

Young Professionals in Space: Transformation through Democratization

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Abstract—Rapid innovations in space technology require smart and immediate adaptation. This can be achieved by harnessing and grooming the young talents of today who will be the stakeholders of tomorrow. Young Professionals (YP) in Space, is a technical program conceived in the year 2016 with a dream of achieving this exact goal. This article highlights and recaps some of the success stories of this program, including the recently held YP event in Dubai, UAE, during November 2019.

I. INTRODUCTION

Traditionally, satellites and related space technologies mainly found their application in remote sensing, security, and direct-to-home broadcast services. With the burgeoning quest for high-speed data access, high-tech conglomerates have started to look up to the skies. The main players in space technology like SpaceX, Amazon, and OneWeb are investing heavily on space internet infrastructure and mega-constellations consisting of both Low Earth Orbit (LEO) and Medium Earth Orbit (MEO) satellites [1]. This potential trillion dollar market invariably requires innovations from varied aspects of science and engineering fields namely: chemical sciences for efficient rocket fuels, electrical engineering for modern communication systems, mechanical/aerospace engineering for novel propulsion systems, and so on. To understand and meet these challenges, YP in space was conceived by Dr. Tushar Sharma in 2016 (shown in Fig.1). The main motto of this program is to bring the world renowned experts from different fields of space technology and young professionals from all over the world under one umbrella [2]. These experts share their experiences and train the young professionals. YP in Space has completed three successful events (see Fig.2) in Bangalore (India 2017), Barcelona (Spain 2018), and Dubai (UAE 2019) so far.

Until few years back, the space sector was perceived to be extremely closely knit and dominated by a few countries. However, some of the innovations and breakthroughs are currently being led by young professionals from different nationalities including from developing countries. This is evident in the kind of startups that are spawning in this area. This in turn has led to the opening up and democratization of the space sector.

II. HANDS-ON-TRAINING FOR STUDENTS

Another integral part of the YP in Space events are the hands-on-training sessions for students and young profession-



Fig. 1. Tushar Sharma (right), the founder and chair of YP in Space being felicitated by Eng. Saeed Al Mansoori (left) from Mohammed Bin Rashid Space Centre at the Dubai 2019 YP event.

als. At the Spain event in association with Tripoli Spain (Rocketry Association Inc.) and Universitat Politècnica de Catalunya (UPC, Spain) Cansat launch was arranged. Here students learnt about spacecraft subsystem design and launched Cansats to an altitude of 700 m [2]. This initiative was very well appreciated by the student community. At the Dubai event, session on Software-Defined-Radios (SDRs) was arranged. In this session we had a total of 29 registered teams (each team with approximately 2 to 3 students). Training included lectures on basic analog/digital communication techniques and hands-on MATLAB programming of SDR kits. With wide use of Cubesats in universities and research institutes all over the world, many universities are including Cubesat design and space mission projects as a part of their graduate course curriculum. These courses are usually inter-departmental bringing together the knowledge base diverse student groups. Such hands-on training sessions will help to promote such initiative which will ultimately benefit students interested in space technology.

III. WOMEN IN SPACE TECHNOLOGY

YP in Space initiative strives to increase women participation in its events. At the Dubai 2019 event we had a record number of women participation. Total women participants were 216 out of 461 total participants (see Fig.4). The Dubai event technical committee chair was led by Eng. Meera Rashid Al Shamsi, who is the Head of Remote Sensing Applications Unit at Mohammed Bin Rashid Space Centre (MBRSC). Laura González Llamazares participated in the YP in Space 2018 Spain event as a graduate student. Today, she is the co-founder of a space start-up company called Radian Systems (see Fig.6).

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Fig. 2. Photographs showing the attendees in the three different YP in Space events.

These success stories not only motivates us but also helps us to encourage new upcoming women entrepreneurs and young professionals in this domain. The event also offered 27 travel grants worth 500 USD each to young professionals from 13 different countries (see Fig.5). These travel grants were highly competitive and had received 251 total applicants. In the near future we plan to offer more of such travel grants.

IV. STARTUPS IN SPACE TECHNOLOGY

YP in Space also provides a networking platforms for startups in space sector. This includes technical presentations and booth spaces to showcase their technology. The start-up space was dominated by interesting companies at the Dubai event. Open Comos is a company based out of United Kingdom and is trying make space technology accessible to all. They their costumers to define their space missions including booking of launches, allocation of frequency channels and contract insurances. They also assemble and test the satellites prior



Fig. 3. Students and young professionals during the hands-on training sessions on software-defined-radios (SDRs) at YP in Space Dubai event.

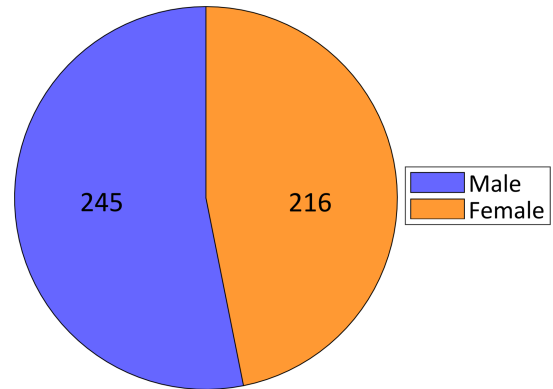


Fig. 4. Total participants at the Dubai YP event were 461 of which 216 were female registrants.

to the launch [3]. Open Cosmos was represented by Daniel Sors Raurell who is the Head of Customer Success. Precious Payload is a friendly digital service for teams planning to launch their satellite [4]. They guide their costumers through all the steps required to get your payload to orbit so that the costumers can concentrate on their mission goal instead of wasting yourself on routine, paperwork, and tasks for suppliers. This company was represented by Andrey Maksimov who is the CEO and co-founder of Precious Payload.

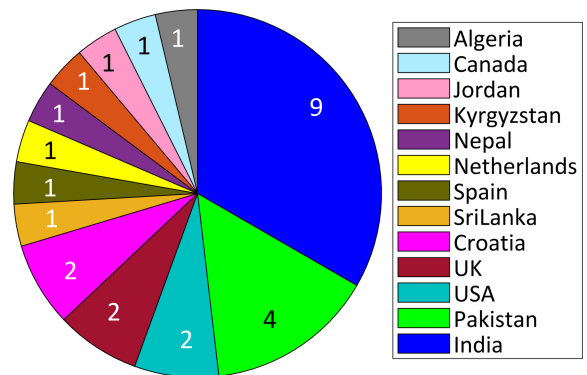


Fig. 5. Shows the country wise break-up of the provided travel grants. Out of 251 received applications 27 travel grants (each of worth 500 USD) were provided.



Fig. 6. Eng. Meera Rashid Al Shamsi (leftmost) with other young professionals at the YP Dubai event (Left photograph). Eng. Meera is the Head of Remote Sensing Applications Unit at Mohammed Bin Rashid Space Centre (MBRSC). Sara Barros (left) and Laura González Llamazares (right) at the YP Dubai event (Right photograph). Sara is Advanced Development Engineer at Thales and Laura is an entrepreneur and is the co-founder of Radian Systems. Encouraging women participation is also one of the goals of YP in Space initiative.

Radian Systems is another startup based out of Spain. This company is trying to provide thermal engineering solutions for space missions to its costumers [5]. This company was represented by Laura González Llamazares who is the co-founder and Chief Marketing Officer of Radian Systems. Lastly, Skyroot Aerospace is a company based out of India trying to revolutionize transportation systems by making it more affordable and low cost [6]. This company was represented by Pawan Chandana, who is the co-founder and CEO of Skyroot Aerospace. Overall, these start-up companies are trying to solve unique and interesting problems in space sector.

V. CONCLUSION

In conclusion, YP in space has completed three successful years and looks forward to many more years. Organizers would like to thank IEEE community and the associated societies for their overwhelming support. In the near future we would like to ??????????????????

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DISCLOSURE

L. G. Llamazares is a co-founder of Radian Systems, which is commercializing agile thermal analysis solutions for satellites and payloads.

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Laura González Llamazares graduated as Aerospace Engineer from University of León, Spain, with a year at University of New South Wales, Sydney, Australia. As an undergraduate, she founded and led a maker society with more than 60 members and several engineering collaborative projects. Passionate about space, she has recently finished her MSc thesis at University Carlos III of Madrid in collaboration with SENER Aerospace. She is currently working as Systems Engineer for two ESA science missions at Spain's National Institute of Aerospace Technology (INTA). She is the CMO and cofounder of Radian Systems, a thermal analysis start-up for space.

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