

## AirSpace Transcript Season 9 Bonus: Voting From a Station Far Far Away

*AirSpace theme in and under*

**Emily:** Welcome to AirSpace from the Smithsonian's National Air and Space Museum, I'm Emily. And unless you live under a rock, you know there's a big election coming up in the United States. But, how would you vote if you happen to be a little -off-planet- for the election?

*(AirSpace theme fades out slowly)*

We were wondering how astronauts in the International Space Station vote in elections (especially astronauts who weren't planning to be there during an election) so we found someone who could tell us

**Katie:** Yes. So my name is Catherine Schauer. Um, I work for NASA space communications and navigation program office.

**Emily:** You work with the Near Space Network, can you tell us about that because I've never heard of this before.

**Katie:** Yes, yes. I can talk about the Near Space Network. So the Near Space Network<sup>1</sup> is a global infrastructure of antennas on Earth. And then relay satellites in geosynchronous orbit. So, the network itself can do either, it can capture a link directly from a satellite in space, for example the Swift spacecraft sends a link to another spacecraft and then that goes down to Earth. That is known as relay communications.

Or, a polar orbiter, for example, ICESat-2 sends its information directly to an antenna on Earth. So these two different communication methods to get data from space to Earth through the Near Space Network.

Um, we support missions out to 1.2 million miles away. So that's actually the Sun-Earth Lagrange points. We share that area, we share the moon and the Lagrange area with our sister network, the Deep Space Network, which is managed out of the Jet Propulsion Laboratory. The Near Space Network itself is actually managed out of Goddard Space Flight Center.

The infrastructure, is, is, um, made up of both commercial and government assets. So, uh, we are not just operating government owned antennas. We are also coordinating with

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<sup>1</sup> <https://www.nasa.gov/communicating-with-missions/nsn/>

commercial companies around the globe, um, because you need a ton of antennas to get all of the information from space.

**Emily:** We're not just talking about data being transferred, right? We're also talking about communications between astronauts and Earth.

**Katie:** Yes. So the Near Space Network itself is the sole provider of communications for the International Space Station, where we have at any given time, like five to 10 astronauts and cosmonauts living on the space station, working there, conducting valuable research.

**Emily:** What you're working with is so interconnected with human spaceflight. And we've had the International Space Station continuously in use for 20 years or more. And that means that there's been people up there for major life events, major historical events, and we're on the precipice of a national election.

How are astronauts casting their ballots from space<sup>2</sup>?

**Katie:** In 1997, they actually passed legislative thing that allowed people to vote from space. They passed it in Texas. Because while our astronauts forego a lot of, like, the creature comforts of home, voting is one of those things that we wanted to make sure they were still able to do.

So the first astronaut that voted from space was David Wolf. He voted from the Mir space station<sup>3</sup>. And then in 2020, Kate Rubins voted from the International Space Station<sup>4</sup>. So this year, the astronauts currently on board the space station, the American astronauts currently on board the space station will cast their vote by kind of like a makeshift ballot room. You can see it in the article we published in 2020<sup>5</sup>.

And it actually, it's an encrypted ballot. So that signal gets sent from the International Space Station to TDRS, the Tracking Data Relay Satellite I mentioned. That is then sent to White Sands, New Mexico.

That, still encrypted, goes to Johnson Space Center, where it is then given to a clerk. The clerk and the astronaut are the only ones who can see the ballot. So at no point, despite it going through a bunch of stops along the system, is it being read by anyone else, which is

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<sup>2</sup> <https://airandspace.si.edu/stories/editorial/how-do-astronauts-vote-space>

<sup>3</sup> <https://www.theatlantic.com/science/archive/2016/11/voting-from-space/506960/>

<sup>4</sup> <https://www.nasa.gov/image-article/nasa-astronaut-kate-rubins-casts-her-vote-from-space/>

<sup>5</sup> <https://www.nasa.gov/missions/station/how-nasa-transmits-votes-from-the-space-station/>

very critical to voting as you know, it's such a personal thing that you want to make sure is private.

So we have very stringent security measures on all of our data, but the voting one is definitely one where they wanted to make sure that the astronauts had the ability to vote in private.

**Emily:** So do you need to know that you're going to be in space for an election or in the case of Suni and Butch, does it work the same way if you happen to be up there when you weren't expecting to be up there and there's an election?

**Katie:** So I did find out in preparation for this that they are going to be given the opportunity to vote, but I do not think that they had planned for that, seeing as their trip has been extended by a few months.

**Emily:** And we have some audio from a press conference with Butch and Suni from the ISS on September 13, here they are answering a question from Marcia Dunn of the Associated Press<sup>6</sup>.

**Butch Wilmore:** I sent down my request for a ballot today, as a matter of fact. They should get it to us in a couple of weeks. And absolutely, yes that's a very important role that we all play as citizens is to be included in those elections and NASA makes it very easy for us to do that. So we're excited about that opportunity.

**Suni Williams:** And Marcia, same here. A very important duty as citizens and looking forward to being able to vote from space which is pretty cool.

**Emily:** So they would, they're not going to miss out on the opportunity to vote just because they're up there

**Katie:** Yes. Uh, yeah.

Yes. A hundred percent.

**Emily:** Great. That's really exciting.

**Katie:** We have people who are like dedicated to making sure that the astronauts up there are having, are like, okay. And are set up for success.

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[https://images.nasa.gov/details/NASA\\_Astronauts\\_Wilmore\\_and\\_Williams\\_News\\_Conference\\_240913\\_2057077](https://images.nasa.gov/details/NASA_Astronauts_Wilmore_and_Williams_News_Conference_240913_2057077)

**Emily:** Right, right. I just, I just love the fact that we're at this point with human spaceflight where there's flexibility. It's not a, well, you didn't bring it with you, so sorry. Or you didn't plan that before you left the ground. So sorry. We've gotten to this point where folks have been up on the space station for such long periods of time that we're now at a point where like you can actually make a pivot and provide them with what they need in order to be comfortable and successful.

**Katie:** A hundred percent. They go through so much training beforehand. There's actually people who are brought in to figure out what their favorite foods are like can we somehow make that edible in space<sup>7</sup>? Like things like that to make sure that they're not losing all sense of self when they're up there.

**Emily:** Yeah, and I'm not sure if voting from space unexpectedly like this could have happened in the 90s when astronauts were first able to vote from space but I think now that we have better communication strategies and infrastructure in place for astronauts to be able to cast a live ballot allows the Human Exploration Program to be able to kind of roll with the punches and the changes in a mission as time goes on so that, folks don't get stranded without their opportunity to exercise their rights.

**Katie:** Exactly. And I'm sure there's a lot of coordination that goes on at Johnson Space Center to make that happen. My group manages the network, but they manage the people. And they are definitely looking out for their rights.

**Emily:** I think you made a really great point, which is that astronauts forgo so much for the privilege of traveling to space, but they also work enormously hard to be there, right, to be there safely, to execute their missions. But I think it's really special to think about giving them that right in real time in a way, right? Because you're like, oh, well, you can just vote absentee. What's the big deal? And it's, it's not the same thing.

**Katie:** I, I, it's, it's a privilege to vote and people are proud when they vote and voting in space is something that we should be able to give to these astronauts since we are developing the infrastructure to support humans in low-Earth orbit, humans on the Moon and things like that.

And with NASA's Artemis program<sup>8</sup>, we're planning on having people living and working on the moon. I don't know what voting will look like when we finally get to that point, but that is a key part of being an American is being able to cast your vote once you turn 18 and contribute to the policies that are being put in place by the people you vote for.

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<sup>7</sup> <https://www.nasa.gov/history/space-station-20th-food-on-iss/>

<sup>8</sup> <https://www.nasa.gov/feature/artemis/>

**Emily:** Election Day is November Fifth. For information on where your polling place is (because it's probably not on the International Space Station) you can go to [vote411.org](https://www.vote411.org)<sup>9</sup>

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AirSpace is from the National Air and Space Museum. It's produced by Jennifer Weingart and mixed by Tarek Fouda.

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<sup>9</sup> <https://www.vote411.org/>