

GENDERED SPACE: EMERGING FRAMES IN NASA PUBLIC RELATIONS AND
MAINSTREAM MEDIA REPRESENTATION, 1958-1986

by

Helen Elaine Wilds

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Thesis Committee:

Dr. Jane Marcellus, Chair

Dr. Tricia Farwell

Dr. Jennifer Woodard

DEDICATION

I would like to dedicate this thesis to my Mom and Dad, who have always encouraged me to reach for the stars.

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I have many people to thank for helping me on this journey. To Mom, Dad, Grant and Jacob and all my loved ones, I'm so thankful for your love and support; it has kept me going even when I doubted myself. To Juju, I'm specifically grateful to you for keeping my 3rd grade Sally Ride poster, which has been a great reminder of my long-standing interest in NASA and women's accomplishments in space while writing this thesis.

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ABSTRACT

The National Aeronautics and Space Administration (NASA) was founded October 1, 1958, and has been the subject of research, news and popular culture since its inception. Recent films such as *Hidden Figures* (2016) and *Mercury 13* (2018) have given credence to the contributions of women to the space agency. This increased attention challenges the long-held image of the 1960's astronaut-hero, steeped in robust masculinity and military pride. This masculine image, perpetuated by the hegemonic ideal of postwar heroism and nationalism, characterizes our collective memory of NASA at mid-century. While popular culture has increased the visibility of NASA women's histories, little research has been done specifically focusing on women's media representation throughout NASA's history. Using frame theory, this thesis examines the historical representation of women employed by NASA, both in the agency's own public relations efforts and the mainstream news, to discover the ways NASA women's media representation changed over time in response to internal changes and shifting roles at NASA and larger external factors, such as the women's liberation movement.

TABLE OF CONTENTS

CHAPTER I: INTRODUCTION	1
<i>Statement of Purpose</i>	4
<i>Women’s Labor and Education History</i>	4
<i>Women in STEM</i>	9
<i>Women’s Military and Aviation History</i>	12
<i>Public Relations at Mid-Century</i>	13
<i>Journalism at Mid-Century</i>	16
<i>Background and History of NASA</i>	19
CHAPTER II: THEORETICAL FRAMEWORK	22
<i>Frame Theory</i>	22
<i>Mythology</i>	23
CHAPTER III: LITERATURE REVIEW	27
<i>Women at Mid-Century in the Media</i>	27
<i>Women in Aviation and the Military</i>	28
<i>NASA and the Press</i>	31
<i>NASA and Public Policy and Opinion</i>	32
<i>NASA’s Crisis Communication</i>	33
<i>NASA in Popular Culture</i>	35
<i>Women at NASA</i>	37
CHAPTER IV: RESEARCH QUESTIONS.....	41
CHAPTER V: METHOD.....	43
<i>NASA Public Relations</i>	44
<i>Broadcast Coverage</i>	45
<i>Mainstream Print Coverage</i>	46
<i>Magazine Coverage</i>	47
CHAPTER VI: OVERVIEW OF FINDINGS	49
CHAPTER VII: “THE EAGLE HAS LANDED”	51
<i>The Hero Frame</i>	52
<i>The Family Man Frame</i>	57
<i>The Astronaut Wife Frame</i>	60
<i>The Rocket Man Frame</i>	63
CHAPTER VIII: “HOUSTON, WE HAVE HAD A PROBLEM”	70

<i>Apollo I</i>	71
<i>Apollo I: Are Rocket Men to Blame?</i>	73
<i>No Space for Women: The Hero Frame in Crisis</i>	75
<i>Tereshkova’s Flight: First Woman in Space</i>	78
<i>Rocket Women Exceptions: “Hidden Figures” and Quiet Exceptions</i>	79
<i>NASA’s “Other Women”</i>	81
<i>Apollo XIII</i>	83
CHAPTER IX: “ROUTINE ACCESS TO SPACE”	85
<i>“Women’s Lib” and NASA’s Equal Opportunity Office</i>	86
<i>Women Astronauts: “Some inconveniences”</i>	90
<i>Ride, Sally, Ride: First American Woman in Space</i>	94
<i>A Teacher in Space: Christa McAuliffe’s Journey</i>	97
<i>Challenger</i>	99
<i>Challenger Administration: Rocket Man Frame Still at Risk?</i>	101
<i>Challenger Astronauts: The Hero Frame Evolved</i>	105
CHAPTER X: CONCLUSION.....	109
BIBLIOGRAPHY	113

CHAPTER I: INTRODUCTION

The women of the National Aeronautics and Space Administration (NASA) have appeared frequently in scholarship and media in recent years.¹ From an explosion in popular culture portrayals to an enhanced focus on women and girls in science, technology, engineering and mathematics (STEM) programs and careers, the visibility of women's involvement in NASA both historically and presently has increased. NASA is the second-most favorably viewed government agency, just behind the Centers for Disease Control, according to a 2015 *Pew Research Center* poll, so it's not surprising that books, movies and documentaries are dedicated to the agency and the women who helped spearhead missions and discoveries that revolutionized American history.² Recent films such as *Hidden Figures* and *Mercury 13* have given credence to the little-known contributions of women to the space agency.³ This increased attention challenges the long-held image of the 1960s astronaut-hero, steeped in robust masculinity and military pride. Indeed, the lack of knowledge surrounding women's involvement in NASA from its outset has begun to dissolve as media reveal women's involvement at the earliest stages of the space program. Still, it would not be surprising to find that if asked about women's history in NASA, many people knew only a handful of women who worked at the agency. Sally Ride, for example, may be more well-known because of the high volume of mainstream news coverage she garnered in 1983 as the first American female in space. Other women who did not receive as much media attention, such as Frances "Poppy" Northcutt and Shirley Jackson, may not be well-remembered in collective

memory of NASA, though recently popular culture and scholarship are bringing these and other women's contributions to light.

NASA is the subject of recent academic literature, particularly surrounding the agency's power to influence public policy.⁴ Major moments in NASA's history, such as the *Challenger*, *Columbia* and *Apollo 1* and *13* disasters have been the topics of much academic work as well, particularly focusing on how NASA's public relations office handled the disasters and the media coverage of the events.⁵ The increased visibility of women's work in early NASA can be seen in studies dedicated to chronicling women's history both in the astronaut program and the science and technology arm of the agency.⁶ However, even recent research on female scientists, astronomers, administrators and astronauts fails to include media representation as a primary focus. Because the women who propelled themselves and others to space throughout the twentieth century are receiving deserved praise and recognition, a comparative analysis of the media frames used by the mainstream media and NASA's own public relations is imperative to understand women's shifting roles at NASA and in mid-century American culture.

This thesis' goal is to fill this gap by comparing NASA's public relations documents and mainstream news coverage. I examine the historical representation of women employed by NASA, both in the agency's own public relations efforts and the mainstream news, to discover the ways media representation of women at NASA changed over time in response to internal changes and shifting roles at NASA and larger external factors, such as the women's liberation movement. This research also draws on historical background, which includes the Cold War and Space Race, the emergence of the women's liberation movement in the 1970s and conservative social backlash years of

the 1980s. Using archival research and frame theory, I examine historical media coverage of NASA throughout mid-century. Archives studied include NASA's History Program archive, Vanderbilt TV news archives (*CBS*, *CNN*, *NBC* and *ABC*), *Time* magazine archive and the historical *New York Times* archive. This analysis will help illustrate women's histories and evolution at NASA using these archives and the theoretical framework of framing.

I chose the years 1958-1986 for their historical significance at NASA, specifically involving the evolution of women in the astronaut program, and my interest in mid-century culture. NASA was founded in 1958 as a response to the Soviet launch of Sputnik, the first Earth-orbiting satellite in 1957. Meanwhile, 1986 is a critical year because the *Challenger* accident changed the way NASA was viewed by the media and public. Women did participate in spaceflight during this time, but the payload specialists or scientists—not pilots. Further, while other historic markers, such as the first female command of a mission (1995) or the first female African American in space (1992) could be endpoints for my research, I decided to choose 1986 so that I could primarily examine mid-century developments, focusing on the context of women's liberation and increased labor force participation. However, I am conscious that my analysis will not include these historic moments, and my hope is that others will gain inspiration by my beginnings and continue to include more women's' histories in research.

This work is important to understand women's roles at the agency and larger culture. The histories of women are important; however, in a traditionally patriarchal society, women's and minorities' stories can be forgotten or silenced. Therefore, this work is important not only to help maintain women's histories and cultures but also to

inform our historical understanding of women's roles in society. The remembered image of NASA as a group of crew-cut astronauts and scientists affects the ways that Americans remember this period of history. This masculine image, continued by the hegemonic ideal of postwar heroism and nationalism, characterizes our collective memory of NASA at mid-century. By challenging this hyper-masculine representation of NASA at mid-century we can begin to understand women's contributions to the agency, which has been overlooked or forgotten in our collective memories. Further, this work can help inform current and future women's STEM careers and representation.

Statement of Purpose

I examine the historical representation of women employed by NASA, both in the agency's own public relations efforts and the mainstream news, to discover the ways NASA women's media representation changed over time in response to internal changes and shifting roles at NASA and larger external factors, such as the women's liberation movement. This research is important because it builds upon existing literature and histories to help illuminate the roles women played in the twentieth century in relation to changes in feminism in the larger culture and more complex roles for women at NASA. My desire in undertaking this research is to bring NASA women's media representations to the foreground, in hopes that the contributions of historic women are recognized.

Women's Labor and Education History

While this thesis examines women's representation from 1958-1986, a background of women's labor prior to this time period is needed. While many common histories of women's labor claim World War II as a watershed moment that catapulted

women's participation in paid labor, earlier moments such as the Civil War and World War I had major impacts. Clerical paid labor, prior to the Civil War, was largely male dominated. After the Civil War, business expanded rapidly, increasing the need for more workers. This increase led to paid positions in clerical work opening as a result of expanding business, and women began to fill these roles, which laid the groundwork for women's eventual role in computing.⁷ During this time "woman's place" ideology emerged and led to the gendered division of labor that created "men's work" and "women's work."⁸ World War I also affected women's labor and opened more jobs for women to move into during wartime, before remasculinization in the 1930s. This cycle of remasculinization repeats throughout America's history. So, while wartime and postwar economic expansion often increase women's participation in paid labor, the return to a male-dominated work force is persistent, as seen after World War II, as well. Throughout World War II, women's participation in paid labor increased significantly, peaking in July 1944 at 19 million.⁹ Wartime labor mobilization played an important role in easing the "traditional sexual division of labor" and opening jobs previously branded as "men's work" to women.¹⁰ The displacement of men from the labor market to war created an acute labor shortage that women filled. With the labor market viewing the war as a temporary crisis, women were able to move into areas like manufacturing, though not without any difficulty, at unprecedented rates.¹¹

The 1950s is characterized as a conservative era, marked by a decline in women's labor force participation—to 33.9 percent of paid labor—after the increased need for women's work during World War II.¹² This decade constituted social backlash years, in part due to the reconversion of paid labor to pre-war masculinity, particularly in the fields

considered “men’s work.” After World War II, though many women remained in paid labor positions, an exodus of many female workers—voluntarily or forced—led to reorientation of the paid labor force to male-dominated throughout the 1950s.¹³ The massive propaganda campaign used to reinforce traditional family values and reconvert the paid labor force was partially successful. However, the large-scale changes in consumer and home goods, along with other changes such as decreased birthrate, began to alter the work women traditionally did within the home, though not necessarily decreasing the time needed to maintain a home.¹⁴ Historian Alice Kessler-Harris notes the contradictory nature of the 1950s; this contradiction, Kessler-Harris explains, involved the assumption that women were tethered to the home, but the necessity for women to take jobs outside the home was simultaneously ingrained in society.¹⁵ Furthermore, cultural phenomena at mid-century served to reinforce stereotypical gender roles. McCarthyism’s impact of women’s labor was largely in the dismantling of many unions during the 1950s.¹⁶ Culturally, McCarthyism was not solely about Communism—it was more broadly a referendum on American values, and this included the role of women in America.

With the expansion of industry after World War II, “white collar” jobs—such as advertising, publishing and human services—began to consume the American labor market, creating a massive need for office and secretarial workers.¹⁷ Women had traditionally been forced into “female jobs.” This included paid labor such as secretarial work, and these jobs were commonly referred to as “pink collar” jobs; in this expanding economy, hiring practices allowed government and civil service agencies to specify the sex of candidates until 1962, and advertising was often gendered.¹⁸ By 1960, the majority

of women employed outside the home—nearly 80 percent—were in stereotypically female roles.¹⁹ However, even with the rise of “pink collar” jobs, women faced a huge barrier to long-term careers: motherhood. In the 1950s, much of the increase in women’s labor force participation were women over forty-five who were past the age likely to have young children in the home at the time.²⁰ Shelia Rowbotham has pointed out that resistance to working mothers was immense, with these women receiving accusations of neglect and warnings that their “neglected” children will become future delinquents.²¹ In 1960, only 25 percent of married American mothers who had children under eighteen were in the workforce.²² Motherhood and legal restrictions were not the only factors that kept women from participating in the labor force with the same vigor as in wartime. Kessler-Harris notes beyond the economic forces that kept women subservient, a persistent, hegemonic attitude about women’s traditional position in society appeared “inevitable and unchangeable,” which led to exceptionalism among few women with the majority rendered subordinate.²³

Despite these barriers and in tandem with labor force participation increases, the women’s movement gained social and cultural traction in middle-class America at mid-century. The women’s liberation movement in the late 1960s began to change the way Americans viewed women’s labor. With the 1960s came an image of a new woman that rivaled the traditional “happy housewife” image of the 1950s. At the cusp of the women’s liberation movement, a *New York Times* article from September 2, 1962, buried on page 127, describes the common view of the “feminist” American woman at mid-century as “a domineering Mom who exploits the male, destroys his masculinity and reduces him to a quivering Milquetoast” before launching into a scathing editorial on equal pay and the

misconceptions of female emancipation.²⁴ The women's liberation movement is most commonly attributed in popular historical accounts to the publication of Betty Friedan's *The Feminine Mystique*, which gave voice to "the problem that has no name" among middle-class white housewives; however, Friedan's work was largely for middle class, white women and largely excluded women of color, lesbian women and women of lower socioeconomic classes.²⁵

Likewise, researchers cannot underestimate the broader Civil Rights Movement's impact on women's history. The conservative climate of the 1950s affected all women, including those who were African American, Native American, part of the LGBTQ communities and more—and the radical social movements of the 1960s helped to break through the conservatism of the previous decade, changing cultural and legal precedent on equality. President Kennedy's Commission on the Status of Women, created in 1963, changed, in some ways, the efforts of the Women's Bureau, founded in 1920, and reframed their efforts not as a fight for women's equality but instead as a piece of the War on Poverty, with efforts redirected to utilize previously "wasted human resources"—women.²⁶ After the Equal Pay Act of 1962, followed by landmark civil rights bills like the Civil Rights Act of 1964, which established Title VII, women could no longer legally receive lower wages due to their sex; however, it is important to note that this did not eliminate wage disparity between men and women.²⁷ Executive Order 11246 in 1973 prohibited sex discrimination in government contract hiring, ushering in a wave of affirmative action programs active throughout the 1970s and 1980s.²⁸ These affirmative action programs greatly impacted women's involvement in credentialed and professional fields, such as law, medicine and accounting.²⁹ The Supreme Court also held in

Pittsburgh Press Co. v. Pittsburgh Common on Human Relations, 413 U.S. 376 (1973) that sex discrimination in help wanted ads was unconstitutional, after the Court upheld a Pittsburg law barring newspapers from publishing help wanted ads by gender.³⁰

However, as white women continued to benefit from the women's movement, women of color were largely excluded both from participation in women's organizations and issues of race were often not included on agendas for many of the largest women's movement organizations, where instead issues white middle-class women faced were more commonly promoted.³¹ Similarly, LGBTQ women were largely excluded from many women's movement agendas. By 1980, women constituted an unprecedented 43% of the American labor force, though only roughly eight percent of these women were non-white; the divide between white women's labor force participation and women of color's participation has shifted, and into the 1970s and 1980s, the growing number of white women moving up out of clerical positions allowed African American women increase access to these jobs.³² However, it is important to note that statistics on women's labor vary. For example, the Bureau of Labor Statistics estimates that in 1980, women constituted 51.5% of the civilian labor force.³³

Women in STEM

While a general background of women's role in the twentieth-century is beneficial, a closer examination of women's historical role in STEM fields is necessary to understand their involvement in NASA's history. Historically, science has been a male-dominated field. As historian David Alan Grier points out, clerical work, which included early "computing," was a male-dominated profession until after the Civil War, when

business expansion necessitated more workers for sub-professional tasks, which women began to fill.³⁴ During World War II, as in most fields, the number of female mathematicians and scientists rose. Many saw the “women’s work” in science fields, particularly computing, as “domestic work for the nation” and therefore appropriate and necessary.³⁵ These new lines of work, which also included “typewriters” and “scanning girls,” became women’s work, with no precedent for gendering the positions.³⁶ The use of “girls” to describe many of these roles was common; they were typing girls, girl computers and scanning girls, and businessmen often gauged the “girls” viability at work based on not just their job performance, but also their physical appearance and morality.³⁷

However, after the war and into the 1950s and 1960s, the “remasculinization” of the sciences pushed many women aside, including those in high-ranking academic positions.³⁸ Even with this remasculinization beginning in the 1950s, the Cold War was in full force, and the nation began to seek female scientists to keep up with Soviet technological and scientist innovation, with the national need for scientific “manpower” outweighing—though only briefly—the sexism ingrained in the masculine culture. Historian Margaret Rossiter points out the evolving and contradictory notion of women’s roles at this time, as women were told by government propaganda and larger culture to defend the home but simultaneously told to take scientific careers to defend the nation; however, the mostly white male-dominated higher education institutions resisted the entrance of women into STEM academics.³⁹ The highest concentration of women at this time in the sciences was arguably in the field of home economics—considered a “soft” science and a hyperfeminine field of study.⁴⁰ The hyperfeminization of home economics,

Rossiter states, was easily tied to the persistence of traditional sex roles in the sciences, affirming “women’s work” in fields such as home economics, which ties homemaking to work.⁴¹ The acute shortage of women at the highest-levels of science led to exceptionalism among few, such as Nancy Roman, a well-known astronomer at NASA. Likewise, the common history of women retreating from wartime work to the home and teaching positions has made women’s scientific work during the war “rendered invisible and promoted a diminished view of women’s capabilities in this field.”⁴² Women in science began to gain traction in the 1960s and continued to grow after affirmative action legislation in the 1970s and 1980s. While the number of women in some STEM fields increased during this time, persistent disparities in some fields—particularly engineering—remained.⁴³

Bans on women and people of color have plagued women’s history in higher education. Traditionally, the patriarchal culture viewed motherhood as women’s eventual job. This has contributed to disparities in the area of girls’ education, particularly girls’ education in light of their “destiny” as mothers.⁴⁴ Women of color have likewise experienced discrimination in academia historically. In 1940, only two percent of black women earned college degrees, due to segregation at many colleges and universities, while approximately ten percent of white women earned degrees.⁴⁵ Throughout the 1950s, the number of degrees awarded to women increased significantly, in part due to opening of previously all-male programs such as engineering.⁴⁶ This growth in women’s educational opportunities continued throughout the 1960s and 1970s with upward trends in women’s participation in STEM. In 1970, 43 percent of bachelor’s degrees awarded to women were in the sciences; however, of this 43 percent, women only received one

percent of engineering degrees, and several programs had only just begun admitting women.⁴⁷ Women's participation in advanced degrees also increased; however, it was not until the late 1960s and early 1970s that the proportion of women receiving master's and doctoral degrees increased significantly.⁴⁸ Though women's participation in STEM programs has increased, minority women remain underrepresented in all professional sciences, and this is particularly true among women of color. Corbett and Hill research the lack of women's representation in STEM professions and degree programs and found many factors influence this disparity, but that stereotyping can be particularly powerful in dissuading girls from joining the sciences.⁴⁹

Despite all these developments, only limited popular culture representations of female scientists and mathematicians exist, particularly in the context of NASA, with the exception of the recent success of *Hidden Figures*—another reason to more closely examine representation in news and public relations at this time.⁵⁰ My aim in this research is to help fill in the gaps of scholarship and popular culture. Because the media underrepresents women in STEM, their historical position in American culture may be misunderstood. It is important, then, to illuminate women's histories and contributions for a more comprehensive understanding of their roles at NASA and in broader culture.

Women's Military and Aviation History

Because NASA restricted the first astronaut group to military test pilots, a brief overview of women's history in the military and aviation is beneficial for context.

Women have participated in every war in American history, usually as nurses and clerical workers. Particularly in World War II, women's service was vital to the war effort. More

than 140,000 women participated in the Women's Army Corps (WAC) in a variety of nontraditional roles; however, it wasn't until 1976 when military academies began admitting women and 1978 until the disestablishment of WAC and full integration of the military.⁵¹ In 2016, all military branches allowed women to serve in direct combat and ground roles.⁵² Further, the Women's Airforce Service Pilots (WASPs) were integral to the war effort during World War II. However, their swift disbandment after the war—with their military flight status not regained until the 1970s—has led to a struggle for recognition. Specifically, Molly Merryman's research focuses on the reasoning for the WASPs' disbandment at the intersection of culture and hegemonic military beliefs that “warriors” were male.⁵³ With the ban against women flying military aircraft at the advent of jet technology, women were largely excluded from piloting jet planes and no woman qualified as a jet test pilot, excluding them from the early astronaut program. Some women, like WASP-pilot Jaqueline Cochran, though, gained access to jet technology, though not through the military and were still excluded. Though women were again allowed to fly military aircraft beginning in 1970, a female pilot was not admitted as an astronaut until 1986 when Eileen Collins joined the astronaut corps.⁵⁴

Public Relations at Mid-Century

The public relations profession is most commonly cited as beginning in early-twentieth-century America as a reaction to industrialization and new forms of journalism, particularly muckraking. Pioneers of the field such as Ivy Lee and Edward Bernays are often lauded as the fathers of modern public relations and credited with its professionalization, with the first public relations professional, Arthur Page, hired by

AT&T in 1927.⁵⁵ However, it is important to note that public relations also grew out of grassroots movements of the early twentieth-century, such as suffrage and early civil rights movements. Following World War I, public relations practice increased, in part due to the massive number of professionals, who were veterans of Wilson's pro-war propaganda effort, the Committee on Public Information (CPI), now available to practice for an increasingly corporate America.⁵⁶ After World War II, the formal education of public relations practitioners began to take shape at American universities.⁵⁷ At mid-century, the practice of public relations had become a profession with over 19,000 practitioners, increasing to 31,000 into the 1960s. Into the 1980s and 1990s, public relations firms merged to form massive agencies, reflecting the increased globalization of corporations.⁵⁸

Because NASA is a United States agency, I include a brief history of government and administrative public relations. Government public relations had been a part of American public administration since the nation's founding, with public administrators publishing annual reports in newspapers.⁵⁹ During the Progressive Era (1890-1920) governmental public relations greatly expanded, thanks in part to agency heads like Gifford Pinchot (US Forest Service). Pinchot, through a concerted effort in conjunction with President Theodore Roosevelt, used governmental public relations to convince Congress to create the National Park Service in 1916, despite the 1913 Gillett Amendment, which placed a ban on unsanctioned governmental publicity experts.⁶⁰ President Woodrow Wilson's CPI was created in response to America's entry into World War I and served as a government propaganda machine to justify American entrance into the war and expansion of Wilson's global policy; the CPI particularly targeted

newspapers and print publications in an early governmental public relations and propaganda effort.⁶¹ However, it was not until the New Deal and President Franklin Roosevelt's administration that governmental public relations reached its height; with the implementation of the New Deal agencies, increased curiosity on the part of journalists to report the actions of the government and a governmental desire to connect the public to works agencies spearheaded a rise in government public relations activity, which included Roosevelt's popular Fireside Chats as a form of publicity.⁶² World War II governmental public relations efforts were mostly seen flowing from the Office of War Information (OWI), charged with morale upkeep and maintaining an informed citizenry on the outcomes of the war. Into the Cold War, government agencies found it difficult to create publicity on a war that was neither physically fought nor wholly understood and subcontracted much of its efforts out to firms to garner publicity for relatively non-controversial Cold War efforts. Much of these efforts served to reaffirm democracy as the paramount political system in the world and communism as the enemy of prosperous countries embracing capitalism. For example, historian Laura Belmonte has described many of the Cold War propaganda efforts and cites just one of many examples in her discussion of the women's pamphlet *Democracy Begins in the Home*, release by the United States Information Agency in 1953; the pamphlet contrasts the living conditions of democratic and totalitarian states (namely the USSR) and emphasizes the individuality and family relationships emphasized in democracies that guard against dictatorship.⁶³ With the advent of television and digital communications, government public relations shifted accordingly, as news programs highlighted "visually interesting stories and [moved] away from dull, but important subject" such as governmental affairs.⁶⁴

Journalism at Mid-Century

Because this thesis is a comparative study of public relations and news coverage of NASA women, I also include a history of American journalism. American journalism's roots date back to the American Revolution and the founding of the nation. The party press was an admittedly biased production of the political parties of the day, sharing partisan news and opinion. It wasn't until the 1830s, though, that the Penny Press model created the basis for modern journalism. The Penny Press was a new form of journalism—one that emphasized news, though often invented, advertising and cheap distribution; Michael Schudson attributes this new form of journalism to the rise of “democratic market society,” which Schudson defines as the “democratization of business and politics sponsored by an urban middle class.”⁶⁵ With the rise in news over opinion beginning in the Penny Press, the ideology of objectivity began to emerge. Objectivity, as defined by Schudson, is the reliance on established rules set forth by a professional community to determine the validity of a person's statements about the world.⁶⁶ Objectivity is then, in an ideological sense, the separation of news from author and treatment of news as product.⁶⁷ Stylistically, the inverted pyramid style of modern journalism represents this ideology. Throughout the nineteenth century, other forms of journalism emerged, such as journalism of action associated with William Randolph Hearst, and the reporter appeared as a professional career. Into the early twentieth century, muckraking emerged as another form of journalism, which served to expose and describe the “muck” in American society. Muckrakers' adherence to fact and illumination of “evils” furthered a literary style of objectivity, which often emphasized description rather than analysis.⁶⁸

However, it was not until after World War I that objectivity as a standard reached its height in journalism. During World War I, the attempts by the government to control the national rhetoric were vast and easily evident. The CPI's role in perpetuating Wilson's justification and policy narrative displays the blending of government and press values at this time. After the war, the rise of objectivity as a "radical separation of values and facts" arose.⁶⁹ Journalists began to turn away from the sensationalism, seen in journalism of action, and government control of the press. More than this, though, Schudson notes a skepticism in the democratic market society that had previously served as catalyst to the Penny Press; This skepticism was rooted largely in the economic hardship of the Depression and stock market crash in 1929.⁷⁰ Journalism during the interwar years championed this notion of objectivity as a standard for journalism. Objectivity did not disappear from journalism; however, attacks on journalism throughout mid-century were not uncommon, particularly with the rise of distrust in the government that characterized the "adversary culture."⁷¹ The challenge of traditional values at this time was galvanizing, and as a result, many questioned the institution of journalism and its ideal of objectivity. However, print journalism continued to hold objectivity as a professional standard, and into the 1970s, a critical look at the government continued. It was in this climate that perhaps one of the most well-known print journalism stories broke—Watergate. *Washington Post* reporters Carl Bernstein and Bob Woodward exposed the political corruption of the Watergate scandal, leading to Nixon's resignation, and in doing so, catapulted the image of American investigative journalists as icons and "saviors of democracy."⁷²

At mid-century broadcast journalism, once dominated by radio, was shifting to television, with the rapid increase in television sets sold to Americans. In 1963, a staggering 80 percent of American homes included a television set, whereas in 1947—the first year of television sales—only 1 percent of Americans owned televisions.⁷³ By the late 1950s, competition between television and print news emerged.⁷⁴ During the 1950s and 1960s, the broadcast journalist became a reliable figure in television news, and by the mid-1960s more Americans received news from television than print news.⁷⁵ Television made news more visual, as Americans were able to literally see news in the making. Broadcast journalists such as Edward R. Murrow and Walter Cronkite grew to define television news reporting during this time. Murrow, perhaps more than any other, is heralded as the founder of modern broadcast journalism; his reliance on eye witness reports, ethos of objectivity and ability to interweave his opinion subtly into his narrative propelled the broadcast journalist to the height of news reporting.⁷⁶ While the Civil Rights Movement and the downfall of McCarthy were some of the earliest televised news stories, the coverage of the Vietnam War was a turning point in American broadcasting. While early coverage was generally positive and supportive of the American intervention policy in Vietnam, by the late-1960s, televised coverage became critical of the war in Vietnam. It was this critical coverage and the graphic imagery of the televised Tet Offensive that many historians believe helped to end the ground intervention in Vietnam, which showcased the power of American broadcast journalism in shaping public opinion.⁷⁷ NASA media coverage emerged into this cultural and mediated environment, as the agency, through public relations efforts, and the press co-constructed NASA's story for the American public.

Background and History of NASA

The National Aeronautics and Space Agency (NASA) was established October 1, 1958, when it absorbed the National Advisory Committee for Aeronautics.⁷⁸ The creation of NASA is most commonly attributed to the shock of the Soviet launch of Sputnik, the first Earth-orbiting satellite, in 1957. Many believed a technological chasm existed between the Soviet Union and the United States after the launch of Sputnik, which heightened an already tense relationship. Though the United States had launched the first atom bomb over Hiroshima and Nagasaki in 1945, the Soviet Union launched a test of their own atom bomb in 1949.⁷⁹ Post-World War II, the American-Soviet relationship had deteriorated, with the United States adopting its containment policy on global communism. In 1950, the Korean War ushered in the military involvement in the Cold War that would last into the early 1970s and include the Bay of Pigs Invasion (1961), Cuban Missile Crisis (1962) and Vietnam War (1955-1975). The Soviet launch of Sputnik added space as a new frontier in the Cold War. After Sputnik's launch, Eisenhower addressed the public with the now infamous claim: "from what [the Soviets] say, they have put one small ball in the air."⁸⁰ Eisenhower, failing to recognize the initial panic Sputnik created, underestimated the connection the American people made between the Soviet's successful launch and the perception of technological power. While the American people previously saw the United States as the world's leader in technological innovation, Sputnik's launch fundamentally questioned how Americans viewed their own country on the world stage. Simultaneously, McCarthyism was elevated to the heights of its power. Beginning in 1950, Joseph McCarthy's attack on Communism swept the nation. The House Un-American Activities Committee (HUAC) was the legislative arm

of McCarthyism that he used to investigate citizens, corporations and government employees suspected of Communist activity. The panic McCarthyism caused turned neighbors against each other and caused fear throughout the population. The trial and execution of Julius and Ethel Rosenberg and government propaganda—such as the popular film “Red Nightmare”—warned citizens of the dangers Communism posed in their own backyards and sparked fears of the “Reds” fundamentally altering the American life.

With the Cold War occupying America’s foreign affairs and McCarthyism and fear of Communism consuming domestic life, Sputnik’s launch was a shock to the American public. Newspapers began running headlines highlighting the disparity between American and Soviet space capability, such as “U.S. Missile Experts Shaken by Sputnik.”⁸¹ However, President Dwight D. Eisenhower did not wish the Soviet Union to view the creation of a space agency as a military aggression. This spurred the creation of a civilian space agency, where space activity was for “peaceful purposes for the benefit of all mankind.”⁸² In a rather unprecedented legislative step, the 1958 Space Act also charged the agency to “provide for the widest practicable and appropriate dissemination of information concerning its activities and the results thereof,” giving the space agency the duty to inform the public to its utmost abilities.⁸³

In 1959, NASA chose the first group of astronauts, commonly known as the “Mercury 7,” for Project Mercury—the first program for manned space flight.⁸⁴ After President Kennedy’s famed 1961 moon speech and the success of Project Mercury, NASA continued to recruit astronauts for further human spaceflight programs, including the Gemini and Apollo programs, leading to the first human landing on the moon in July

1969. The advent of the Space Shuttle program in the 1970s ushered in the era of reusable space technology, allowing for a significant increase in the number of space missions. In 1978, NASA accepted the first astronaut group to include women and minorities, and in 1983, Sally Ride became the first American woman in space when she flew on STS-7.⁸⁵ However, it wasn't until 1990 when NASA chose the first woman-pilot, Eileen Collins, for an astronaut class and 1995 before Collins led the first woman-commanded NASA mission.⁸⁶

Women's participation in the labor force and specifically in STEM careers has steadily increased. With the women's liberation movement and larger cultural shifts, women have increased their percentage of the paid labor market since the Civil War. This participation includes women at NASA, whom the agency has employed since its founding in 1958. The space agency's role in shaping American culture at mid-century is important and expansive. Larger cultural events at this time, such as McCarthyism and the Cold War, likewise influenced American culture. Furthermore, journalism and public relations practice at this time evolved, with the rise in objectivity in journalism and the increase in corporate and government public relations professions at mid-century. These historical threads combine to illustrate the background for this analysis.

CHAPTER II: THEORETICAL FRAMEWORK

In this thesis, I use frame theory to examine the public relations and mainstream news coverage of NASA's women from 1958-1986 to better understand women's roles at NASA and in the larger culture at mid-century. Qualitative frame analysis is preferable to quantitative frame analysis for this study, as the primary goal is not to count and analyze frames but to identify and illuminate them for further qualitative analysis; furthermore, qualitative frame analysis allows more straightforward comparison of shifting identified frames over the chosen time period.

Frame Theory

Frames are ways of organizing information into recognizable patterns. Todd Gitlin (1980) in his quintessential work *The Whole World Was Watching*, says media frames "are persistent patterns of cognition, interpretation, and presentation, of selection, emphasis, and exclusion, by which symbol-handlers routinely organize discourse, whether verbal or visual."¹ Robert Entman (1993), contends that frames increase certain aspects of a text, which makes this content more salient.² This salience means particular content is more important or more noticeable in the text. Journalists' content decisions and material selection create media frames. By relying upon selective frames to tell media stories, media construct a reality, in lieu of mirroring one; media do this in a way that allows them to "certify reality *as* reality."³ In this way, media are not passive in society but active in the construction, organization and proclamation of the realities they create. It follows, then, that frame analysis is the "examination in these terms of the

organization of experience.”⁴ Frame analysis can illuminate frames both in mainstream media and public relations communication.

I use frame theory to identify frames of NASA’s women in public relations and mainstream news. Identification of media frames helps me better understand and analyze women’s shifting roles in response to larger cultural changes and the space agency’s evolution from 1958-1986. While researchers often use frame analysis in quantitative methods to count the persistence of these frames, I seek not to count frames but to identify them to look more closely at discursive construction created by them. Because of my chosen timespan—1958 to 1986—an understanding of the shifting frames used throughout time is a key component of this research.

Mythology

Myth is the constructed meaning and memory constructed by a social group. Roland Barthes characterizes myth as “a system of communication...a mode of signification.”⁵ Semiotics is the foundation of myth. Consistent with Barthes semiotic work—which built on Ferdinand de Saussure’s foundation—a signifier is an empty object, and a signified is a meaning or value; when paired, these items create a sign. However, myth emerges in the second level of signification. Here, the sign becomes a second-level signifier. When paired with further meanings, this second-level signifier becomes myth.⁶ Myth is steeped in history. As Barthes contends, myth “transforms history into nature.”⁷ This transformation creates “natural” understandings and associations in speech, leading to mythologization.

Other scholars have worked with myth. While my analysis primarily relies on Barthes' ideas of mythologizations, it is useful to review other ideas of myth. Using Nike as an example, John Harley describes myth as “[turning] something cultural (a show) into something natural (‘just doing it’).”⁸ In his work on myth and media, Marshall McLuhan suggests becoming “masters of cultural and historical alchemy” to study media, language and language as myth.⁹ However, McLuhan's approach has not been without criticism, as Wayne DeFehr points out in discussion of McLuhan's “linear mode” and “joint evolution of myth and media.”¹⁰ The *Oxford English Dictionary* defines myth as:

A traditional story, typically involving supernatural beings or forces, which embodies and provides an explanation, aetiology, or justification for something such as the early history of a society, a religious belief or ritual, or a natural phenomenon.¹¹

This traditional definition of myth contrasts to the theoretical framework I use in my analysis and is aligned with the popular definition of myth, which usually invokes falsehood or absurdity. However, since this definition is the one most people might associate with “myth,” it is worth noting. In fact, Joseph Campbell differentiates two types of myth in his co-authored book with Bill Moyers *The Power of Myth*. Campbell asserts that two levels of myth exist; the first level is one of personal and natural, and the other is “strictly sociological, linking you to a particular society.”¹² This second level of myth as defined by Campbell is closer to the theory of myth I use in analysis, though I rely primarily on Barthes. However, I do use Campbell's work on hero mythology. The monomyth—or hero's journey—is an old one. Before Campbell's influential *The Hero With a Thousand Faces*, scholars had been working with the hero as an archetype and

overarching myth. For example, Carl Jung worked with myth in psychology and dream analysis, defining archetypes—like the hero—as “unconscious content that is altered by becoming conscious and by being perceived.”¹³ The hero is a classic archetype, which Campbell elaborated on in his work. Campbell defines the hero myth as:

a magnification of the formula represented in the rites of passage: *separation—initiation—return*: which might be named the nuclear unit of the monomyth. *A hero ventures forth from the world of common day into a region of supernatural wonder: fabulous forces are there encountered and a decisive victory is won: the hero comes back from this mysterious adventure with the power to bestow boons on his fellow man.*¹⁴

The hero’s journey is characterized by an adventure, adversity and return as a heroic figure. These are all concepts that work both for the individual hero and transform the public to which the hero returns. This myth, I argue, is applicable to the mid-century astronaut-hero. Myth emerges in my study as an important theory to help understand the historical representation of gender at NASA.

Furthermore, to better understand NASA women’s representation, historical context is necessary to aid my understanding of the frames which emerge during my research in a meaningful way. Historic audiences exposed to the various media frames used by both NASA’s public affairs office and the mainstream news media would have interpreted the communication surrounding women in the context of twentieth-century America, so the need to have a full understanding of the time period in question is vital. However, just as media construct a reality, so do historians construct a reality when attempting to interpret the past. Because present-day historians examine history, it is important to consider the ways in which historians may impose present-day values onto

history. While a complete separation of present-day values in historical interpretation is difficult to achieve, it is my goal to attempt to avoid the pitfall of adhering modern values and attributes to my analysis. Presentism is the “bias towards present or present-day attitudes” and is not a useful method for interpreting and analyzing the archival material in this thesis.¹⁵ Imposing present-day values on the archive—practicing presentism—undermines the historical nature of the research. In other words, by using a present-day value frame in historical interpretation, researchers do not analyze the archival material in the same value frame it was constructed. Therefore, I use context and theory to help me understand the history surrounding the construction of the archives. Fact and theory both have roles in historical analysis. I cannot engage in uncovering facts for the sake of repeating them. Instead, I seek to use theory to help me understand history while acknowledging my status as a present-day historian.

Frame theory, discursive practices and historical methods intersect in this research to enable a comparative analysis of public relations and mainstream news coverage of NASA’s women at mid-century to better understand shifting roles for women at the agency and in the larger culture at this time. Discursive practices are largely rooted in history and likewise, to employ frame theory, an historical understanding of mid-century is essential for analysis. Therefore, these theories all converge in my desire not to solely identify media frames used in this context, but to employ discursive practices to further understanding of women’s roles and representation at NASA at mid-century.

CHAPTER III: LITERATURE REVIEW

This thesis examines NASA women's representation to better understand women's roles at NASA in the context of the larger culture at mid-century and the agency's evolution during this time. Therefore, I review numerous threads of academic scholarship for context and understanding of existing literature. These threads include analyses of NASA, including studies dedicated to women at NASA, and NASA's representation in popular culture. Furthermore, I review academic literature dedicated to women at mid-century, including in the sciences, aviation and military.

Women at Mid-Century in the Media

While I have given an overview of historical context of women at mid-century, certain literature on women at mid-century is worth noting. Analysis of representation of women at mid-century also provides greater context for the analysis of NASA women's representation at mid-century. Rupp and Taylor discuss in *Survival in the Doldrums*, the 1950s "Happy Housewife" image. The image is generally known; she is "the smiling, pretty, suburban matron, devoted mother of three, loyal wife, good housekeeper, excellent cook."¹ This image of the typical white, middle-class suburbanite mother was common in magazines, television and advertisements. Cultural phenomena like McCarthyism, which targeted Communism and made any non-conformist attitude or action suspect perpetuated throughout the 1950s, perpetuated this image. Magazines, television, radio and advertising "sold the ideology of woman's place" as homemaker, which solidified it in the cultural lexicon.² Women's image at mid-century has been

researched broadly, particularly concerning advertising. Corzine's 2010 study examining beer advertisement from 1933 to 1960 illuminates the brewing industry appeal to the "Happy Housewife" to make beer respectable by appealing to domesticity and framing beer as the right of working men, which is the "obligation of the women" to provide.³ Further, Foust and Bradshaw's study of women's representation in *Broadcasting* magazine in the 1950s concluded that though magazines portrayed women as professionals in their imagery, the professional woman was heavily outweighed by more stereotypical images of women, which the author defines as housewives, sex symbols or displayed in typical roles.⁴ The idea that strong women threatened male masculinity was not novel to mid-century America; however, it was becoming a larger issue during a time when female consciousness-raising was taking place in middle class neighborhoods across America.

Women in Aviation and the Military

Because of the military management of NASA during its early years, notwithstanding its status as a civilian agency, and the exclusive selection of male military jet test pilots for the first Mercury missions, a brief review of academic literature devoted to women's representation in military and aviation is a needed. Gordon, Hogan and Pritchard's quantitative content analysis and qualitative interpretation of high school textbooks concluded that women's involvement in World War II, while often included, was merely counted instead of discussed in any meaningful way, particularly African American women's involvement.⁵ Similarly, Hesse-Biber and Carter's history of women's labor discusses educational textbooks' reliance on gendered imagery prior to

the 1970s, with males shown in a range of occupations and women traditionally represented as wives and mothers.⁶ Coble and Kessler-Harris' 1993 survey of college textbooks found that students encountered women's accomplishments in activism, but the books lacked information pertaining specifically to the labor movement and its implication for class and overall structural evolution of work since mid-century.⁷

Orwig's study of the World War I "Knit Your Bit" CPI and Red Cross campaign—led by Ivy Lee—analyzed the link made in the campaign's communications in *Ladies' Home Journal* between knitting and patriotism; Orwig posits the campaign contributed to war support and generated patriotism among women, though the campaign is often overlooked in lieu of the better-remembered "Uncle Sam" posters from the CPI.⁸ Numerous studies on the World War II image of "Rosie the Riveter" are available. One such analysis is Streitmatter's chapter on Rosie the Riveter and World War II news coverage of working women; according to Streitmatter, media portrayed the working woman as representative of a balance of beauty, home and work, and the unprecedented visibility of working women in the media at this time helped usher the increased labor force participation during wartime and postwar, before the conservative backlash of the 1950s reverted the workforce to primarily masculine.⁹ Honey's *Creating Rosie the Riveter: Class, Gender, and Propaganda During World War II* analyzed the Rosie the Riveter campaign and its representation of working women, with emphasis on the intersections of class and gender. Honey concludes that class impacts on the Rosie the Riveter worked to create dueling myths of working women at this time as either the "guardian" or "tough fighter" and as such cannot be ignored.¹⁰ Marcellus' study on working women's image within industry public relations magazines during World War II,

specifically Kaiser shipyard publications *Bo's'n's Whistle*, found that much of the language framed women as sexual and out-of-place, reaffirming men's continued dominance and maintaining men's morale in industry.¹¹

Ghilani's analysis of Vietnam-era advertising offers a glimpse into the Women's Army Corps advertising strategy to gain women by showing the "potential for heterosexual partnership and cross-continental romantic intrigue."¹² Research on recruitment advertising for the post-Vietnam volunteer military has also been undertaken. Brown's analysis found that military advertisements emphasized the imagery of women as non-combatant and feminine, while male recruitment advertising emphasizes warriorhood and masculinity.¹³ In the twenty-first century, the connection between masculinity and military pride are still viable. Howard and Prividera's 2006 study found that college students' ideas of the "ideal soldier" were primarily masculine, which served to gender nationalism and marginalize women's involvement in many national activities like warfare.¹⁴

Recent histories like Keith O'Brien's *Fly Girls* have helped illuminate the history of women's early aviation in the 1920s and 1930s.¹⁵ Following Amelia Earhart, Ruth Elder, Florence Klingensmith, Ruth Nichols and Louise Thaden, O'Brien tells the history of the women's aviation and their campaign of inclusion in the 1936 Bendix Transcontinental Speed Race, despite the pervasive rhetoric used against them as "petticoat pilots, ladybirds, flying flappers, and sweethearts of the air... just 'girl fliers.'"¹⁶ Researchers have likewise examined representation of female flight attendants or stewardesses (after the exponential growth of commercial airline in the late 1920s), particularly regarding the development of the profession from the initial idea to feminize

air cabin services with the use of female nurses as attendants and “nurturers.”¹⁷ Women’s aviation representation in popular culture has been the subject of research, including Lisa Stepanski’s analysis of the *Girl Aviator* adolescent literary series, published in 1911 and 1912, and its effects on the acceptance of female pilots.¹⁸

NASA and the Press

NASA has been the subject of many research studies and academic works. Research dedicated to NASA’s relationship with journalism has been undertaken. Louis Alexander’s analysis includes a close examination of the relationship between the press corps and Houston’s Manned Spacecraft Center, including facilities, procedures and limitations imposed on the press.¹⁹ Similarly, Dale Cressman analyzes the open feud that *ABC* had with NASA in the mid-1960s, particularly concerning the agency’s restrictions on TV news cameras on Gemini flights, which Cressman attributes not only to the technical reasons the agency cited but also astronaut resistance.²⁰ Kaitlin Kelley analyzed the shifting frames used to cover three major time frames in NASA’s history and the relationship between the media frames used to represent NASA in news media and public support for the space agency.²¹ Kelley’s research also explains the relationship between NASA and the press in terms of science communication models, namely the old model—used pre-*Challenger* and characterized by the one-way flow of information from scientist to journalist and eventually to public—and the new model—based on the distrust NASA garnered in its secrecy surrounding the *Challenger* disaster.²² Researchers have likewise undertaken work to understand NASA’s power in the realm of storytelling. Miriam Williams’ study examines NASA’s 50th anniversary website, specifically the narrative

photography timeline used to tell the agency's history. In this study, Williams uses a visual narrative framework to examine NASA's depictions of tragedy and triumph throughout its history, with the acknowledgement that "NASA and the media have served as coauthors of NASA's legacy."²³ David Meerman and Richard Jurek chronicle the herculean effort to market the Apollo program—which they call the "largest...and most important marketing and public relations case study in history"—to the public using public relations and press to win over the American public's support.²⁴ Meerman and Jurek also provide history on NASA's Public Affairs Office, stating the offices, which were located at each facility and independent of NASA headquarters in many ways, were largely made up of journalists and worked more like a newsroom with rapid information dissemination during the Apollo program.²⁵

NASA and Public Policy and Opinion

Scholarship has also been dedicated to the agency's power to influence public policy and opinion; for example, Gibson's thesis gauged audience perceptions of NASA's media efforts and revealed that respondents held positive perceptions of NASA, particularly their online media efforts.²⁶ Furthermore, Ryan Weber, Semih Dinc and Matthew Williams' experimental study gauged the effectiveness of different media types on support for the James Webb Telescope, finding that interactive media outperformed other media in garnering support for the telescope's construction, but no texts, traditional or interactive, heightened support for NASA's funding.²⁷ Kristen Starr, in analyzing the power of NASA's public relations efforts during the Cold War, concluded that NASA's public relations power was incredibly high during the Cold War-era and transformed

NASA and aerospace news into government Cold War propaganda; however, the influence waned considerably after the Apollo program ended.²⁸ Starr's research also chronicles the shifting forms of public relations practiced by the NACA and NASA at the advent of the human spaceflight program in the late 1950s. As Starr posits, the differing needs of the agencies spurred this shift, with NASA needing to justify its budget and support for human spaceflight, accompanied by high public interest and the need for a larger public relations machine at the agency.²⁹

NASA's Crisis Communication

Major moments in NASA's history, such as the *Challenger* and *Columbia* disasters, have also been researched at length.³⁰ Randy Sumpter and Johny Garner's media study on the *Columbia* disaster focused on the source selection used by *New York Times*, *Washington Post* and *Houston Chronicle* after the 2003 disaster, and found that government officials, NASA officials and engineers constituted the majority of sources for stories covering *Columbia*, and these sources most often offered neutral information and facts regarding the technical aspects of the disaster.³¹ Arjen Boin and Denis Fishbache-Smith's crisis assessment study of the *Columbia* disaster examined closely the Columbia Accident Investigation Board's conclusions and hearings, disputing some of the CAIB's assessments of causal blame for the incident.³² Michael Lockaby's thesis on the print media coverage of NASA's culture before and after the *Challenger* explosion documented the changing coverage of the agency over time in the news media, with an emphasis on the media's framing of the organizational culture of NASA.³³

Guy Adams and Danny Balfour's organizational study of the Marshall Space Flight Center suggests the existence of a destructive culture at the center—led by the ex-Nazi rocket scientist Werner Von Braun—contributed to the *Challenger* disaster directly, claiming the culture was reliant upon an “unwilling to ‘fail’ or ‘lose.’”³⁴ However, Diane Vaughan leads readers away from simply blaming agency culture or any particular agents and instead broadly concludes an “organizational-technical system failure” was the cause of the *Challenger* disaster.³⁵ Alan Gross and Arthur Walzer's investigative study claims that beyond technical and organizational failures during the *Challenger* lead up and launch were ethical and rhetorical failures to deliberate, which the authors claim persist among some communication scholars examining the incident.³⁶ Vaughan conducts an ethnographic study of her own previous research focused on *Challenger*, tracing mistakes, the research method and theories of disaster she used in establishing causes—which were contradictory to many of the accounts immediately after the incident—and examining the ways in which theory, discourse, history and policy intertwined.³⁷

Furthermore, James Kauffman's examination of NASA's crisis communications strategy in the midst of both Apollo 1 and Apollo 13 concludes a failure on the agency's part regarding Apollo 1 crisis communication but that the agency's public relations efforts resulted in a “successful failure” for Apollo 13.³⁸ Kauffman also suggests that the agency's coverage of the Hubble Telescope in 1990 placed NASA in a crisis when misleading and premature data were released, which, coupled with the recency of the *Challenger* disaster, led to a lack of trust and support in the agency.³⁹ Ryan Martin and Bois Boynton's comparative analysis of NASA's crisis communication after *Challenger* and *Columbia* concluded that newspaper coverage of the incidents differed significantly,

with NASA's post-*Columbia* crisis communication efforts garnering more positive coverage overall than *Challenger*.⁴⁰ Willie Smyth's folkloric study on the advent and dissemination of "*Challenger* jokes" shortly after the 1986 disaster examines the ways in which people distance themselves from intense tragedy and often use mediated language within the larger context of disaster joking.⁴¹

NASA in Popular Culture

American popular culture has included NASA since its inception, with the agency the subject of numerous movies, television shows and songs. Many films feature futuristic settings about space and advanced versions of NASA; however, an extensive list exists of films based upon true events in America's space history. Perhaps one of the most well-known representations of NASA in popular culture is the movie *The Right Stuff*, based on Tom Wolfe's 1979 novel.⁴² The movie chronicles the Mercury astronauts through selection and the first American space flights. Following the "Mercury 7," as the group is colloquially-known, and test pilot Chuck Yeager, the story focuses on the personal and professional lives of these men and the "right stuff" needed for space flight, while women are primarily represented as wives, playing a secondary role throughout the film's plot. The hyper-masculine and militaristic portrayal of the men follows the historical desire for military jet test pilots to serve as America's first astronauts. However, the wives of the Mercury 7 are also characterized in the miniseries *Astronaut Wives Club*, based on the 2013 biographical book of the same name.⁴³ The show chronicles the comradery shared among America's first astronaut wives throughout the

early years of space exploration, with an emphasis on the instant celebrity afforded both them and their husbands by virtue of being America's first.

Apollo 13 follows the aborted Apollo 13 mission to the moon in 1970. Based on the book *Lost Moon: The Perilous Voyage of Apollo 13* by astronauts Jim Lovell and Jeffrey Kluger, the story chronicles the mission and the malfunction that inhibited the 1970 moon landing, including the three male astronauts aboard.⁴⁴ Two of the most recent examples of NASA in popular culture, and the only focused on women, are the 2018 Netflix documentary *Mercury 13* and the film adaptation of Margot Lee Shetterly's 2016 nonfiction book, *Hidden Figures*.⁴⁵ *Hidden Figures* decidedly was a huge commercial success; the story follows African American women, Katherine Johnson, Dorothy Vaughan and Mary Jackson, who worked at National Advisory Committee for Aeronautics and eventually NASA.⁴⁶ The women worked as "Human Computers," who computed the mathematical calculations necessary for spaceflight, while fighting sexism and racism. Despite *Hidden Figure's* focus on women, the cultural conversation is easily shifted back to the male hero in *First Man* with its title emphasizing masculinity and intense focus on Neil Armstrong, with his wife, Janet, portrayed as a secondary character and plot device.⁴⁷

NASA has been the subject of numerous documentaries, with the majority depicting the Apollo era from 1968-1972. The most recent of these films is *Apollo 11*, released in 2019, which is entirely constituted of newly released archival footage of the historic moon landing mission in celebration of the 50th anniversary and contains no narration.⁴⁸ Even the last man on the moon, Gene Cernan, has a documentary dedicated to his time at NASA. *Last Man on the Moon* portrays, through modern interviews and

historic footage, the history of NASA and specifically Cernan's role as a Gemini and Apollo astronaut, emphasizing the masculine image of NASA at this time.⁴⁹ Likewise, the hyper-masculine portrayal of NASA continued in the 2017 documentary *Mission Control: The Unsung Heroes of Apollo*. The film focuses on the Apollo era mission control teams and their role in both the failures and successes of the Apollo missions, with interviews and historic footage of the all-male mission control at the Manned Spacecraft Center, now called the Johnson Space Center, in Houston.⁵⁰ The 2007 documentary *In the Shadow of the Moon* tells the story of the surviving Apollo astronauts—with the exception of Neil Armstrong—through interviews and archival footage. The documentary focuses on representing the Apollo era through the astronauts' own words and only contains narration from the astronauts' interviews.⁵¹

Women at NASA

Since the beginning of the agency in 1958, NASA has employed women in various capacities. Most commonly, women at mid-century worked in so-called “pink collar” jobs at NASA, such as secretarial work. However, women have played vital roles in the scientific community at NASA, as well. Natalia Holt's history of the all-female “human computers” team at the Jet Propulsion Laboratory illuminated the stories of the women who joined NASA's ranks shortly after the National Aeronautics and Space Act; this team of women worked on trajectories for unmanned space flights throughout the mid-twentieth-century, though they did not receive credit on much of the academic work produced by the lab in the early mid-twentieth century.⁵² Similarly, Margot Lee Shetterly's historical account of the African American women who worked at the

Langley Research Center has helped increase the visibility of their contribution to NASA. Shetterly chronicles women like Katherine Johnson—now immortalized in the movie version of *Hidden Figures*—and showed them charting a course to the stars long before they received national or popular recognition.⁵³ Historian Margaret Weitekamp has illuminated many of the histories of the earliest attempts to integrate women into the astronaut corps. Her work tells of the women who attempted to enter NASA as astronauts, though female astronauts were not accepted into the human space flight program until 1978. As early as 1961, Dr. Randall Lovelace was testing women, including flight legends Jackie Cochran and Jerri Cobb, using the Project Mercury tests given to the Mercury Seven for space flight, but the program was shut down before any further testing.⁵⁴ After the testing, both Cochran and Cobb served as NASA consultants; however, Cobb summed up her NASA work, which she saw as paving the way for female astronauts, characterizing herself as “the most unconsulted consultant in any Government agency.”⁵⁵

Key female figures in NASA’s history are the subjects of literature, as well. Sally Ride is the subject of Lynn Sherr’s 2014 biography chronicling her time at the space agency, as well as her pre- and post-NASA life.⁵⁶ Works specifically dedicated to illuminating the contributions of the Mercury 13 are available for study, as well. Martha Ackman and Tanya Lee Stone both contributed to this illumination with the publication of their chronicles of the Mercury 13 and the failure to form a “Woman in Space” program in the 1960s.⁵⁷ Amy Foster found that “much of why women were denied the opportunity to fly comes down to America's expectations about what women could and should do with their lives.”⁵⁸ In a close reading of the 1962 “Qualifications for

Astronauts” Congressional transcript, Marie Lathers posits that Cobb and Joan Hart, representing the potential women in space program, were unceremoniously and rhetorically pushed aside by the subcommittee and witnesses, who argued against allowing women in the space program; Lathers concludes that the rhetoric employed in the hearings not only pushed women aside but also proclaimed that men must first make the history before women could participate in its continuation.⁵⁹

Furthermore, D. Sage examines the ways in which the agency and popular media maintained and perpetuated a strict gender binary, particularly during the Apollo era with a focus on hyper-masculinity and a reduction of women (including employees and astronaut wives) to typical feminine roles that persist into the late twentieth-century despite the advancements of some women in the agency.⁶⁰ Matthew Hersch likewise concludes in an analysis of astronauts in popular culture, that early media representations (particularly in the 1960s) emphasized the all-male astronauts’ “competence, rugged masculinity, and unique fortitude of character.”⁶¹ Carolyn Huntoon, who would become director of Johnson Space Center and worked closely with the 1978 astronaut class, offered a NASA perspective on the lack of female employment in its early history stating specifically that female astronauts probably were not chosen because of the culture in the 1960s and 1970s and the “military aerospace management of NASA.”⁶² Significantly, analyses of Ruth Bates Harris, the first woman and first African American senior manager at NASA who had a hired-fired-rehired career trajectory, help illuminate the agency’s treatment of women.⁶³ Using intersectional methods, Stefanie Ruel, Albert Mills and Janice Thomas produce an organizational analysis of Harris’ time at the agency, with an emphasis on reconstructing her path to senior management and using

critical sensemaking framework to aid in the growth of intersectionality as a research methodology. Kim McQuaid expands upon the understanding of women and minority roles at NASA during Affirmative Action through her analysis of Harris and Harriet Jenkins' (who joined the agency in 1974) time in the agency's Equal Employment Opportunity Program. Recently, Devlin Healey studied NASA's historically discriminatory practices against women in-depth and produced speculative work on how to prevent those practices from repeating in the new age of long-duration space flight.⁶⁴

Prior literature on NASA and women in media and culture is fundamental to my research. An understanding of the academic work already undertaken helps illuminate the gaps in literature. Here, I found a gap in media studies of women at NASA. This thesis' goal is to fill this gap and provide a more comprehensive picture of women's history at the space agency. This research will help illuminate a better understanding of women's roles at NASA and in larger mid-century culture to help reclaim the histories and contributions of women to NASA and larger culture.

CHAPTER IV: RESEARCH QUESTIONS

In my research so far, I have found that much academic literature has been dedicated to the study of NASA. However, little work has been done specifically focusing on women's media representation—particularly women in STEM professions and astronauts—throughout NASA's history. Indeed, even less work has been dedicated to non-astronaut women in NASA. While research on these women is becoming more abundant, their media representation is still understudied. Because media representation informs what the public knows about NASA's activities and histories, it is important to dedicate research to women's representations and shifting coverage over time. For NASA, the collective memory of the agency as masculine and militaristic is common, particularly the image of the male astronaut-hero of the Apollo era. However, women have been present at NASA since its genesis. Though recent literature and popular culture representations of women's histories at the agency are challenging the long-held view, a disparity remains in their media representation, particularly in the agency's early years.

To better understand this disparity, this thesis analyzes women's representation in NASA's public relations efforts and mainstream news coverage. My hope is to illuminate NASA women's representation in the media in the context of the culture at-large, including through women's labor history and the women's liberation movement, and shifting roles within the agency throughout mid-century. Broadly, my research is dedicated to the analysis of NASA women's representations in the media to help understand their evolving roles in response to changes at NASA and larger culture at

mid-century. Specific research questions include: How do changes in NASA women's representations in the media inform our understanding of women's roles in NASA's history? What do the emerging frames and discursive constructions tell us about gendered roles in the mid-to-late twentieth century? How do these frames and discursive constructions challenge or affirm the mythology of NASA as masculine and militaristic, particularly concerning the astronaut-hero image at mid-century? By recognizing women's past contribution to the space agency, scholars can create a more comprehensive understanding of their roles and importance in American culture. Because media representation informs what the public knows and the collective memory of NASA, it is important to dedicate this scholarship to women's representation over time.

CHAPTER V: METHOD

In order to study women's representation at NASA throughout the agency's history at mid-century, I sought to find primary sources from both NASA and news media outlets. To compare NASA's public relations efforts with mainstream news coverage, I analyzed archives of broadcast and print news. I retrieved archived press documents from NASA online from NASA's History Program Office website.¹ Communication with NASA archivists provided reliable confirmation of the website and documents' authenticity. Digitized documents in this archive include all materials from the Historical Reference Collection, which the NASA History Program digitized and archived.

Qualitative research methods are primarily employed in this analysis. I follow John Pauly's advice on qualitative research, choosing to study women's frames throughout NASA's history deliberately, not solely due to personal interest but also the niche aspect of this topic within existing work done on NASA, women's labor and women in science.² I favor qualitative methods in this thesis for the expanded possibilities of analysis, including a deeper understanding of topic based on cultural, social and historical context, as well as interpretive abilities allowed to qualitative researchers. My historical methods are informed by David Sloan and Michael Stamm's methodology for conducting historical communications research. In heeding their advice, I use mainstream media to compare the government public relations efforts with the

mainstream media coverage of NASA to allow for a richer interpretation and context for analysis.³

NASA Public Relations

This thesis uses press records from 1958-1986 for sampling. I chose the years for study because of their historical significance both in NASA's history and the external cultural history of the nation. Because NASA's press releases contain the information the agency desired the public to know, I studied them to help illuminate the way the agency represented women in their public communications. The press records publicly available on the NASA History Program website for study include press kits, press releases, press conference transcripts, administrators' speeches and speeches of key officials.⁴ After extensive preliminary research, I decided to consider all records available within each year for study, following Stuart Hall's advice on a "long preliminary soak" with the archive.⁵ Then, I closely examined documents that were significant to gender representation for their relevance to the research questions examined in this study; however, documents that were only technological or scientific in nature—though catalogued—were excluded from examination in my study, unless they contained quotes or team listings for the projects. Studying only documents representative of gender issues was necessary because of my primary research goals and the vast number of documents available for study and the time constraints on performing close readings of all documents available in the archive. Mission transcripts were likewise omitted, since the primary goal of this research is to understand NASA women's representation in public relations and mainstream news.

Using this historical background and context, I examine the historical representation of women employed by NASA. Public relations communication from NASA and mainstream news, such as *The New York Times*, broadcast—CBS, CNN, NBC and ABC—and *Time* magazines, are utilized for analysis. I use frame theory, discursive practices and historical communication methods to better understand NASA women's representation in the media in the context of the culture at-large, including through women's labor history and the women's liberation movement, and shifting roles within NASA. I use NASA's news release archive, TV news archives (*CBS*, *CNN*, *NBC* and *ABC*), the *Time* magazine archive and the historical *New York Times* archive for this thesis.

Broadcast Coverage

Broadcast news coverage from various networks, including *CBS*, *CNN*, *ABC* and *NBC*, was chosen for study for years 1968-1986. I use broadcast news as a comparative analysis because of its unique position as a new and massively popular technology in mid-century America. With the evolution and solidification of television as America's source of entertainment, news became more visual, allowing viewers to literally see news in the making. For NASA, this meant that viewers across the country could see launches, press conferences and even the first human steps on the moon from their homes. Selection of NASA officials and employees to broadcast on television and what events garnered extensive coverage will be sources of analysis. Major events, like the *Challenger* disaster were live broadcast, which allowed viewers to see disaster news in the making. Because of this large availability of archived NASA broadcasts, purposive

searches of archived broadcast material provide important comparative material. I accessed television archives using Middle Tennessee State University's access to the Vanderbilt University TV News digital archive, which began recording broadcasts in 1968 and includes broadcast coverage from major networks in the twentieth century.⁶ Though the archive includes a categorized database of some common research topics, I conducted searches on the archive website to locate coverage of specific individuals and dates known to be important for comparative analysis.

Mainstream Print Coverage

For this analysis, I considered print newspaper coverage from the *New York Times* for the years 1958-1986. The *New York Times* was chosen as the primary print journalism for study because of its long-standing history as the newspaper of record in the United States. Likewise, I also chose the newspaper because of its extensive coverage of NASA throughout its history. Instead of a comprehensive method of coverage for mainstream print coverage, I searched *The New York Times* database for articles after cataloguing NASA's public relations documents. Focusing on the comparison of women's representation in corporate communications and mainstream news coverage, I conducted searches on the Historical *New York Times* ProQuest database, accessed through the Middle Tennessee State University Walker Library website, related specifically to women's involvement in NASA and the coverage of Project Mercury from 1958-1963.⁷ In order to properly compare the two forms of communication and representation included within each, a purposeful and directed search of the *New York Times* historic database was necessary.

Magazine Coverage

Magazine coverage from *Life* and *Time* magazine was chosen for study for years 1958-1986. I decided to focus on *Life* and *Time* for their long-standing runs and positions as magazines of record historically in the United States. The magazines has also have illustrious histories with the space agency and covered astronauts extensively—particularly the Mercury 7—allowing for ample material for comparative analysis. Magazines reliance on long-form journalism also adds a different dynamic for study than does newspaper. The emphasis on feature-length articles and visual material provide another medium in analyzing the representation of NASA’s women. I use *Life* and *Time* magazines as further comparative tools in analysis in addition to newspaper and broadcast coverage. Purposeful searches were conducted for specific dates and issues of *Life* and *Time* known to be relevant to this thesis topic through secondary research and literature review material. To access historical issues, I searched the digital *Time* magazine vault and Reader’s Guide Full Text database.⁸

I use these archives for my analysis of NASA women’s representations in the media. My methods follow Pauly’s methodologies for qualitative analysis. Textual analysis is the close reading of texts and involves understanding the meaning-making involved in producing texts. A text, in this case, refers to my archival documents, such as a press release, news article and other artifacts. After my initial readings of the texts—or my “preliminary soak”—I begin to notice themes, or as Pauly calls them, “recurring patterns of discourse.”⁹ These recurring patterns I identify and group into media frames. The use of frame theory in my analysis allows me to look closely at texts in order to analyze them deeply. I identify these frames and discursive construction to better

understand NASA women's shifting roles throughout mid-century in response to larger cultural changes such as the women's liberation movement and increased labor force participation. By elucidating these women's media representations and understanding their historic contributions to NASA, I hope to inform a better understanding of their histories and challenge the long-held collective view of NASA as a group of men. In challenging this view, I am picking up on recent literature and popular culture work that has already helped to illuminate these histories. It is my hope that in helping to fill the gaps, others will likewise undertake work on NASA and other understudied women's histories to fill in the gaps I leave, as well.

CHAPTER VI: OVERVIEW OF FINDINGS

This thesis examines historical representation of women employed by NASA in the agency's public relations efforts and the mainstream news to discover how NASA women's media representation changed over time in response to internal changes and shifting roles at NASA and larger external factors. In the Space Act, NASA is given power to "plan, direct, and conduct aeronautical and space activities," but it is also charged to "provide for the widest practicable and appropriate dissemination of information concerning its activities and the results thereof."¹ In other words, the agency had need for an organized press department. Since NASA's inception in 1958, NASA's Office of Public Information has created and distributed press releases and information to its publics, which includes government, contractors and the American public. NASA's public relations documents follow in the vein of the agency's charge to inform the public. The mainstream media provides extensive coverage of NASA starting from its 1958 origins. Though the news was dominated by the standoff at Little Rock High School in the early days of October 1958, *The New York Times* began reporting on NASA with the announcement of newly named administrators to the agency beginning on October 5, 1958.² However, the announcement of the human spaceflight program and subsequent naming of America's first astronauts were turning points in NASA's relationship with the press and grew massive interest in the agency. As a result of the increased attention, NASA focused budget and energy into its public relations efforts, sending out hundreds of press releases each year and allowing media access to astronauts and administration

through press conferences. Walter Bonney, who had been hired by NACA in 1948 to transform their Office of Public Information, crafted the public relations strategy throughout NASA's early years.³ The increased public relations efforts of NASA was in part due to Bonney's realization that "unlike the NACA, NASA would be an instrument of U.S. policy," requiring more publicity efforts to justify its budget and keep its publics informed.⁴ While the major media outlets often picked up NASA's press releases and published the agency's desired information, there were often times when they did not, particularly after mission failures, tragedies and budget disputes.

In the following chapters, I identify and analyze emerging media frames of NASA from 1958-1986. In the first chapter, I identify four frames that emerge from early media representation of NASA, starting with Project Mercury. These frames characterize the agency's personnel: the Hero Frame, Family Man Frame, Astronaut Wife Frame and Rocket Man Frame. These frames include media representation of NASA astronauts, wives, engineers and scientists. Women, except as wives, are notably absent from these frames. The disparity in women's media representation becomes evident in analysis of NASA's public relations archive. From this identification and analysis, I chart changes, disruptions and exceptions to these frames. For example, tragedies and disasters disrupt the framing of NASA astronauts. Exceptions to these frames are also present in both mainstream news and public relations documents, such as Dr. Nancy Roman. New frames emerge in later media response to internal changes at NASA, such as the first group of female astronauts, and external shifts in culture, such as the women's liberation movement. I analyze these latter exceptions and professions in chapter ix.

CHAPTER VII: “THE EAGLE HAS LANDED”

President Kennedy’s “moon” speech is perhaps one of the most well-known in American history.¹ His charge to send man to the moon and back by 1970 influenced much of NASA’s activities throughout its early years, with a massive emphasis on the human spaceflight program. Following the panic caused by Sputnik’s launch in 1957 and subsequent failures of the Vanguard program to launch a satellite, NASA was under intense pressure to achieve in space. The program was afforded a massive budget in its early years and justified it by framing the program firmly in Cold War discourse. For example, in a 1960 speech to the House Subcommittee on Space and Aeronautics, Glennan says, “there is only one way to regain the ground we have lost—ground lost several years ago.”; the way to gain back this ground, Glennan assures, is with his \$802 billion budget proposal for 1961.² By rooting the program in Cold War competition and American exceptionalism, the agency equated achievement in space with the pride of the nation.

The human spaceflight program was one of the most important areas for American achievement in space, and so the agency focused much of its budget and early public relations efforts on Projects Mercury, Gemini and Apollo. In doing this, NASA created the mid-century astronaut hero. Bonney focused on “selling” the program by “selling the astronauts’ personal stories.”³ By tying the program so closely with the personal lives of the astronauts, it invited a media fervor and intense interest in the astronauts themselves, which carried into both the Gemini and Apollo mission astronauts. Indeed, a publisher in 1963 was willing to pay \$3.2 million for the astronauts’ flight

stories before the deal eventually fell through, though the 55 astronauts active in 1969 and astronaut widows received \$1 million for their stories.⁴ Frame theory and hero mythology intersect in the Hero Frame, as the astronaut-hero came to symbolize mid-century culture. Closely related to the Hero Frame are the Family Man Frame and Astronaut Wife Frame. Additionally, the Rocket Man Frame emerges from coverage of the agency's administrators, engineers and scientists. These frames all support the mythologized image of NASA at mid-century. Analysis of these frames affords a deeper understanding of NASA's media representation in its early years. By tracking changes in these frames across time in later chapters, I explore the ways that internal and external factors influence NASA's media portrayal in both its own public relations efforts and mainstream news.

The Hero Frame

With NASA closely tied to American identity at this time, the astronaut became an embodiment of an American hero. This astronaut-hero dominated how Americans identified as a nation and a culture. The Hero Frame is characterized by an emphasis on military achievement, courage, gumption and a test-pilot ethos—particularly in assumption of risk for the nation's pride. The journey of the astronaut into the new frontier—space—is reminiscent of Joseph Campbell's work on hero mythology, which is characterized by the "hero's journey."⁵ Space was chosen as the new frontier and rhetorically linked with adventure and exploration. For example, in a March 1961 speech, John Johnson—NASA's General Counsel at the time—characterizes the historical need for exploration and the new frontier of space as:

From man's earliest beginnings, he has been engaged in one kind of exploration or another... We think of the great voyages of discovery of Columbus and Balboa, Magellan and Cook, and, in our own century, of Peary, Scott and Amundsen... But in 1958, our nation conceived for the first time that it should be an essential and continuing function of government to undertake the exploration of the new frontier of outer space without regard to any of the motives which have moved nations in the past to reach beyond themselves into the unknown.⁶

In this example, a direct link is made between previous exploration, all of which had world-changing consequences, and the American exploration of space; the emphasis here on peaceful exploration harkens back to the Space Act's requirement that space exploration be for "peaceful purposes for the benefit of all mankind," which was often emphasized so as not to antagonize potential aggressions from the Soviet Union.⁷ The direct link of the astronaut heroes to explorers like Columbus shows the lionization of these men within American culture, with the implication that their journeys will have worldwide consequences. With space tied to frontier discourse—which had historically been male-led—it suggests that the conquest of space must be accomplished by men first, leaving out women as adventurers.

The mythology of the mid-century, astronaut-hero has not left American culture. Indeed, it has lingered through the decades, perpetuated by popular culture depictions, such as the 1983 film *The Right Stuff*, based off Tom Wolfe's novel of the same name. Because of the emphasis placed on the astronaut-heroes, they were covered extensively in news. For example, a *New York Times* archive search for Neil Armstrong on the ProQuest database for June 21-August 21, 1969, returns 54 mentions of his name in articles.⁸ A similar search for John Glenn from January 20-March 20, 1962, yields 43 results.⁹ The massive attention afforded NASA in the press and the agency's public relations efforts is

indicative of the public's desire for information about the program and the agency's voracity in promoting its activities and projects. In speaking about Alan Shepard's historic 1961 flight, Jim Webb talks of the agency's relationship with the press, stating:

The press has had full access to the program. This has been so because we operate in a democratic society where our failures are known as well as our success. . . NASA has not attempted to encourage press coverage of the first Mercury-Redstone manned flight. It has responded to press and television requests with the result that over 400 representatives of the press, radio and TV are now at Cape Canaveral.¹⁰

While NASA claimed to promote the Mercury-Redstone flight no more than other flights, it is evident that NASA anticipated the interest the press and public would have in the astronaut program, and crafted public relations tactics to help promote the program, while maintaining its duty to inform the public of its activities. This included promoting the astronauts themselves.

NASA did not discourage this conflation of the astronauts with American pride, and in fact, encouraged it by themselves framing the astronauts as heroes. James Lee Kauffman has pointed out that in "selling" the space program, creating and maintain a positive image of the astronauts was a key factor in NASA's public relations strategy.¹¹ This is particularly evident in the numerous speeches and lectures given by NASA administration at this time. For example, in a speech given by Hugh Dryden in 1959, he spoke of the future first American man in space by saying: "The man, who will carry out this arduous [Project Mercury] mission, also has to be chosen with the utmost regard for the novel circumstances in which he will find himself—circumstances totally new in man's experience, of a kind never before encountered by a traveler on Earth..."¹² The early astronauts were all constructed as American adventurers taking on a new frontier.

This is true of the Mercury, Gemini and Apollo astronauts. Kennedy in his language framed the entire lunar program as what Kauffman calls a “a heroic adventure story.”¹³ This new frontier was unknown, harkening back to one of the first phases of Campbell’s hero journey in which, “a hero ventures forth from the world of common day into a region of supernatural wonder...”¹⁴ For example, one day after the announcement of the Mercury Seven, the *New York Times* said the men had all volunteered for the “spirit of adventure, a desire to pioneer in a new dimension of flight, a military sense of duty and patriotism.”¹⁵ Alan Shepard, the first American man in space, was lauded as a “space hero” and “symbol of the nation” in May 9, 1961 *New York Times* articles.¹⁶ In particular, John Glenn became “the quintessential American astronaut.”¹⁷ It was Glenn who typified the American astronaut, as the March 2, 1962 *Time* story about Lieut. Colonel John “Shorty” Powers—who was a NASA public affairs officer and narrated Glenn’s flight on radio and television—claimed Glenn “whirled three times around the globe to his place among American heroes.”¹⁸ The Hero Frame is intertwined with military pride, as seen in the criteria for astronauts early in the program and in the emphasis of their military backgrounds. In 1965, Ed White—who would later die in the Apollo I fire—accomplished another first for NASA, the first extravehicular activity in space (often called an EVA or “spacewalk”). In the post Gemini 4 coverage, White is mentioned as being “steeped in the tradition of the professional military man.”¹⁹

In mid-century culture, this hero had to be a man. In the patriarchal American culture of the 1950s and 1960s, men traditionally led families, government and business, though there were of course exceptions. The hyper-masculine, military, Family Man Frame used to construct these men solidified their positions as heroes in of America,

working to beat the Soviets and establish America as a global superpower. Masculinity was an important factor in creating the astronaut-hero story, and this gendering of the program led to the hyper-masculine mid-century image of NASA that remains in American's collective memory. By conflating American achievement in space with Cold War competition with the Soviets, NASA was able to create this heroic narrative in which the astronauts became the heroes of American democracy, freedom and technology. However, David Meerman and Richard Jurek have pointed out that by the mid-1960s, NASA was trying to avoid Cold War framing of Americans in space. This was in part due to the difficulty securing the massive funding they had previously received after the lunar missions when the race for the moon had been framed as an American-Soviet competition.²⁰ However, even with the lessening of cold war language throughout the 1960s, the Hero Frame lingered and entered into American mythology. The characteristics of the astronaut-hero were defined and explicit in the requirements NASA maintained in recruitment. For example, the first group of Mercury Seven astronauts were required to be experimental jet test pilots, a designation not open to women at the time, showing the hiring-gate discrimination of women at the outset of the astronaut program. Implicit in these requirements was the need for a young, white, military family man. Even in later astronaut classes, this implicit requirement was maintained. Women, while not explicitly barred from the program after the agency began allowing scientists and loosened its flight requirements for Group IV in 1965, were not chosen until the Group VIII 1978 class.

The Family Man Frame

Closely related to the Hero Frame is the Family Man Frame. The mid-century astronaut-hero was constructed within the 1950s and 1960s patriarchal society. The implicit requirement within this astronaut-Hero Frame, who was rooted in the hegemonic male culture, was the need for a family. The Family Man frame is characterized by an emphasis on the astronauts' families, particularly their roles as leaders of the family with doting and nervous wives awaiting their return from their hero's journey. In the culture that subverted women to caretakers and mothers, men were needed to lead the family. Family was a characteristic of the astronauts' stable lives. Even in NASA's public relations documents, the astronauts were portrayed as "family men," as evidenced in their biographies released from NASA's public relations efforts and the comments of officials during speeches and press conferences. In his autobiography, astronaut Gordon Cooper said NASA only wanted "happily married family men as America's first astronauts"; in response to this, Cooper claimed he lied during his selection interview, citing a happy marriage, before having to ask his wife—whom he had been separated from for some time—to move back in so they could have a "happily married' illusion" to appease the agency.²¹ Extensive biographies were provided for all astronauts throughout mid-century and some other male personnel. They included basic information, such as hometown and education, their family information and their accolades, which were typically military. For example, Neil Armstrong's bio from the Gemini 8 press kit in March 1966, mentions his marital status and children alongside his "78 combat mission during the Korea action" and "more than 3,400 hours flying time."²² The massive media attention given in particular to the Mercury Seven and Apollo XI astronauts may explain some of the

information provided by NASA. In an attempt to promote the space program, NASA emphasized the astronaut's role and in turn, publicized them highly.

Perhaps the most obvious example of this is the *Life* contract struck between the magazine and NASA's Public Affairs Office, which lasted over a decade. The contract entailed exclusives from the astronauts and their wives, making them household images. As Starr pointed out, this aligned NASA's Public Affairs Office more closely with corporate America, as they shifted away from explaining activities funded by taxpayer dollars and towards promoting human spaceflight to the American public.²³ One of the most famous issues during the contract were the covers featuring the Mercury astronauts and their wives on September 14, 1959, and September 21, 1959, respectively. These issues elevated the astronauts and their wives to symbols of NASA, which in turn made them symbols of the nation. The front covers of these issues show the seven astronauts and wives in the same pose, with the astronauts all crew-cut in suits and ties and their wives in dresses and curled hair. The contrast between the astronauts and their wives is summed up in the front cover headlines: the astronauts' stories of the start of their "epochal missions" versus their wives "inner thoughts, worries."²⁴ The contrast of the worried, doting wife and heroic man on a mission reinforces the masculinity of mid-century culture. At the forefront of this representation is the family, an unimplied requirement for mid-century astronauts.

John Glenn once again typified the astronaut-hero, and his status as a "family man" was covered extensively in the press and in popular culture.²⁵ For example, in the Sunday, February 25, 1962, *New York Times* after Glenn's Friendship 7 flight, he is characterized by writer James Reston as what is missing from the dominant American

culture in 1962: “courage, modesty, quiet patriotism, love of family and religious faith”; the article goes to ask if the moon is truly worth Glenn, as he and men like Shepard are needed so desperately on Earth, before mentioning he, of course, can’t leave wife Annie for the vastness of space forever.²⁶ This summary of Glenn’s most notable characteristics encapsulates the ideal mid-century astronaut, who is an important intersection of the hero and Family Man Frames. In a March 4, 1962, full-page spread, Glenn’s return to his hometown in Ohio is covered in detail, with Annie and his children mentioned in almost every article, starting with the first mention on the issue’s homepage in which Glenn “[pulled] his wife to the side and [kissed] her” to hide his emotions as he was cheered on by a gymnasium full of people.²⁷

The Gemini and Apollo astronauts were likewise cast as family men, though some recent media have combatted this image.²⁸ In a July 17, 1969, article *The New York Times* pointedly asks in its headline, “The Crew of Apollo 11: What Kind of Men Are They?” The answer? The article quotes an associate of the crew, stating they are “‘Home and hearth men’”²⁹ This emergence of the Family Man Frame highlights the larger cultural belief in men as the head of the household and therefore, the leader of the family; this hegemonic belief was deeply ingrained in the American public at this time. Most often, wives during these flights were seen waiting at home for news of their husbands’ flights. However, the Family Man Frame emerges in this coverage by the media’s reinforcement of the wives’ roles as home bound. For example, after the 1965 Gemini 4 flight, coverage of Patricia White and Patricia McDivitt emphasizes their suburban, homemaker roles, as they are described as “the happiest at home” as they receive news of their husbands’ flight success.³⁰ Wives as supporting characters in their husbands’ heroic life further

divided the gendered American power at this time. However, the Family Man Frame transcends the image of man as the head of household by showcasing, specifically, the family as an asset to male astronauts. Though working outside the home for mothers was taboo at this time, it was treated as an asset for these men, showing as Bonney called their “stability.”³¹ During a press conference, Walter Bonney explicitly states, “They are as you know family men. I am not worried about their stability, their powers of observation, or their powers to accomplish the task which they are given.”³² Here, the implication is that being a family man shows steadiness or “stability,” which was needed to explore the new frontier, as it was an arduous task requiring a brave, yet steady man. Showcasing this stability was essential to selling the astronaut’s stories, which in turn was essential in promoting the space program to the American public.

The Astronaut Wife Frame

The family man exemplified American ideas of family at this time. As such, a man needed a wife and mother to his children. The Astronaut Wife Frame is characterized by a supportive—or at least complicit—attitude towards the astronaut-husbands’ careers and decisions. Throughout the 1950s and 1960s, men were most likely to work outside the home. Motherhood was a barrier to women working outside the home throughout mid-century. In 1960, only 25% of women with children under 18 participated in the paid labor force, and paid maternity leave was not a federal mandate until the Family and Medical Leave Act of 1993.³³ The subservience of women was deeply ingrained in American life at this time, as women were seen as supporters of their husbands in the home. To bolster the astronaut’s appearance as family men, their wives

were frequently interviewed and appeared in news coverage and were often characterized as doting wives awaiting their husbands' return. For example, a March 3, 1962, article offers snippets from an interview with the Mercury Seven wives, citing their support for their husbands; Annie Glenn, wife of John Glenn, was cast as the "central figure" by the author, again asserting John Glenn's role as the American astronaut-hero.³⁴ The same article also introduces Rene Carpenter [now Price] as "an attractive ash blonde."³⁵ Likewise, in an April 4, 1959, press conference, Gordon Cooper is quoted as saying, "My wife (Trudy Cooper) is also a pilot and is quite sympathetic, and particularly to this program. She is enthusiastic." Trudy Cooper is described in a May 16, 1963, *New York Times* article as taking "her two daughters and her emotions into a bedroom and [closing] the door" during the last Mercury flight, though no mention of her status as a pilot was not mentioned.³⁶ A July 18, 1969, *New York Times* article includes quotes from Janet Armstrong [now Janet Shearon] stating that she was "100 percent certain" the lunar landing would be a success; though the article did mention during Armstrong's launch, she was so caught up in the moment she temporarily lost sight of her children, emphasizing her role as a mother in contrast to her husband's occupation.³⁷ In contrast to the characterization common for the astronaut wives as nervous and worried, the reporter asked Shearon [then Armstrong] if she was fearful, to which she replied, "No sir, I'm not."³⁸

However, not all coverage cast the wives as supporters but instead represented them compliant more than supportive. In a May 6, 1961, article from *The New York Times* announcing Alan Shepard's flight, his wife, Louise, is quoted as saying, "What are you bothering to ask me for? You know you'll do it anyway."³⁹ Similarly, in a 1959 press

conference with the Mercury Seven, when asked about their wives' support, John Glenn is quoted as saying "If it is what I want to do she is behind it," and later in the conference says, "when they [the wives] first hear something like this, they have reservations about it because they don't know anything about it."⁴⁰ In the same press conference, Deke Slayton is quoted as saying, "What I do is pretty much my business, profession-wise. My wife goes along with it."⁴¹ This naturalized subversion of women was a product of the hegemonic culture in which the Astronaut Wife Frame emerges. The language used here to describe the astronaut wives characterizes them with little agency when it comes to family decision making. Indeed, they are even referred to simply as "wives" throughout the conference, suggesting a bloc mentality that does little to afford them power. In contrast, when asked about how the agency ruled out men with "unsympathetic wives," Bonney replied, "they didn't volunteer."⁴² This contrasts the image of the supportive and complicit wives and suggests that those wives with agency in their families disqualified the men before they could volunteer.

This frame is also reminiscent of what Rosabeth Kanter in her organizational study of the corporate world at mid-century identified as the "corporate wife." The corporate wife's actions and circumstance, according to Kanter, is "a function of the husband's career stage."⁴³ This narrative of wives as both supporters of their husband's work and compliant in their decisions is consistent with the traditional view of women's work as homemakers and supporters of children and husbands at mid-century. Astronaut wives were thus just that—wives. These examples are indicative of the hegemonic role of men in the family, and in this way, the astronaut wife and family men frames are intertwined. As mentioned previously, the family men frame was an asset to the

astronauts, as it helped “sell” them to the American public and supported their roles as astronaut-heroes. However, the contrast lies here in the professional roles of the wives and astronauts. Because what might hold a woman back from a professional career—parenthood—was seen as a positive for the male astronauts. This is not to say that none of the astronaut wives worked outside the household. For example, Trudy Cooper, wife of Gordon Cooper, was a pilot, as he mentioned in the first Mercury press conference.⁴⁴ However, working mothers as astronaut wives did not fit into the narrative NASA employed to promote the human spaceflight program, with the male astronauts as the centerpiece.

The Rocket Man Frame

Though most media focused on the human spaceflight program and the astronauts, coverage of NASA administrators, engineers and scientists is also present in the archive. The Rocket Man Frame is characterized by a balance of bureaucratic, scientific and expert knowledge of the new frontier. Media representation of these NASA employees—almost exclusively male—exists in the archive. Though these figures were important and garnered media coverage, they were not mythologized as the astronauts were. The Rocket Man Frame emerges from media coverage of NASA administrators, engineers and scientists. In the same way that the astronaut-hero was assumed male, so were the rocket men. Masculine pronouns were often used to refer to them, much in the same way that “man” and “mankind” were used to discuss humankind. For example, in a February 1959 speech, Keith Glennan states, “But man, himself, is the best piece of instrumentation we know about.”⁴⁵ This was not uncommon, as Casey Miller and Kate

Swift have pointed out in their work. As Miller and Swift point out, “man” has referenced both humans and males throughout history; however, the usage of “man” to mean human being does not always translate, as “man the human being has been subverted by the more persistent image of man the male.”⁴⁶ While this usage was common, it does reinforce the hegemonically patriarchal society that dominated American culture at this time.

With the need for public support, speeches and lectures given to interest groups and clubs by administrators were common finds in the digital archive. These administrators were the bureaucratic arm of the Rocket Man Frame. For example, in 1959 alone, over 15 percent of the 176 available documents are speeches or lectures. In addition to the administrator transcriptions available, a large number of administrative personnel releases are likewise available for study. These releases are indicative of the mid-century space bureaucrat, as they focus on the movements of administrators within NASA leadership. A typical release of this type announces a promotion, resignation or retirement of a high-level employee. Throughout this time, the mainstream media picked up the majority of these releases, so that the visibility of high-level leadership was much more prominent than other NASA employees, save astronauts.

This frame is also seen in mainstream news. Print and broadcast news both covered NASA’s administrators. In NASA’s early years, many changes were occurring as the NACA transitioned and other facilities across the United States were brought into the NASA fold. Coverage of these events was usually very business-like. One such example is from the August 10, 1962, *Time* magazine story on Keith T. Glennan and the potential merging of the U.S. Army Ballistic Missile Agency (ABMA) and Caltech’s Jet

Propulsion Laboratory (JPL) with NASA. The merge was characterized as a “fight” among the Washington bureaucrats and agency leaders, such as ABMA leader Werner von Braun.⁴⁷ Von Braun is the epitome of the Rocket Man Frame in many ways. The ex-Nazi rocket scientist was brought to America at the close of World War II in “Operation Paperclip,” which was an effort to round up Nazi scientists from Germany and utilize them in American rocketry and science fields.⁴⁸ Von Braun’s acumen for media publicity was discovered early; for example, he appeared on the February 17, 1958, cover for *Time* as an American “missileman.”⁴⁹ He exemplified the rocket man, as an expert rocket scientist and American bureaucrat, and his frequent appearances both in public relations and mainstream news helped propel the rocket men to household names and cultural import.

Personnel releases at this time were almost exclusively covering male employees. Because of the military influence on NASA—regardless of its civilian status—and the influence of the hegemonically male society, the majority of NASA upper leadership was male and therefore received the majority of leadership representation in both mainstream news and public relations coverage. A typical release of this nature would, however, mention an administrator’s wife. This usually occurred like the following excerpt from a March 2, 1959, release: “Mr. and Mrs. Abbott (the former Martha Leola Streeter)...”⁵⁰ Often, a wife’s name might not even be mentioned, as in this later example from 1969: “Bernier is married and has three children.”⁵¹ As with the astronaut wives, the administrators’ wives are reminiscent of Kanter’s “corporate wives.” However, they were not represented in media like astronaut wives, if at all; the astronaut wives were included in the 1962 *Life* contract and thus appeared on the magazine’s cover and invited more

media attention, whereas the rocket men's wives were simply background characters, with brief mentions as in the above examples from the press release archive. The Astronaut Wife Frame was constructed to reinforce the Hero Frame, which helped construct the male astronaut-hero myth. However, rocket men did not rely on a wife frame because they were constructed differently in the media.

Perhaps one of the more lasting images of this frame refers to the engineers and scientists at NASA, particularly the hypermasculine mission control imagery. This imagery was described by Holt in her book about the women at JPL as "white guys in white shirts and skinny black ties wearing headphones, facing forward at long desks outfitted with communications consoles."⁵² This description is consistent with the media representation of mission control at the time. Men like Chris Kraft embodied the mission control rocket man, who directed the flights from the ground. For example, a *New York Times* article following Gemini 4's flight describes Kraft as the "big boss" among the "300 men in a vital command post" and the "calmest of men in a business of steel-nerved men."⁵³ This article is adjacent to an article applauding other men involved in mission control who "were not in the limelight focused on the astronauts," accompanied by an image of four of the men (Eugene Kranz, Glynn Lunney, John Hodge and Chris Kraft) in suits, much like Holt's description.⁵⁴ It is interesting that the article that claims these men were "not in the limelight" should be part of a full-page spread (though not a front-page) dedicated primarily to them. However, while the front page of this issue was dedicated to the astronauts, this hierarchal structure is indicative of the ways in which the Hero Frame and Rocket Man Frames work together: the astronaut-hero is the frontier explorer assuming risk and exemplifying bravery, while the rocket man serves as his expert guide

leading his journey from the ground. Many of the images and video footage of mission control served to perpetuate this masculine image of mission control, and indeed much of the footage used to includes only men. In print, photos showed the all-male mission control team, and it was not uncommon for them to be referenced as “the men of mission control.” For example, an article following Apollo XI’s return refers to them as “the men who controlled the historic moon-landing flight” and shows a triumphal photo with George Low and Dr. Robert Gilruth partaking in the now-classic post-landing cigar.⁵⁵

While women were both scientists and engineers at this time, the usage of “he” and “man” to reference them gendered these professions further. A 1954 speech by Glennan states: “The *engineer* dealing with these matters must stretch *himself* to keep up with the advancing state-of-the-art.”⁵⁶ While the “man embraces woman” mentality is likely present here, assuming that the usage of the male pronoun somehow encompasses women, it’s important to point out that at this time, women made up a small percentage of engineering degrees, which were typically all-male programs until some began opening to women in the 1950s.⁵⁷ Several other instances of employees assumed to be men exist in the archive. Along with this assumed gendering are overt references “rocket men,” from which I draw the title of this frame.⁵⁸ For example, in 1959, NASA began releasing team lists for projects, which the agency would continue to do in different iterations throughout mid-century. However, early examples of these lists are headline “Men Behind the Experiments.” One such example of this is in the public relations documents for Pioneer, which lists the “Men Behind the Experiments,” symbolically annihilating women who worked on the flight, including the women of JPL, who worked as computers for non-human spaceflight missions.⁵⁹

The usage of masculine language and media representation of the rocket created a masculine image of NASA, and indeed, most of NASA's high-level administration at this time was male. For example, in a release announcing Abe Silverstein's retirement in 1969, Silverstein is quoted, "As NASA engages in its second ten-year program, it may be important that the men who decisions initiate the new long-range projects be available to complete them."⁶⁰ This language suggests a movement to the future, into NASA's new age past Mercury, Gemini and Apollo. This future, however, is still imagined in terms of the hegemonically patriarchal society. This is indicative of the larger culture at the time, where men held the majority of leadership positions in both government and business.⁶¹

The Rocket Man Frame has endured through history. Though these men were not mythologized in the same way that the mid-century astronauts were, they were important factors in the collective memory of NASA during this time. An interesting exception to this, however, is seen in Deke Slayton, who was chosen as a Mercury Seven astronaut but grounded from flight due to a heart murmur; after his grounding, Slayton served as a manager for the astronaut program before returning to flight status during the American and Soviet joint Apollo-Soyuz missions.⁶² Lasting images of mission control and men with crew cuts exemplified the hyper-masculine image of NASA at this time. The Rocket Man Frame works in tandem with the hero and Family Man Frame to create a hegemonically male NASA culture. With men seen leading the agency, it was viewed as a strong, militaristic arm of the American effort in the Cold War. This has led to the misunderstanding of women's major contributions to the space agency throughout this time, which are coming to light recently in popular culture and academics. This image would not always persist, though, as later chapters characterize the shift in the agency's

image with important changes to NASA, including a falling out with the American public after Apollo, inclusion of women in the program, major disasters and other watershed moments.

CHAPTER VIII: “HOUSTON, WE HAVE HAD A PROBLEM”

The Hero, Family Man, Astronaut Wife and Rocket Man Frames were present throughout mid-century fortified NASA’s hyper-masculine, militaristic media image. However, disruptions and exceptions become apparent during analysis of the archive. Disruptions to these vary and include disasters and mission failures, along with contradictor narratives. For example, the blame surrounding the Apollo I tragedy questioned the confidence in NASA’s “rocket men,” which put into question the Rocket Man Frame. Further, coverage of the Fellow Lady Astronaut Trainees (also known as FLATS) served as a disruption to the Hero Frame when it called into question the validity of NASA’s gender requirements for early astronauts by supplying contradictory narratives. Later disasters like the Challenger also put NASA’s image in crisis and disrupted the narrative. Furthermore, exceptions to these frames were present since NASA’s founding. Dr. Nancy Roman, for example, serves as an exception to the Rocket Man Frame. New frames emerge in response to internal changes at NASA and external changes in the culture at-large. Namely, the women’s liberation movement and addition of women to the astronaut corps shifted the masculine image of NASA, allowing new frames to emerge, including the women astronaut frame. Notable women also garnered massive coverage in the news and are detailed in this chapter, such as Sally Ride and Christa McAuliffe. The following chapter charts and expounds these disruptions, exceptions and emergences.

Apollo I

Apollo I was the first disaster to involve astronauts during official mission activities, though three other astronauts had previously died while employed by NASA.¹ On January 27, 1967, astronauts Roger Chaffee, Gus Grissom and Ed White were performing pre-flight testing on the Cape Canaveral launch pad when the capsule caught fire, killing all three astronauts. This tragedy happened at the beginning of the much-anticipated Apollo program, with the goal of placing a man on the moon and returning him to Earth by the end of the 1960s. The day before the fire, NASA released a press release detailing the program, including its desired \$454,700,000 Apollo budget for FY1968.² Just two years prior, in fiscal year 1966, NASA reached its highest budget from the era, with a staggering \$4.511 billion.³ This disaster, though tragic, did not derail the multi-million-dollar program.

NASA began its crisis communications the day after the fire, January 28, with a memo to editors appointing members of the Apollo 204 Review Board, charged with investigating the cause and impacts.⁴ Charting the Hero Frame through this disaster reveals a disruption in NASA's media narrative. However, this disruption does not derail the Hero Frame. Instead, it reinforces the framing of space as the new frontier and the sacrifices of men cast as military conquerors of space. The deaths of Grissom, White and Chaffee were characterized in the January 28, 1967 *New York Times*. In the issue, President Johnson is quoted, "Three valiant young men have given their lives in the nation's service."⁵ This vocabulary is reminiscent of military tragedies and deaths and suggests the equation of the space program with the nation's identity as a superpower. However, with the close relationship of the space program with frontier language, the

deaths were also framed as inevitabilities. For example, White's father is quoted about the inevitability of the disaster, while Chaffee's father says they were, "conditioned for things like this," emphasizing the risk in space exploration.⁶ A *CBS* anchor minced words while explaining this logic:

But while the astronauts are upset, it would not be fair to say that [mumbles] that they're broken-hearted over this. That's not the right word either but, as test pilots, as astronauts they were well-aware of the dangers involved in this, and they seem most concerned tonight with the finding out of just what went wrong.⁷

Dan Rather reported that von Braun told reporters at the Apollo dinner—where NASA administrators and guests were during the test—that the astronauts lived “on a first name basis with death” before Walter Cronkite appeared on set to emphasize the astronauts’ roles as test pilots who assumed risk.⁸ Along this same line, the disaster was not just an agency disaster but a national disaster that deeply affected the American public and world. Two days after the fire, on January 29, brief articles from across the world were featured in *The New York Times* that offered condolences from Asia, Russia, Britain and more, emphasizing the international scope of interest in the space program.⁹

The fallen astronauts’ roles as family men were likewise emphasized in coverage. For example, a headline within the January 28 coverage of the disaster reads: “Scholarships Available for Astronauts’ Children.” This emphasis on their roles as fathers reaffirms the Family Man Frame. While some of coverage immediately after the disaster speculate the cause, most is dedicated to the human losses of Apollo I. The front page of the issue was dedicated to the disaster and several other articles focus on the lost astronauts and their families, including detailed sketches of the astronauts.¹⁰ This

coverage includes descriptors of the lost astronauts such as “brave,” “courageous” and “gallant,” emphasizing their frontier roles in space exploration. For example, President Eisenhower’s condolence message includes a typical response, describing the men as “highly trained, skilled and courageous astronauts.”¹¹ This equation of the astronauts’ deaths with militaristic language reinforced the connection between the astronaut program, Cold War and conquering the new frontier, and this connection deepened the roots of the astronaut-hero, as he served as the heroic adventurer, willing to face death for the furthering of American conquest.

Apollo I: Are Rocket Men to Blame?

After the Apollo I fire, the mainstream media discussed NASA’s “rocket men” with some vigor. Throughout the initial coverage of the fire, emphasis on lack of information and access for media is emphasized. For example, *The New York Times* emphasized NASA and Air Force “[impounding] data” and restricting access to the site of the accident from reporters and media; while this might not be unusual, coupled with NASA’s evasiveness, it created a lack of trust in the agency’s handling of the accident.¹² The initial *CBS* special report mentions NASA’s charge for openness while also reinforcing the state of speculation surrounding the Apollo I fire, as media was not informed of the fire’s cause immediately.¹³

Once the initial shock of the tragedy subsided, attention turned to blame. Kauffman pointed out in his study of the agency’s public relations efforts after Apollo I that NASA “exacerbated the tragedy” with delays and incorrect information.¹⁴ The media and NASA engaged in a blame game of sorts that emerges in this coverage. Though

NASA assigned a “15-man” board of inquiry, the *New York Times* still emphasized the agency’s “secrecy.”¹⁵ Even after the Review Board’s 3,000-page document was released, NASA would not confirm an exact cause, instead stating that multiple factors might have led to the fire. An April 16, 1967 *New York Times* article highlighted NASA’s evasiveness, the agency’s refusal to disclose information and contradictory reports led the *Times* to claim a “penetrating review” of the agency could occur. The article goes on to characterize the reports finding, which include a “swarm of problems...both technical and managerial.”¹⁶ This emphasis on managerial concerns places the “rocket men” in the spotlight for blame. The suggestion that mismanagement was a root cause of the fire was persistent in the press and led to speculation once management changes persisted at NASA throughout 1967.

In February 1967, the Senate opened a separate investigation. The mainstream media followed the investigation and reported on its findings as they were received. Stories about the Senate’s investigation and NASA’s response were present in news throughout the year. For example, *The New York Times* published NASA’s denial of the race to the moon as a cause of the accident in February 1967, just a month after the fire. In the article, George Mueller, who was then head of the manned spaceflight division, is quoted as telling the Senate committee they have made a “serious” and “unfounded” charge in blaming the agency’s goals for the 1970 moon landing for the accident.¹⁷ Just two months later, *The New York Times* reported again about the accident, this time with NASA insisting that administration changes due to the accident were not linked to blame for the accident. For example, an April 1967 article announcing Dr. Joseph Shea’s move to another department and subsequent replacement by George Lowe stated that NASA

“denied that it involved and intention to fix the blame the blame for the fire that killed three astronauts...”¹⁸ This insistence by NASA was met with opposing coverage of the Senate investigation, which assigned blame to NASA officials for the accident. For example, a year after the accident, *The New York Times* reported that the Senate committee concluded that NASA and their contractors’ “overconfidence” and “complacency” contributed to the accident.¹⁹ This back-and-forth blame game did little to build confidence in NASA’s “rocket men.” In contrast, it undermined their representation as expert administrators of America’s space effort. The accusations from mainstream news and NASA’s denial—coupled with its managerial changes—painted a vastly different image of NASA. This disruption questioned the expertise of the rocket men, their defining characteristic within NASA’s narrative. Similar to the astronaut corps, the agency’s management was steeped in masculinity, as high-level management was all male. The disruption of the Rocket Men Frame highlighted this masculinity to the forefront, as coverage of the rocket men during this time focused on the all-male management.

No Space for Women: The Hero Frame in Crisis

While Apollo I did not disrupt the Hero Frame, the frame had previously been countered by a contradictory narrative of women’s involvement in astronaut testing. Women could not participate in the astronaut program during the Mercury, Gemini and Apollo missions. This bolstered the astronaut-Hero Frame by reaffirming the militaristic, masculine characteristics needed to be a space traveler. However, it barred women from participating in the physical exploration of space. While this was partly attributable to the

qualifications needed to become an astronaut (women were not allowed to fly military jets), these qualifications grew out of the belief that the next frontier should be crossed by men first.²⁰ Tying the space program to frontier language—championed by Kennedy—created the gendering of space; as the new frontier, space was seen as an obstacle to be conquered and explored first by men, who were represented as heroes. The debate on women’s role in space was one that NASA chose not to engage in many ways, finding justification for women’s exclusion in their astronaut qualifications.²¹ However, it was a topic that the mainstream news covered in the early 1960s, particularly after the revelation of the Lovelace “Woman in Space Program.” This served as a disruption to the Hero Frame. While it did not ultimately derail the astronaut-hero mythology, it did question the fundamental narrative NASA produced for its heroes. Thirteen women participated in astronaut testing at the Lovelace Center, run by Dr. Randy Lovelace—who was chairman of the NASA Special Advisory Committee on Life Science—before the program’s abrupt end after the government failed to fund further testing.²² Coverage of these women, particularly Jerrie Cobb, Joan Hart and Jacqueline Cochran, was substantial enough to warrant discussion in the mainstream press.

In particular, Cobb and Hart’s 1962 Senate Judiciary hearing garnered mainstream news coverage. It is important here to note that a thorough search of the NASA archives provided no evidence that the agency included the transcript in their press documents, though astronauts John Glenn and Deke Slayton, along with several administrators, participated in the surreptitiously named “Qualifications for Astronauts” hearing. For example, an October 21, 1962, article from *The New York Times* asks in its headline, “Why Not Astronauttes, Also?” Though the article tempers the need for a

female astronaut with the lack of perceived frustration from women at their exclusion, it does fundamentally question the assertions made by Glenn and Slayton at the hearing.²³ In the same article, Glenn is quoted as saying, “If we can find any women that demonstrates they have better qualifications for going into a program than we have, we would welcome them with open arms, so to speak.”²⁴ Glenn’s phrasing has been the focus of study by Marie Lathers, who concludes that Cobb and Hart were pushed aside by this rhetoric.²⁵ Further, the assertion by Glenn expands the notion that women must not be equal but better to participate, which in some ways is perpetuated in the news coverage of these women. In another *New York Times* article covering the committee hearing, Jaqueline Cochran’s testimony is represented as a “dash of cool water” on the pleas of Cobb and Hart, suggestive of the gendered language of women being “heated” when passionate.²⁶ In addition, stories about Cobb likewise included her measurements and described her as “trim,” a reminder of the gendered language used to characterize women at the time.²⁷ At the time of the hearing, Cobb was serving as a consultant to NASA, as Jacquelin Cochran did also; however, Cobb’s assertion on her appointment was summarized as “the most unconsulted consultant in any Government agency,” as she is quoted in a 1963 *New York Times* article.²⁸ Atkinson and Shafritz have pointed out that their appointments did more to acquiesce the female population and smooth NASA’s image than to bring in female participation.²⁹ This disruption to the hero frame was minimal and easily corralled partially by Cobb’s appointment to NASA but more so by the gendered coverage and cultural response to their attempts to go into space.

Tereshkova's Flight: First Woman in Space

The American coverage of Soviet cosmonaut Valentina Tereshkova's 1963 flight is likewise telling of the cultural thought of women's participation in the new frontier and likewise served as a disruption to the Hero Frame. During this time, many saw Tereshkova's flight as a Soviet publicity stunt, used to garner support and international intrigue. In a June 17, 1963, article in *The New York Times*, Tereshkova is framed as an exception, not the rule when it comes to women in space flight, furthering the debate on "women's place" in space. The article details her lack of pilot experience and formal education—leading to her confusion on many aspects of rocket technology—but praise her "determination," "sheer physical stamina," "physical toughness," and "courage."³⁰ These characteristics are reminiscent of the Hero Frame. Though coupled with negative coverage of her skills, this emphasis on Tereshkova's personality reinforced the notion that men were more qualified for spaceflight. The exception is of course where a woman displays traditionally male qualities. Another editorial printed on the same day talks of the first woman in space not as a victory for women necessarily but a sign that American-Soviet space programs should be working jointly; the article states,

The Soviet Union has given us the first heroine of the space age, thus demonstrating that its long lead in the science of space travel is matched by its acumen in space showmanship. We have long known that this is a woman's world; it remained for the Russians to turn it into a woman's cosmos...The sad part is that there must be any nationalistic tinge to this achievement...Yet in both the Soviet Union and the United States we persist in the endless waste and duplication of effort attendant on making a race of what ought to be a joint embarkation in the peaceful application of knowledge for the common benefit of all.³¹

The author posits that the emphasis on the “nationalistic tinge” subverts Tereshkova’s achievement as the first woman in space. However, if the angle here was not enough to subvert her as a national pawn for U.S.-Soviet competition, the reminder that the Soviets achieve greater “showmanship” in space is a stark reminder. Regardless of the male language used to describe the “stunt,” it is a reinforcement of America’s lag in the space, which the author regards as a “waste” of resources on the part of both nations.

After the initial articles on Tereshkova’s historic flight, much of the coverage of her centers on her post-flight travels, her marriage to fellow cosmonaut Andriyan Nikolayev, the birth of their child and plans to fly after giving birth. It would be 20 years before a woman would be heralded in the news as breaking barriers in space, with Sally Ride’s historic flight in 1983. This disruption to the Hero Frame was brief, and likely did more to reinforce the American astronaut-hero than deter the American public’s faith in him. With the American media largely characterizing Tereshkova’s flight as a dangerous publicity stunt, the contrasting astronaut hero, appeared prepared, qualified and, of course, male—all important characteristics of NASA’s astronaut program.

Rocket Women Exceptions: “Hidden Figures” and Quiet Exceptions

Dr. Nancy Roman, NASA’s first chief astronomer, is an exception to the missing frame. Much in the same way Margot Lee-Shetterly deemed the African American computers at Langley as “hidden figures,” I call Roman an exception here.³² Roman received her PhD in Astronomy from the University of Chicago in 1946 before becoming NASA’s Chief of Astronomy, a position she held from 1959-1979; Roman is credited with establishing NASA’s astronomy department and is often lauded as the “Mother of

the Hubble Telescope.”³³ While present in some press documents, primarily when personnel or task groups were named, Roman was not found as often in speech transcripts and press conferences as other male colleagues. While this could be attributed to her title and expertise in non-human spaceflight in a time when America frenzied to know more about getting a human in space, it is still notable that she is less frequently seen in these documents. However, this is not to say that Roman and other women are completely absent from the archive, and indeed, in some instances, women’s career in the sciences were encouraged by NASA, while the agency simultaneously justified their barring women from the astronaut program. For example, in a June 1961 commencement speech to George Washington University, Webb states:

And let me point out here that by no means do men have a monopoly on careers in space. Ann E. Bailie, a gifted young NASA scientist, made important contributions to the recent investigation which revealed that the earth is shaped more like a pear than a bulging sphere. Dr. Nancy Roman is chief of NASA's Astronomy and Astrophysics Satellite and Sounding Rocket Programs and Eleanor C. Pressly is head of the Vehicle Section of the Space Sciences Division at Goddard Space Flight Center.³⁴

While these mentions highlight women at the agency at this time, it is important to note that women were still vastly underrepresented in media coverage. In addition, the grouping of these women into one bloc—as “women in space”—reinforces the masculine norm at NASA and “others” these women, a practice seen in many cases where women are framed as exceptions.³⁵ This display of a select few women at the agency is reminiscent of Kanter’s “token high-level women.” According to Kanter, tokens are often seen as symbols and at INDSCO “were deliberately thrust into the limelight and displayed as showpieces, paraded before the corporation’s public.”³⁶ Though the agency highlighted and championed them as symbols of women at the agency, women overall were vastly

underrepresented in NASA media throughout mid-century. This underrepresentation was also present in mainstream national news, as notable men at the agency were much more frequently mentioned than women. For comparison, a search of *The New York Times* for von Braun—who headed the Marshall Spaceflight Center—from 1959-1961 yields 18 results, whereas the same search for Roman returns only 1 mention. Other pioneering women at this time are missing from the public relations archive. Women like Margaret Hamilton, who helped build the computer program to launch Apollo to the moon; Dorothy Vaughn, who was the NACA's first black supervisor and was integral to the Langley Research Center; Shirley Jackson, NASA's first black female engineer at Langley; Margaret W. 'Hap' Brennecke, Marshall Space Flight Center's first female welding engineer; Sue Finley, an engineer at JPL who as of 2017 became the woman longest employed at NASA; and countless others are not as visible in the archive though they played essential roles in the nation's space race.

NASA's "Other Women"

Because the focus of many early documents during the Mercury, Gemini and Apollo projects involved space flight, women were seldom acknowledged in public relations efforts. As previously shown, most public attention was focused on the all-male astronauts from these missions, with an emphasis on their personal stories. When women were mentioned in conjunction with the "manned" missions, they were most often the wives of astronauts quoted about their husbands' flights. However, women have been present at NASA since its founding in 1958. Changes and appointments in upper management of NASA were common press releases (and continue to be). However,

because women were concentrated at lower levels of employment within the agency, they were seldom seen in press documents. Indeed, this concentration of women at lower-level work was not exclusive to NASA, as 96% of high-level managers and supervisors earning more than \$15,000 were men, according to the 1970 census.³⁷ There were exceptions to this general trend, as seen in the exception frame.

Mentions of women as a bloc do exist in the form of official statements from NASA administrators. For example, a one-paragraph clip from *The New York Times* on June 28, 1962, mentions the need for women in the space industry; James Webb, then administrator of NASA, is paraphrased as asking for women to join the existing ranks of “146 women aero-space technologists and seventy-seven professional mathematicians” at the agency, though he acknowledges that women are not part of the astronaut program.³⁸ Even after NASA announced they would include scientists on future space flights, women were still absent from discussion, though no gender qualification was explicit in the requirement. Astronaut Group IV in 1965 was the first of these scientist-astronauts and applicants were not required to have test-pilot experience, though it was encouraged; this loosening of flight experience requirements encompassed a wider recruitment pool, that, though unpublicized by NASA, included women. Instead, NASA placated women with the emphasis on the “other women” at the agency who contributed to the space program in administrative and scientific roles. This encouragement with restrictions is characteristic for women at mid-century, as the labor force reverted to the pre-war hegemony and limits on women’s advancements became traditional again. Though the powerful men at NASA were becoming household names, most women at the agency were represented in this bloc way, with only a few of their names appearing in

mainstream national news consistently. Likewise, many of the articles surrounding Group IV astronaut selection are framed in such a way as to highlight the nonexistence of sex requirements for the job of astronaut. For example, a September 25, 1966 article's secondary headline boasts, "Women Applicants Will Be Judged Like Men for Jobs on Orbiting Laboratories."³⁹ After selection, an April 4 article delivers the names of the new all-male astronaut class after making mention of the six women who applied and were rejected because they did not meet "minimum requirements."⁴⁰ It wasn't until the mid-1970s that women gained more visibility in NASA's media.

Apollo XIII

Apollo XIII was the first disaster after the lunar landing. The April 1970 mission went wrong just two days into the journey to the moon when an oxygen tank burst. The crew included Jim Lovell, Jack Swigert and Fred Haise, who had to survive on the limited oxygen originally provided for a lunar landing as they circled the moon and returned to Earth. Though there were no casualties, Apollo XIII was characterized as a mission failure, as it did not achieve its goal of a lunar landing. Kauffman has pointed out that Apollo XIII characterized a "successful failure" concerning the agency's crisis communications methods during and after the mission. Kauffman cites NASA's quick and open communications as the criteria for its success. This contrasts with the crisis communications NASA utilized after Apollo I, which were largely "closed door" tactics that distanced the media from learning the cause and immediate ramifications of the disaster.

Coverage of the mission was broadcast live on television. *CBS* showed live coverage of mission control and played the live audio recording of the control communication with the astronauts. In contrast to Apollo I coverage, “rocket men” were not shown to blame; instead, they were represented as tirelessly working to bring the stranded astronauts home. Similar to Apollo I coverage, the media emphasized the inevitability of risk and possibility of danger in the space program. Speaking of Apollo XIII on *NBC* then-administrator Thomas Paine said, “We’re at the beginning of man’s conquest of space. Just as in the early days of aviation we will have accidents occasionally.” This reinforces the frontier narrative that NASA relied on throughout the Apollo program and beyond. This narrative again reinforced the Hero Frame.

CHAPTER IX: “ROUTINE ACCESS TO SPACE”

NASA’s budget was already being cut throughout the 1960s; however, after Apollo XI, the agency experienced sharper cuts than in previous years. After the race to the moon had been won, the agency could no longer rely on Cold War competition to justify its massive budget—they had beaten the Soviets, after all. In February 1970, just seven months after the lunar landing, *The New York Times* reported that NASA experienced a 12.5% decrease in budget, with only \$3.4 billion for the 1971 fiscal year.¹ In August 1970, NASA’s administrator, Thomas Paine, quit the agency. While administrators had come and gone, Paine’s resignation was a topic of conversation in the mainstream news and indicative of the sentiment towards NASA post-Apollo. For example, *The New York Times* called NASA a “declining agency” in its headline announcing Paine’s resignation.² The agency had steadily cut personnel throughout this time, and much of the discussion of budget in mainstream news during this time was focused on this human cost of budget cuts. Broadcast news detailed these cuts in coverage, adding sweeping shots of NASA employees—who were almost exclusively male—at various centers, often in manufacturing and mission control. Likewise, the employees were often referred to as men. For example, in a December 1972 *NBC* broadcast, the anchor says, “By the end of next year, 2,600 more men will have lost their jobs [at Kennedy Space Center].”³ In this climate, NASA began to experience unprecedented internal changes.

“Women’s Lib” and NASA’s Equal Opportunity Office

In the 1970s, national news headlines began including words like “sisterhood” and articles began telling the stories of women running for Congress, striking and renewing calls for passage and ratification of the Equal Rights Amendment, first introduced in the 1920s. Parity for women in the workplace was not instantaneous after Title VII passage in 1964, which barred discrimination based on race, color, religion, sex or national origin, and creation of the Equal Employment Opportunity Commission in 1965; it wasn’t until the 1972 Equal Employment Act that federal government began legally enforcing Title VII.⁴ This cultural landscape was the backdrop for NASA’s evolution, which began with the establishment of the agency’s Equal Opportunity Office in 1971. While previous years had seen NASA attempt to highlight its “other women,” the shift beginning in the 1970s saw women receiving an increase in media attention from this 1960s effort. This shift was characterized by inclusion of news releases for female personnel, as more women were moving into higher level positions, EEO coverage and perhaps most famously, the search for America’s first female astronauts.

Even after the Equal Employment Act and creation of NASA’s EEO, progress was slow. Ruth Bates Harris, NASA’s first EEO deputy director and the highest-ranking woman at the agency in 1971, was charged with enforcing the federal government’s employment mandates. However, in a publicized dispute with the agency, Bates was fired from NASA. Though mainstream media did not extensively cover the dispute, an October 28, 1973, *New York Times* article leads with the headline: “Top Black Woman Ousted by NASA.”⁵ The emphasis on her race and gender painted a stark portrait and contrasted NASA’s public relations attempts to tell the story of an inclusive government agency.

After public outcry, Harris resumed her employment at NASA in 1974 as Deputy Assistant Administrator of Public Affairs for Community and Human Relations; her job duties described in the release are indicative of NASA's reaction to increased calls for equality, as her work "involved detailing the importance of NASA's missions and their contributions to concerned community groups including minorities, women, senior citizens and the handicapped."⁶ *The New York Times* likewise included a brief "Mentions of People" column on Bates' return.⁷ These groups mentioned in Harris' line of work are almost verbatim from the Equal Employment Opportunity Act of 1972, which serves as a reminder of NASA's charge as a government agency to comply with the demands from government—influenced by calls from movements like the Women's Liberation Movement—to integrate its workforce. Efforts to highlight NASA's Equal Opportunity programs continued, particularly after the hiring of Dr. Harriet Jenkins, who joined the agency as the Deputy Assistant Administrator of the Equal Employment Office in February 1974.⁸ The agency's equal opportunity efforts were characterized by then-administrator James Fletcher as "making encouraging progress," with a commitment to hire 80 minorities and 80 women in 1974.⁹ Several other releases on Jenkins in the archive show the attempt of the agency to highlight its inclusive progression in a time when "Women's Lib" was a common headline.¹⁰ However, NASA was still run largely by men at this time, with women and minorities making up only a fraction of NASA's management.

The agency and mainstream media also highlighted more than the women of the EEO. Minority men, for example, received more attention, as an April 1974 release with the headline "NASA Appoints Minority Press Aide" shows; the emphasis on Leon

Perry's minority status in the headline and explanation of his role connecting NASA with minority media and publications in the release reinforces NASA's attempt to exemplify inclusivity in its public relations efforts.¹¹ Equal Opportunity Awards were also given by NASA, with the first received by Goddard Space Flight Center for "its well planned and executed management strategies which have contributed significantly to the employment, development and utilization of minorities, women and the handicapped."¹² This emphasis on minority and gender employment at the agency were often lumped together as an overall diversity program. This is reminiscent of the bloc mentality used to describe the astronaut wives, as minority, women and disabled employees were often spoken of in this way. However, women did receive separate coverage in both news and mainstream media. For example, NASA continued to highlight its Woman's Program—led by Jo Marie DiMaggio and Oceola Hall—throughout this time with release detailing its activities, including a November 1974 "Women's Week."¹³

Scientific releases also began to highlight women at the agency. For example, a December 1974 release details all-women experiments conducted at Marshall for potential inclusion on the space shuttles, led by Dr. Mary Johnston, Ann Whitaker, Carolyn Griner and Doris Chandler.¹⁴ Even the mention of the women's full names indicates a shift in NASA's public relations efforts, which historically excluded women from project lists and personnel releases. This shift is partially due to the increased employment of women at the agency and the concentration of women at higher levels within the agency, which they were previously largely absent from as educational and cultural bars were firmly in place to subjugate them to lower levels of employment. Another example is seen in a January 17, 1980 release about Jackie Parker, a nineteen-

year-old woman, whose job was to flight data during the shuttle missions.¹⁵ Broadcast news began showing women in NASA centers more, as well. A March 1982, for example, showed women in mission control.¹⁶ Later, an *NBC* segment from July 1985 detailed Jenny Howard, a NASA engineer in mission control, and her decision to override the computer system actions during a *Challenger* mission.¹⁷ At this time many “firsts” were happening for women, as well. For example, in 1981, Carmen Batten won an award for her invention of a visible and infrared polarization ratio spectrophotometer, which NASA claimed was the first time “a woman has been the sole inventor of a contribution for which a patent has been issued.”¹⁸ However, many women had already accomplished firsts and NASA began to retroactively acknowledge them. An example of this retroactive acknowledgement is seen in a December 1978 release. The long-form release details the women who completed the “Bed Rest Tests” in 1978, which were tests to study the effects of weightlessness on the body. These tests had been held since 1973; however, 1978 was the first year to include women.¹⁹ The release details not only the experience of the women involved in the test, but also the NASA nurse manager in charge of testing, Dee O’Hara. At the end of the release, O’Hara is named as “the nurse on all NASA’s manned space missions, from the Mercury program to the Apollo Soyuz Test Program.”²⁰ This retroactive acknowledgment of O’Hara’s work during the hyper-masculine Mercury program shows the presence of women from the agency’s earliest years. However, the mention also highlights the historic absence from NASA’s media representation, which symbolically annihilated them, to use Tuchman’s term, from the agency’s image throughout early mid-century.

Women Astronauts: “Some inconveniences”

Women’s roles at NASA had evolved—as they had in larger culture—and their participation in leadership and “non-traditional” jobs shifted the ways NASA talked about its personnel and the way the agency was framed in mainstream news. As the “old guard” at NASA were retiring, the agency’s image changed. For example, Shepard’s retirement in 1974 showed the contrast in NASA’s historical media image and its emerging image; Shepard was described with the Hero Frame characteristics, such as “pioneer” and “man of great courage and capability.”²¹ This contrast shows the evolution of the agency and the changes beginning throughout the 1970s. Perhaps one of the most important changes was the inclusion of women in the astronaut corps. In 1978, six women trained and were accepted into NASA’s astronaut program: Anna Fisher, Shannon Lucid, Judith Resnik, Sally Ride, Rhea Seddon and Kathryn Sullivan.

After these women were chosen for the astronaut corps in 1978, NASA began to include a reference to them in most releases about the Shuttle program. The line most often appeared as, “including six women.”²² As they began training, NASA released several documents detailing the preparations for their entry into the program. For example, a December 29, 1978, release details the need for smaller space suits. “Finding the perfect fit is important with space suits, particularly since women have joined the astronaut corps. . . The system must accommodate extra-small sizes for women.”²³ The language here separates the women from the men in the program. The need to “accommodate” for women emphasized their “otherness.” Many changes were made to “accommodate” for women in the program, perhaps most famously regarding hygiene and privacy. For example, NASA added privacy curtains on the shuttle, and a NASA

official in a pre-flight conference mentioned there might be “some inconveniences” from Ride’s presence, as a woman, on board STS-7.²⁴ This language suggests that women’s physical presence, the literal space they inhabit, was a barrier.

Though NASA ran a massive campaign to recruit diverse astronaut candidates during the mid-1970s, I do not focus on this campaign for several reasons, namely its reliance on advertising and focus on specialty publications, such as *Ebony*.²⁵ However, NASA did create public relations documents for recruitment for national publications, which are available in their press release archive. The phrase used in mass recruitment campaigns was repeated in following years: “Qualified minority and women applications are encouraged to apply.”²⁶ The qualifications for the astronaut corps expanded as mission and payload specialists were added to the program, and this qualification encouraging minority and women candidates to apply began appearing in press documents throughout the 1970s. Payload specialists, in particular, were meant to expand the space program and achieve a major objective “for more people to go into space, easily and safely, in order to enhance the scientific, commercial and national security objectives there.”²⁷ However, the implicit requirement for women and minority candidates is that they be better than average, as suggested by the qualifying phrase mentioned above. For example, a June 1983 article mentions that women were not part of the astronaut corps in years previous because medical data showed that compared to average men, average women were less tolerant of physical stress; however, the author states that an above average woman—“physically fit women like those selected”—was qualified for space travel, since she could compete with “average men.”²⁸ This need for women and minorities to be better than average is a reminder of the culture that was still

largely patriarchal and Caucasian. The language used here casts “otherness” onto the “women and minorities” that forced them to become exceptions, not the rule. This exceptionalism harkens back to prior coverage, such as the insistence that Tereshkova was an exception in her 1963 spaceflight.

The mainstream media and the agency’s public relations efforts differed in some ways in its coverage of the first female astronauts. For example, when NASA announced the STS-7 crew, it made no fanfare out of the historic nature of the flight, choosing instead to list crew members for several upcoming flights in normal releases. In contrast, *The New York Times* announced the news with the headline “Woman and Black Named for Shuttle Mission.”²⁹ This contrast emphasizes the way NASA maintained a business-as-usual tone, while the mainstream news predictably emphasized the historic nature of the new shuttle crews. However, NASA officials acknowledged women’s accomplishments in speeches more than the agency’s press releases did. For example, a January 1984 speech by Jim Beggs announced Sullivan’s planned spacewalk, acknowledging that NASA “expected her to make history,” which she did as the first American woman to perform an EVA on STS-41-G.³⁰ All of these women made history, and this was emphasized in media coverage. For example, *NBC* covered the new candidates for the astronaut program prior to Group VIII selection. Footage emphasized the eight female candidates who were then training at Johnson Space Center, and Seddon was the focus of much of the clip, who mentioned that men back home were joking that the women would be stewardesses.³¹ NASA’s history was also highlighted in contrast to the new astronaut class in broadcast. Overall, women received more of the media attention than the first African American astronaut—Rob McNair, though some emphasis

on inclusion of minorities was seen in mainstream news. For example, another *NBC* segment after Group VIII selection mentioned, “All astronauts have been men and white, not black. Today all that was changed.”³² This contrast was pointed out across coverage, including an *ABC* segment that highlighted the historical qualifications for astronauts.³³

Their womanhood was also emphasized. For example, a 1979 article on Lucid characterized her as “one of two married female astronauts and the only one with children.”³⁴ Motherhood was likewise emphasized when Fisher became the first American woman in space on board STS-51-A. A November 9, 1984, *New York Times* article details Fisher as a “physician...and [with] a 14-month-old daughter.”³⁵ However, subsequent coverage of the mission emphasized the retrieval, for the first time, of two communications satellites by the crew. In addition, astronaut husbands were also mentioned in news. Though they did not receive the immense coverage the early astronaut wives received, they were mentioned in stories about the astronauts. In particular, Ride and Fisher’s, husbands, Steve Hawley and William Fisher, were mentioned, since they were both astronauts as well. Wives had been mentioned throughout the early years in terms of their husbands; however, for the female astronaut class, husbands were mentioned in terms of their wives, a shift in the masculine tradition of the agency. For example, a NASA press releases referred to William Fisher as “the husband of Anna Fisher, who was selected for the astronaut candidate program in 1978.”³⁶ Hawley was likewise characterized in this way during a broadcast segment when the reporter mentioned the STS-41-A flight crew, calling Hawley the “husband of Sally Ride” and Resnick the “second woman in space.”³⁷ This change highlighted the internal shifts NASA experienced through this time, as more women joined in the space agency’s

work. Throughout the 1970s and 1980s, the idea of who could be an astronaut was fundamentally changed. In prior years, the qualifications had been steeped in militarism and masculinity. These qualifications had helped to create the Hero Frame, which was characterized by militaristic and masculine traits; however, as women joined the program the Hero Frame evolved, though women were generally not characterized in the same way as their previous male counterparts.

Ride, Sally, Ride: First American Woman in Space

Sally Ride was the first American woman in space. Ride had studied physics at Stanford University, earning her doctorate in 1978. Ride had responded to an article in the *Stanford Daily News* about recruiting women into the astronaut program and applied in 1977.³⁸ She became one of the first six female astronauts. Leading up to her historic 1983 flight on STS-7, officials in releases and conferences began referencing her as “Dr. Sally K. Ride, who will become America's first woman in space.”³⁹ *The New York Times* announced Ride’s inclusion on STS-7 in 1983 with the headline “Americans in Space: Women are Ready,” before characterizing previous barriers to women’s space flight as “long doubts, and what some might call prejudices.”⁴⁰ Ride was characterized after her flight as “cool” and “versatile” in mainstream coverage, though the article mentions that her gender overshadowed her accomplishments on the flight, as she performed one of the most important tasks of the shuttle era—capturing satellites with a robotic arm.⁴¹ An article immediately following her flight made mention that her flight proved that “women [were] equal to men as astronauts.”⁴² This language is reminiscent of Kanter’s token woman, as seen previously in coverage of Roman. It seems that NASA, for all its

business-as-usual language in announcing the Shuttle crews, knew Ride's flight would cause a media fervor. In some ways, the agency tried to limit this. For example, in the pre-flight briefing, flight commander Bob Crippen is quoted, "I've, from a commander's standpoint, I was a little bit concerned because I did know of all the attention Sally was going to be getting. I was afraid it was going to detract from some of her training. Consequently, I've probably been guilty of having Sally avoid quite a bit of the contact with the media."⁴³ A June 16, 1982, *NBC* broadcast reporter mentioned, "most of the publicity about Saturday's Space Shuttle trip is centered around Sally Ride, the first American woman scheduled for space, but there are four other astronauts and an ambitious set of experiments."⁴⁴ Despite the agency's attempts to control her media attention, Ride was naturally the focus of intense media attention. This was also contrasted by the relatively smaller media attention garnered by Guion Bluford's historic flight as the first African American in space in August 1983.

In the pre-flight briefing for STS-7 a reporter characterized Ride as a "footnote in history and a symbol," emphasizing her role as a capital-F First woman.⁴⁵ In the same conference, Ride was subjected to gendered question received by no other crew members. For example, a female reporter asked her if she had plans to be the first mother in space and whether she was afraid space travel would affect her childbearing ability. After having the crew physician answer the biological question, Ride poignantly answered "And you'll notice that I'm not answering the first part of your question."⁴⁶ This question again emphasized the ways that motherhood could still serve as a cultural and physical barrier to a woman's career. Another example of these gendered question is seen when a male reporter asked Ride how she handled adversity.

Now, Dr. Ride, during your training exercises, as a member of this group, when there was a problem, when there was a funny, a glitch, or whatever, how did you respond? How do take it as a human being? Do you weep, do you, what do you do?⁴⁷

Ride, in response, asked why no one asked flight commander Bob Crippen the same questions. These gendered questions were asked of Ride only. In this way, Ride's womanhood is emphasized—and often as a barrier. However, the opposite was also true. Another reporter during the pre-flight conference asked Ride if she had “become one of the boys.”⁴⁸ This opposite reaction to Ride—omitting her womanhood—suggests a struggle to reconcile Ride's gender with her job.

After the STS-7 mission, the crew participated in a post-flight press briefing, as was common for all crews. Ride was asked about how she felt about her publicity and what advice she has for other women both within and without NASA; however, she was also asked directly how she felt she performed: “before you went into orbit, you said it was important to you that you do a good professional job. Do you feel that your performance during the mission was up to your own hopes and expectations?”⁴⁹ This question was not asked of the other crew members. By singling out Ride with this question, the reporter separated her from the male crew members and suggested she must qualify her accomplishments. This is reminiscent of the recruitment language used to solicit applications from “qualified” minorities and women. Even with the gendered coverage of Ride throughout the 1980s, she is remembered as a symbol of the agency from this time. However, the massive media coverage of Ride has also served to overshadow other women at the agency, particularly those in administrative and scientific roles. This was pointed out in mainstream coverage, as an August 28, 1983, article

mentions the “other women” at NASA who had been overshadowed by the “hoopla” over Ride and the other female astronauts’ flights.⁵⁰

A Teacher in Space: Christa McAuliffe’s Journey

Women made large strides at the agency at this time, which included first journeys into space, space walks, civilians in space and more. NASA began the Teacher in Space program, which was begun in 1984 after President Reagan began the program to inspire students and teachers.⁵¹ NASA announced the program in November 1984, seeking a candidate for an “early 1986 flight.”⁵² The teacher chosen would be a payload specialist—a non-astronaut civilian who went through NASA training. After a lengthy search, Christa McAuliffe, a high school social studies teacher from New Hampshire, was chosen as the first Teacher in Space candidate. McAuliffe was framed as an ordinary person. In mainstream news, her roles as a teacher, wife and mother were emphasized. In the immediate coverage of the *Challenger* disaster, she was characterized as “the first ordinary citizen to go into space.”⁵³ McAuliffe was a normal person who had been chosen for the space program, which catapulted her to national fame. In media she was characterized as having a “wholesome, family-oriented, small-town” background, emphasizing her status as “ordinary” compared to other astronauts.⁵⁴ She was also characterized in broadcast news, after the *Challenger* disaster, as a “pretty perky school teacher.”⁵⁵ This language shows the way media emphasized her civilian status and the ways she was humanized in the press, as the public felt they could relate to her in a way they could not with the astronauts and other civilians on board, like the commercial payload specialists.

Mainstream media seized on McAuliffe's story and covered her journey to space extensively after she was chosen in 1985. The search for a teacher for spaceflight was a popular one, with *The New York Times* publishing articles detailing the application and search process, announcing in July 1985 that 10 finalists had been announced.⁵⁶ On July 20, 1985, McAuliffe was announced as the teacher chosen for a shuttle mission. In NASA's public relations archive, 1985 releases are largely absent and could not be located elsewhere. In the announcement in *The New York Times* McAuliffe said she would keep a journal to "humanize" space and chronicled her journey to the top 10 finalists.⁵⁷ Broadcast news likewise covered McAuliffe's journey, most notably the announcement by Vice President George H.W. Bush and McAuliffe's speech. Leading up to the flight, *The New York Times* characterized the flight's focus on McAuliffe as "what's promised to be a public relations bonanza," with more than 800 reporters who had requested credentials for the liftoff at Kennedy Space Center.⁵⁸ The emphasis on McAuliffe during this flight, shows the evolution of not only NASA but also space travelers, who evolved from a select few military men to "ordinary citizens," opening space to a more inclusive audience, as the larger culture called for equality through the Women's Liberation Movement and Civil Rights Movements.

This shift was seen early in coverage of the 1978 astronaut class, and Ride and McAuliffe in particular. However, this shift also emphasized womanhood, as inclusion of women into the program was a headline-making event for the mainstream media. McAuliffe's memorial profile in *The New York Times* following the *Challenger* incident emphasized her role as a "wife, mother and teacher," and also detailed the "importance of womanhood" by publishing a portion of her application in which she wrote:

‘As a woman,’ she wrote in her application to NASA, ‘I have been envious of those men who could participate in the space program and who were encouraged to excel in the areas of math and science. I felt that women had indeed been left outside of one of the most exciting careers available. When Sally Ride and other women began to train as astronauts, I could look among my students and see ahead of them an ever-increasing list of opportunities.’

This quote highlights the shifting sentiment surrounding NASA astronauts, as the mid-century astronaut-heroes, who were at one time only male military men, evolved to include women who “had been left outside” and barred entry from the program.⁵⁹ This contrast shows the evolution of the Hero Frame, as the mid-century astronaut-heroes were mythologized and the language used to describe the astronauts in media changed as the astronaut corps itself changed.

Challenger

The *Challenger* disaster was a watershed moment for the space agency. At the time, it was the worst disaster the agency faced—claiming seven lives. Those on board were Gregory Jarvis, Christa McAuliffe, Ronald McNair, Ellison Onizuka, Judith Resnick, Dick Scobee and Michael Smith. The Shuttle program was framed as a low cost, sustainable program to sustain the agency and usher in commercial and military usage of space using NASA astronauts and transport. Tom Brokaw, in an *NBC* segment, characterized the Shuttle as “a kind of national symbol.”⁶⁰ By 1986, launches had become routine, with 24 successful launches from the previous five years. Because of this, only *CNN* was live broadcasting the launch, with the other major broadcast networks taping the launch at Cape Canaveral to play on later evening news segments. However, on

January 28, 1986, the shuttle *Challenger* exploded 73 seconds after launch at Cape Canaveral.

The shock of the tragedy was immense, and mainstream media covered the explosion and subsequent investigations throughout the late 1980s. For the week after the tragedy, *The New York Times* had stories about *Challenger* on the front page of every issue until February 8, ten days after the tragedy. At the time of the explosion, NASA was much better-prepared to handle a tragedy of this magnitude than it had previously been in the Apollo era. However, even with this increased ability to respond, NASA's handling of the *Challenger* disaster has been lauded as a failure, as the agency did not respond directly to media inquiries following the explosion. NASA's own public relations documents following the explosion are fact-oriented and offer information on administrative and investigative changes. For example, the first mention of the *Challenger* in the available documents is on February 10, with an announcement that several planetary probe missions were postponed, as the shuttle missions later in the year were to launch them.⁶¹ In the archive, there is a gap in documents from January 16 to February 10, and I was unable to locate the releases from this gap; however, mainstream coverage detailed below allows some of these gaps to be filled, as articles make mention of NASA releases and personnel statements.

Mainstream media coverage of the disaster was extensive. For example, a search of *The New York Times* for front page articles throughout 1986 yields over 100 results. *Challenger* was framed in early coverage as a "moment of disaster and loss."⁶² The language used to describe the *Challenger* displays the emotional connection of the public and officials to the disaster. *The New York Times* characterized the days after the disaster

as having “heavy emotion,” with a description of President Reagan—at a Houston memorial service—as “ashen.”⁶³ Coverage of the astronauts’ families characterized the “mourning” and “sense of helpless grief,” accompanied by photos of mourning family members and community members around the Johnson Space Center.⁶⁴ Concern for children was likewise a media topic of discussion in the days following the incident. For example, a January 30, 1986, cover article details the concern for children—who had watched the liftoff in higher numbers at school due to McAuliffe’s participation—and explained the need for “openness” to solace children.⁶⁵ This coverage of the disaster is expected, as media attention for a shocking tragedy begins in the news cycle with grief and loss. However, after the shock began to wane, mainstream media attention turned quickly to speculation and blame.

Challenger Administration: Rocket Man Frame Still at Risk?

The agency came under intense scrutiny from the press, public and government in the months following *Challenger*. While the Rocket Man frame had involved and exceptions for Rocket Women had begun to appear, the majority of NASA’s high-level administration was still male. Therefore, the speculation and blame in mainstream media following the incident in some ways still jeopardized the Rocket Man frame that persisted even after the Hero Frame had evolved to include women and minorities. On the first day of coverage, one of the front page’s article headlines asks, “How Could It Happen? Fuel Tank Leak Feared.”⁶⁶ This mild speculation took a more accusatory tone as time progressed and details of investigations began to surface. In spring 1986, *The New York Times* began publishing articles that turned away from questioning and toward theories.

For example, the first article to suggest this tone begins with the headline, “NASA Considered Shuttle Boosters Immune to Failure.”⁶⁷ The language here takes on an adversarial tone. The agency, who by this point had not released a cause of the incident, was not receiving much positive coverage. The shift in tone suggests a devolving relationship between the press and NASA, who for many years had enjoyed a symbiotic relationship in less tragic times. In addition, coverage of NASA’s investigation had begun as early as January 30. In addition to NASA’s review board, the president established an independent investigation. Early coverage of the presidential investigation was conciliatory, as *The New York Times* reported that the White House wanted to lessen concerns about the integrity of the agency’s investigation or appearances of waning support.⁶⁸ However, NASA’s media image, which had so long been characterized by expertise and excellence, began to shatter. For example, a February 4 article stated:

But NASA seemed above such mundane shortcomings. The agency projected an image of almost superhuman technical and managerial proficiency: clean-cut as an astronaut, laconic and resourceful in the face of danger, hypercautious in minimizing the risks, computerized at the cutting edge of technology, sophisticated in its public relations strategy, squeaky-clean in its integrity.⁶⁹

This image of NASA was one carefully crafted over almost two decades of a co-constructed narrative from the agency and media. The language, particularly descriptors like “clean-cut,” “resourceful,” “cutting edge” and “squeaky-clean” were indicative of not only the agency’s image but also of the astronauts and staff. However, as the *Times* later said, this began to change as the agency was “put under a microscope and blemishes began to appear.”⁷⁰

This blame rhetoric continued throughout the year, and the “blemishes” began to appear in front-page news. One example of the deep divide between NASA’s public relations and *The New York Times* is seen in a series of April 1986 articles. On April 23, 1986, *The New York Times* published a scolding article chronicling NASA’s “abuses and mismanagement” and characterized the agency as plagued by “pattern of management problems, as well as broken promise on costs, schedules and performances.”⁷¹ The next day (April 24), the agency published a second article in its series, claiming that NASA wasted millions of dollars and forewent “safety spending” during budget cuts in favor of other programs.⁷² The April 24 article cites NASA’s press release responding to the federal audits ordered by the Congressional investigation; I was unable to locate this document referenced in the archive. In a rather unprecedented step, the agency responded directly to this article. On April 25, the agency issued a press release responding to the articles, citing assumptions and incorrect information. For example, early in the release, the agency claims the article misrepresents the way the agency is managed, citing the reporter “gives a misleading impression.”⁷³ However, NASA did not always respond so directly to reports. Instead, NASA chose not to comment as these accusations of mismanagement first began to surface. For example, a February 9 article details the warnings circulated through NASA about safety lapses and mentions that NASA would not return comments.⁷⁴ Broadcast news characterized the agency as taking “shortcuts,” engaging in “secrecy” and creating a “cultural lack of safety.”⁷⁵ In addition to the blame placed on the agency at this time, administrator Jim Beggs’ resignation garnered negative coverage in the news. Beggs was indicted on contract fraud charges, which began appearing in mainstream coverage in 1985, and his final resignation came in 1986 after

Challenger. Broadcast news mentioned his resignation was not a result of *Challenger* but because of these criminal pending charges; however, the timing of this only added fuel to NASA's negative media image at this time.⁷⁶

With NASA and the press at odds throughout the first half of 1986, public relations and mainstream coverage diverged perhaps more than at any other point in the agency's history. This divergence led to different ways of characterizing announcements and information surfacing from NASA and the investigation. One area this was apparent was in changes in leadership, that began to appear in mainstream and public relations documents in early 1986. The first example appears in NASA's archive, with the assignment of Rear Admiral Richard Truly appointed to lead the Space Shuttle program, which was announced on February 20.⁷⁷ While the agency's release frames this move as a promotion for Truly, the mainstream press characterized it as a shuffle to move Jesse Moore—who had been in the position for the *Challenger* mission; the article goes on to say the Presidential commission found that three top officials had not been warned about the engineering concerns by midlevel management leading up to the mission but still suggests the move was “unexpectedly quick.”⁷⁸ While NASA's own top officials were under pressure from the press at this time, it was NASA's midlevel management and contractor, Morton Thiokol, that the press characterized as largely responsible throughout February. For example, *The New York Times* details the concerns raised by engineers leading up to the launch that did not reach decision-makers and describes this lack of communication as a result of “subtler pressures” from the agency and high-level Morton Thiokol officials.⁷⁹ Further changes were announced as the Marshall Space Flight Center Director, Dr. William Lucas, left in July 1986. No release detailing Lucas' retirement

could be found, though a release announcing his replacement, James Thompson, appeared August 5, 1986.⁸⁰ In a June 5 article, *The New York Times* announced Lucas' retirement but characterized it as the latest change in a string of "personnel shakeups" before announcing a "management overhaul likely."⁸¹ In a June 10 article, *The New York Times* provided final details of the Presidential commission, where officials mentioned they were not asked to assign blame and did not in the report; however, the *Times* began with the headline "Commission Blames NASA and Rocket Builders for Challenger Explosion."⁸² The language used to describe the fallout from the *Challenger* incident, particularly when it involved the agency's administration, is reminiscent of the Apollo I framing of the "rocket men." While gender was not directly indicated in the fallout of both *Challenger* and Apollo I, the coverage and shifting blame continued to highlight the hyper-masculine management of the agency, even after women's visibility at NASA increased in media. The notion that *Challenger* could disrupt the Rocket Men Frame, and its continued existence illustrates the perpetuation of the frame and gendering of many NASA jobs, even after massive internal shifts, such as the Group VIII astronauts. However, one area of fallout that did highlight gender was the *Challenger's* effects on the Hero Frame and its evolution to include the newly diverse astronaut corps.

Challenger Astronauts: The Hero Frame Evolved

The *Challenger* explosion differed from previous tragedies, such as Apollo I, in many ways. The early astronauts had been framed as adventurers who assumed risk for the sake of conquering a new frontier; many later astronauts, particularly shuttle astronauts, were framed as routine space travelers and scientists. After Group IV

astronaut selection—the first to include civilian scientists—and Group VIII—the first to include women and minorities—the astronaut evolved, and mission and payload specialists became routine crew members during the Shuttle era. Throughout later mid-century, the Hero Frame shifted and no longer encompassed only the traditional, military man it once did from the Mercury, Gemini and Apollo eras, and the astronaut-hero remained in mythology, if not in practice. As astronaut requirements and NASA culture shifted to include more than the mid-century military man, so did the framing of the astronaut themselves. The Hero Frame certainly did not disappear. Instead, the Hero Frame that characterized the early astronauts entered a place of American mythology, where it still lingers today in the remembrance of the mid-century astronaut-hero, who “fought” the Cold War in the new frontier. However, with the shift in astronauts, a new type of Hero Frame emerged that still included the traditional military man but was now also open to women and minorities—though no military woman would command a mission until the 1990s.

The astronauts, after the explosion, were characterized as “heroes” in the mainstream news. In *The New York Times*, a headline emphasizes President Reagan’s naming the astronauts “heroes.”⁸³ *Time* magazine likewise dedicated its February 10, 1986, cover to *Challenger* and articles detailing the “*Challenger* Heroes.”⁸⁴ Memorial services were held, and NASA began to build its astronaut memorial at Kennedy Space Center in April of 1986.⁸⁵ The memorial honors all fallen astronauts, and is a stark reminder of the evolution of the astronaut program, as it shifted from the first class in 1959 to the inclusive class of 1978. An example of this shift is seen in the coverage of some of the fallen astronauts after *Challenger*. On February 9, *The New York Times*

began a three-part series memorializing the astronauts, beginning with Resnick and McNair. The *Challenger* astronauts were still characterized as heroes; however, the framing of these heroes had evolved for many of the astronauts, who were framed as intellectuals and scientists instead of militaristic and masculine. For example, Resnick was characterized by her “zest for knowledge” while McNair was characterized as a “hero in [his] state” and an example of Black achievement.⁸⁶ Another example of this is seen in the profiles of McAuliffe and Jarvis, who were both civilians and framed as such in news coverage; McAuliffe, as mentioned previously, was framed as a “teacher, wife and mother,” a vast difference from the military family men from the Apollo era.⁸⁷ However, a reminder of the Hero Frame is seen in coverage of the remaining three astronauts from *Challenger*: Scobee, Smith and Onizuka. All three of these men were characterized as “test pilots and military men, and all keenly understood the dangers of the machine that would ultimately kill them.”⁸⁸ This language is reminiscent of the primary characteristics of the mid-century astronaut-hero and shows the divide in framing the scientist-astronauts and pilot-astronauts.

The Hero Frame had evolved to include the traditional military man, scientist-astronauts and civilian-astronauts. However, coverage of the *Challenger* characterized all of the fallen astronauts as heroes, who were at the mercy of the agency’s decision-making. For example, *The New York Times* charged the agency with risking the lives of the astronaut unnecessarily—a shift from the framing of the Apollo I astronauts, who were assumed to understand the risk in early space exploration.⁸⁹ In an age when space missions had become so routine, the risk to astronauts—while implicitly present—was not as explicit in the framing of the astronauts as it had been during the early days of the

Hero Frame. The contrast is stark. The Apollo I astronauts, for example, were sacrifices for the sake of progress; however, the *Challenger* astronauts were unnecessary casualties of a mismanaged agency. The comparison lies in the framing of NASA's management during these disasters. During Apollo I and *Challenger* aftermath, the agency's management received intense scrutiny and blame, but coupled with the language used to describe the astronaut deaths, the accusations against the management during *Challenger* was more intense and derailed the agency. *Time* magazine's June 9, 1986, cover sums up the media image of NASA throughout the year after the *Challenger* incident, with its headline, "Space: Fixing NASA."⁹⁰ After *Challenger*, massive changes to internal management and information release was overhauled. This change shifted the way that NASA communicated internally and externally, and in turn, changed the way the agency was characterized in the media.

CHAPTER X: CONCLUSION

When people think of NASA, it would not be surprising to hear that the deepest held associations of the general public are held in collective memory of astronauts or mission control. Perhaps two of the most notorious quotes from NASA's history have come from these groups—Armstrong's "one small step for a man" and Lovell's "Houston, we have had a problem" to mission control. The mid-century astronauts who were the foundation of the space program and its champions throughout the Cold War have been mythologized in American culture. Barthes' theory of a cultural myth certainly applies here, as astronauts such as Glenn—the hyper-masculine military man—have become synonymous with collective memory from this time, conflating these ideas into a myth of American mid-century culture. Campbell's theory of the hero's journey is indicative of the journey taken by these first men, who launched into space for the sake of exploration and American achievement. It is likewise a journey taken by the nation at this time. When space exploration became a normal talking point for the American public, the country was beginning to change culturally and militarily. Civil Rights discussions began alongside fear of Soviet missiles. Particularly after the first American space fetes, the nation changed, and a new technological age began. As the agency relied on frontier language, the explorers themselves—taking both their own hero's journey and beginning the nation's journey—needed to be reliable, brave and of course—male. Mid-century culture was deeply steeped in masculinity, and this certainly was true of NASA at this time, too. Out of all this has come the mythologized time in America's history where NASA was military and masculine. This is summed up well in a June 1, 1979, release

celebrating Apollo XI: “And in all the historical and scientific narratives, and in the annals of courage, July 20, 1969, will defer to the few who were first.”¹ This myth of NASA was perpetuated throughout mid-century by media representation of the agency and its personnel. However, this historical image of NASA, while true, is not the whole truth, and the rest of this truth is what I have sought to explain here.

Thousands of scientists and administrative workers keep the agency moving, too, and many of those roles have been historically unsung in the media, both in NASA’s own public relations and mainstream news. Many of those roles have been filled by women. Media representation of NASA-employed women was minimal for much of mid-century, particularly through the 1960s. Because of this, women at the agency did not receive the national representation that men did and were symbolically annihilated, to use Tuchman’s term.² Recently, films like *Hidden Figures* brought little-known women’s history at NASA to light; in contrast, recent films such as *First Man* continue to emphasize the mid-century astronaut-hero’s role in American history and culture. In a July 1983 post-flight press briefing, a reporter mentioned to Ride that “we’re going to see any number of books, perhaps movies, maybe even breakfast cereals, based on your experiences” and asked how she would feel about that.³ However, we have not seen this. Popular culture continues to emphasize the male accomplishments in NASA’s history, while the women of NASA have not received equal representation.

Because my focus in this thesis is to compare NASA’s public relations efforts with national news, I have focused on the national publications to identify the persistent patterns in gender representation of NASA. However, not all media excluded NASA-employed women from coverage, and many local or regional publications covered these

women. For example, Shetterly pulls much of her primary source material from local coverage of the computers from the *Norfolk Journal and Guide*. Likewise, articles from the *Miami Herald* and *Houston Chronicle* make mention of women working at Cape Canaveral, which became the Kennedy Space Center, and the Center for Manned Spaceflight, which became the Johnson Space Center. However, I chose to focus on national coverage because I hope to provide an accurate picture of women's representation across the country in one of the most-read newspapers in America's history. I did not come by this choice lightly, and I hope that others will pick up this work to show the regional and local representation of women at NASA during this time.

In my examination, I have found that women were underrepresented in media throughout NASA's earliest years, experienced a boom in coverage around affirmative action years and had champion-women starting with the first female astronauts. This tidal wave of women's involvement into the 1970s is indicative to changes in the larger culture at the time. However, as I mention several times, women had always been at the space agency. The focus on women's achievement in the late 1970s and 1980s—heralded by the first six female astronauts and Ride's 1983 mission—while important, does little to recognize the many women who came long before a woman reached space. These women have been, in many ways, forgotten to history. History is not likely to forget the John Glenns or Neil Armstrongs, and it is not likely to forget the Sally Rides, either. However, we must also remember the Jackie Parker's, Dee O'Hara's, Margaret Hamiltons, Sue Finelys and countless others who have been forgotten. We must not forget them. Efforts to reclaim women's histories has increased recently, and women like Margaret Hamilton have received renewed interest. *Hidden Figures* has carried this reclamation into popular

culture, as well. It has been my hope to highlight the frames used to create NASA's media narrative throughout mid-century in order to understand the ways that the agency's women were represented in response to internal changes at NASA and external changes in culture. I have done this by identifying four emergent frames from the agency's earliest years—the Hero Frame, Family Man Frame, Astronaut Wife Frame and Rocket Man Frame—and tracking disruptions, exceptions and emergences to these frames throughout mid-century.

My hope is that others will continue this work in other ways. Suggestions for further research are numerous, including examination of regional publications, NASA's own internal communications and broader national publications. Research on later years would help illuminate these changes through time and track the agency's shifting media narrative after other milestones, such as the first Black female astronaut and the first female pilot. Oral histories and ethnographic work would be particularly valuable, as it would allow the women who historically had little to no representation tell their own stories. Finally, broader work on women's history in general needs to be continued. As we continue to uncover and bring to light a diverse history of women throughout time and cultures, we understand more meaningfully how we arrived at our current point in history and, perhaps, where we are going from here.

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CHAPTER I: INTRODUCTION

¹ The National Aeronautics and Space Administration is referred to throughout by the popular acronym “NASA”

² Motel, “NASA Popularity Still Sky-High.”

³ Melfi, dir., *Hidden Figures*.; Sington and Walsh, dirs., *Mercury 13*.

⁴ Gibson, “A Comparative Analysis.”; Starr, “NASA’S Hidden Power.”

⁵ Lockaby, “Print Media Portrayal.”; Kauffman, “NASA in Crisis,” 1-8.; Kauffman, “Adding Fuel to the Fire,” 421-432.; Kauffman, “A Successful Failure,” 437-448.

⁶ Foster, “The Gendered Anniversary,” 150-173.; Weitkamp, *Right Stuff, Wrong Sex*; Lathers, “No Official Requirement,” 14-40.; Ruel, Mills and Thomas, “Intersectionality at Work,” 17-49.; McQuaid, “Race, Gender and Space,” 405-434.; Healy, “There are No Bras in Space,” 595-617.

⁷ Grier, *When Computers Were Human*, 81-82.

⁸ Kessler-Harris, *Out to Work*, 142.

⁹ Anderson, *Wartime Women*, 4.

¹⁰ Milkman, *Gender at Work*, 1.; Many notable women's history scholars, including Ruth Milkman, Karen Anderson and Alice Kessler-Harris have written about the wartime mobilization of women during this time.

¹¹ Young white women experienced the highest level of mobility in wartime, with older women and women of color facing continued barriers to employment in war industries. Likewise, women in some areas, such as shipyards, cab drivers and longshoremen, still endured considerable hostility toward their participation in industry, Anderson, *Wartime Women*, 23, 44.

¹² "Changes in Men's and Women's."

¹³ Milkman, *Gender at Work*, 1.

¹⁴ Kessler-Harris, "Stratifying by Sex," 114.; Kessler-Harris notes that despite the advancements in home technology, higher standards of care in the home may not have reduced the overall time and dedication needed to maintain a traditional home.

¹⁵ Kessler-Harris, *Out to Work*, 309

¹⁶ In particular, the clerical workers' unions (largely consisting of women) were victims of anti-Communist purges during this time, Rowbotham, *A Century of Women*, 271.

¹⁷ Kessler-Harris, "Stratifying by Sex," 114.

¹⁸ Kessler-Harris, *Out to Work*, 309.

¹⁹ Kessler-Harris, 303.

²⁰ Kessler-Harris, 302.

²¹ Rowbotham, *A Century of Women*, 321.

²² Holt, *Rise of the Rocket Girls*, 171.

²³ Kessler-Harris, "Stratifying by Sex," 98.

²⁴ Graham, "Who's in Charge Here," *New York Times*, September 2, 1962, p. 127.

²⁵ Friedan, *The Feminine Mystique*.; Historian Shelia Rowbotham has pointed out *The Feminine Mystique's* failure to acknowledge broader changes needed for poor women and women of colors' mobility, along with its reliance on white femininity as a model for larger ideology of femininity, Rowbotham, *A Century of Women*, 367.

²⁶ Laughlin, *Women's Work*, 96. The War on Poverty was part of President Johnson's Great Society, aimed at alleviating poverty through legislation.; While the Commission's report called for equality in pay, widows' benefits and employment opportunities, the report did not address head-on women's and girls' education and did not describe clearly whether the Commission believed girls' education should be focused on motherhood preparation or careers, Rowbotham, *A Century of Women*, 371.

²⁷ According to "Median Annual Earnings by Sex" from the Women's Bureau, in 1960, the median annual income for women of all races was \$22,792, roughly 60.7% of men of all races' \$37,565 median salary. In 1986, the last year of consideration for this thesis, men of all races earned a median salary of \$54,077, while women of all races earned roughly 64.3% of men of all races' income with a \$34,755 median salary. However, earnings for Hispanic and African American women were likewise lower than median earnings for white women. In 1987 (comparative data for women's earnings by race is not available prior to 1987), compared to non-Hispanic White men, Hispanic women earned 53.5%; Black women earned 58%; and, White women earned 63.5% (see "Women's Earnings by Race"). Currently, according to the Institute for Women's Policy Research, the wage gap between men and women (of all races) is 20 percent, with women earning 80.5 cents to every dollar, with further gaps persisting among women of different races (see "Pay Equity and Discrimination").

²⁸ Exec. Order No. 11246. 3 C.F.R. 339 (1973).

²⁹ Milkman, *Gender at Work*, 155.

³⁰ *Pittsburgh Press Co. v. Pittsburgh Common on Human Relations*, 413 U.S. 376 (1973).

³¹ Rupp and Taylor, *Survival in the Doldrums*, 159.

³² Amot and Matthaai, *Race, Gender and Work*, 309-316.

³³ Bureau of Labor Statistics, <https://www.bls.gov/opub/td/2007/jan/wk2/art03.txt>.

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- ³⁴ Grier, *When Computers Were Human*, 81-82.; Grier also points out the shift in terminology around 1944 when female computers became “girls,” which was persistent through much of the mid-century, 276.
- ³⁵ Light, “When Computers Were Women,” 461.
- ³⁶ Light, 462.
- ³⁷ Marcellus, *Business Girls*, 17.
- ³⁸ Rossiter, *Women Scientists in America*, 33.
- ³⁹ Rossiter, 49.
- ⁴⁰ Rossiter, “Which Women,” 180-182. Although home economics as a field was first established in the late nineteenth-century, it was not until 1920 that institutions began receiving funding for home economics. However, with the feminization of the field, federal funding from several important agencies, such as the NSF and the 1958 National Defense Education Act, was not offered, since the field was not seen as a worthy area of study.
- ⁴¹ Rossiter, “Women’s Work,” 395.
- ⁴² Light, “When Women Were Computers,” 483.
- ⁴³ Corbett and Hill, “Solving the Equation,” 9; Female workers comprised 27 percent of computers and mathematicians in 1960, 20 percent in 1970 and 26 percent in 1980; eight percent of chemical and material scientists in 1960, 12 percent in 1970 and 20 percent in 1980. However, only one percent in 1960, two percent in 1970 and five percent in 1980.
- ⁴⁴ Rowbotham, *A Century of Women*, 325.
- ⁴⁵ Shetterley, *Hidden Figures*, 40.
- ⁴⁶ Rossiter, 55.; In 1951, 561 women were enrolled in undergraduate engineering programs, and this number increased in 1957 to an all-time high of 1,661.
- ⁴⁷ Corbett and Hill, “Solving the Equation,” 19.; Holt, *Rise of the Rocket Girls*, 226.
- ⁴⁸ Snyder, ed., “120 Years,” 70.
- ⁴⁹ Corbett and Hill, 65.
- ⁵⁰ Melfi, dir., *Hidden Figures*.
- ⁵¹ US Army, “Women in the Army.”
- ⁵² US Army, “Women in the Army.” Some ground roles had been open to women since the late 1980s; however, the rule barring them from direct combat missions was in place until its disbandment in 2016.
- ⁵³ Merryman, *Clipped Wings*.
- ⁵⁴ NASA, “Women in Space.”
- ⁵⁵ Lamme, et al., “Development and Expansion,” 21-36
- ⁵⁶ Lamme, et al., 27.
- ⁵⁷ Wright and Flynn, “Public Relations Education,” 60.
- ⁵⁸ Lamme, et al., “Development and Expansion,” 21-36
- ⁵⁹ Lee, Likely and Valin, “Government Public Relations,” 65-80
- ⁶⁰ Lee, Likely and Valin, 65-80
- ⁶¹ Neumann, “Committee on Public Information.”
- ⁶² Lee, Likely and Valin, “Government Public Relations,” 68.
- ⁶³ Belmonte, *Selling the American Way*, 138.
- ⁶⁴ Lee, Likely and Valin, “Government Public Relations,” 70.
- ⁶⁵ Schudson, *Discovering the News*, 30-31.
- ⁶⁶ Schudson, 7.
- ⁶⁷ Knowlton and Freeman, *Fair and Balanced*, 150.
- ⁶⁸ Knowlton and Freeman, 145.
- ⁶⁹ Schudson, *Discovering the News*, 122.
- ⁷⁰ Schudson, 122.
- ⁷¹ Schudson, 162.
- ⁷² Streitmatter, *Mightier than the Sword*, 189.
- ⁷³ Streitmatter, 147.
- ⁷⁴ Streitmatter, 147.
- ⁷⁵ Streitmatter, 163.

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- ⁷⁶ Knowlton and Freeman, *Fair and Balanced*, 200-201.
⁷⁷ Streitmatter, *Mightier than the Sword*, 173.
⁷⁸ National Aeronautics and Space Act of 1958, H.R. 12575, 85th Cong. (1958).
⁷⁹ Gaddis, *The Cold War*, 57.
⁸⁰ NASA, "One Small Ball in the Air."
⁸¹ Finney, "U.S. Missile Experts Shaken by Sputnik," *New York Times*, Oct. 13, 1957.
⁸² National Aeronautics and Space Act of 1958, H.R. 12575, 85th Cong. (1958).
⁸³ Van Dyke, *Pride and Power*, 252.; National Aeronautics and Space Act of 1958, H.R. 12575, 85th Cong. (1958).
⁸⁴ Atkinson and Shafritz, *The Real Stuff*, 30. Sally Ride was included in the astronaut program as a mission specialist, as were all women before Eileen Collins was admitted as the first female pilot.
⁸⁵ Atkinson and Shafritz, 172.
⁸⁶ NASA, "Women in Space."

CHAPTER II: THEORETICAL FRAMEWORK

- ¹ Gitlin, *Whole World*, 6-7.
² Entman, "Framing: Toward Clarification," 52-53.
³ Gitlin, 2
⁴ Goffman, *Frame Analysis*, 11.
⁵ Barthes, *Mythologies*, 217.
⁶ Barthes, *Mythologies*, 221.
⁷ Barthes, *Mythologies*, 240.
⁸ Hartley, *Key Concepts*, 154.
⁹ McLuhan, "Myth and Mass Media," 348.
¹⁰ DeFehr, "Mythology of McLuhan," 29.
¹¹ "Myth," Oxford English Dictionary.
¹² Campbell and Moyers, *The Power of Myth*, 28.
¹³ Jung, Shamdasani and Hull. *Four Archetypes*, 5.
¹⁴ Campbell, *Hero With a Thousand Faces*, 30.
¹⁵ "Presentism," Oxford English Dictionary.

CHAPTER III: LITERATURE REVIEW

- ¹ Rupp and Taylor, *Survival in the Doldrums*, 14.
² Rupp and Taylor, 14.
³ Corzine, "Right at Home," 859.
⁴ Foust and Bradshaw, "Something for the Boys," 93-100.
⁵ Gordon, Hogan and Pritchard, "Assessing 'Herstory.'"
⁶ Hesse-Biber and Carter, *Working Women in America*, 118.
⁷ Coble and Kessler-Harris, "New Labor History," 1534-1545.
⁸ Orwig, "Persuading the Home Front," 60-82.
⁹ Streitmatter, "Using 'Rosie the Riveter,'" 117-130.
¹⁰ Honey, *Creating Rosie the Riveter*.
¹¹ Marcellus, "*Bo's'n's Whistle*," 83-108.
¹² Ghilani, "Glamour-izing Military Service," 201-228.
¹³ Brown, "Woman in the Army," 151-175.
¹⁴ Howard and Privera, "Gendered Nationalism," 134-145.
¹⁵ O'Brien, *Fly Girls*.
¹⁶ O'Brien, *Fly Girls*, xiii.
¹⁷ Barry, *Femininity in Flight*; Corn, "Marking Flying 'Thinkable,'" 556-571.
¹⁸ Stepanski, "Like Sportive Birds," 769-788.
¹⁹ Alexander, "Space Flight News," 722-728.
²⁰ Cressman, "Fighting for Access," 133-151.

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- 21 Kelley, "Framing NASA."
- 22 Kelley, "Framing NASA," 5-6.
- 23 Williams, "Reimagining NASA," 374.
- 24 Meerman and Jurek, *Marketing the Moon*, ix.
- 25 Meerman and Jurek, xi.
- 26 Gibson, "A Comparative Analysis."
- 27 Weber, Dinc and Williams, "American's Supports," 601-625.
- 28 Starr, "NASA'S Hidden Power," 313.
- 29 Staff, "NASA's Hidden Power," v-vi.
- 30 Kauffman, "Lost in Space," 263-275.
- 31 Sumpter and Garner, "Telling the *Columbia* Story," 455-475.
- 32 Boin and Fishbacher-Smith, "Failure Theories," 77-87.
- 33 Lockaby, "Print Media Portrayal."
- 34 Adams and Balfour, "Destructive Organizational Culture," 301.
- 35 Vaughan, "The Trickle-Down Effect," 96.
- 36 Gross and Walzer, "Revival of Rhetoric," 75-93.
- 37 Vaughan, "Theorizing Disaster," 615-347.; The previous research mentioned is specifically referring to Vaughan's 1997 book *The Challenger Launch Decision: Risky Technology, Culture, and Deviance at NASA*, though the previous article mentioned by Vaughan was published the same year.
- 38 Kauffman, "Adding Fuel to the Fire," 421-432.; Kauffman, "A Successful Failure," 437-448.
- 39 Kauffman, "NASA in Crisis," 1-8.; see also Flam, "NASA PR: Hype or Public Education," 1416-1418.
- 40 Martin and Boynton, "From Liftoff to Landing," 253-261.
- 41 Smyth, "Challenger Jokes," 243-260.
- 42 Wolfe, *The Right Stuff*.; Kauffman, Phillip, dir., *The Right Stuff*.
- 43 Savage, creator, *Astronaut Wives Club*.; Koppel, *Astronaut Wives Club*.
- 44 Howard, dir., *Apollo 13*.; Kluger and Lovell, *Lost Moon*.
- 45 Sington and Walsh, dirs., *Mercury 13*.; Shetterly, *Hidden Figures*.
- 46 Melfi, dir., *Hidden Figures*.; Since its release in December 2016, *Hidden Figures* has grossed more than \$200 million worldwide.
- 47 Chazelle, dir., *First Man*.
- 48 Todd Miller, dir., *Apollo 11*.
- 49 Mark Craig, dir. *Last Man*.
- 50 David Fairhead, dir., *Mission Control*.
- 51 David Sington, dir., *Shadow of the Moon*.
- 52 Holt, *Rise of the Rocket Girls*, 203.
- 53 Shetterly, *Hidden Figures*.
- 54 Weitkamp, *Right Stuff, Wrong Sex*.
- 55 "U.S. not Planning Orbit," *New York Times*, June 17, 1963.
- 56 Sherr, *Sally Ride*.
- 57 Ackmann, *The Mercury 13*.; Stone, *Almost Astronauts*.
- 58 Foster, "The Gendered Anniversary," 173.
- 59 "'No Official Requirement,'" 14-40; "Qualifications for Astronauts" was a 1962 Congressional hearing (Science and Astronautics Subcommittee, colloquially known as the Air and Space Subcommittee) detailing the "needed qualifications" for NASA astronauts in response to Cobb and other women participating, successfully, in Dr. Randal Lovelace's "Woman in Space" testing. In part, the testimonies of fellow female aviator Jackie Cochran and astronauts John Glenn and Scott Carpenter (among others) kept women from joining the space program.
- 60 Sage, "Giant Leaps," 146-163.
- 61 Hersch, "Lost Spaceman," 73-92.
- 62 Huntoon, "Opening Doors," 205.
- 63 Ruel, Mills and Thomas, "Intersectionality at Work," 17-49; McQuaid, "Race, Gender and Space," 405-434.

⁶⁴ Healey, "There are No Bras in Space," 595-617.

CHAPTER V: METHOD

¹ NASA History Program, <https://historydms.hq.nasa.gov/>; The NASA History Program is an agency-run program founded in 1959 "dedicated, long-term effort to provide a comprehensive understanding of the institutional, cultural, social, political, economic, technological, and scientific aspects of NASA's activities in aeronautics and space.; Dick, Garber and Odom, *Research in NASA History*, 2.

² Pauly, "Beginner's Guide," 3.

³ Sloan and Stamm, *Historical Methods in Communication*.

⁴ NASA History Program, <https://historydms.hq.nasa.gov/>.

⁵ Hall, Introduction to *Paper Voices*

⁶ Vanderbilt TV News Archive, <https://tvnews.vanderbilt.edu>.

⁷ MTSU Walker Library, <https://library.mtsu.edu/>.

⁸ Time Magazine Vault, <http://time.com/vault>.

⁹ Pauly, "Beginner's Guide," p. 19.

CHAPTER VI: FINDINGS

¹ National Aeronautics and Space Act of 1958, H.R. 12575, 85th Cong. (1958).

² "Top Aides Named," 65.

³ Starr, "Hidden Power," 102.

⁴ Starr, "Hidden Power," 140.

CHAPTER VII: "THE EAGLE HAS LANDED"

¹ National Aeronautics and Space Administration, "Historical Origins of the National Aeronautics and Space Administration," 6. Starr, "Hidden Power," 9. While President Kennedy's 1961 speech placed the lunar program in the public's mind, scholars have debated his role in advancing a lunar destination for NASA, arguing instead that other political and social forces may have propelled this decision further.

² National Aeronautics and Space Administration, "Statement by Keith T. Glennan," 83.

³ Kauffman, *Selling Outer Space*, 72.

⁴ Toth, "Negotiators on Astronaut Stories Differ on Snag," 11. Lyons, "Astronauts to Get a Million in Year for Their Stories," 1.

⁵ Campbell, "The Hero With a Thousand Faces."

⁶ National Aeronautics and Space Administration, "The New Frontier of Space," 111-112.

⁷ National Aeronautics and Space Act of 1958, H.R. 12575, 85th Cong. (1958).

⁸ Search terms: "NASA" AND "Armstrong," June 21 – August 21, 1969.

⁹ Search terms: "National Aeronautics and Space Administration" AND "Glenn," January 20 – March 20, 1962. It's important to note that "NASA" was not commonly used in the early years of the agency, which is why the search terms are adjusted for Glenn and Shepard in contrast to Armstrong.

¹⁰ Webb, "Statement by James E. Webb," 1.

¹¹ Kauffman, *Selling Outer Space*, 17.

¹² "Exploring the New Frontiers of Space," 10.

¹³ Kauffman, *Selling Outer Space*, 5.

¹⁴ Campbell, *The Hero With a Thousand Faces*, 80.

¹⁵ Finney, "7 Named as Pilots for Space Flights," 3.

¹⁶ Shanley, "TV: A Day of Triumph," 79. Reston, "Symbol of the Nation," 35.

¹⁷ Kauffman, *Selling Outer Space*, 60.

¹⁸ "Calm Voice from Space," 39. Though this quote is found in the story about Powers, the cover is dedicated to Glenn and the Friendship 7 flight.

¹⁹ "The Americans in the Gemini 4 Spacecraft," 15.

²⁰ David Scott Meerman and Richard Jurek, *Marketing the Moon: The Selling of the Apollo Lunar Program* (Boston: The MIT Press, 2014), 117.

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- 21 Cooper and Henderson, *Leap of Faith*, np.
- 22 "Crew Biographies," 97.
- 23 Starr, "NASA's Hidden Power," 6.
- 24 "60 Years Ago," National Aeronautics and Space Administration.
- 25 In the film adaptation of *The Right Stuff*, Glenn is a central character whose home life is portrayed perhaps more than any other character, save Chuck Yeager in the beginning of the film.
- 26 Reston, "Is the Moon Really Worth John Glenn?" E9.
- 27 Hailey, "Glenn Cheered by 50,000," 1.
- 28 In *First Man*, the 2018 film about Neil Armstrong, tension is shown between then-wife Janet and Neil that combats the image of the happy astronaut household. Likewise, in *The Last Man on the Moon*, a 2014 documentary about Gene Cernan and the Apollo program, the family image is likewise challenged in some ways by interviews with surviving astronauts, including Cernan and his ex-wife.
- 29 Stevens, "The Crew of Apollo 11," 31.
- 30 "Safe Landing Ends Wives," 23.
- 31 Rowbotham, *A Century of Women*, 321.
- 32 "Press Conference: Mercury Astronaut Team," 4.
- 33 Holt, *Rise of the Rocket Girls*, 171.; Family and Medical Leave Act, Pub.L. 103–3; 29 U.S.C. sec. 2601; 29 CFR 825, 103rd Cong. (1993).
- 34 Peterson, "Astronaut's Ambitions Backed by all Seven Wives," 8.
- 35 Peterson, "Astronaut's Ambitions Backed by all Seven Wives," 8.
- 36 "Family Following Flight by TV," 19.
- 37 "Mrs. Armstrong Has No Doubts," 14.
- 38 "Mrs. Armstrong Has No Doubts," 14.
- 39 "First US Space Man: Alan Bartlett Shepard Jr.," 8.
- 40 "Press Conference: Mercury Astronaut Team," 6 and 22.
- 41 "Press Conference: Mercury Astronaut Team," 7.
- 42 "Press Conference: Mercury Astronaut Team," 34.
- 43 Kanter, *Men and Women of the Corporation*, 112.
- 44 "Press Conference: Mercury Astronaut Team," 22.
- 45 Glennan, Cleveland Technical Societies Council, 11.
- 46 Miller and Swift, *Women and Words*, 29.
- 47 *Time*, "Fight for Space," 21.
- 48 Brinkley, *American Moonshot*, 95.
- 49 "Space: Reach for the Stars," *Time*.
- 50 "Ira H. Abbott," 2.
- 51 "Bernier Appointed," 2.
- 52 Holt, *Rocket Girls*, 217.
- 53 Clark, "Ground Control Calls the Shots," 15.
- 54 "Professional Directors Play Key Role in Gemini," 15.
- 55 Wilford, "Men at Mission Control," 29.
- 56 Glennan, Cleveland Technical Societies Council, 11.
- 57 Corbett and Hill, "Solving the Equation," 19.; Holt, *Rise of the Rocket Girls*, 226.
- 58 von Braun, National Aeronautics and Space Administration, American Newspaper Publishers Association, 2.
- 59 "Men Behind the Experiments," 13. s
- 60 "Dr. Silverstein Retiring," 1.
- 61 Kanter, *Men and Women of the Corporation*, 17.
- 62 Gray, "Donald K. 'Deke' Slayton."

CHAPTER VIII: "HOUSTON, WE HAVE HAD A PROBLEM"

¹ Astronauts Theodore Freeman, Elliot See and Charles Bassett were all killed during air flight. Freeman was en route to Houston when he crashed after a bird flew into his propeller and

Freeman and Bassett—who were the upcoming crew for Gemini 9—were killed en route to St. Louis.

- ² “Apollo Applications Program,” 98.
- ³ “Apollo Program Budget Appropriations.”
- ⁴ “Note to Editors,” 128-129.
- ⁵ “Johnson Voices Sorrow,” 10.
- ⁶ “From White’s Father,” 49; “Chaffee’s Father’s Tribute,” 49.
- ⁷ “Watch: 1967 CBS News.”
- ⁸ “Watch: 1967 CBS News.”
- ⁹ “Grief Expressed the World Over,” 49.
- ¹⁰ “3 Apollo Astronauts Die in Fire,” 1. “Sketches of the 3 Apollo,” 11.
- ¹¹ “Tragic Loss to Nation,” 10.
- ¹² “3 Apollo Astronauts Die in Fire,” 10.
- ¹³ “Watch: 1967 CBS News.”
- ¹⁴ Kauffman, “Adding Fuel to the Fire,” 422.
- ¹⁵ Wilford, “3 Astronauts Tape Ended,” 1.
- ¹⁶ Wilford, “The Apollo Disaster,” E5.
- ¹⁷ Clark, “NASA Rejects Race to,” 1.
- ¹⁸ Wilford, “Top Apollo Aides Shifted,” 1.
- ¹⁹ “Senate Report Assails NASA on Apollo Deaths,” 8.
- ²⁰ Margaret Weitekamp, *Right Stuff, Wrong Sex*, 49.
- ²¹ In their book 1985 book *The Real Stuff*, Joseph Atkinson and Jay Shafritz comment on the selection of all white, male candidates at this time, contending that “This was not by design, but resulted from a search for the most technically qualified representatives,” 30.
- ²² Weitekamp, *Right Stuff, Wrong Sex*.
- ²³ Lasagna, “Why Not Astronauttes?” 268.
- ²⁴ Lasagna, “Why Not Astronauttes?” 268.
- ²⁵ Lathers, “No ‘Official Requirement.’”
- ²⁶ “Woman Pilot Sees,” 59.
- ²⁷ “Science: From Aviatrix to Astronautix,” *Time*.
- ²⁸ “U.S. Not Planning Orbit,” 8.
- ²⁹ Atkinson and Shafritz, *The Real Stuff*, 105.
- ³⁰ “First Woman in Space,” 8.
- ³¹ “Woman in Space,” 24.
- ³² Shetterly, *Hidden Figures*.
- ³³ Langer, “Nancy Grace Roman.”
- ³⁴ Webb, “Commencement Address,” 30.
- ³⁵ Marcellus, *Business Girls and Two Job Wives*, 113.
- ³⁶ Kanter, *Men and Women of the Corporation*, 208 and 213.
- ³⁷ Kanter, *Men and Women of the Corporation*, 17.
- ³⁸ “Women Needed in Space Work,” 8.
- ³⁹ Schmeck, Jr., “Young Scientists Being Recruited as Astronauts,” 17.
- ⁴⁰ “NASA Choses 19,” 17.

CHAPTER IX: “ROUTINE ACCESS TO SPACE”

- ¹ Lyons, “12.5% Slash in NASA,” 22.
- ² “Space: Head of NASA Quits,” 126.
- ³ “Apollo XVII.”
- ⁴ Schwartz, “A Man’s World?”
- ⁵ Delaney, “Top Black Woman is Ousted,” 23.
- ⁶ Fitzpatrick, “Mrs. Harris Assumes New Post at NASA,” 45.
- ⁷ Krebs, “NASA Aide is Back,” 41.
- ⁸ Zylstra, “Dr. Jenkins Assumes Post,” 44-47.
- ⁹ Perry, “NASA Administrator Cites,” 15.

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- 10 Perry, "NASA Official to Address," 124; Perry, "Dr. McConnell Named to Applications Post," 30-33.
- 11 Perry, "NASA Appointment Minority Aid," 58-59.
- 12 Marman, "Goddard Earns," 1; This release was once available in NASA's digital press release archive. However, it is no longer available online. The release was obtained by direct contact with the NASA History Program, which had the release in its internal servers and sent me a copy.
- 13 Perry, "NASA Schedules Women's Week," 72-74.
- 14 Garrett and Hunt, "Women Experimenters," 136.
- 15 Ebeling, "At 18 Years Old," 268.
- 16 "Space Shuttle," video file no. 522708.
- 17 "Space Shuttle," video file no. 545008.
- 18 Drummond, Langley Research Center Honors Inventors," 343.
- 19 Weeks, "Women Complete Space Tests," 12-19.
- 20 Weeks, "Women Complete Space Tests," 19.
- 21 O'Donnell and Riley, "Astronaut Alan B. Shepard," 4.
- 22 Pomeroy and Fitzpatrick, "Highlights of 1978 Activities, 42.
- 23 Allen, "Space Fillers," 33.
- 24 "STS-7 Pre-Flight," 103; NASA also infamously asked Ride how many tampons she needed for a week in space, with the male engineers' guess of 100.
- 25 Atkinson and Shafritz, *The Real Stuff*, 151.
- 26 Reim, "NASA to Recruit Space Shuttle Astronauts," 301.
- 27 Garrett, "NASA Expands Payload Specialists," 174.
- 28 Reinhold, "Americans in Space," C9.
- 29 "Woman and Black Named," C3.
- 30 Beggs, "Suggested Remarks: National Space Club," 48.
- 31 "Space Exploration."
- 32 "Space Exploration / New Astronauts."
- 33 "Space Exploration / Space Shuttle."
- 34 "One of the Few," A16.
- 35 "Sketches of Five Astronauts."
- 36 White, "NASA Selects 19," 347.
- 37 "Space Shuttle," video file no. 90494.
- 38 Sherr, *Sally Ride*, 82.
- 39 Garrett, Hess, White and Taylor, "Ambitious STS-7 Mission," 41.
- 40 Reinhold, "Americans in Space," C1.
- 41 Broad, "Cool, Versatile Astronaut," 1.
- 42 Wilford, "First U.S. Woman in Space," 5.
- 43 "STS-7 Pre-Flight," 103.
- 44 "Space Shuttle," video file no. 531083.
- 45 "STS-7 Pre-Flight," 80.
- 46 "STS-7 Pre-Flight," 82.
- 47 "STS-7 Pre-Flight," 85.
- 48 "STS-7 Pre-Flight," 96.
- 49 "STS-7 Post Flight," 64.
- 50 Reinhold, "Behind Each Astronaut," E20.
- 51 "Honoring a Teacher."
- 52 Guerny, "NASA Seeks Teacher," 97.
- 53 Rimer, "After the Shock," 1.
- 54 Wilford, "A Teacher Trains," SM16.
- 55 "The Tragedy of Challenger's Seven."
- 56 "10 Teachers Advance," C3.
- 57 Wilford, "Teacher is Picked," 1.
- 58 Broad, "Teacher is Focus," 11.
- 59 Wald, "2 Space Novices," A1.

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- ⁶⁰ “The Tragedy of Challenger’s Seven.”
⁶¹ Kukowski, “NASA Postones,” 18-19.
⁶² Rimer, “After the Shock,” 1.
⁶³ Weinraub, “Reagan Lauds ‘Heroes,’” 1.
⁶⁴ Reinhold, “The Mourning Families,” A1.
⁶⁵ Goleman, “Openness is Key,” 1.
⁶⁶ Browne, “How Could It Happen?” 1.
⁶⁷ Wilford, “NASA Considered Shuttle Boosters Immune,” A1.
⁶⁸ Boyd, “President Names 12-Member Panel,” A1.
⁶⁹ Boffey, “Space Agency Image,” A1.
⁷⁰ Boffey, “Space Agency Image,” A1.
⁷¹ Diamond, “NASA Wasted Billions,” A1.
⁷² Diamond, “NASA Cut or Delayed Safety Spending,” A1.
⁷³ Garrett, “NASA Responds,” 90.
⁷⁴ Boffey, “NASA Had Warning,” 1.
⁷⁵ “Challenger Investigation.”
⁷⁶ “Beggs / Resignation.”
⁷⁷ Garrett, “Thompson Appointed,” 23.
⁷⁸ Sanger, “Unexpectedly Quick Move,” A1.
⁷⁹ Sanger, “Top Aids at NASA,” A1.
⁸⁰ Keegan, “Thompson Appointed,” 33.
⁸¹ Wilford, “Key NASA Rocket Official Quits,” 1.
⁸² Boffey, “Management Cited,” A1.
⁸³ Weinraub, “Reagan Lauds ‘Heroes,’” 1.
⁸⁴ Morrow, “A Nation Mourns.”
⁸⁵ Garrett, “Astronaut Memorial,” 72-73.
⁸⁶ Kolbert, “Judith Resnik,” 1 and 28.
⁸⁷ Wald, “2 Space Novices,” 1 and B8.
⁸⁸ “3 Boys’ Dreams of Space,” 1.
⁸⁹ Reinhold, “Astronauts’ Chief,” 1.
⁹⁰ Magnuson, “Space: Fixing NASA.”

CHAPTER X: CONCLUSION

¹ McBee, “Apollo 11: A Good Ending to a Bad Decade,” 9; This release was once available in NASA’s digital press release archive. However, it is no longer available online. The release was obtained by direct contact with the NASA History Program, which had the release in its internal servers and sent me a copy.

² Tuchman, Introduction to *Hearth and Home* 8.

³ “STS-7 Post-Flight,” 73