WIA-E Rome Local Group

Online Webinar: "From STEM to Stars" with Naoko Yamazaki

4th of September 2020

1. Introduction

Why this webinar? The WIA-E Rome Local Group (LG) started in July 2020 a series of online webinars titled "From STEM to Stars" to provide different examples of female and male role models within the International Aerospace sector and to offer the participants the chance to interact with them. This webinar series, of the duration of one hour, is structured in two main parts: during the first part (of about 30 minutes), the main speaker shares her/his experience and passion to inspire the audience; the second part offers the attendees the chance to share thoughts and ask questions. The moderators of this webinars' series are chosen among the members of the WIA-E Rome Local Group.

For the 2nd online event of the "From STEM to Stars" series – held on the 4th of September 2020 from 1 to 2 pm (CET) – WIA-E Rome invited the former JAXA's astronaut Naoko Yamazaki, who participated in 2010 at the STS-131 Space Shuttle's mission (Figure 1).

Figure 1: Flyer of the "From STEM to Stars with Naoko Yamazaki" online webinar

The webinar was moderated by Alice Pellegrino (from Tokyo, Japan, where she lives) who is Lead System Engineer at Canon Electronics Inc. in Tokyo, Japan and a member of the WIA-E Rome LG Committee. The official language of the event was English, to allow all WIA-E members to participate. The audience of the event consisted in 57 participants, connected from different countries in Europe.

2. The webinar

Firstly, Naoko Yamazaki presented her experience and shared with the audience information about her career and achievements within the Aerospace field (Figure 2).

Figure 2: Naoko Yamazaki's Presentation

Naoko Yamazaki was born in Chiba prefecture (Japan), and she grew up in Hokkaido, Japan's northernmost island, where she developed her passion for the stars at an early age. "The sky was so clear and beautiful," she recalls. During her childhood, she was usually watching cartoons with her brother and the very first time she saw a space-related anime she really appreciated it. Despite her strong passion, she did not own a telescope, but she discovered more about Moon and other Planets by attending dedicated event at the observatory. Later, she remained very impressed by the Space Shuttle Challenger disaster in 1986, realizing that Space

applications and missions were real, not only science fiction anime and movies, as is shown in Figure 3.

Figure 3: Main details shared during Yamazaki's presentation about her childhood

She therefore started considering to study Aerospace-related subjects and she enrolled in Aerospace Engineering at University of Tokyo, to become part of those people dedicating their lives to Aerospace programs. Indeed, she choose at first to be an engineer. During her University years, she had the chance of studying 1 year abroad as exchange student at University of Maryland in College Park (Maryland, USA), sponsored by the Rotary Club of Matsudo Chuoh (Chiba, Japan) – Figure 4. The chance to work on international projects contributed to her career choice.

After her graduation, Yamazaki joined JAXA as a member of the development team for the system integration of a module designed for the International Space Station (ISS). Following one failed attempt, in 1999 Yamazaki passed the national astronaut candidate selection test in Japan, becoming an officially selected astronaut candidate in February 1999. Her training lasted 11 years in total, with travels to different countries (US, Russia, Canada, Germany and others). During the first 2 years she performed the basic Astronaut training. Then, her daily activities were usually dedicated 60% to ground jobs (supporting other Astronauts in space, checking operational documents, attending safety panels etc.), and 40% to training.

Figure 4: Main details shared during Yamazaki's presentation about her experience at University of Maryland

In 2002 she had her first child and later it was really demanding for her to find the proper work-life balance. Anyway, "I have been able to do everything because the people around me understood the situation and supported me in any possible ways" she declared. During all her training years, she needed always to be prepared and constantly being ready to any eventual assignment. "Sometimes I worried about if I would have ever flown and when, but despite it what helped me going on was my passion. It is important to enjoy what you do" she said. Finally, Yamazaki had the chance to go to ISS in 2010. During her mission she operated the robotics arms inside Leonardo Module and really enjoyed the Cupola window with her colleagues. While on the ISS she was excited and felt very familiar in microgravity, even though it was her first time. She felt familiar to be floating, with the impression of having her body made of stars. Additionally, she appreciated the international cooperation as the key to innovation and success: "If you want to develop your own project, national contribution is faster, but if you want to go further, international collaboration is the way to go" (Figure 5).

Figure 5: Main details shared during Yamazaki's presentation about her experience during the STS-131 Mission

Since her return to Earth, Yamazaki has been involved in post-flight activities and she is currently the Representative Director of Space Port Japan (Figure 6) Association. If you want to discover more about this project, refer to this link.

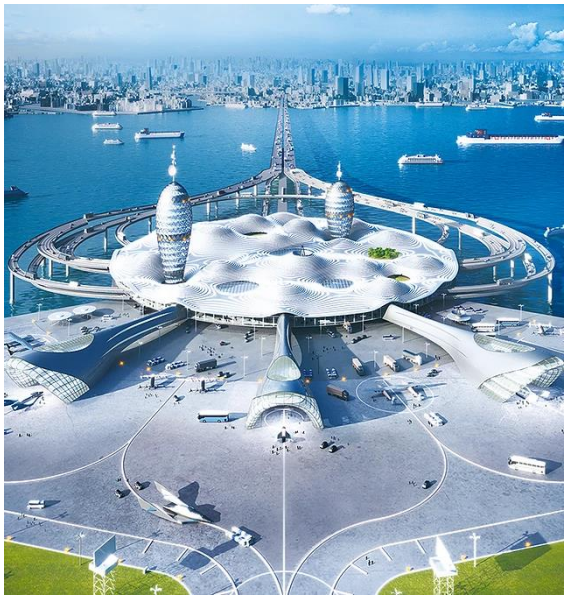

Figure 6: Overview of the designed Space Port Japan

Naoko Yamazaki is also part of the board of Women in Aerospace Japan (Sorajo), an organization supporting workshops, networking events, exhibitions, sessions at symposiums, that collaborates also with the young Astronauts Club in Japan. Naoko's experience allowed her to identify the need to work on STEM, Space, promoting Equality. Since when Yamazaki started her career as an engineer, she did not see any substantial change for what concern the gender gap in the Japanese Aerospace sector. Moreover, in 20 years the number of women in STEM in Japan has not improved much and their participation is still very low. "I think that it is mainly due to an unconscious bias. For instance, I also had the idea that pilots were only male when I was younger. I also had to fight this bias in my mind. In space we need more diversity, as space is growing 7% every year worldwide. I would like more women involved in the space field. This is why I am also involved in activities promoting the participation of women" she said. To this purpose, the activities of associations as WIA-E an Sorajo (Figure 7) can play a very important role.

Figure 7: "Sorajo" (Women in Aerospace Japan) Board

These types of associations can connect people studying and working in the Aerospace sector, providing a platform that allows people that have the same interests to meet and share experiences and ideas. Additionally, the chance of meeting experienced professionals and listen to their career can inspire the younger generation providing role models. Indeed, knowing that there is a group that sustains you and fights for your same ideals and goals is very important, especially at a young age and in environments where the gender representation is not equal.

In the last part of the webinar, very interesting topics were discussed during the interactive Q&A Session. While talking about **Human Spaceflight**

situation, Yamazaki explained Japan's intent to focus at first on International cooperation, decision encouraged by previous experiences, as the Artemis program. In addition, there is the aim to rely on the lesson learned to go to space independently. The discussion focused also on the **future of Spaceflight**. Indeed, Yamazaki expects that something like space tourism is going to happen, along with Space Transportation. She believes this because the "desire to connect people to people is strong, so space transportation will be popular". For the latest information by JAXA about Human Space Activities and Utilization of the Space Environment, refer to this link.

Additionally, the **service sector's business model is changing**: in Japan almost all the space industry belongs to the Government, while the commercial sector requires more time to grow and expand. To this purpose, Japan is trying to create a link between the government and the private companies. For instance, new start-ups are being funded and new space-related applications, such as agriculture and insurance, are promoted. JAXA is becoming also a hub for open innovation (further information at this link), inspiring and supporting many companies during the starting phase. Then, funds from the government are provided. Anyway, according to Naoko, this change will require some time.

Dealing with less technical topics, the importance to specify always that associations as WIA-E and Sorajo are not a closed club only for women was expressed (Figure 8). Indeed, there is the need to **improve men's attendance and involvement** in the topics of interest of these organizations, because they can contribute and play a key role in working together for the definition of new strategies and improving the situation. In particular, men with daughters are usually more sensitive to the topic and more willing to promote actions. Additionally, the **role of diversity within the aerospace sector** was addressed. Space programs are not only STEM-related, and a variety of other activities are fundamental too. Aerospace applications are increasing and evolving, thus diversity of background and contribution is required. To better specify diversity means gender, backgrounds, cultures and perspectives. To this purpose, **Education is important** for leading girls and women towards STEM and Aerospace subjects. In Japanese elementary school or junior high schools, female teachers exist, but especially during university years the most part of professors is man. There are some studies saying that if more girls would learn from female teachers, more girls would choose to study STEM subjects. When young, many girls in fact show interest in science, but later they give up. "I think increasing the number of female teachers would help to improve this, as they would also have more role models" Yamazaki said.

Figure 8: Picture taken during the Sorajo's networking Kick-off event on October 3, 2015, involving women and men from the Japanese Aerospace sector

Finally, the challenges and pressure of being a woman in a male-dominated environment was discussed. In these cases, it is very important to speak up when identifying any biases or feeling uncomfortable. Yamazaki shared her experience and the actions she performed when she found out some rules not friendly about gender equality during her training (e.g. holidays, flexible working times, etc.). Indeed, she decided to stand up and luckily she had the chance to find the right people that understood her requests and helped her.

Space makes you dream and we dream of a modern society with gender equality and inclusion