



"A certain level of stress is necessary"

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European astronaut Luca Parmitano's 'Volare' mission will begin on 28 May 2013 with the launch from the Baikonur Cosmodrome in Kazakhstan. The International Space Station will be his place of work and home for the next six months. During this time, he will care for 14 German experiments, which are funded by either the German Aerospace Center (Deutsches Zentrum für Luft- und Raumfahrt; DLR) or the DLR Space Administration. In this interview, Luca Parmitano speaks about the challenges that he seeks in his profession – and enjoys.

By Manuela Braun

When people go on holiday, they think about what to pack and what to do before leaving. You are going to be in space for more than 100 days. So what are your last preparations, and how do you feel about your trip to space?

I have never thought about going to orbit as a trip, I always talked about it as a mission. Really, there is not a lot I must prepare or take with me to the Station because there are people that have been asking me and preparing everything that I will need once I'm there. There will already be already sets of clothing, food, running shoes and bicycle shoes for me; everything has already been sent, or will be arriving when I am in the Station. The only things left for me to take are small items, like souvenirs, my wedding ring or pictures of my family or objects I want to take up to give to my friends and family when I return. It is really not a lot because we can only carry 1.5 kilograms of items with us on the Soyuz spacecraft.

You will be the Flight Engineer on this mission – what will your main tasks on board the ISS be?

Being a Flight Engineer means carrying out a lot of different jobs. During the launch phase, the Flight Engineer is actually the co-pilot of the spacecraft, which means that during launch and re-entry phase I will be supporting the commander, who sits in the centre seat. I will be sitting on his left and am in charge of all the systems of the spacecraft, while the commander is responsible for the navigation, orientation and safety of the spacecraft. I must check the engines, the navigation systems, the computers, the life support systems – these are all my responsibility. Once we get to the Station, the Flight Engineer must perform a lot of tasks. We are in charge of maintenance – it is our job to replace anything that needs to be replaced on the Station. We are also in charge of the interaction with all the experiments that are on the Station. At any time on the Station we have to care for about 150 experiments. Around 100 of these require direct interaction with the crew. That takes up – I would say – about 50 percent of our time, especially when we are also the subjects of these experiments. While I am on the Station, I will also be responsible for monitoring the approach of ATV-4, and I will also be involved in all the robotics operations for the arrival of other cargo spacecraft. Finally, there are two EVAs – two spacewalks – planned during my increment, and I will be in charge of them together with my colleague Chris Cassidy.

It's rather busy while you are at the Station. The Japanese transporter HTV, the Russian Progress spaceship, and the European ATV-4 arrive.

There will be two EVAs. These are all tasks that require a quick and successful reaction from you. Besides the normal training for that, how do you prepare yourself for this work? Are you a relaxed person by nature, or will you get a little nervous?

I am probably not the best person to answer this – maybe you should ask my instructors! But yes, I would say that I am a relaxed person; I am confident that the training I have received is

what I need to perform well. My background is very operational; having been a pilot for the past 20 years, I have always worked in high-pressure environments where you need to perform and you need to do it right in the first time. Well, it doesn't mean that I am not nervous. I think a certain level of stress is necessary to perform better because it heightens your level of focus, your attention. Of course, I will be thinking about it, I will be preparing myself mentally by reviewing the procedures, by training as much as I can while I am on board, and also by talking to people who are more experienced than I am.

You will take part in more than 40 experiments on board – from radiation to nutrition, from experiments in material science to an experiment analysing the reduction of your muscle tissue in space. How much information do you get about the scientific background of these experiments, and what kind of experiments are the most interesting from your point of view?

We receive as much background information as we want. The great part about the scientific experiments is that we have contact with the principal investigators. We can get in touch via email or phone calls; we also have face-to-face-encounters where we can ask about the science. That is extremely interesting – especially for me, since I don't have a strong scientific background. That is why I volunteered for all the physiology experiments; what we learn today about physiology in orbit, about what happens to our body when we leave for an extended period of time in weightlessness, will be vitally important, indispensable knowledge for future explorations. We need to know what happens to us if we want to leave lower Earth orbit and travel further away. So I am looking forward to all the experiments that are somehow linked to this kind of research, to physiology. One of these is a diet. The idea behind this diet is that we can control the loss of calcium from our bones while in weightlessness – and this is also important on Earth, when people are suffering from osteoporosis. Of course, the exercise that we do on the Station is also an important part of the research. We look at how our muscles change while we are in orbit. So, I am certainly excited about all the physiology experiments. But there are also experiments more related to technology. There is one called 'Green Air', which involves research towards biofuels. The study in orbit will focus on trying to reduce the toxic waste from combustion. It's an Italian experiment and I am very proud of that.

So, preparing for your mission, you had to learn many different things; you had to train for the different experiments, you were trained for grasping the HTV, for monitoring the arrival of the ATV, there was survival training, you had to learn Russian. What parts of the training in the last months did you like the most, and which did you find most difficult?

When you come to a job like that of an astronaut, you are looking for challenges. If everything I did came easy to me, it would almost be boring. The truth is, everything we do can be very complicated – the harder it is, the most satisfactory it is mastering it. I have to admit that a lot of the training is fun. It is fun because it takes a lot of effort. Certainly, flying the Soyuz in a manual mode is very hard. We need to demonstrate that we can safely dock the spacecraft to the Station, as well as that we can manually land the spacecraft. An EVA in Houston under water in a pressurised space suit is also very physically demanding. It takes full concentration. These are all hard things, but it is also part of the training I enjoyed the most. Robotics training takes a lot of skills, a little bit like mental gymnastics, because we are looking at a robotic arm through cameras and we have to build a 3D-image in our mind using the various cameras. I have really enjoyed everything that I have done in the past 4.5 years. I haven't stopped learning since I became an astronaut.

You have already visited the Columbus Control Center at DLR Oberpfaffenhofen, and met the crew that will be in contact with you during the mission. DLR's User Support Center in Cologne will be part of the mission, as well as six more support centres in Europe and, of course, NASA's control room. So you will work together with a whole network of people around the globe. In a way, you depend on these people. How much trust is necessary, and how do you build up this relationship?

You are absolutely right; we depend on these people! I wouldn't be able to do anything by myself if it wasn't for the support of all these amazing people that work in the space sector. They are almost invisible behind the scenes, but they are as important, if not more important, than the astronauts who get all the visibility. How do I build a relationship with them? It's very simple; throughout my training, we meet each other and talk. We learn to trust each other and to trust each other's experience and background just by working together. I know they are all extremely responsible, I know that they put all their efforts into what they are doing. It is enough for me to know that there is somebody out there who cares for me and my safety.

You are the first astronaut of the European Astronaut class of 2009 who will be in space. The German Alexander Gerst and the Italian Samantha Cristoforetti will follow in 2014. Will you be involved in their training when you return from ISS in November?

As soon as I come back, there will be about six months for my recovery from the six-month-flight. So it will be a little late for me to help Alexander. By the time I am back, Alexander will already be in Russia getting ready for his own flight. For Samantha, I certainly plan to help her during training through my experience.

Some of your former colleagues, like Canadian astronaut Chris Hadfield or Japanese astronaut Soichi Noguchi sent a lot of photos and videos during their stay in space. Do you have plans to keep in contact with Earth, and what hobbies will you have in space?

Chris Hadfield is an experienced astronaut. He already has three flights under his belt and is an incredibly talented person, with both communication and singing skills. I don't even try to match somebody at that level; I am not able to communicate in that way. I would like to be able to share my experience of being in orbit. I like music, and on the ISS we have a guitar and a keyboard and I think I will be playing a little bit – but mostly for my own pleasure.

Right now before your launch, what moment during your mission are you especially looking forward to?

I am a 'rookie' - somebody going to space for the first time – so everything is unknown to me. Everything will be a surprise: the launch, being in orbit, entering the Space Station, seeing Earth, being outside of the Station for the EVA. I have been dreaming about these things all of my life. I will come back with a memory of something that changed me for life. I am certain of that. I am just looking forward to enjoying this experience, being up there and fulfilling a dream that I have had for a very long time.

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Luca Parmitano during training



The European Astronaut Luca Parmitano has trained for the 'Volare' mission in Moscow, Cologne and Houston.

Credit: Gagarin Cosmonaut Training Center.

Visiting the control centre at DLR



Astronaut Luca Parmitano met the crew that will look after him in the course of his mission to the International Space Station during a visit to the Columbus Control Center of the German Aerospace Center (DLR).

Credit: ESA.

Dress rehearsal with a spacesuit



At NASA, Luca Parmitano tested his spacesuit, which was specially prepared for his mission to space, which will last from May to November 2013.

Credit: NASA.

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