



Symposium “Space economy: women as game changers and innovators”

2019 AIDAA – XXV International Congress

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“Space makes you dream and we dream of a modern society with gender equality and inclusion”. With this inspiring words **WIA Europe** opened the symposium “Space economy: women as game changers and innovators” in the framework of the XXV International Congress of the Italian Association of Aeronautics and Astronautics (AIDAA). Diversity is a benefit that should be respected, encouraged and not discriminated.

On 12 June 2019, we marked the 10th Anniversary of WIA Europe and today is part of the planned event to celebrate the decade.



Dr Annamaria Nassisi (Chair a.i. and Communication’s Director for WIA-E and Manager Strategic Marketing OEN for Thales Alenia Space, Geophysics) gave an introductory speech on WIA-E organization, by illustrating its envisioning and supporting mission and presenting the local groups and corporate members.

WIA Europe provides professional development, conferences, networking opportunities and annual awards for the aerospace community with no constraints on age, gender or nationality. Annamaria takes the opportunity to remember the sudden disappearance of a great woman who died recently (August 28) and whom to dedicate this symposium: **Dr Carolina Matarazzi**. For over twenty years she has been a prominent figure in the Italian Space Agency and in 2007 she was Vice President of ASI. Since 2009, Advisor for various projects and has been a milestone for European programs aimed at monitoring and maritime protection of the Mediterranean. She had the honor of supporting her on initiatives for Maritime Security and always remember her with great affection.

Then, she introduced the theme of the symposium: the role of women in the global space economy environment. Nowadays, modern space missions call for commercial, legal and economic competencies. This new needs should be read as an increasing involvement of the women in the field. Several studies demonstrated how women’s participation in different projects could effectively represent an added value, leading to higher performance if working in an inclusive environment.





The first part of the symposium was devoted to Paper presentation selected in the AIDAA conference as an example of women's role in space companies, and presented by **Ing. Elisa Carrubba**, PhD (Project Manager in Kayser Italia) titled "Commercial Exploitation of flight-proven hardware for life science investigations in space". Dr. Carrubba is currently working on projects concerning sciences of life and on the development of equipment for the International Space Station (ISS). The Company is also involved in the PLATO Mission Consortium. She

stated the percentage of female personnel in Kayser Italia is only around 11%. Nevertheless, gender diversity is one of the strengths of the company. Indeed, contribution of the women of Kayser Italia has been a weighting factor in the birth of the new commercial Bioreactor Express Service of the Company, thanks to their skills, consolidated competences and background experiences. In detail, Bioreactor is a service which aims to establish an "express" way to perform scientific and/or technological experiments on board the ISS, by exploiting the controlled-temperature KUBIK Incubator Facility of the European Space Agency (permanently installed on the Columbus Module of the ISS). With this approach, several categories of experiments can be performed by using available miniaturized "bioreactors" dedicated to biological, biotechnological and biochemistry experiments. Moreover, other typologies of experiments (as material science, food production, educational) can be supported inside KUBIK. They encourage the development of scientific ideas from the very beginning: from the feasibility assessment and the selection of experiment hardware to the simulation tests and mission logistic support (including the transfer to the ISS and return). They also support astronauts in their missions, as Paolo Nespoli during the scientific sessions with the Kayser Italia different bioreactors of the "ASI Biomissions" in 2017. She concluded by citing some women who were pioneers in the space field: Valentina Tereshkova, Sally Ride and Samantha Cristoforetti.

Annamaria pointed out the paper was entirely presented by women and she asked if a different design approach was used when developing the service.

Dr. Carrubba replied the project was developed thanks to the participation of the entire company. According to her vision, women's contribution is strategic when they work in synergy with men. She noticed a complementarity in the way women and men reason and act, which is fundamental to reach success in technical projects as they can learn from each other. She concluded saying the "forma mentis" is usually not changed when designing, but the way men and women approach the problem could be different despite having the same objectives.



After Elisa's speech, **Annamaria** introduced and moderated the second part of the symposium: "**Inspiring Talk: Women and Men in Leading Space**". She presented the panellists as a heterogeneous group of unique insights and gained experiences. Then, she opened the round table on the theme of space economy by asking to present their vision on the thematic.

The Space Market is going through a huge growth and expansion. Today it is roughly \$325 billion and global space economy would reach \$1 trillion by 2040 (Goldman Sachs report). The space sector is attracting much more attention worldwide, as public and private investors look for new sources of economic growth and innovation, and space economy has become a relevant domain for high-tech innovation, commercial opportunities and strategic purposes. Which is the role of women in this competitive and challenging environment? Is true that they can become a game changer and Innovator?

Prof. Amalia Ercoli Finzi (Scientist and Aerospace Engineer) was the first to talk. She gave a speech entitled "A wonderful future...". She stated the judgement of women in the technology field still relies in the 3-T idea: "no talent, no temper and no time". She said women have to be assertive to overcome such cultural bias and to reach their goals. Unfortunately, women's value is not totally appreciated: their intrinsic skills and capabilities are likely to be underestimated. Furthermore, she argued women are still expected to do most of the housework even if they are working the same amount of time of men. She said someone might state men's capacities are mostly related to thinking and sensing, while women's abilities are based on intuition and caring. In this regard, she cited a controversial research that shown how the interviewed women

preferred to make a choice based on its social value rather than a prospective reward. Starting from this example, she shifted the attention to the importance of supporting space missions that have a social impact. She concluded saying space economy is currently essential to the development of the social fabric: we have to address our resources also to solve the main problems of society. In this context, the role of women could consist in being protagonists of the modern space economy by producing money and benefits to the society.

Dr Maria Cristina Falvella (Head of the Strategy and Industrial Policy Unit of the Italian Space Agency, Astrophysics) stressed the importance of embracing an approach that values diversity. At present, society is increasingly space-oriented (everyone has a mobile with a GPS or an internet connection). However, space is not only related to the technical field, but also to the space economy and free satellite data exploitation. By using information from space, the costs of several terrestrial services (as goods transport logistics) can be reduced up to 75%. The new Industry 4.0 is an open environment, which tends to accept different point of views and contributions. Women's contribution is fundamental in this scenario: they are very skilled students and are particularly able to identify needs (and the space economy is driven by society needs). She stated out of 50000 European people who are working in the aerospace sector one-fifth are women: most of them have a PhD. In Italy, out of 7000 aerospace people one-third are women.



They are working mostly in small and medium companies, start-ups and spin-offs. The new society fabric is intrinsically inclusive. Concerning the Italian Space Agency (ASI), out of 283 people, 145 are women. In the technology divisions of ASI, women are roughly a half of the total amount of employees: the gender equality has been reached. She pointed out the results of such an inclusive working environment are well visible at the international level.

Prof. Maria Sabrina Sarto (Prorector of Infrastructures and Instruments for Research Excellence,



Head of the Department of Astronautics, Electric and Energy Engineering, DIAEE) talked about the role of women in the space economy from the academic point of view. She mentioned a recent survey from Alma Laurea confirming the number of female students in the STEM subjects remains well below the amount of their male colleagues: they are the 24% of the total, reducing to the 2.4% if considering only the Cyber and IT sectors.

Concerning the research and university environment, women are the 38% of the total, with a 40-45% of researchers but a very low number of professors. She underlined she is the first female Head of Department for DIAEE. Nevertheless, she confirmed the high competencies of the female researchers and remarked how fruitful the collaborations with their male colleagues are. She stressed the importance of involving more and more female students in the STEM disciplines, also noticing their medium final grade is higher than the men's one (103 vs 101, for the same duration of the course).

Dr Maria Luisa Riccardi ("Vice Capo Gabinetto" of Minister of Defence and Member of ASI and ENAC CdA) always worked in technology and military research field. Even if the two last Italian Minister of Defense were women, she has not noticed a general evolution in the representation of women in the Italian public administration since 1998: only "cosmetic changes". She admitted gender equality committees and gender budgeting subjects are experienced only as duties. She believes a real sensitivity to the matter is currently lacking. She stated a woman working as a leader in the public administration is a "specie on the verge of extinction". We should encourage young women to pursue a career in the administration and advise them to be assertive even if someone may say they have a "bad temper".



Prof. Andrea Sommariva (Director of SEALAB Bocconi University) is a reference person for the



space economy in Italy. He gave the audience an insight on the subject as an economist. He cited John Stuart Mill, a philosopher who wondered what is the impact on the economy of precluding the access to employment to women. In the last decades, it was the family (i.e. parents or relatives) the first factor that held women from having a job. Nowadays, the obstacle to

women's full realization is rather the general absence of inclusive policies in companies. He continued stating that, in general, we still do not allow women to contribute to the development of society on the highest levels (as head of companies or CdA). He pointed out such an issue is affecting also the happiness of the whole society. He said it is fundamental to evaluate a person only on the base of her/his own value. None should be looking at gender when deciding to hire or give a promotion to an employee.

Dr Ersilia Vaudo Scarpetta (Chief Diversity Officer at ESA, Astrophysics) works on gender, geographic and generational diversity. According to her experience, the European Space Agency (ESA) is a pioneer in space as a Department to ensure respect for diversity has been established. Fortunately, other companies and agencies are slowly sticking to this approach and are developing their own specific departments to the direct dependence of the CEO. She gave to the listeners an overview of the European job applications to work in ESA. The 61% of the applicants comes from only three countries: Italy, Spain and France. The phenomenon is due to the fact a deep "space culture" can be noticed in such states. Consequently, it is particularly difficult to ensure a geographic diversity when hiring people for ESA. Women's condition is problematic as well. They are roughly



one-fifth of the European aerospace personnel. Furthermore, only the 20% of total number of applicants to ESA's positions are women. Out of them, more than a half are from the three countries mentioned before. She remarked how it is complicated to make ends meet. It is fundamental to keep a sense of fairness while not compromising the excellence. She revealed Italian women are the most interested in space in Europe. They are very skilled and ready to travel. Nevertheless, the proportion of female workers in the STEM sector is lower than 39%. She shifted the attention to the fact that women are more involved in the STEM field in those countries with lower gender equality. She said that they see a scientific career as a way to emancipate themselves. In 2017, OCSE stated the progress in gender equality matters is very slow and sometimes annoys the ones who are not directly involved in the discrimination. She affirmed the real revolution would be concluded only when the same number of women and men will be in places of empowerment. Concerning the future of the economy and work, she said tomorrow's engineers should have soft skills, emotional intelligence, creativity, ethical and social competencies. The Z-generation and the Millennials are not dedicated to gender equality with the same involvement as previous generations. Their main concern is directed to the climate change. In this regard, they want to contribute to save the planet by studying STEM subjects. She foresees the new STEMs will be more inclusive and the role of women fundamental.

Dr Eugenia Finocchiaro (from CRISEL) is the only female CEO of an Italian space company. She represents the AIPAS, AIDA and AIAD associations, which gather large, medium and small Italian companies. She acknowledges women are starting to lead their own way to the top management, but such a process have to be properly assisted. Indeed, we are coming from an old cultural heritage. However, nowadays the social organization is different: we



have no longer the same constraints. In her opinion, what is still missing is a network of family care and infrastructures (i.e. nurseries, etc.) to help women reaching their career milestones without any compromise. She stated women are roughly a half of the entire humanity and we are wasting many economic resources! Women's vision is usually directed to future developments and their skills are fundamentals in meetings and brainstorming. She proposed the companies should receive CVs containing only relevant information about work experience and skills, without specifying gender or age whatsoever.

The second part has been devoted to the Inspiring Debate with Q&A asked to the panellists and engaging debate with the unique insights and experiences gained by the panellists through achieving excellence in their respective professional fields.

As first question Annamaria affirmed gender equality studies demonstrated that the enterprises guided by women have produced 35% more than those led by men do. They obtain the 50% more as venture capital and produce 20% income. Thales Alenia Space has imposed the number of women to be hired as managers and executives. Then, she asked to the speakers their opinion about the so-called "**quotas for women**".



The panellists agreed companies or universities should not consider the gender if everyone has unconditioned access to the education and has the same rights. However, men are still chosen more than women are. Why? This is essentially a cultural problem; generally, we prefer tradition to change. Nevertheless, the Italian Constitution (Art. 3) states it is a duty of the Republic to remove any obstacles to the complete development of each individual. Maria Luisa Riccardi said that if the

system does not move autonomously towards what we want, it needs a help, as the "quotas" could be. If we decide that the diversity is a strength, then the inclusion is politics' responsibility.

The Prof **Paolo Gaudenzi** from Sapienza stepped in the discussion by sustaining that "none should feel stranger in his/her own home if she/he is worthy of trust or leadership" (Caristide). He stated we should be more creative to overcome the "quotas" and find additional solutions to address the problem of inclusion.



The **second question** concerned the difference between "poor" and "rich" countries. In India, parents are encouraging daughters to pursue a scientific career. In doing so, they believe they will be well paid and have a nest egg for the future. Could it be a leverage, instead of quota, to guarantee the presence of women in these type of countries? The speakers concluded that using female names for space missions is essential to give a message to young women: they can pursue a career in STEM subjects. The most important

function of associations supporting women is likely to provide them role models. We have also to invest on communication and social media to spread the word about women's possibilities.

The **third question** was more provocative by providing the example of the new mission to land the first woman on the Moon titled Artemis, Apollo's sister in mythology. Can we read it as a message of shake-up? Or it is only a fashion message to highlight the presence of women? The only man of the round table declared that for sure it is only fashion by inviting to reflect on this new trend.

As a **fourth question**, Annamaria suggested we mostly know male leaders (as Steve Jobs, Jeff Bezos, Elon Musk, etc.) and wondered if there exist women at the same level who are little known. Why there is no visibility on women in this challenging environment? is this a sort of lack of role model? Some of the panellists stated the lack of well-known women leaders could also be traced to a visibility issue. In the USA, there are numerous female business owners. However, women seem to suffer of shadowing and understatement more than men do. Furthermore, middle management is the area in which women are not so represented, mostly due to the fact they have no assistance for their private life. In Sweden, where women are called in the government to express themselves about family care regulations, the fertility rate has increased.



Finally, Annamaria thanked all the speakers and the participants for their attendance and took the floor for closing salute to the Chair of the AIDAA congress, **Prof. Mario Marchetti**, who stressed the importance of supporting and organizing events like this symposium.

WIA Europe is extremely satisfied with the participants' level of involvement in the discussion and perceived a deep sensitivity about the value of women's contribution in the new space economy scenario. All the panellist, also during the dinner, expressed very positive comments such as: "the event was interesting and constructive, enriched my wealth

of considerations on the subject", "come back home with an adding value", etc. These comments are the best to receive after a Symposium! Many thanks to all participants.

Special thanks also to the members of the **Rome Local Group**, for their great support to the event by collaborating with photo, notes and any other logistic supports, **AIDAA Chair of Congress Prof Mario Marchetti** offering this opportunity and supporting us with dinner to the panellist and

Thales Alenia Space by sponsoring WIA-E presence with subscription to the AIDAA congress of the Moderator.

We close the report by recalling a very effective sentence provided by Prof **Amalia Ercoli Finzi**:

"There are pack horses and race horses: women are race horses!"

