and milestone objects is part of its exhibitionary poetics. Columbia is sitting in the middle of the Milestones of Flight gallery and there is a wide berth between it and the other objects in the room. It is in the middle of the room and usually one of the first objects encountered. This imbues Columbia with an importance that suggests in a museum full of historical objects, this object is the most important. The distinct difference in style of text panel also separates Columbia from other objects in the exhibit and the museum on the whole. The presentation style of Columbia also works on the level of the politics of exhibiting because it is continuing to reinforce visitor knowledge that the first moon landing is the most important mission in the history of space travel. Lidchi (2009:166) draws from Barthes to suggest that there is a first level denotation of the object and a second level connotation. The denotation of Columbia is that it was a part of the historic Apollo 11 mission that returned astronauts safely to Earth. The connotation of Columbia is inherent in the display method chosen by NASM curators. This object is of high importance, one that should not be missed by any visitor who comes to the museum. Coupled with this is the sparse information on the text panel that suggests the visitor should already have some feelings about, or an understanding of, the value of Apollo 11 (Figure 5).
From this area in the museum NASM is divided roughly into space artifacts on the left and aviation artifacts on the right, if entering from the National Mall entrance. The exhibit space to the direct left is *Space Race* which displays artifacts from the American push for a moon landing in the 1960's. The Space Race began with the USSR's launch of Sputnik in 1957. Fuelled by cold war anxieties and the desire for dominance in the new frontier of space, America and the USSR began to wage a technological war (Figure 6).
A turning point in this race was John F. Kennedy's famous speech at Rice University in 1962. Kennedy charged America with landing a man on the moon by the end of the decade. This challenge heralded unprecedented interest and funding in NASA, the likes of which have yet to be seen again, which ultimately culminated in the Apollo 11 moon landing on July 20, 1969. The artifacts in *Space Race* tell the story of this complicated history. In this exhibit, there are several nods to the USSR and their efforts as well. Yuri Gagarin’s space suit is displayed prominently next to John Glenn’s (Figure 7). Gagarin was the first person in space; Glenn the first American to orbit the Earth.
The achievements of these two space flights were stepping stones to the moon landing. Gagarin's mission proved that, indeed, people could go to space and come back safely. Glenn's mission demonstrated that someone could spend an extended amount of time in space with few lasting side effects. The prominent display of these suits side by side show the interconnectedness of the American and USSR space programs even, if they were at the time, in competition with each other. The early success of the USSR drove America to enter onto the space stage, ultimately usurping USSR dominance with the moon landing. Further, the exhibit features a model of Skylab which represents the joint effort between the two nations to set up a permanent base in outer space as well as the Apollo–Soyuz test project. The exhibit displays artifacts not only from the Space Race, but also the eventual collaborations that these two space superpowers embarked on. The inclusion of extensive coverage of the USSR's initial success in space subverts the Space
Race Model of cultural narrative. The display of Gagarin's space suit next to Glenn's implies an equivalency. This perhaps is a false equivalency in that Gagarin was the first person in space, Glenn the third American in space. However, the visitor can see, even in an exhibit called *Space Race* that traditional notions of American exceptionalism are being subverted.

One of the biggest challenges to the Space Race Model is text panels that describe the V2 rocket and its role in the American space program. At the centre of the exhibit space there is the missile pit, a collection of artifacts which represent the progression of rocket technology. Most prominently displayed is the V2 rocket. One of the most instantly recognizable space craft is the Saturn V rocket. This 6.2 million pound behemoth is the largest and most intricate craft to be used by NASA to date. The rocket heralded the beginning of the Apollo space program and the push to send American men to the moon. The Saturn V was powered by V2 rocket technology which was the brain child of Wernher von Braun.

The accompanying text panel for the V2 rocket acknowledges a darker side to the history of human space flight. During the Second World War, von Braun manufactured the very same V2 technology in a factory in Peenemünde, Germany for the Nazi party. Concentration camp victim labour was used from the Mittelbau-Dora concentration camp in order to complete von Braun's work and manufacture the V2 rocket. The Saturn V rocket was literally built on the backs of holocaust victims. Von Braun became a hero of the American space program and the trust of the American public was put in a rocket that had bombed their allies and used victims of concentration camps as workers. When the camp was liberated, American soldiers had concentration camp workers return to the site in order to take anything of value regarding the V2 rocket before the Soviet Union got to it first. Johannes Erichesen writes: "Wernher von Braun's
post war involvement in the American Space program provided an excuse to glorify Peenemünde as the place where the technology for the moon landing was developed [Figure 8]. The fact that the Nazis used the place to build missiles to win the war was regarded as an unfortunate aberration” (Erichesen quoted in Gorman 2005: 92). Peenemünde has since become a popular destination for space tourists, and is uncritically touted as a place where the moon missions were born (Gorman 2005: 93).

Figure 8 Gallery 114 Space Race, NASM, text panel (Lindsay Marlies Small 2015)

NASM addresses this difficult history in their Space Race exhibit. The text panels reference the use of concentration camp labour, the unimaginable working conditions and the rush for the spoils by both American and Soviet soldiers once Peenemünde was liberated (Gallery 114 Space
Race text panel). It is also noted that von Braun surrendered to the US Army and that "plans were quickly made" to bring him and other German scientists to America (Gallery 114 Space Race text panel). What remains unsettling is that Von Braun's assistance in advancing rocket technology and the pivotal role of the V2 in winning the Space Race for the United States seemingly absolved him of his culpability of his role at Peenemünde.

The inclusion of this history suggests a subversion of the Space Race Model. Gorman critiques Peenemünde as one of her spacescapes that has been uncritically heralded as "the cradle of spaceflight" (2005: 93). However, the poetics of this exhibit suggest that the visitor is asked to think critically about the role that von Braun's technology has played in the American moon landing. The text panels show images from Peenemünde and do not hide the fact that the rocket technology was constructed by holocaust victim labour. Politically, the text panels for the V2 show the visitor a different side of the space program; that the technology that helped America get to the moon is steeped in a gross violation of human rights.

The Apollo program continues to be explored at great length through many different objects in the gallery Apollo to the Moon on the second floor of the museum. The opening text panel for the exhibit explains that Apollo was "one of the greatest feats of exploration in human history" (Gallery 210 Apollo to the Moon text panel). This aligns with the narrative of American dominance in outer space as well as the supremacy that was achieved by being the first nation to land humans on the moon. The Apollo to the Moon exhibit is not set up around one large or historically important artifact. As the title suggests, this exhibit is mainly a repository of Apollo program artifacts. However, it does feature objects from the Mercury and Gemini program as well. This exhibit consists mainly of smaller objects the astronauts used during their space
flights. The cabinets are full of cameras, medical kits, personal items and space suits. The emphasis here, according to the museum’s overview on its website, is the “unparalleled display of artifacts from Apollo and earlier missions that bring this sweeping endeavour down to a human scale” (airandspace.si.edu 2016). Curatorially, the intention is to help visitors relate more readily with the idea of space flight by showing items that astronauts used on a daily basis or took with them as mementos from home. For example, Walter Schirra and Tom Stafford brought a harmonic and bells on their Gemini 6 mission.

*Figure 9 Gallery 210 Apollo to the Moon, NASM, Walter Schirra and Tom Stafford's musical instruments from Gemini 6*

*Text Panel partially reads: These musical instruments were used by Walter Schirra and Tom Stafford to broadcast a rendition of the song "Jingle Bells" (© Harp Academy 2016)*

The exhibition space is dark, lit very sparingly, with a warren-like feel as you traverse narrow passageways through object cases and black walls. The overwhelming darkness, with brief interruptions of light, conjures a sense of being in space. The passageways are lined with items that exemplify the day to day of living and working in space. You cannot help but think of everything in the exhibit as having been to space—as “authentic” objects. Although these items are presented as everyday objects, by virtue of being in a national museum, they are imbued with importance.
The items are accompanied by tiny, straight forward text panels that state only what the item is and occasionally a story to accompany the object, like the musical instruments above. The poetics of such a display method suggest that space flight is not just a technological feat, but a human one as well. The personal items and equipment in most cases indicate who used them and on what mission. This adds a personal element to these objects. The politics then suggest that there are human beings behind the grand narrative of the moon landing. This too subverts the Space Race Model, as this exhibit attempts to show the visitor another, personal side of space travel that does not quite align with Gorman's narrative of a hegemonic American effort in space.

The final exhibit which solely focuses on human space flight is *Moving Beyond Earth*. This exhibit examines how space missions have taken shape after the moon landing. This exhibit is an example of the changing narrative of space flight. Far from the Space Race Model, *Moving Beyond Earth* suggests that access to space is changing and who gets to go there is also changing. A text panel about the Mir space station is entitled "Learning to Cooperate in Space" (Text panel gallery 113 Moving Beyond Earth). This is an acknowledgement of a changing tide of international cooperation in outer space. The text panel about the International Space Station (ISS) itself also features the flags of nations that contributed technology to the endeavour of creating a permanent station in space. The exhibit also acknowledges the changing diversity of the astronaut corps since the civil rights movements of the 1960's (Figure 10).
The language of this text panel acknowledges that there were, indeed, barriers to break in order to make it into the astronaut corps. Astronauts who were selected for the Mercury, Gemini and Apollo were all white men. The traditional narrative of space flight is steeped in the notion that these men and their values are presented as universal values and that "colonial aspirations of space-faring nations are eclipsed by a 'master narrative'" (Gorman 2005: 86). However, *Moving Beyond Earth* suggests that there is a more nuanced version of this statement. There are text panels that also speak to the changing way in which space is being accessed. Governments are no longer the sole way to reach space.
Figure 11 shows that not only is space tourism on the horizon, it is not just the United States that has a hand in it. This speaks to the necessity of international cooperation that present and future space missions will require.

One indication that the Space Race Model is still influential in space travel narrative is the way in which NASM has chosen to display objects from the Challenger disaster. The glass case (Figure 12) has various objects to honour and commemorate the explosion of the Challenger space shuttle. The case is very low to the ground and could be easily missed. The poetics of this exhibit strategy suggests a minimization of the tragedy that has befallen the space program.
While the subject matter is included, it is not highlighted and the display does not call attention to itself. This would align with Gorman's troubling of space narrative as solely focused on American exceptionalism and national pride.

![Image](image.png)

*Figure 12 Gallery 113 Moving Beyond Earth, NASM, Challenger ephemera (Lindsay Marlies Small 2015)*

NASM's secondary site The Udvar Hazy Center features the Space Hanger. This exhibit space houses several different milestone artifacts such as Mercury and Gemini capsules, models of a piece of a Saturn V rocket and rovers and the actual space shuttle Discovery. The section on the museum map describing the area these artifacts are held is entitled "Human Spaceflight." The Space Hanger itself is impressive even from the outside. Upon entering the Udvar Hazy, the space shuttle is visible in the distance below a giant American flag. The lighting choices for the exhibit coupled with the positioning of the shuttle give the visitor a sense of wonder in the way
that Greenblatt describes: the visitor is aware they are in the presence of a unique object (1991:42). (Figure 13)

Many of the objects at NASM and the Udvar Hazy Center draw on the display strategy of awe and wonder. The lack of narrative and contextual information within text panels suggests a museological opinion that the object can and should speak for itself (Post 2013:219). Udvar Hazy especially draws from this strategy that employs little narrative structure throughout the museum: “Udvar Hazy press kits referred to the mode of display as ‘enhanced open storage’” (Post 2013:219). The aviation section is loosely grouped into four different eras of flying. The Space Hanger’s text panels have very little narrative, but the objects are spatially grouped into four different areas: Human Spaceflight, Space Science, Applications Satellites and Rockets and Missiles. All of the rockets and missiles have accompanying text panels that lay out the type of mission the object would have been used for, the materials the object is made of, height, weight and power. This suggests that the visitor is aware of these types of weapons and that they do not
require a narrative to understand what they are and what they do. This is seen in how the text panels are formulated for the missiles in the Space Hanger (Figure 14).

Figure 14 shows is an example of how the missiles in the Space Hanger are written about and communicated to the public. There is information about the technology, how powerful it is and its cost. It explains what the missile was used for but only in so far that it was "air –to-surface" and "air-to-air." The text panel also makes mention of "penetrating power." This type of language focuses on the technological advancements of the missile without an acknowledgement that it is destructive and a technology that is made explicitly for killing. This is the case for every missile text panel in the Space Hanger. They employ the same discursive strategy as the rocket text panels (Figure 15).
The rocket text panels also have the specifications of each particular rocket as well as an assessment as to what the rocket is used for. The rocket in figure 15 was used for both military and civilian purposes. That the missiles and rockets are written about in exactly the same manner suggests that the destructive nature of these technologies is being intentionally obfuscated. Further, that these rockets and missiles are housed in the same exhibit as the space shuttle and other feats of space exploration suggests that the curators wished to conflate the two as celebrated technologies. This plays into Gorman's Space Race Model in that there is a collapse of military, civilian and nationalist values into a "master narrative" (2005: 86).

Some objects speak better than others, while some objects enchant. The invocation of awe that Greenblatt writes about is present in this exhibit. The space shuttle Discovery is front and centre.
in this exhibit. This gives importance to the object in the same way as Columbia does at NASM. The lighting of the exhibit is done in such a way that there is no doubt that Discovery is the focal point of this exhibit. There is lower lighting in the Space Hanger than in the rest of the museum. The strategic use of lighting draws the eye to both the shuttle and the American flag that hangs behind it. The sheer size of the shuttle commands attention; everything in the space hanger is planned around the shuttle. The visitor can get almost close enough to touch the shuttle and there is a clear walk way all around Discovery. Behind the shuttle there is video of the final shuttle launch playing on a loop.

The poetics of this exhibit suggests several things. Human space flight is inextricable from military missiles and rockets. They are one and the same. In some cases, like the Redstone rocket that is displayed in the Space Hanger, the rocket was used both for military purposes and space flight. Whether this is supposed to be an uncomfortable tension for the visitor or not is left to the individual. It depends on the associations one has with weaponry. However, putting it in the same exhibit as cultural and technological marvels such as the space shuttle and Mercury capsules suggests a positive reinforcement of what these types of weapons are capable of. The meaning produced for the visitor to the Space Hanger creates a connection between these two types of objects.

The politics of the exhibit, how it contributes to knowledge, lies in the associations that have been created by conflating rockets, missiles, and spaceflight objects in the same exhibit. This presents an uncritical view of weapons of war that suggests they are supposed to be celebrated as technological marvels that are representative of the ability to dominate on a global scale.
2.2 Summary

The poetics and politics of display at NASM are nuanced and varied. The Space Race Model can be seen in some facets of the museum, while this narrative is subverted in others. However, the determination that there is a master narrative that seeks to privilege American exceptionalism cannot be said to exist in totality at NASM. Several displays actively work to nuance the discussion around space flight. There are some examples which suggest that, like Gorman's spacescapes, the narrative of American exceptionalism is intertwined with the poetics of display. The conflation of military weaponry with space exploration, the minimizing of tragedy, and the front and centre display of the Columbia command module suggests that the Space Race Model does exist within this institution. However, it is not the only way in which space exploration is being discussed and displayed.

The lack of narrative on text panels is suggestive of an interpretive strategy where objects are asked to speak on their own. This requires that either the visitor have some prior knowledge of the context of the object in order to understand why it is being displayed and also that the visitor is allowed to make up their own mind in regards to objects that may have a contested or difficult history. The lack of narrative however, suggests a narrative in itself. When initially conducting this research, there was an assumption that NASM would be heavily steeped in the Space Race Model and there would be little variation from the theme of American exceptionalism and an uncritical view of American involvement in outer space. This has not proven to be the case. Preceding examples have shown that there has been an effort to include different sides to the history of the American space program and how this has affected and influenced the present and future of space exploration.
Chapter 3
The Canadian Aviation and Space Museum

3 Background

CASM opened in 1960 and in 1964 amalgamated the three collections of the National Aviation Museum, the Canadian War Museum, and the Royal Canadian Air Force collection (casmuseum.techno-science.ca). The museum grew through the years and in 2010 the collection grew to include Canada's involvement in space and aerospace technology (casmuseum.techno-science.ca). The mission of CASM is broadly to:

1) Create a greater appreciation for Canada's aviation heritage
2) Demonstrate the vital role of aviation in the lives of Canadians
3) Illustrate the significance of aviation in the growth and prosperity of the country (casmuseum.techno-science.ca)

Further, the vision for the museum is to:

1) Maintain and strengthen its place as Canada's leading aeronautical and aerospace museum and [as] one of the best in the world
2) Encourage a greater appreciation of Canada's aviation and aerospace heritage
3) Highlight the vital role and influence of aviation and aerospace in the lives of Canadians and the growth and prosperity of their country
4) Showcase Canada's place in the history of aviation and aerospace (casmuseum.techno-science.ca)
CASM is located at the Rockcliffe Airport which is approximately twenty minutes from downtown Ottawa (Figure 16). Rockcliffe is a small airport that used to be a military base during the First World War. It is now home to the Rockcliffe Flying Club. CASM had 222 169 visitors in the 2015/16 year (CSTMC Annual Report 2016: 18). CASM operates under the Canadian Science and Technology Museum Corporation umbrella which also includes the Canadian Science and Technology Museum and the Canadian Agriculture and Food Museum. The generated revenue for all three museums combined in 2015/16 was $3.86 million (CSTMC Annual Report 2016: 19).

Canada has had a different relationship to outer space than the United States. The Canadian space program was not born out of competition. Canada’s space program was born of a technological collaboration with the United States. The Canadian Space Agency web site states:

In 1974 NASA sought out Canadian expertise for the development of a robotic arm, the famous Canadarm. That marked the beginning of a close collaboration between Canada and the United States in
human space flight. Not long after, NASA invited a Canadian astronaut to participate in a space mission. That invitation led to the creation of the first team of Canadian astronauts in 1983. (asc-csa.gc.ca 2016)

There have been eight Canadian astronauts that have flown in space since 1984 (asc-csa.gc.ca 2016). The Canadian Space Agency has never possessed the ability to launch human missions into space on their own; Canada has always been reliant on the United States and Russia to have astronauts and technology launched into space. It is perhaps with this sense of cooperation in mind that CASM has curated their space exhibit.

3.1 Poetics and Politics of CASM

I have selected four parts of CASM’s space exhibit in depth in order to investigate the narrative strategies that are present: The Canadarm, the model of the International Space Station, Chris Hadfield’s space suit and the history of the Canadian space program text panels at the end of the exhibit. Within CASM’s structure, there is a mixture of nationalist history and also a desire to de-prioritize this history in favour of an internationalist perspective.

The display of the Canadarm at CASM is one of the first space objects that the visitor comes into contact with. It is elevated and incased in Plexiglas. The visitor has the ability to walk around the entirety of the Canadarm as well as view it from above from a catwalk on the second floor of the museum. The Canadarm is removed from the other space objects, it is an exhibit unto itself (Figure 17).
There is a tiny text panel on inside the Plexiglas case that states the company that built it (Spar Aerospace) and that:

Canada built five Canadarms for NASA. Here on display is the first Canadarm which was launched aboard the space shuttle Columbia on November 12, 1981. Canadarm 201 performed 23 missions and travelled 153 million kilometers. It completed its final mission on June 1, 2011 aboard the space shuttle endeavor. (Canadarm exhibit text panel, CASM)

The presentation of the Canadarm is reminiscent of NASM's display of the Columbia Command module. It is set apart from the rest of the exhibit and there is very little interpretation involved. The Canadarm is an object that is largely asked to speak for itself. There is an assumption that the visitor will have knowledge of this object, its importance to the Canadian space program and that the awe of the object is interpretation enough. There is no connection between the Canadarm and the larger exhibit about the International Space Station. This is representative of there being no master narrative for this exhibit and, by extension a lack of Gorman's Space Race Model. This also privileges the international usefulness of the Canadarm over the achievement which this object represents for Canadian robotics. The politics of this exhibit are hampered by
technology. When I conducted my research the large touch screens that are meant to give a
deeper, more contextual meaning to the Canadarm were not working. Certainly, one can expect
that technology malfunctions from time to time; however, this lack of access to these
technological elements affects the efforts of the curatorial staff to situate the Canadarm in the
larger narrative of Canadian space history. Without the accompanying text panels, visitors must
rely on their previous knowledge and the accompanying text panel to inform them of the
importance of the Canadarm. However, as stated above, the Canadarm is also placed away from
the other objects in this space exhibit, and thus it is decontextualized from the narrative of the
rest of the exhibit.

The 1:50 scale model of the International Space Station precedes the exhibit *Life in Orbit: Living
and Working in Space* (Figure 18).

*Figure 18* Life in Orbit, CASM, 1:50 Scale model of the International Space Station
(Lindsay Marlies Small 2015)
This heralds the message of the main exhibit: that internationalism is essential to living and working in space. The ISS is the culmination of technology from eighteen different nations (NASA 2016) and the display of this model to the visitor in a Canadian national museum suggests that the Canadian story is one of international cooperation as opposed to competition between nations. The poetics of the ISS model suggests to the visitor that Canada is instrumental in the international story of space as opposed to the crafting of a national narrative that suggests superiority. The Space Race Model is subverted by such an exhibit as it is actively suggesting that international cooperation in space is imperative for the future. The visitor cannot enter the main exhibit without passing this model, which ostensibly sets the visitor up for the poetics and politics of the main exhibit. The text panels surrounding the ISS model state technical specifications for the craft. The expansive model, and the way it is set up in relation to another scale model of a satellite, gives the visitor a sense of how big the ISS is in this way. The model could be said to invoke Greenblatt’s sense of resonance, in that it portrays a visual that is hard to grasp due to sheer size in a way that is digestible to the museum visitor.

One nod to exceptionalism in the Canadian narrative is the amount of Chris Hadfield centric memorabilia that is present in this small exhibit. Hadfield rose to international popularity and fame during his 2012-13 mission aboard the ISS. Hadfield popularized tweeting pictures from the ISS as well as creating instructional videos for YouTube while he was in space. To the right of the ISS scale model is one of Hadfield’s space suits from his most recent mission to the ISS (Figure 19). Similar to the Udvar Hazy text panels, CASM has relayed only the technical specifications for the space suit. There is an assumption that the visitor will be in awe of being in the presence of this space object, not just because it has been to space, but because of who wore it. Poetically, the visitor should have some prior knowledge of Hadfield and his contribution to
the Canadian space program in order to understand the full value of this object and its meaning as it is situated within a national museum.

Hadfield’s space suit is next to a card board cut out of his likeness. Upon entering the *Life in Orbit: The International Space Station* exhibit the visitor can view Hadfield’s guitar, videos made by him while in space and reproductions of tweets that he sent out during his mission. The significance of this is that in an exhibit that does not have many objects, Hadfield is centre stage for most of CASM’s space exhibits. He is highlighted like no other Canadian astronaut including Marc Garneau, the first Canadian astronaut in space or Roberta Bondar, the first Canadian woman in space. The poetics of highlighting Chris Hadfield suggest that, when selecting objects and other visuals the curators were aware of the amount of publicity that Hadfield had at the time. Instead of focusing on firsts, CASM has chosen to highlight a person of interest in the
moment in time in which the exhibit was being created. This is not to suggest that Hadfield did not have his ‘firsts’: he was the first commander of the ISS and the first Canadian to perform extravehicular activity (CSA 2016). The amount of inclusion that Hadfield has received in this small exhibit surrounds the exceptional and ideal notion of what it is to be Canadian. Hadfield represents national pride on an international scale (Gurney 2012). Thus, his inclusion in this exhibit speaks to the desire of the curators to acknowledge leadership in space that is still wrapped up in an internationalist model of exhibiting. The politics of including Chris Hadfield to the scale that he is in this exhibit speaks to a curatorial desire to align Canada’s successes in space with the successes of one individual that can be proudly pointed to as an example of the Canadian space program.

The main exhibit at CASM surrounds the day to day life of astronauts aboard the ISS. There is little by way of objects that are represented in this exhibit. There is a generic space suit with a Canadian flag on it, an example of where astronauts sleep and a space toilet. There are a few experiments that the visitor can participate in such as seeing what it is like to grasp an object while wearing a pressurized space suit and trying to figure out what types of food are allowed on the ISS. Most of the narrative of this exhibit is told through images and text panels on the walls that show astronauts performing science experiments and living day to day in space. The entrance to the space exhibit is preceded by a large model of the International Space Station. The main exhibit, entitled Living and Working in Space is designed to emulate the look of the inside of the ISS as well. Throughout the exhibit there is a heavy emphasis on international collaboration in space and how several nations have come together to cohabitate and carry out scientific inquiry aboard the ISS. One of the first text panels that the visitor sees is instructions on how to say ‘welcome’ in Russian (Figure 10). This is significant in that this theme of
inclusiveness tends to run through the whole exhibit. In a Canadian national museum where the two official languages are English and French, the inclusion of other languages sets the stage for the visitor to understand that there are several contributing nations that all have an equal part in life on the ISS.

Figure 20 Life in Orbit, CASM, text panel
(Lindsay Marlies Small 2015)

This approach decidedly takes the exceptional out of space travel and, like the Apollo to the Moon exhibit at NASM, tries to bring life aboard the ISS down to a level that is accessible to the visitor. The exhibit itself looks like the International Space Station and the visitor is invited to crawl through the hatch that simulates the opening to the ISS when a spacecraft is docked, to learn to say hello in Russian as there are several nations that participate in the ISS and to see
what it is like to look through the cupola of the ISS as it flies over Earth. The design of this exhibit is meant to engage the visitor in the daily working of the ISS and thus, show that there are very human things that go on even in outer space.

Here, the visitor exits the exhibit proper and finds themselves in a long white hallway. On the left-hand side of the hallway are several text panels that chronicle the history of the Canadian space program. These panels consist of small pictures and text that describe several milestones in the Canadian space program (Figure 21).

![Figure 21 Canada in Space, CASM, text panel (Lindsay Marlies Small 2015)](image)

The text on these panels is very straightforward. Paragraphs state: “With the Allouette 1 launch Canada became the first nation after the Russian and American superpowers to design and build
its own satellite” (CASM Canada in Space text panel). The text highlights an event or a person and describes its significance to Canada in Space. Here the poetics of this exhibit are evident, not in the text panels themselves, but how they are displayed. When visitors enter the exhibit through the route described here, past the Canadarm and ISS models, these text panels are the last thing that the visitor sees. There are no objects associated with the panels and it is exceptionally text heavy. Further, the text panels themselves do not stand out against the walls and are out of the general flow of visitor traffic. This suggests a de-prioritization of this set of text panels that exist to ostensibly situate the visitor in the historical contributions of Canada to outer space. This adds to the internationalist model that CASM embraces in that the in depth exhibit is about the International Space Station and the text panels densely pack information about Canada’s history in at the end of the exhibit. The politics of this display method suggest that this knowledge is secondary to the ISS portion of the exhibit and garners less attention from visitors.

3.3 Summary

CASM employs a heavy emphasis on international cooperation in space. This represents a direct opposition to the Space Race Model. Privileging the International Space Station as the main narrative of the exhibit suggests that the curatorial emphasis was placed on highlighting Canada as a partner in space exploration as opposed to a leader. There are several objects that represent Canadian achievements and these can be seen as playing into nationalistic pride. The Canadarm and the multiple inclusions of Chris Hadfield point to the desire to highlight specifically Canadian achievements. However, the Canadarm is still framed within the rhetoric of an ‘assistant’ of the space shuttle program. The deprioritization of Canadian history suggests that there is a larger narrative being displayed at CASM that makes specifically Canadian achievements secondary to the participation of Canada in the international efforts of space
exploration. There is a distinct lack of narrative overall in this exhibit. Unfortunately, the most information the visitor receives about Canada in space is covered by the easily missed text panels at the end of the exhibit. Text panels that relate to objects present specifications, use, height, weight, etc. This is in line with the familiar wonder that space objects represent, and that because they invoke such wonder, they can largely speak for themselves. The text panels of the Life in Orbit exhibit present a narrative of day to day life aboard the ISS. This strategy of display brings space to a human level and explores the necessary research that is performed on the ISS.

At the outset of this research, the anticipation was that the interpretive strategy of CASM would be very different from NASM. This turns out to not be the case. There are several overlapping factors. This may point to a type of display that is common to aviation and space museums, however more research must be done to draw this conclusion. In both museums, there can be seen nationalistic elements – something that would not be out of place within a national museum. However, at CASM there are elements, such as international inclusion and de-prioritization of national history that subvert a traditional Space Race Model and suggest that there are more nuanced and inclusive ways in which to present future space heritage exhibits.
Chapter 4
Discussion and Future Research

This chapter explores the findings at NASM and CASM and the implications for museological practice as it intersects with space objects in national museums. This chapter also offers a speculative view of how the narrative that exists in these museums may influence the future museological opportunities on Earth and in outer space.

4 The Space Race Model and the Future of Space Museology

Alice Gorman's Space Race Model is not the only way in which space travel is communicated to the public at both NASM and CASM. While both institutions show a legacy of popular rhetoric that shaped the Space Race Model, there are other strategies that run alongside this more traditional model.

The Space Race Model is evident at NASM through a lack of narrative. The objects are asked to speak for themselves. The knowledge of the importance of the object is (or should be) evident to the visitor by the very virtue of the artifact being displayed. The Milestones of Flight Gallery houses artifacts that are representative of the best, the first, the fastest. This gallery is one that the visitor cannot miss by virtue of how the museum is laid out. Awe and wonder are evoked by simply being in the presence of a space object. The Columbia command module has a small text panel with the basic information of the flight of Apollo 11, however, there is no historicizing or contextualizing of the object. The importance is self evident.
This is further seen at the Udvar Hazy site where military interests are conflated with space objects. The destructive capabilities of rockets and missiles are downplayed and housed in the same exhibit as space objects. Thus, a narrative of national importance, significance and necessity is created.

At CASM, the Space Race model is visible in the over inclusion of Chris Hadfield, suggesting a desire to highlight a Canadian space hero who represents “Canadian ideals” in outer space. Likewise, similar to Columbia, the Canadarm is placed out of context with very little information, which assumes the visitor is aware of the importance that artifact has to the Canadian and international space programs. Where there is an absence of interpretation, the Space Race model can come to fill the gap.

There are numerous spaces in both institutions, however, where the Space Race Model is not present. Most interestingly, the Space Race Model is not evident in the NASM exhibit entitled “Space Race.” Here there are examples of successes from the USSR as well as an acknowledgment of the history of the V2 rocket. This speaks to an acknowledgment of the complicated history of military and civilian efforts in space as well as the absolution of Wehner Von Braun for his role in World War II in exchange for his rocket research.

There are also text panels in the “Moving Beyond Earth” exhibit that acknowledge the expansion of the astronaut corps to include people of colour and women and the language moves to a more inclusive “crewed” or “piloted” as opposed to “manned.” Further, attempts to personalize space travel exist in the Apollo to the Moon exhibit which displays personal items from the Apollo astronauts. Instead of creating a grand narrative about the “right stuff” this exhibit seeks to show the people behind the missions.
CASM relies heavily on, what I have termed, an “Internationalist Model” of space narrative for their main exhibit. The museum has chosen to create an exhibit around the international space station, with a focus on the world wide benefits of science and engineering done in space. Like NASM, CASM also seeks to show the day to day activities of astronauts, thus bringing a personal level to space travel.

Within CASM, a national Canadian history in space is deprioritized, overshadowed by a main exhibit that speaks to partnership in space. For example, Allouette 1 – the first Canadian satellite, is on display at the Udvar Hazy Center as a replica, and although the Canadian Science and Technology Museum Corporation has the electrical prototype of the satellite in their warehouse, this milestone in Canadian space history is only mentioned on a text panel at the end of the space exhibit.

4.1 The Internationalist Model

While the Space Race Model favours the narrative of largely white, male, Americans, the Internationalist Model risks assuming the intentions of space travel participants represent universal values for everyone on Earth. This becomes especially salient as corporate interests in space begin to take hold.

Internationalism finds a mirror in universal museums on Earth. Universal museums hold objects from multiple disciplines (history, ethnology, natural history and geology, art) and from around the world. Supporters of universal museums argue that these collections hold value for everyone, even if the collections are held in former imperial and colonial centres and may have been
collected during colonial expansions. Universal value for heritage is also seen in the rhetoric of UNESCO sites which deem “outstanding cultural value” to places on Earth.

The term internationalist as it is often employed in the heritage community suggests a unilateral cooperation between nations to coordinate the dissemination of heritage objects to cultural institutions throughout the world (Merryman 2005). I am also employing this term to describe the ability that these exhibits have to provide a view that space travel is, as Merryman writes "for the good of mankind" (2005). This suggests that there is an underlying inherent assumption of universal value and that space exploration, when it is framed through internationalism is for the good of humanity. This becomes a salient point in that, to date, the United Nations has been the institution that has been responsible for the most treaties that have to do with international cooperation in outer space. Further, there have been investigations by UNESCO into turning the moon landing sites into world heritage sites (Chang 2012). Having a world heritage site implies that there is a universal valuing of heritage that can be equally understood by everyone on Earth. This is seen in CASM and NASM with the limited narrative of space heritage objects on text panels and how the objects are asked to communicate for themselves either through previous knowledge or awe and wonder. The awe or aura of a space object can communicate its importance and that importance is a shared value between all visitors to these national museums regardless of the visitor's background. UNESCO has already claimed many sites on Earth as heritage sites which are places that are significant to the entire world. Cleere writes: "The UNESCO World Heritage Convention of 1972 was conceived in order to establish 'an effective system of collective protection of the cultural and natural heritage of outstanding universal value'" (1995: 63). Initially this program was set up to recognize artificial objects created by humans, but the definition was broadened in 1972: "The phrase 'the combined works of nature and man' is an implicit recognition from the outset of the eligibility from inclusion on the World
Heritage List of nonmonumental cultural property i.e. cultural landscapes” (1995:63). The melding of natural landscapes with those that have had significant cultural impact has not only changed cultural heritage preservation on Earth, it can be applicable to artifacts in space as well. This began a very real push to declare Tranquility Base, the site of the first moon landing, as one of these sites. The problem is that, according to UNESCO, the site has to be tied to or owned by a specific country (whc.unesco.org). Since the Outer Space Treaty states that: "outer space is the common territory of all humanity and sovereignty or ownership cannot be claimed over space or celestial bodies" (Gorman 2005: 100) the moon does not fall under this criteria.

Further complicating these issues is the “hyper-privatization” that is occurring in space (Weeks 2006:1). No longer are governments the sole bastion of space exploration. Corporate involvement has become much more significant and space tourism, a very real prospect. Consider the Lunar X Prize, started by Google and specifically designed to have nongovernmental organizations compete for a corporate lunar landing. The Prize will pay up to $20 million for the first team to "successfully land a rover on the moon" (Billings 2008). One team in particular, Astrobotic Technology, announced that it was their intention to land at the Sea of Tranquillity, better known as the Apollo 11 landing site. This came on the heels of Lunar X announcing what they called a 'heritage bonus'. "A 'Heritage Bonus Prize' of $1 million will be given to the team that also sends back images of previous human activity on the moon. In order to take photographs of these artifacts, groups would have to first target their craft to land close to a previous landing site, then move their rover as close as possible -- even into the area where human activity occurred 40 years ago" (Thomas 2009). Thus, a real conversation began about what exactly to do with the lunar landing sites. Should these sites fall under protection? Whose protection? Astrobotic Technology has since rescinded their plan to land near Tranquility Base,
but the question still remains: if missions are sent to the moon, is there a responsibility for preserving the cultural heritage of these landmarks? As of yet, there are no legally binding laws for space or celestial bodies. The Outer Space Treaty makes suggestions, and many countries have signed on. Yet, there is no consequence (perhaps other than bad PR) for violating a space treaty. "NASA held a workshop a year ago about the preservation issue. Then...a team that cataloged what was left on the moon after the six Apollo landings, and it recommended how to balance historic preservation with the likely desire in the future to investigate how well the materials have lasted. The recommendations, issued in the fall, place greater protections on items from the first moon mission, Apollo 11, and the last one, Apollo 17. For Apollo 11, the recommendations ask that any visitor, robotic or human, stay at least 75 meters from the lander" (Chang 2012). Since it is more than clear that the Apollo program was not a triumph for all humanity, but for the United States, the question begs to be asked: should the rest of the world care? "Perhaps insignificant in themselves, the Tranquillity Base artefacts represent one of the major motivations of the space race: to imprint a specific national, ideological and colonial meaning on the moon" (Gorman 2005: 102).

Recent developments such as the involvement of private companies like Space X and Blue Origin place an emphasis on the need for a heritage conservation policy in outer space. This proves to be a difficult task. Both national and international models of heritage preservation have benefits and pitfalls when applied to heritage sites in outer space. The influence of public spaces where people can consume knowledge about outer space are an effective method for educating and disseminating knowledge about the past, present, and future of space travel. The issues that are faced by museums can speak to the difficulties that may arise when the creation of a heritage policy in outer space is imminent.
4.2 The Future of Space Heritage and Museology

Based on my findings from both NASM and CASM there are several recommendations that I would suggest for future sites of space heritage or spacesacpes. These recommendations are based on the assumption that there will be heritage sites in outer space and that there will be a mechanism for space tourism that will eventually be accessible to a large number of people on Earth.

1) A modified Internationalist Model: Outer space projects will continue to grow in size, complexity and cost. It is a reasonable assumption that international cooperation in space will continue into the future. Thus, any curatorial efforts must be mindful of the contributions that have been made by all countries involved without privileging the narrative of one nation over another. However, this narrative should not take for granted that everyone on Earth values space travel. Avoiding a grand narrative which seeks to provide a homogeneous history is prudent.

2) Language use: To that end, the use of language is an important aspect of curating heritage sites in outer space. Inclusive language is a necessity for communications strategies. This has already been acknowledged by NASA in their current style guide for writing. Unless speaking historically, for example a direct quote: "One small step for man...", the use of non-gender specific language is essential. Tranquility base could be a popular space tourist destination in the future. While the language that was used at the time of the first moon landing is steeped in exclusionary practices, it is not necessary to perpetuate this in the future. A more inclusive language structure speaks to more people and includes them within the narrative. This is not to suggest an altering of history or historical quotes. This is to suggest that gendered and exclusionary language does become a thing of the past.
3) Deprioritizing colonial narratives: Language use should also extend to an awareness of terms like frontier, colonize and pioneer. These words are steeped in a legacy of uneven power dynamics and their usage aligns future space missions with these past colonial endeavours. A reframing of language use can in regards to how space is spoken about can work to include more heterogeneity within space heritage communication techniques.

4) No assumptions: Future heritage sites should not assume that all people have the same relationship to historical context, space missions and/or space artifacts. Objects should be explained, contextualized and when possible situated in the context of history. The extensive visitor research conducted by Falk and Dierking has pointed to the influence of situated knowledge on a visitor’s experience. Therefore, it is difficult to plan in advance how an exhibit will be received. Further, there could be strong curatorial intention within the exhibit that is not communicated to the visitors. Ultimately, it is the visitor interaction with the exhibit that should be privileged. This means that assumptions surrounding visitor knowledge, interest and positionality should be reexamined within this context.

4.3 Conclusion and Future Research

Space tourism is fast approaching a reality and it is the assumption of the author that there will eventually be a mechanism for touring space similar to how one can purchase a plane ticket and visit a different country. It is also the assumption of the author that visitors to space will want to tour and see heritage objects in lower Earth orbit as well as on the moon and Mars.
Therefore, this research seeks to create a pathway to discussing the larger issue of creating heritage spaces off Earth and what that might mean under the lens of current heritage management structures. This will include more in depth research into visitor studies in order to determine the lens through which visitors view space objects. This will include future research at both NASM and CASM as well as museums in Russia and China to examine how non-Western museums frame space exploration and speak to space exploration achievements from the West.

Future research will also include an examination of the changing relationship to private companies that the space industry is engaging in currently and how this may affect future heritage conservation efforts in outer space. Outer space cannot be owned by a sovereign nation according to the Outer Space Treaty (1967) therefore this discussion operates on the assumption that any creation of heritage sites in outer space would have to be done within the context of an international governing body. Further, I operate under the utopian idea that this governing body could potentially enforce heritage standards that would be suitable to all the people of the world, an unlikely scenario in and of itself.

It is the contention of this research that the issues faced by current heritage institutions can speak to the benefits and pitfalls of applying cultural heritage management structures in outer space. It is also the hope of this future research that the application of these structures can also speak to current heritage practices and inform the nuanced nature of how space is presented to museum visitors on Earth.
## Appendices

### Appendix A

<table>
<thead>
<tr>
<th>Concept</th>
<th>Terms</th>
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</thead>
<tbody>
<tr>
<td>Exceptionalism</td>
<td>first, fastest, largest, biggest, premier, powerful, best, American, race, competitive, competition, national, Canadian, failure, ushering in new era hero</td>
<td>Internationalism</td>
<td>international, transnational collaboration, co-operation, Russian, European, global, collective, humankind/mankind, (all) people of Earth, Non Canadian/American achievements, perspective humanity</td>
<td>Social Impact</td>
<td>social good, collective good, beneficial progress, communisn, democracy, capitalism, civilian</td>
<td>Militarization</td>
<td>war, army, navy, air force, weapon, defense, casualty, kill, strikes, arms, armamen, missile, bomb</td>
</tr>
<tr>
<td>Frontierism</td>
<td>pioneer, frontier, discovery/discoveree, destiny, explore, uncharted, wilderness/wild, uninhabited progress</td>
<td>Historical Impact</td>
<td>heritage, history, era, change, advancement</td>
<td>Inclusivity</td>
<td>mankind, manned, crewed, un/piloted, robotic, fabricated, women, minority, African-American, ethnic, ethnicity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Colonialism</td>
<td>colonize, inhabit, conquer, imperial, expansion, advancement, bases, move out</td>
<td>Technological Impact</td>
<td>milestone, advancement, genius, engineering, technology, new, doomed, develop</td>
<td>Corporatization</td>
<td>corporate, company, tourism, industrial, economy, civilian, logos, company, names</td>
<td></td>
<td></td>
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</tbody>
</table>

Full list of terms and concepts used to code text panels
Appendix B

Examples of coded text panels
Bibliography


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