

SPACE: Monaco's final frontier

A Monegasque in space; a commercial space station, and going to Mars...these were the topics discussed by a recent panel of NASA astronauts in Monaco.

By NICOLE RUSKELL

NASA'S 60TH ANNIVERSARY *Monaco hosts US astronauts*

Last year marked the 60th anniversary of NASA, the American space agency. To honour the occasion, the Embassy of Monaco to the United States, with the high patronage of HSH Prince Albert II of Monaco, hosted the second edition of 'Pioneers and Innovators of Our Time,' a special gathering of experts in air and space technology. The two-day event took place from 21st to 23rd November at the Prince Rainier III Audi-

torium, where a panel of seasoned astronauts met with journalists, esteemed members of the community, and several classes from local schools.

A press conference with the panel of astronauts is held on Thursday morning, Thanksgiving day for the Americans. Her Excellency, Maguy Maccario Doyle, the Ambassador of Monaco to the United States welcomes guests and the panel of astronauts, members of the crew of the Columbia Space mission and one of the first women in space.

The curriculum vitae of the panel is impressive--but so are their personalities. The smart, fascinating panel was also genuinely kind, humble and funny. Through entertaining banter, the astronauts and scientists revealed incredible things about the future.

The first question posed kicked off a lively discussion about the future of space travel.

"I would love to go to Mars!" says Captain Robert Gibson, former US naval officer, test pilot, aeronautical engineer and retired NASA astronaut. He crewed the Columbia, Atlantis and Endeavour space shuttles. "But I think they might tell me I'm too old," he says with a laugh. Then in a more serious tone, he informs the audience: "Our young people today will have the chance to go. Within the next 15-20 years, we will have someone on Mars. What an experience that would be." He leans forward and asks the woman on the panel if she would go.

Dr Margaret Seddon is one of the first women on NASA's space programme and one of six women who flew to space on the Columbia in 1985. She is also Captain Gibson's wife.

"No," she replies matter-of-factly. "I am quite

Her Excellency, Maguy Maccario Doyle, the Ambassador of Monaco to the United States (L) and Mesut Ciceker, Director of EMEA Region of Lockheed Martin (R)
© Embassy of Monaco Washington DC





The crew of the Columbia Shuttle Mission ©NASA

happy to stay back here on the ground.” Jokes are tossed around between the panel, all of whom are long-time friends and shuttle crew. The astronaut couple has three kids, the only kids in the world with both parents as astronauts. They tell us they used to call the Gibson’s kids ‘astrotots’.

“I want to go to Mars!” chimes in Dr George Nelson, physicist, astronomer, and mission specialist on the Columbia mission. “But at my age, he continues, “I would plan on only going one way.”

Mr Guy Beutelshies, Vice President of Commercial and civil space for Lockheed Martin states dryly: “I have never been to space. But NASA and Lockheed Martin are building the next crew vehicle, Orion, which is designed to go farther than astronauts have ever gone before. To the moon and eventually to Mars and safely home again. I’ve gone and actually seen the capsule and I’ve always thought I should just sneak in there and at least pretend that I was going!”

Saving the blue planet

When asked how being in space changed them, Dr Seddon quickly replied that the view of the Earth from space is like nothing else. “I think being able to see the earth from that altitude, you realise how connected it is to everything. You’ll see a sandstorm in Africa and then you’ll come back around you see that sand is out over the Atlantic. Then you do another orbit and you see that it’s dropping dust on your car in Houston, Texas.” The destruction is visible too: “You can see what man has done to the planet and the fact that we have to take better care of it. You can see things in the ocean, where ships have dumped oil, you can see many things that aren’t good for the earth. And it gives you a feeling that we need to protect it.”

The panel praised Monaco for its environmental initiatives and fierce planet protections it puts in place. General Charles Bolden, former NASA Administrator, Major-general of the US Marine Corps and NASA astronaut said:

“It’s important to point out the important and critical role that Monaco plays in preserving and protecting the planet. That is a huge part of what NASA does in their Earth science mission projects, one of the most important parts of NASA’s portfolio.” NASA’s earth sciences department has partnerships with over 120 countries and more than 800 active agreements.

The International Space Station

For twenty years, numerous nations have worked together to support the ISS. The space station has been a mainstay for space travel and an easy way for astronauts to do extended research just outside the reaches of Earth’s gravity.

“The ISS celebrated its 20th anniversary two days ago and for 18 of those years, there has been somebody living aboard,” said Captain Michael Lopez-Alegria, three-time shuttle mission crew and ISS visitor. “Kids today have never lived a day of their lives without having somebody in space. That’s remarkable.” He described the immense proportions of this floating station: with 1000 cubic metres of interior volume it is bigger than a football field and weighs 420 tonnes. It has been a peaceful collaboration between all the nations involved, but he revealed that it’s becoming obsolete. “The ISS is a really incredible feat of engineering, but it’s going to end someday--probably within the next decade.”

NASA spends a large portion of its budget on keeping up ISS and now they want to start looking beyond ‘lower-Earth orbit.’ Captain Lopez-Alegria continued with an amazing revelation: “We’ve been going to orbit now for 60+ years and we’re pretty good at it. NASA and the other agencies would like to let other companies take up residence there, in lower-earth orbit, and have an economy.” There it is--the ISS is being handed over to private commercial companies.

But the biggest announcement was yet to come... ▴



Buzz Aldrin, the second man on the moon was a special guest ©Embassy of Monaco Washington DC



ASTRONAUTS MEET WITH MONACO STUDENTS

Several groups of students from the principality had the chance to meet with the astronauts, ask them questions and get free goodies, including signed pictures of the Columbia mission, and information about space programmes.



ABOVE AND BEYOND

An advanced screening of Oscar-nominated filmmaker Rory Kennedy's documentary 'Above & Beyond: NASA's Journey to Tomorrow' was shown to an audience of local students, and general public. The film covers the work carried out by NASA on earth and throughout our galaxy and looking at what's to come, with the next generation of telescopes, prototypes of spacecraft planned for Mars and the organisation of technical missions to better understand space.

The film was followed by a panel discussion with the astronauts and autograph signing for the kids.

MONEGASQUES HEAD TO SPACE

On 22 November, history was made yet again in the principality, as Monaco's *Space Systems Institute* (SSI) signed a Memorandum of Understanding (MOU) with *Axiom Space* to train Monaco citizens (or residents) as professional astronauts and fly them on an orbital space mission. The landmark agreement was announced by *Axiom's* Captain Michael Lopez-Alegria, an astronaut on three NASA shuttle missions and one ISS mission. He said: "Yesterday, we signed an agreement to investigate the possibility of training a Monaco citizen or resident to fly to space, either as a professional or as a tourist for missions that last for ten days, or even longer. So this is really the beginning of the possibility to have somebody wearing the flag of Monaco in space. Which would be wonderful."

According to Dr Ilhami Aygun, President & CEO SSI, a Monegasque astronaut will be able to bring the Monaco colours to space by 2025. That would make the Principality the 19th nation to send an astronaut to the International Space Station (ISS).

Axiom Space CEO Michael T. Suffredini, who managed the ISS program at NASA from 2005 to 2015, said their unique ability to build 'indigenous astronaut selection and training capability' to NASA standards will accelerate the development of Monaco's plans for human spaceflight and space research. Once trained, Monaco's future astronauts will be eligible for official assignment to ISS missions. The MOU agreement additionally covers the possibility

that the mission will instead fly to an Axiom Station.

Dr Ilhami Aygun, President & CEO SSI, said: "In addition to being an honour for our company, this collaboration is a great step for Monaco to further establish its role in the international space community. Axiom is composed of all the great people who contributed to the success of the ISS missions, and now that human spaceflights tend towards privately trained astronauts, we are proud to contribute to such a prestigious project with the DNA of Monaco".

The two companies also agreed to study the long-term possibilities of 'space tourism' in Monaco and a potential "Monaco Space Module" to be attached to the Axiom Space Station--which is set to be constructed onto the ISS and later separated to operate independently. This will be the world's first commercial space station.

Fans of the 'Star-Trek' series can certainly imagine this is the first step to a future of intergalactic space stations. The tagline of the cult science-fiction series no longer seems so fictional.

The expansion of Monaco's space activities into human spaceflight is aimed at conducting fruitful experiments and data collection in Earth orbit, and fostering public enthusiasm for space, science, technology, engineering, and mathematics.

Dr Aygun further revealed that they are planning to have a Monaco Module on the Space Station that can be used for scientific purposes, but also for space tourists with a Monaco Tourism touch. "Monaco is the centre of luxury tourism," he said, "so it makes sense to choose Monaco as the first place to send travellers to space. We will see how it develops. It will be a very good opportunity for young people to become candidates and trained as a professional or as a tourist," he said.



Panel (L-R): Jean-François Clervoy, Guy Beutelschies, General Charles Bolden, Dr Margaret Seddon, Dr George "Pinky" Nelson and Captain Robert Gibson
©Embassy of Monaco Washington DC



Dr Margaret Rhea Seddon ©Embassy of Monaco Washington DC

Q&A WITH RHEA SEDDON

Dr Margaret 'Rhea' Seddon was one of the first women admitted to NASA's space programme in 1977, one of the first women in space aboard the Discovery Space Shuttle in 1985 and became the Payload Commander of her third mission, Columbia in 1993. She is a medical doctor and trained surgeon, and used her medical expertise research the physiologic effects of space travel and zero-gravity. In 2015, Dr Seddon was inducted in the United States Astronaut Hall of Fame.

How did you go from working in the emergency room to joining the Space Programme?

It had always been in the back of my mind that I would love to fly in space one day. But of course, [at the time] you had to be a man and a test pilot and you had to be between 5'6 and 5'10 (167 - 177 cm). I was never going to be any of those things. So I chose the profession that I intended to spend the rest of my life in.

When I was finishing my surgery training, I found out that for the first time they were going to take a class of astronauts to fly in the space shuttle and for the first time they were accepting applications from women and minorities. They began accepting applications in 1977 and the classes started in 1978. So I thought, if I'm ever going to do this, I've got to apply now. You never know

when opportunities like that will come along, but you seize the moment.

So was it just a leap of faith?

It was! When you apply for NASA, they bring you down for a physical and they interview you, but they also give you some information about what they're going to do. They told us we would start flying in 1978 or '79 and that we would fly 50 flights a year. So I thought, well, I could try that, do a couple shuttle flights and then come back to my surgery residency. Of course, the shuttle didn't fly until 1985. So it took a long time before I was in line to fly. I was going to go back to med school, but I married an active astronaut, so that changed things.

In the meantime, I met my husband (astronaut Robert Gibson) and we had our first child in 1982. I only planned on spending a few years with NASA and I ended up spending 19 years with them.

Was NASA interested in your medical experience from the beginning, or did that develop as you worked with them?

When they took the shuttle astronauts, we knew they were taking us for our expertise in the scientific field. They couldn't guarantee that we would fly on a flight that would use that expertise, but they knew that there

would be missions with experiments in the life sciences. They were looking at how humans adapt [to space] and how to keep humans healthy for longer and longer periods of time. They took all of us because of our different expertise. "Pinky" was an astronomer and Sally Ride was an astrophysicist, and Judy Resnick was an engineer. They wanted a cadre of people that they could select from if there was an upcoming flight where their expertise would be useful.

There's a bigger push now to get girls into STEM classes at a young age. What can we do to make sure we encourage girls in the sciences?

I think parents do that. My father told me I could be anything I wanted. It's very important for parents to encourage their children to explore and think of what they might do. I like the saying 'If you can see one, you can be one.' And that's one of the reasons I go out and talk to young people. Because I think that little girls have a vision of what an astronaut looks like or sounds like, or what kind of person they are...and then they see me.

I can remember going on a field trip with one of my sons in 3rd or 4th grade, and the teacher told the kids I was going to go to the Space. One of the kids said: 'but she looks just like somebody's mom.' I think kids have this vision of 'well I can't do that' but if they see the person, that changes.

Do you think schools having speakers visit is a good way to teach them?

Absolutely. And the teachers are wonderful by having the students apply what they learn to something that they can understand. Like dehydrated food, or planning a science experiment and getting the results. It's the fun of science that needs to be taught--it shouldn't just be something you read about in a book. It has to be hands-on and you get more and more involved in the actual science as go along. Science can be fun and I think we need to let girls know that. When you look at the first six women astronauts, we ran the gambit from a very athletic person to me on the other end, who was a Southern Belle. And you can be any of those things and still have a wonderful career [in science].

I love to tell people that you can be part of the Space Program without being an astronaut. There are plenty of women involved in the programme, from dieticians to medical doctors, women in Mission Control monitoring the engines or the electric power. There were women doing all sorts of things for NASA who feel like they are part of something bigger. It's an amazing place to work. ▀