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## Chapter 15

# Women in Space Exploration History\*

Yu Cao<sup>†</sup>

### Introduction

Astronomy enthusiasts frequently ask, “What are the roles of women astronauts in history?” The fact is that female astronauts have been participating in, and contributing to, the space journey through the entire history of space travel. It began with Valentina Tereshkova (Soviet Union)—the first woman in space in 1963—and continued with Sally Ride (United States), the first American woman on the Space Shuttle from 1983–1984 and Shannon Lucid (United States), the first American woman on a space station. Since then, many women have made their names written in the sky. From the very earliest female pioneers, female racing pilots, the first female commercial pilots, all the way up to the women working daily in space, our female astronauts have never given up their dreams of flying high.

In fact, the early days of women’s sky travel were not easy. In the early 1990s, female participants in space programs were often neglected and restricted to mundane tasks. Despite all the prejudice and difficulties, many female astronauts have played incredibly significant historical roles and are finally gaining full access to both military and commercial opportunities. Now, there is a proliferation of great female astronauts, and consequently modern aerospace is pros-

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<sup>†</sup> Beijing Institute of Electronic System Engineering, Beijing, China.

pering with the great passion of more and more female astronaut candidates. This chapter will provide a clear historical review of women's important roles in space exploration by considering the aspects of culture and science, as well as the deep meaning for the future of the space program.

### **They Were the Real Pioneers**

About 50 years ago, when the United States sent its first men into space successfully, it was implied that there might be another option: female astronauts in space. However, the history of these events is difficult to determine, as discrimination was common in many aspects of life at that time. In the 1970s, women gained only about 4 percent of all physics degrees,<sup>1</sup> as reported by Wikipedia, whereas that number is about 20 percent today.

The first woman who flew closer to the Moon was Valentina Tereshkova (Soviet Union) in 1963, when she opened a new frontier for other female astronauts. The first American woman in space—Sally Ride, who died in 2012 at the age of 61, was part of a wave of women who entered the traditional male disciplines of natural sciences and engineering.<sup>2</sup> After two Space Shuttle flights in the 1980s, astronaut Sally Ride spent much of the rest of her life trying to encourage children, particularly girls, to give science a shot.<sup>3</sup>

Some of the astronaut programs' selection criteria are very unusual, for instance:

- Astronauts cannot have body odor or decayed teeth.
- Female astronauts should have had children by natural delivery; they won't qualify if they have delivered their babies via Caesarean section.

The truth is that scars could open up in space, dental problems could cause serious infections, and body odor must be avoided in a confined spacecraft. But there is no such complication if female astronauts are not already mothers.<sup>4</sup>

### **Heroines of China—"Little Flying Knight"**

Nowadays, seven nations (United States, Soviet Union, United Kingdom, Canada, Japan, France, China) have sent a woman into space, but due to the technological abilities, there were only two, the Soviet Union and the United States, to have done so using their own spacecrafts.

On 16 June 2012, the Shenzhou-9 spacecraft blasted off from its Gobi desert launch site carrying three astronauts into space. Liu Yang became the first Chinese woman in space. During the two-week task, Liu Yang and the other two

male astronauts completed China's first manned docking with the Tiangong-1 module already in orbit, an important first step toward China's aim of creating a working space station by 2020.

Liu Yang, an outstanding pilot with very strong mental qualities, who passed a rigorous selection procedure, had been finally chosen as the only female astronaut in this space task. She was 34 years old and the deputy head of a flight unit in the nation's air force. In March 2010, she showed a "rare calm" to land her plane safely after it was struck by 18 pigeons, which made her honored a "model" pilot award. She was a veteran pilot with 1,680 hours of flying experience, and excelled in space testing after two years of training. "Baby eagles can never soar under their family's wing," she explained why she never let her parents visit her during her four years in pilot training.<sup>5</sup> "As a female pilot, the sacred rose garden in my heart is the motherland's blue sky," she said during an English speech competition. After Shenzhou-9 landed successfully, she said, "Men and women have their own advantages and capabilities in carrying out space missions. They can complement each other and better complete their mission."

Major Liu Yang broke barriers with grace and professionalism—and literally opened a new chapter of China's space program.

### **Into the Wild Blue Yonder**

Loneliness along with fear, pessimism, and anxiety, and some other emotional issues would persecute both male and female astronauts. And female astronauts have better durability, psychological stability and ability to deal with loneliness. Most women possess natural-born patience and endurance, in many different areas. However, to break the prejudice and challenge the rules and regulations of male chauvinism has been a long road with all kinds of difficulties during the centuries.

Due to many political reasons, in the early 1950s, there were no female military test pilots in NASA, since the U.S. military banned women in pilot training. So the question of whether to accept women as astronauts never even came up. Moreover, the only hope that NASA might accept a female astronaut was not as an equal partner of other male astronauts, but as a political token: the first woman in space. Even after the Soviets "beat" NASA, launching Valentina Tereshkova in 1963, nobody thought that launching the second woman in space was a worthwhile political gesture.<sup>6</sup>

The successful launch of Valentina Tereshkova was hailed as a milestone; however, there was no other female-crewed space mission for another 20 years,

which was because that mission was, as mentioned before, politically motivated using limited hardware. Though the journey to space had been long and tough, many great women have followed Tereshkova's footprint to mark their records toward steps of human's space exploration history.

## Women's Progress in STEM

For many decades, there were very few women who tended to pursue careers in STEM—science, technology, engineering and math, because most women held their expectations less and tended to assess their abilities lower, that's often true even when females get higher grades and outscore males in many aspects. Since then, role models like Valentina Tereshkova, Liu Yang, and many other women pioneers would be so important and meaningful to reduce the effective stereotype, the more you see women succeeding in these areas, the less strong that stereotype is.<sup>7</sup>

Some general facts of female astronauts are given below:

- fifty-five different women in total, including cosmonauts, astronauts, payload specialists, and foreign nationals have flown in space.
- six different female cosmonauts have flown on the Soviet/Russian program.
- one female astronaut or taikonaut (Chinese astronaut) has flown in the Chinese program.
- forty-eight different women have flown with NASA; forty-three of these were Americans.<sup>8</sup>

Nowadays, women have had a great shared involvement in aviation and space exploration, aligning with male colleagues, more importantly, as an equal partner. They have also contributed to advances and achievements in science, engineering, astronomy, medicine, aviation and astronautics. With strength, passion, confidence, fortune and many other factors to success, many female astronauts have left Earth and explored outer space.

## References

<sup>1</sup> [http://en.wikipedia.org/wiki/Women\\_in\\_science](http://en.wikipedia.org/wiki/Women_in_science).

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<sup>4</sup> <http://fl.gzu.edu.cn/s/219/t/448/6f/91/info28561.htm>.

<sup>5</sup> <http://www.bbc.co.uk/news/world-asia-18410501>.

- <sup>6</sup> <http://www.newscientist.com/blogs/shortsharpscience/2009/10/why-nasa-barred-women-astronau.html>.
- <sup>7</sup> [http://www.forbes.com/fdc/welcome\\_mjx.shtml](http://www.forbes.com/fdc/welcome_mjx.shtml).
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