AirSpace Season 1, Episode 12

Around the World

Emily Martin:

So fun fact, the UK space agency was founded in 2010.

Nick Partridge:

The UK space agency?

Emily Martin:

Yeah.

Nick Partridge:

They've been coasting off of the Royal Navy. They've been coasting off colonial glories since...

Emily Martin:

I know, that blew my mind. Get it together you all. 2010.

Nick Partridge:

Welcome to this episode of AirSpace from the Smithsonian's National Air and Space Museum with help from PRX. We're your hosts.

Emily Martin:

I'm Emily Martin.

Nick Partridge:

I'm Nick Partridge.

Matt Shindell:

And I'm Matt Shindell.

Nick Partridge:

Today we're talking about international space exploration.

Matt Shindell:

And there is more to space exploration than NASA.

Emily Martin:

How international is the International Space Station? Is it just a bunch of Americans and Russians chilling out up in space?

Nick Partridge:

18 different nations have flown astronauts to the ISS.

Emily Martin:

Yes. Mm-hmm (affirmative). But the experiments being run on ISS come from 93 different countries.

Nick Partridge:

Name them all.

Emily Martin:

Oh, I didn't have my Wheaties this morning, I don't think I can get through 93.

Matt Shindell:

Yeah. It's pretty incredible how international space exploration has become. If you look at how it began, where it was a race between two super power nations trying to outdo each other in space. When Apollo 11 landed on the moon in 1969, there was a plaque on the Eagle that said, "We come in peace for all mankind."

Nick Partridge:

Humankind.

Matt Shindell:

Oh, excuse me. For all humankind. And at the time it was hard to read that in that way in the context that it was done.

Nick Partridge:

Speaking of Apollo, did you know that the first flag on the moon was Swiss?

Emily Martin:

Sort of.

Nick Partridge:

One of the first experiments deployed on the moon was a solar wind experiment designed by a Swiss scientist and created by Switzerland. And it used a flag to collect particles from the solar wind. I'm waving my arm like a flag. It used a flag to collect particles from the solar wind. So it wasn't actually the flag of Switzerland, but it was a flag of sorts made by the Swiss. They joked about putting the actual flag of Switzerland on it, to just ride the whole way on an American spaceship and then at the very last second, oops, Switzerland. We were here first.

Emily Martin:

If you Google pictures of the experiment, it looks like it's about 12 inches wide and it's this flag that's maybe four feet tall and it looks like it's made out of those space blankets that you see marathoners wrapping around themselves after they finish a race.

Matt Shindell:

The Mylar blankets.

Emily Martin:

Is that what it is, Mylar?

Matt Shindell:

And is it Mylar?

Nick Partridge:

Yeah.

Emily Martin:

Well, it's shiny and it's silver and it's sparkly so it looks really cool on the moon. And it's very gray of course, because it's reflecting all the grayness around it. And there's this little tiny red splotch in the corner of the flag. And I was like, oh, that must be the Swiss flag. But it's not actually the Swiss flag, it's a big tinfoil flag that's actually an experiment from the Swiss that originated in Switzerland.

Nick Partridge:

Yeah, it's kind of a jokey thing, but it was an important experiment. It flew on every Apollo mission and is the only international experiment flown to the moon during Apollo.

Matt Shindell:

But these days, that really makes sense because it really did eventually open up a realm of science and a realm of exploration that the entire world is now participating in.

Emily Martin:

If you think about when the race to space was happening...

Speaker 4:

On every continent and in every land, the story of Sputnik 1 dominated the front pages. The United States space program bruised and battered in competition with the Soviet union, took a significant and highly gratifying step forward today. The United States on its first try, sent a man into space and recovered him safely.

Emily Martin:

It didn't take very long before you had these two superpowers, U S and Russia, working together. And I think most notably as we were talking about before the international space station. The Russians launched the very first piece of the International Space Station in 1998 and a couple of weeks later, the US launched a second piece of the space station with a crude mission to actually go Lego brick, the two pieces together and actually create what is now... I don't know how many pieces are part of the International Space Station, but...

Nick Partridge:

Minimum 93. Right?

Emily Martin:

Well, maybe. I don't know, do you count the inflatable habitat that they put up there recently?

Nick Partridge:

So, all right. I was joking. There are certainly more than 93 moving pieces in...

Matt Shindell:

So space exploration has become international and that's not just the international space station, but it's also planetary science and studying the solar system, right? It's easy for us as Americans to just look at NASA and look at what NASA is doing and think that this is what's happening in space, but in fact, other countries are doing quite a lot and sending things out. Although usually on either a different scale or different types of goals in mind.

Emily Martin:

With some of these larger space agencies, they have the flexibility to do things like space research in terms of planetary science research, as well as human exploration research. But there's a lot of other countries that we'd never think about as having space agencies, and it's a little bit more out of necessity.

Nick Partridge:

So what are some other countries with space programs?

Emily Martin:

Israel, Sri Lanka, Hungary...

Matt Shindell:

The UK and France each have their own space program, even though they're also part of ESA the European Space Agency.

Emily Martin:

Bangladesh, Lithuania...

Matt Shindell:

Also Turkey has a space program.

Emily Martin:

Mongolia has a space agency, which blew my mind. And the purpose of that space agency specifically is to put satellites up in orbit so that they can do real time remote sensing and mitigating natural hazards of their region.

Matt Shindell:

And that could include looking out for storms, tracking weather patterns, and also studying the way that land is used and mapping out the usable land in a territory.

Emily Martin:

Simply taking care of some national interest stuff. So it's not just the US and Europe.

Nick Partridge:

How many spaceports are there? How many countries have spaceports?

Emily Martin:

I don't actually know the answer to that. I know Israel is the smallest country with a spaceport and launch capabilities.

Matt Shindell:

A spaceport, meaning a location where a rocket could be launched into space.

Emily Martin:

Right, while the US has space ports that are capable of launching humans into space because we did put people on the moon and we're still the only ones who have accomplished that feat. We don't have a rocket anymore that's capable of launching humans into space, which is why we go to Kazakhstan.

Nick Partridge:

Yeah. The vast majority of space missions don't involve sending people into orbit. ESA, the European space agency has had a lot of really high-profile solar system missions over the last few years.

Matt Shindell:

Yeah. So the Cassini–Huygens mission was a joint ESA and NASA mission to Saturn. ESA also sent an orbiter to Mars.

Nick Partridge:

And then there was the Rosetta mission to a comet.

Emily Martin:

Yeah, Rosetta was really spectacular and if you ever saw the comics.

Nick Partridge:

Yeah.

Emily Martin:

The sort of anthropomorphized version of Rosetta and it's little tiny Philae lander. They gave it a little backpack. And the Philae lander was really spectacular because Rosetta, the spacecraft itself, was going into orbit around this comet named 67P. And I said 67P because the first two words... Can you say it, Matt?

Matt Shindell:

No.

Emily Martin:

Look it up, it's a lot of letters. It's a lot of consonants and I don't want to say it. And when it landed on the surface, it was supposed to deploy these harpoons to latch into the surface because the gravity on 67P is really small. Well, didn't totally work the way they had planned so Philae bounced off the surface and it managed to land back on the surface which was really impressive, but it meant for a while, they didn't actually know where the Philae lander was and it landed in the shadow so it didn't end up having as much power as it had hoped because it was solar powered.

Matt Shindell:

It was in a small crevice, wasn't it?

Emily Martin:

Something like that. So they did end up finding it awhile later, but that was a wildly successful mission and you should look up some of the photos from that mission because they're some of the most alien terrains you'll ever see. And that's saying something since I look at weird stuff in the outer solar system.

Nick Partridge:

Always take a look at the scale and the bottom corner of those photos, because what you're looking at is huge. The scenes from that comet, what looked like rocks you could pick up in your hand are 30 feet across. They're in meters though so it's hard for the Americans to do math.

Emily Martin:

Sure. So we mentioned ESA sent orbiters to Mars. The Indian Space Research Organization has also been to the red planet. They have a Mars orbiter, which has been collecting data since 2014. They've also been to the moon and I believe they're getting ready to go again, if they haven't already, back to the moon.

Matt Shindell:

Robotically in all of these cases.

Emily Martin:

Robotically, yes. None of these are human exploration missions, but the Japanese space agency has done some really spectacular, simple return missions.

Matt Shindell:

Yeah. Starting in 2003, they sent their first robotic mission to an asteroid called Itokawa.

Emily Martin:

It launched in 2003, it came back in 2010. So these are really long duration missions but one of the things that I think is most impressive is not just the engineering feat, the technological feat to make these simple returns happen. But they have opened up these samples to the community in the same way that here at the Smithsonian, if you're a scientist and you need to work on some meteorites, you can write into the meteorites' curator. And they don't just hand them out to everybody. You have to justify why you need these samples and there's a panel that decides whether or not they're going to distribute those samples to you. But they're not just keeping those for themselves, they're keeping it for everybody.

Matt Shindell:

The Japanese space agency has launched two missions to asteroids. The first one, Hayabusa, brought back 1500 samples from its asteroid. And the second, Hayabusa2, to just got to its asteroid, but Hayabusa1 brought back tiny little samples.

Emily Martin:

Do you know what the total weight is?

Matt Shindell:

It's tiny.

Emily Martin:

It's something like grams, right?

Nick Partridge:

15 grams.

Matt Shindell:

Yeah.

Nick Partridge:

Mm-hmm (affirmative).

Matt Shindell:

Because these are small particles. But you know what one of the coolest things is about these particles?

Emily Martin:

Tell me what the coolest thing is about these particles, Matt.

Matt Shindell:

If you look at them under a microscope, really close up. What you see is that they have tiny craters in them.

Emily Martin:

Meteorites, if you will.

Matt Shindell:

Yes. So these little particles have been struck by micrometeorites while on...

Emily Martin:

And nano meteorites.

Matt Shindell:

Yes.

Emily Martin:
Do you think they're so small that they could be nano meteorites?

Matt Shindell:
Is that a term yet?

Emily Martin:
I don't know.

Nick Partridge:
It might.

Matt Shindell:
It just teaches you that there are all these tiny little things whizzing about in the asteroid belt, right?

Emily Martin:
Yeah.

Nick Partridge:
Yeah.

Emily Martin:
And right now Hayabusa2 is out there. Pictures are coming back regularly. They just sent a closeup of the surface of the asteroid. The images show that there are huge boulders on the surface.

Nick Partridge:
So the samples from Hayabusa will go to scientists and labs all over the world. Is it safe to say that most space missions are international in some way?

Emily Martin:
Right? So you can say curiosity is an American Rover, you could say that the Indian Space Research Organization's mission to the moon was an Indian mission. But there were NASA instruments on that mission too, in the same way that there's ESA instruments on NASA missions. You can't just put that one flag or that one stamp on each one of these missions because even if it's under the umbrella of the space agency of a particular nation, they've all helped each other. They've all worked together and the scientific community is international. You can't just say, well, I work with this person over in Italy, but I'm not going to ask the expert in this thing to not help out with this mission because ultimately you want it to be a success and that means you have to pull in the people who can do the work. Who are the best, of the best, of the best, as Rip Torn would say.

Matt Shindell:

You know, there's no denying that even today one of the main things that a country gets out of having a space program or having a successful mission is a certain amount of international prestige. It sort of allows you entry into an international club of spacefaring nations.

Nick Partridge:

It's really the same as other clubs. The bar just has... The prices are increased. It's much more expensive.

Matt Shindell:

I think you get a special black credit card with stars on it.

Nick Partridge:

Amex black with starfield.

Matt Shindell:

It's the Diners Club.

Emily Martin:

No. It's the Discovery [crosstalk 00:12:39] Card, Matt.

Nick Partridge:

That's it for this mini episode of AirSpace.

Emily Martin:

AirSpace is produced by Katie Moyer, Lizzie Peabody, and Jocelyn Frank.

Matt Shindell:

Mixed by Tarek Fouda. Special, thanks to Jason Orfanon, John Barth and Genevieve Sponsler.

Emily Martin:

Check us out on Twitter @airandspace.

Nick Partridge:

We'll be back at the beginning of next month. Airspace is supported by the Alfred P. Sloan Foundation. Enhancing public understanding of science, technology and economic performance. More information at sloan.org.

Emily Martin:

If we'd been up there for about 20 years living in the space station, Do you remember what your technology was like 20 years ago? Do you remember what your life was like 20 years ago?

Nick Partridge:

The International Space Station actually runs entirely on Tamagotchi technology. They plugged all of the main computers into Tamagotchi key chains.

Speaker 4:
From PRX.