

AirSpace Season 1, Episode 5

2001 An AirSpace Odyssey

Matt Shindell:

Open the podcast doors, Nick.

Nick Partridge:

I can't do that, Matt.

Emily Martin:

They're not going to get it.

Matt Shindell:

Do either of you have an Amazon Echo?

Emily Martin:

No.

Matt Shindell:

Oh my God. If you have one, ask it to open the pod bay doors. It will answer you. It's really great.

Emily Martin:

What does it say?

Nick Partridge:

What does it say?

Emily Martin:

Alexa, open the pod bay doors.

Alexa:

I'm sorry, Dave, I'm afraid I can't do that. I'm not HAL and we're not in space.

Matt Shindell:

That's what she says.

Nick Partridge:

It's the 50th anniversary of one of the slowest, strangest, and yet most referenced science fiction films of all time. Back in 1968, the film 2001: A Space Odyssey debuted a tale of futuristic exploration and alien encounters, but in a totally new way.

David Kirby:

No more shiny spaceships, shiny rocket ships, goofy spacesuits, crazy aliens, things like that.

Matt Shindell:

The film was notable, not just for what it didn't have, but for what it did.

Emily Martin:

It included cutting edge collaborations with NASA scientists and partnerships with high-tech research and development companies who were designing the technologies of the future.

Nick Partridge:

We'll talk about how 2001 gave us our first peaks at digital tablets, 3D printers, and even the worldwide web.

Emily Martin:

And we'll take a look at how contemporary science fiction reflects on our present and experiments with what the next 100 years could look like.

Nick Partridge:

That's coming up next on AirSpace from the Smithsonian's National Air and Space Museum, with help from PRX.

Emily Martin:

Before we get into all the cool collaborations that were really what made this film so special, I think we need to review a basic outline of what some of the quintessential scenes were in this film.

Matt Shindell:

Challenge.

Nick Partridge:

It's been 50 years. If you haven't seen it yet, you had your chance. And if you have seen it, you still might not have caught everything that went on. It is notoriously silent and inscrutable.

Matt Shindell:

First it was directed by Stanley Kubrick and he collaborated on the screenplay with the science fiction writer, Arthur C. Clarke.

Emily Martin:

In my mind, there's four sections in this movie.

Nick Partridge:

Okay, everyone describe your section in one sentence. Someone will have to go twice. Who goes first?

Emily Martin:

I'm raising my hand.

Nick Partridge:

Emily raised her hand. I'm calling on Emily.

Emily Martin:

Monkeys get visited by a giant black headstone that gives them knowledge to kill other monkeys and eat other animals.

Nick Partridge:

Four million years later, descendants of the prologue monkeys find the alien artifact from the first scene on the moon and it emits a radio signal towards Jupiter. Cause unknown.

Matt Shindell:

Part three, two astronauts, some sleeping astronauts, and an artificial intelligence named HAL are on their way to Jupiter to investigate the destination of the signal from the monolith.

Mr. Amer:

Good afternoon, HAL. How's everything going?

HAL:

Good afternoon, Mr. Amer. Everything is going extremely well.

Mr. Amer:

HAL, you have an enormous responsibility on this mission, in many ways perhaps the greatest responsibility of any single mission element. Does this ever cause you any lack of confidence.

HAL:

Let me put it this way, Mr. Amer, the 9,000 Series is the most reliable computer ever made.

Nick Partridge:

Spoiler alert. HAL Kills everyone, except one guy. Part four of the film, our hero, Dave Bowman, takes a super psychedelic trip across the width and breadth of the universe and transforms into the Star Child.

Emily Martin:

Which is a giant floating baby above the Earth.

Matt Shindell:

In a bubble.

Nick Partridge:

Yeah, it's a giant floating baby. There's no elegant way to visually to describe the Star Child, the visual of the Star Child. Matt, which member of Kiss was the Star Child.

Matt Shindell:

How would I know? I never listened to Kiss

Emily Martin:

Wait, hold on, there's a member of a Kiss named Star Child?

Nick Partridge:

All of the members of Kiss have names for their personas.

Emily Martin:

I didn't know they had names.

Nick Partridge:

There's the Star Child, The Demon... What are the other ones?

Matt Shindell:

I told you, I don't listen to Kiss.

Emily Martin:

All right, all that said. That's weird. Star Child is weird. It's a weird floating baby above earth. What do you guys think about the end of this movie? What do you think about the movie? Specifically the end, where things just get weird.

Matt Shindell:

Things get weird and cosmic at the end of the film. It seems to indicate some bigger future for humanity beyond where we exist today, but that we can't understand because we're still living here in this part in our history, right?

Emily Martin:

Why? Why would you try and make it so obtuse?

Nick Partridge:

Spoiler alert. They didn't know how to end the film.

Emily Martin:

Seriously?

Nick Partridge:

Yes.

Emily Martin:

They just made it hard because they wrapped themselves in too much of a quagmire?

Nick Partridge:

It's a little bit more nuanced than that. I think that's being a little harsh on Kubrick and Clarke, but Carl Sagan always said that he met with them during the production process and they were nowhere on the ending.

Matt Shindell:

Well, they did a better job than Lost.

Nick Partridge:

They did.

Matt Shindell:

Guess what? We're all dead. But-

Nick Partridge:

Spoiler.

Matt Shindell:

If you haven't seen Lost, well, just don't.

Nick Partridge:

Save it for the 50th anniversary of Lost episode.

Matt Shindell:

Yes, there you go.

Nick Partridge:

Turns out all of the weirdness in 2001: A Space Odyssey actually adds up to, believe it or not, one of the most scientifically accurate films of all time. David Kirby is the author of Lab Coats in Hollywood: Science, Scientists, and Cinema. I spoke with him about what makes this film so special,

David Kirby:

No more shiny spaceships, shiny rocket ships, goofy spacesuits, crazy aliens, things like that. Kubrick, he wanted to put that in the past.

Nick Partridge:

Was it a surprise for audiences in 1968?

David Kirby:

Oh yeah, absolutely. People often ask me what is the most scientifically accurate film ever made, and I mean, it's 2001 by a lot.

Nick Partridge:

Just to give us an idea, what would be the second?

Emily Martin:

Well, I mean, there's a lot of contemporary films, like *Interstellar*, or *The Martian* would probably be a good number two, where they did also put a lot of work into making that as scientifically accurate as they could. And *The Martian* had the advantage that they could actually use some of NASA's equipment, whereas in 2001 they had to develop it all.

Nick Partridge:

Tell us a bit more about Kubrick's connection with NASA. What did that look like?

David Kirby:

He had two major science consultants. So Frederick Ordway was the primary science consultant. He had just started a company called General Aeronautics Research Company, but he had worked at the Marshall Space Center throughout the 1960s, so he had a sort of in with NASA.

They also had Harry Lange, who, for a long time, worked at NASA illustrating advanced space vehicle concepts. So they actually had someone who had done this work for NASA now doing it for their film.

Nick Partridge:

You make it all sound like smooth sailing, but this was during the space race and NASA was really busy. Was it hard to get NASA onboard? Did they have the bandwidth? What was in it for them?

David Kirby:

Well, if you believe the conspiracy theorists, it was so that Kubrick would then help them fake the moon landing. But the real reason is it was able to project the notion of where space travel could go. Unlike a film like *Destination Moon* from 1950, where one of the goals of the scientists working on that film was to convince the American public we have to go into space, with 2001 the moon landing was just a year away, so NASA's goal was to think long-term then, talk about what could be the future. And also to try and show how technologically advanced their equipment was.

Nick Partridge:

They wanted to show that, but how well did it actually turn out? There were NASA collaborators and other corporate partners all contributing ideas to the film. How did they feel about the final product?

David Kirby:

As far as I could tell, they were almost universally happy with the depiction. Companies like Honeywell or Bell Labs or RCA, they wanted their technology associated with what was supposed to be the future.

The one exception is that IBM wasn't quite happy with the depiction of HAL the computer, and then they pulled away. A lot of people think it was because, well, HAL ended up being a homicidal maniac for a computer and they didn't necessarily want that association.

Nick Partridge:

Do we know anything about the astronauts who were flying missions at the time, what their impression of the film was?

David Kirby:

I don't know about the American astronauts, but there's a great quote from a cosmonaut named Alexei Leonov who, after seeing the film, said, "Now I feel as if I've been in space twice." And for Arthur C. Clarke, he said that was actually the greatest testimonial that he could have ever had indicating that they'd essentially gotten it right.

Nick Partridge:

Matt and Emily, that Leonov comment is kind of a big deal. Leonov was the first person to walk in space. He did so from a really tiny spaceship, and it was a little bit hair-raising, if you ever want to look up the story.

By the time of 2001 envisioned in the film, we have really big elegant elaborate space stations like Space Station Five, which looks, for everyone in the world, like a big old wagon wheel in the sky.

Emily Martin:

Matt, studying space history and talking, as you do, to all those NASA engineers, the idea of a rotating space station to kind of induce an artificial gravity wasn't entirely crazy, it's just not what our space stations ended up looking like, right?

Matt Shindell:

Right. And Kubrick and Clarke imagined the wagon wheel station because NASA engineers were thinking along those lines in the 1950s and 60s. And even if you talk to engineers today, they're still imagining creating artificial gravity in some kind of way like that, but we haven't really figured out how to do that or how it would affect the human body to live in that type of gravity environment.

But it turns out also one problem is, if you create the wagon wheel space station, the gravity you produce is going to be different at your feet than what it is at your head and the disorientation that that potentially causes, nobody's sure yet if they can stand long durations of that type of gravity.

Nick Partridge:

The aforementioned wagon wheel is kind of a big deal as far as space infrastructure goes. This was big and expensive and probably took somebody a lot of time. But its introduction in the film is kind of lighthearted, you've got a kind of a waltz playing in the background and it kind of seems like the docking space plane, the Pan Am space plane, is sort of waltzing with the space station, and it gives this kind of lighthearted feel where, nodding towards not just the sophistication of old-timey air travel, but also how commonplace spaceflight had become.

Matt Shindell:

The designs featured in 2001 were about more than the big interior and exterior shots of the ship waltzing by. There was a lot of attention paid to the tools and technologies the astronauts used during their missions and during their downtime too. Films can sometimes make people want to have a technology in their lives and inspire companies to develop them.

Emily Martin:

We'll get into how iPads, and even 3D printing, were part of this after the break.

Nick Partridge:

Now it's time for the space breakdown. Kubrick went to great lengths to get the design of his film just right, and he was famous, or maybe infamous, for being quite picky.

Emily Martin:

Can you give us some examples?

Nick Partridge:

I can. All the decisions about set design, the backdrops, the furniture, the color palettes, the costumes, the hairstyles, they had to feel right to him otherwise they were sent back for, to hear other people say it, infinite revisions.

Matt Shindell:

I read in David Kirby's book that 2001 was also monumental for something that he calls diegetic prototypes.

Nick Partridge:

Would you call it monolithic for that same reason? What is a diegetic prototype?

Matt Shindell:

A diegetic prototype is a placement for a product that doesn't exist yet. So every now and then you see product placements in movies, this would be a placement for a product that maybe someone wants to exist or thinks could exist.

Nick Partridge:

Does it have to exist later to be a diegetic prototype?

Matt Shindell:

Yes. What makes it a diegetic prototype is that the product does follow, in most cases. One good example is from Minority Report, the film with Tom Cruise, who we like to talk about every month on this show.

Nick Partridge:

Coming up next, on Cruise-cast...

Matt Shindell:

That sort of information swiping gesture control that's used on all kinds of futuristic devices, it actually exists today and was developed through that film by the same artist who developed the concept. He patented it and then actually developed it.

I'm a historian, so I love archives, and there are extensive archives from 2001 that includes some pretty noteworthy designs that seem to predict what arrived in the future.

Abraham Thomas is the curator in charge at the Smithsonian Renwick Gallery in Washington, DC, and a few of Kubrick's collaborations really stood out to him when he went to the archives.

Abraham Thomas:

Perhaps most famously when they were collaborating with RCA Whirlpool on the space kitchen, they actually prototyped a kind of, not really a working version but a version of moving parts. They actually toured around various department stores in the run-up to the film's release, so it kind of worked as this amazing kind of mutually beneficial initiative.

Emily Martin:

They really toured around department stores?

Matt Shindell:

They did. I mean, yeah it was futuristic, but was it appetizing?

Emily Martin:

Well, the food didn't look really good, it sort of looked like square baby food, but the kitchen was really cool in that it had this very cool black and white sort of diner booth, kind of a U shaped diner booth, and it was really long and narrow with black sort of vinyl cushions and white table and banquette. And then just to the side, I don't know, envision like a soda machine, but with slots in it instead of spouts, and you watch the astronauts in the film sort of push a bunch of buttons and then a few seconds later, they start pulling these plates of food, sort of square baby food, out of these slots in the side of the machine.

Nick Partridge:

Square baby food for adults. That was a product that never got off the ground from 2001.

Matt Shindell:

Yeah, well, we do have Fruit by the Foot. Isn't that kind of a square baby food for adults?

Nick Partridge:

We do, I guess.

Emily Martin:

We have Fruit Roll-Ups.

Matt Shindell:

Fruit Roll-Ups.

Nick Partridge:

But if it was intended to nourish you on a space mission, I bet it wouldn't taste very good. The thing that stuck out to me about the space kitchen is that the astronaut is clearly burning his hands pulling those plates out of the slots, so we've got trillion-dollar space infrastructure, but you can't make a man use a potholder.

Matt Shindell:

Can we please go back to the archives? Abraham reviewed drawings and photographs from the archives about all sorts of plans that were being considered, and when he was reviewing concepts for the space

kitchen, he noticed something that I hadn't heard about before. Well, here's what he had to say about a connection between 3D printing and 2001.

Abraham Thomas:

Amongst these photographs are something described as a plastic dish maker, which, I mean, you look at the detailed descriptions, you realize what they're essentially describing is a kind of 3D rapid prototyping machine where these dishes could be created within seconds from some kind of polymer based substance.

Matt Shindell:

Something that didn't make it into the film's space kitchen, but did later come into reality.

Emily Martin:

It must be actually a pretty powerful feeling for a director of a film like this to consider that they're not just designing a movie experience for the viewers, but they may actually be helping shape a future reality.

Nick Partridge:

There was, of course, a famous technology that was showcased in the film that nearly all of us use around the clock, and in fact you're probably plugged into it right now. I'm speaking of course about digital tablets and smartphones and all of your smart surfaces.

I love how Abraham noticed that it wasn't just the visual aesthetics of today's iPad that made its way into the film, it was the way the astronauts explored the news. Here's what he said.

Abraham Thomas:

From the archive files it was called the news pad, and this was an object designed by IBM and particularly working with Eliot Noyes, who was IBM's long standing designer in residence. Eliot Noyes and the IBM team had proposed to Kubrick's team this object will be a sort of flat-screen object, your be able to receive what was described as sort of news messages from earth, digital articles from Sports Illustrated or Newsweek, and you'd be able to drill down into different articles.

You realize that not only is this product being designed and conceived of in the mid 60s a predictor of what we might think of now as the Apple iPad, but it also kind of predicts the sort of secondhand nature we have now for drilling down information on the worldwide web.

Matt Shindell:

Looking back, even though it's really difficult to draw direct lines between what appeared in the movie and what we have today, the tech in 2001 was pretty groundbreaking. Today, it's hard to imagine living without anything like the tablet and wifi, but neither of these were in the public's hands at the time. These were completely creative.

Emily Martin:

It gets back to the chicken and the egg debate. I mean, were engineers inspired to develop these kinds of technologies because they were inspired by 2001? And did they think about how these astronauts were using these kinds of tablet computers to check up on the news and sort of use them as ways of

entertainment in some of their downtime? Were they envisioning these kinds of things and how we were going to use them because of the movie?

Matt Shindell:

The way I think about it is I think there's many chickens and many eggs. There's the scientists doing work that's inspiring the filmmakers to think about what could happen in the future. And then there's scientists watching films and thinking about what they could possibly do. And it's sort of this cycle that goes back and forth.

It's worth noting that futurism, the idea of designing for the future and creating the future we design, it isn't just a retro concept. It wasn't just something that people in the 1960s were interested in. Abraham explains that futurism is still a very active part of design, but now in some different realms.

Abraham Thomas:

In terms of design, I think futurism has itself rooted much more in a sort of socially engaged way. When one thinks about designers who are working on pop-up shelters for refugee crisis camps or temporary architecture being developed for post disaster zones, there's this idea of futurism being channeled with a kind of slightly negative, sort of dystopian, apocalyptic vision of the future. Whereas I think in the 60, and the 70s to an extent, there was still this idea of the sort of Jetsons inspired optimism of flying cars and personal transportation. I think we've become sadly, but perhaps understandably, a lot more cynical and real about what the future holds for us.

Matt Shindell:

Science fiction is not just an opportunity to try out new gadgets in an imaginary sense, but it's also a way to try out new ways of life and to critique, maybe, some of the ways that we're living now.

Emily Martin:

For the episode today, we didn't want to just talk about all the interesting and important things that 2001: A Space Odyssey did, we wanted to know what science fiction authors and creators today are saying about the next 50, 100, or even 10,000 years from now.

Matt Shindell:

Monica Byrne is a science fiction writer and futurist.

Nick Partridge:

She received her degree in biochemistry, then went to MIT to study geochemistry. She got her pilot's license and she even worked for NASA.

Emily Martin:

She puts it best when she says...

Monica Byrne:

After really giving it, so to speak, the old college try, realized that that is not the toolbox I wanted to use, that I wanted to be a writer. And that's not to say scientists can't be creative, scientists are incredibly creative. But their raw material is different. And I really just wanted to create my own systems with their own sets of constraints. To make things up.

Nick Partridge:

I talked with Monica about science fiction and optimistic takes on the future, about humanity's potential for advancement and even enlightenment.

The hallmark of mid-century science fiction was a utopian vision of the future. Is that still the case? Is contemporary science fiction concerned with utopia and is the only alternative dystopia?

Monica Byrne:

Definitely not the only alternative is dystopia. I mean, we have far too many dystopias right now, and that, to me, is a result of the authorship of science fiction being predominantly, still, white and male, and the only future that they can envision is dystopia because they mistake the crumbling of their world for the crumbling of the world, whereas that is not the case.

Much more science fiction now, especially in the last 10 or even five years, is concerned with a much more realistic grappling with the idea of utopia that is intersectional, that does not look like a bunch of nuclear families living in a walled city, which is what a lot of the utopian societies looked like in the 50s and 60s. And right now I feel like science fiction is beginning to engage with all the kinds of technology that there are out there.

Nick Partridge:

Tell me more about those technologies. How do you define technology?

Monica Byrne:

I think I would define technology as anything that humans invent. Technology in the sense that science fiction writers thought about in the 50s and 60s was a very small piece of a tapestry of all technology, including social technology, religious technology, ritual technology.

Nick Partridge:

I like the idea of science fiction teaching us about different types of technology. Can you give us an example of one of those?

Monica Byrne:

Here's a great example, satyagraha. Satyagraha is the discipline of non-harm, non-violent, civil disobedience, basically, that was pioneered by Gandhi and used to push the British out finally. That was a set of ideas that had never been articulated and employed before to such great effect. This is what I mean by technology, and this technology ended an empire.

Nick Partridge:

Technology can mean a lot of different things. What are some examples of gadgets that are showing up in modern science fiction that have potential to impact society the way that you're saying?

Monica Byrne:

Universal translators. So that is definitely a thing that is just assumed to exist in all science fiction that I read, even if it works imperfectly. And we already have it in the form of Google Translate, and it's very imperfect, but it can't not exist in a future that I can see.

Building with biomaterials is already happening. There are entire structures made of bamboo and chitin, for example, from insects. And I would, again, they're not shiny or they're not metal, but they are devices, they are technologies, and they are designs that come from science fiction.

Nick Partridge:

Does science fiction have anything to tell us about diversity?

Monica Byrne:

Absolutely. Science fiction has always been, but now is much more explicitly, engaging in the problem of how to reconcile self with other. Star Trek is a great example of that. I mean, it is the current human enterprise in another form, which is going out into the universe and encountering all kinds of life forms and being radically open to them all and not interfering in their civilizations or their cultures. That mentality definitely did so much to shape science fiction.

Nick Partridge:

Last thing, I want to ask you about contemporary science fiction and what it may be trying to tell us about our time and place, and what futurism may have to say about where we're headed.

Monica Byrne:

Futurism is the work of remaking the world in the image that you think it should be made in. I tend to think of futurism as being an inherently positive venture, and I think we're getting to a point where institutional mistrust and corporate mistrust and mistrust of social media is reaching levels I've never seen before, and that we have to grapple with that through human relationships, through our technological relationships, and right now is the most important time to choose which fictions we believe in.

Nick Partridge:

Monica recommended a slew of contemporary science fiction and futurist authors who are prototyping our future, but we didn't have time to include them all in this episode. We'll have a list on our website.

That's it for this episode of AirSpace. All that talk of space food has given us an idea. Next episode, we will delve into Matt's beloved archives to see what kinds of wonders are hidden in the drawers and drawers of preserved 1960s space food that we keep here at the National Air and Space Museum. Tune in next time to see if it's still edible.

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Speaker 10:

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