Indie Sci Fi with Tobias Cabral and Erasmo Acosta

[Opening theme music with voiceovers.]

Tobias Cabral

There's a basis for a psychological consideration of the value of a planet which is not easily dismissed.

Erasmo Acosta

You look up in the sky and you see the clouds, you don't see the other. You see continents on the sky, but you don't even get to the series because they are 601, 200 km away in the sky.

[Theme music plays out.]

Joel McKinnon

Welcome back, friends, to another very special episode of Seldon Crisis. Today, we have not one, but two guests on to talk about their unique and exciting views of possible human futures. We have intelligent and soulful machines, rotating space habitats, cruel but compelling villains incredibly long timescales, a city on Mars, Dyson Swarms around our sun and many others in our galaxy, exhilarating action scenes, interstellar travel, and much, much more. Today we're going to celebrate independent science fiction, featuring a couple of very different but highly imaginative takes on what may be in store for humanity in centuries and millennia to come.

Joel

A little bit about our guests today. Tobias Cabral is a clinical psychologist as well as a lifelong speculative fiction fan, a mythology and aerospace junkie, and perhaps a bit unhealthily preoccupied with chaos complexity theory. Both alone and in collaboration with other authors, he has written a number of science fiction novels, novellas, and short stories. Welcome Tobias!

Tobias

Thank you kindly, Joel. Considering how enthusiastically I've listened to your podcast in the past, it is a groove to be here.

Joel

All right. And Erasmo Acosta is an emigrate from Venezuela who came to the US in 1996 and worked for most of his life in software, but is now the author of a fascinating and incredibly audacious novel that spans a billion years - that's with a B - into the far distant future. K3+ is the story of humanity's journey from a single planet to become masters of the entire galaxy. Great to have you on, Erasmo!

Erasmo

Thank you, Joel. I'm privileged to be here.

Joel

Okay, well, let's get going. I'm going to start with you, Erasmo. When I first came across one of your essays on Medium, I can't remember which one now, since I've read quite a few of them. I was just blown away by the boldness of your vision. Your book, K3+, is no different. You tell the story of a young man born in the late 20th century and follow his life for a billion years into the future. To do this, you had to imagine the course of humanity from a fractious civilization on a single world, finding a way to grow and thrive beyond the cradle of Earth and imagine a possible path to the stars.

And you describe each incredible step in detail. Can you give our listeners a brief introduction to this amazing story, what the research for it entailed, and tell me how you summoned the courage to launch into such a huge project.

Erasmo

Thank you, Joel. Well, K3+ is the story of how mankind survives our current dystopia to build a post-scarcity civilization in space. The key elements of the story are rotating habitats, cylindrical megastructures that emulate Earth's gravity by spinning. The story begins in the distant future, when we have colonized the Milky Way, all the galaxies in the Local Group, and are in the process of colonizing neighboring galactic clusters. We no longer settle planets, but build these rotating colonies that I just told you about. When you have enough of them around the star to completely surround it, you capture its entire energy output, and that's what we call a Dyson Swarm.

Planets become a curiosity because very few have set foot on one. We met the main character, a guy named Fedrix, with an "x" celebrating his billion year birthday by space diving into a planet with a bunch of friends. Humans are genetically enhanced. They live forever, looking like they're

in their early 20s. They have nanobots inside their bodies ensuring perfect health and use neural interfaces to communicate. In K3+, people no longer speak, but exchange thoughts. Thought exchange was inspired by the way people from the Second Foundation mentally interact with each other. Combined with a faster than light communication technology, people can have all sorts of interactions across millions of light years.

Fedrix and his friends live in a colony ship called The Eternity, going from star to star, delivering billions of colonists. When they arrive to a new star, they begin building rotating habitats. After they get everything going for the future Dyson Swarm, they move on to the next task. So after a spectacular week long party, the storyline jumps to 2016, and the next couple of chapters are devoted to how mankind becomes a spacefaring civilization. Fedrix was born Federico Tarifa in 1966 in Colombia. He is being interested in space his entire life. In 2016, he realizes that building rotating habitats instead of trying to colonize the Moon or Mars is the way to go, and he becomes an advocate for the cause.

Years later, a group of scientists, engineers, and ex NASA astronauts create an organization called the Space Initiative. They begin mining asteroids and after a few decades, managed to build the first rotating habitat a very tiny colony the size of a stadium and capable of housing a thousand people. They call it Terminus in honor to the great Isaac Asimov. Federico becomes one of the first residents of Terminus and later gets promoted to be the colony administrator. From Terminus, they launch an automated mining operation to the planet Mercury. This allows them to build rotaring habitats the size of an island and capable of housing tens of millions of people.

The influx of raw materials allow the Space Initiative to pay all their loans, and it becomes extremely wealthy. It also becomes an independent nation with its own seat at the United Nations. Little by little, people start immigrating to space, trying to escape climate change and economic

inequality. The Space Initiative offers free housing and a universal basic income to all its citizens. In the beginning, only a few people live, but in the 23rd century, 17 billion people live in space versus just 3 billion people on Earth. And nations begin to collapse due to underpopulation. The United States declared immigration an act of treason in an effort to deter people from leaving.

But the exodus continues. At the same time, the Space Initiative is desperate to extract a group of scientists that has just discovered the secret to faster than light communication. Because this technology will allow a unified human civilization throughout the universe, the initiative is willing to do whatever it takes to secretly extract their scientists. Fedrix is now a Space Initiative board member, and the chairman puts him in charge of a covered operation to rescue the scientists. As people continue to flee, the United States launches a first strike attack with space ballistic missiles, destroying two of the habitats.

Russia and China are allied with the Space Initiative and launch a massive counter cyber attack that paralyzes most of the US. Offensive weapons. But the American president launches all the nuclear weapons he had left against the two superpowers, triggering World War II. A century after the war, humans restore Earth to its pristine glory. But everybody lives for space, and the planet becomes a vacation destination. By the year 2400, a trillion people live in space. And new technologies allow the construction of continent sized rotating habitats, each capable of housing 5 billion people. Humans are now ready to send the first interstellar ship to Alpha Centauri.

The ship is accelerated without fuel by bouncing a powerful laser off its back shield. The laser provides a tiny acceleration, so it takes about four years to reach 20% of light speed in a total of 25 years to reach Proxima. Once the first interstellar voyage is successful, mankind colonizes the Milky Way in under a million years. But even before our galaxy is fully

colonized, they reach for neighboring galaxies. Now, K3+ hinges on the Fermi paradox. But now, when the storyline returns, the future, the eternity, is in intergalactic space outside the M 87 galaxy when they encounter the first extraterrestrial civilization.

Joel

Wow, that's a lot. That's a big story. Probably bigger than anybody else has ever written beyond the audacious vision of telling this story. I was really impressed by your depth of conviction regarding the most effective path humanity has to take to reach the stars. And, you know, from our exchanges online, I am one of those planetary chauvinists who loves the idea of humanity settling Mars. I've been a member of the Mars Society for twenty years or so, and other worlds in our solar system, along with the kind of space settlements you were describing in the story.

The efforts to settle Mars don't go well, being undermined by the deleterious effects of gravity coupled with substance addiction and depression. Why are you so convinced that planetary settlements must be avoided in humanity's future? And that only the approach you describe is worth exploring.

Erasmo

One thing Asimov constantly reminds me is that we all have our biases and that it's very difficult to get past them. I believe he had an epiphany during that conversation with Gerard O'Neill when he coined the term planetary chauvinism. To be honest, I think it's a bit strong, and I actually use the term deeply ingrained planetary bias. I think it's a little bit softer than saying planetary chauvinism. And first, planets are fundamentally limited. If I had a magic wand and made Mars and Venus identical to Earth gravity and all, we'd fill them in a couple of generations.

Second, to get access to the amount of raw materials available in space, we'd have to disassemble those planets, and we know how well that's going on Earth right now. Personally, I have come to regard Earth as mankind's womb. Our ancestors lived in caves. I believe our descendants will live in these rotating oasis around the stars. We can house more people inside rotating habitats around the sun than on all habitable planets in the Milky Way. And we still have another 200 billion stars to settle, regardless of whether they have habitable planets or not. Finally, I want to add that stars are the low hanging fruit for a technology advanced civilization such as mankind to colonize space because they offer virtually unlimited energy and raw materials.

We will start building rotating habitats around the sun one by one, and within a thousand years, we'll have built so many of them, we completely surround our star. That said, I'm not stopping anybody from going to settle Mars and the clouds of Venus if they want.

Joel

All right, good, because I'm heading there. No, I'm curious about one thing, and I want to ask you after we talk, to get into Tobias' book a little bit, but I'm curious about when exactly that interview with Gerard O'Neill was with Azimov, because is it before or after he'd written the sequels and the prequels to Foundation? Do you remember?

Erasmo

1975.

Joel

'75. Okay, so it was before he wrote all that stuff. Okay, that's interesting.

Erasmo

I guess he had a lot on his plate.

Joel

Yeah, definitely. So let's move on to a completely different take on the future. Tobias, you wrote a really interesting book, a few of them, but the one that I first read was "New Eyes." I think it's your most recent published book. Or one sinse, I guess, right?

Tobias

One sinse.

Joel

Yeah. So it's set largely on Mars in what feels like just a few decades into the future. Robots feature extensively in your story, and the relationships between humanity and the artificial life we create is a big part of it as well. I was really captivated by the depth of the characters in your story, including the villains, who are really quite nasty but also have compelling backstories and always believe they are doing the right thing. Can you give us an introduction to the story and why you decided to center it so much on the relationship of humanity with artificial life.

Tobias

Yeah, thanks, Joel, and thank you very much for your words on my book. New Eyes is actually a sequel to a book that I co wrote with Joseph Cotilli. Funny story, very briefly, way, way back in graduate school, sometime during the mid-Taft administration or something, Joe and I were on a twelve hour and excruciatingly boring twelve hour shift at a psychiatric hospital where we worked, and we decided, hey, let's write a story together. So he and I sketched out some world building and some alternate history and a few characters, and we wrote like roughly the first chapter of the story.

And then, as with so many things at life, it sort of fell away. And fast forward some 20 years later, we reconnect on Facebook and he said, hey, do you remember that story we started writing?

Joel

Yeah.

Tobias

Well, we never finished it, but there's like a bunch of other stories that I wrote in that world. I said, oh, that's groovy. And then we put our heads together and we finished that first story called The Source Novella, as it turned out, because brevity is not my strong suit. And several other stories ensued and they're all partaking of the same general universe. And one of them, his daughter, his brilliant daughter, came up with the idea of an android serial killer. And they bounced the idea off of me. And because in addition to being a huge geek, I'm also like, badly addicted to puns.

I thought about alternate spellings for the word serial, but this android was horribly abused. Ridiculously abused. And as a result came up with this delusional idea of avenging artificial life against humans who in any way normalized that kind of abuse and started killing people in a very sort of cyberpunky way. Who? Somebody who was using androids to test radiation shielding. He designed nanites that would detonate his skin because androids are very sensitive to ionizing radiation. Another restauranteur who you employed and abused, only androids in his restaurant had his viscera explode. So this was a very brutal idea, but at the core was this being, this sentient being who was just trying to do the right thing and had been so distorted by his experiences that he turned to this awful mode of vengeance.

And so that was sort of a detective cyberpunky story. But I came up with the idea for New Eyes, which would be a sequel that would focus on what

were ultimately secondary characters in Mechanical Error, which I guess violates know you keep your main characters in the sequel, but whatever. I had The Empire Strike Back focused on like, Boba Fett and the guy with the cybernetic implants. And the objective was to in some way redeem this poor android without reprogramming, without a death sentence of consciousness, to bring him into a more moral empathic way of being.

And as a result, I created these characters, continued and fleshed out these characters, one of whom was like the beautiful woman in the front row who never failed to attend the android's performances and who was never given a name because her purpose was to be his tragically distantiated moral center. Then I gave her a name, and this one cyberneticist, who was inadvertently duped into helping the android create the nanites that would cause his victims to explode and felt he had to redeem himself. And in order to redeem themselves, they have to go to Mars, because Mars has much more lax laws on androids than on Earth.

Androids are property on Mars. They work off their manufacturing costs and can become full citizens.

Joel

Indentured servants, I guess, right?

Tobias

Essentially, yeah. But in the sense, in an existential sense, I'm working off the cost of my presence in the universe, and after that, it's on me. Which people of good conscience can disagree as to the morality of that, but it takes a lot of money to build an android. So something but one of the main thoughts I had was that if you have a truly sentient AI, a networked general intelligence that has achieved self reflexive awareness, to the extent that you could call it sentient, then our task as creators of such beings is far less akin to programming than parenting.

And that's a thing I'm sure we'll get back into. But, I mean, you mentioned my villains, and I love my villains. I love my villains. One of them in particular, Ireen, she is so marvelous. She could have been such a tremendously fruitful, generative agent in the universe, except that certain things went wrong in her background and she became somewhat narcissistic and psychopathic. And so you can see how awesome she is, but you can also see how broken she is. And that's really hard for me to write. There are two villains, two main villains in New Eyes, and they're the first villains I'd ever written because I have an unhealthy inability to distance myself from the empathy for characters.

So to make them bad and deserving of bad things is really difficult for me. So that was a bit of know...

Joel

I have to interrupt you for a second. I didn't even really get that Ireen was a villain at first. I was drawn into her so much like when you first started writing about her, that I, you now, really liked her from the get go. And then gradually she became quite sick - I guess she was that way all along.

Tobias

In my mind she's got the greatest voice, too. She's like a cross between Catherine Hepburn and Wendy Malek. But anyway, that's thing I come from a family of musicians, so I hear voices in my head, which sounds a lot worse when I say it out loud.

Joel

Okay, so that's the wrap on your book. That's quite a bit.

Tobias

Sorry, mate.

Joel

Okay, this is kind of for both of you. As someone who's never written a novel, I'm often overwhelmed by the amount of research that a novelist, and especially a hard Sci-Fi novelist, has to do to sound like they know what they're talking about. So can I get you guys to talk about that process and some of the biggest challenges you face in your world building and creating the details of a story set in a world so unlike what we as the readers are familiar with. For instance, Erasmo in K3+, you go into quite a bit of detail on the construction of rotating space habitats and the Kardishev Scale.

Can you talk at all about what that means and your process of researching these concepts? And maybe you could also describe a little bit more about the Fermi Paradox and how that plays into the story.

Erasmo

Perhaps I should explain what a rotating habitat is. It's basically a gigantic cylinder made of a rectangular section bent until it forms a tube. This is what we call the drum, and two circular sections to seal the atmosphere inside the cylinder rotates to create the effect of gravity inside the drum. But at the center of the regular sections, you have zero gravity. The concept of rotating habitats was popularized by American physicist Gerard O'Neill in the seventies, and extends his work to incorporate 21st century technology. For example, we use a Kevlar composite to build them bigger than O'Neill's original design.

We grow crops using vertical farming with aeroconic irrigation, and animal protein is grown in vitro without sacrificing a living being. All this is done in the zero gravity area along the rotating axis, maximizing the use of the drum for human activities. The Fermi paradox is one of the most exciting aspects of K3+. The best metaphor I came up with to explain it is if you are waiting for a friend who lives half a mile away and he doesn't

arrive within the hour, something out of the ordinary happened. That is the essence of the Fermi Paradox.

Given the size and age of the Milky Way, there's been more than enough, thousands of times more than enough time for an alien civilization to colonize it. Even without faster than light travel, with our current technology, we can achieve the task in under a million years. I want to be very cautious with my words at this point. The more we learn, the more likely it appears that we are the first civilization in the Milky Way. Stars like the sun are only 2.5% of the galaxy, and even the sun appears to be exceptionally tame compared to other yellow dwarfs.

Then, when you look at the very unlikely accidents in the evolution of life on Earth, we are here doing this webcast by a miracle. Finally, yellow dwarves have a very short life. In the next 500 million years, the Sun's luminosity will increase by 10%, and that will spell doom towards biosphere.

Joel

Yes, it'll get a bit hot.

Erasmo

You may say that.

Joel

So, yeah, I kind of agree. After reading Stephen Webb's book on why are we here [Where is Everybody?], I came to the same conclusion he did. He led me to that we are probably alone. There's just so many crazy steps required for life to become multicellular in the first place and then to actually become the time it takes to get to where we are. Tobias?

If I may.

Erasmo

Yes.

Tobias

In retrospect, the probability of all the things having happened exactly the way that they did is hilariously low. However, the present is always inevitable. The fact that we're having this conversation means that all those things have already occurred. And I understand if you're extrapolating on probabilities, you're going to say, yes, how likely is it this has happened? But, I mean, the probability of things having occurred the way that they did so that we could be having this conversation is one, it is 100% probable that all those things could have occurred. I know you're probably going to get into this more about the Fermi paradox.

And by the way, I freaking love that idea about the guy down the street who he hasn't talked to you in more than an hour. Then something's up. That is just a really freaking beauteous way to encapsulate it, but it's a big damn neighborhood, gentlemen, and it takes a long time for information to traverse that. If they're limited by flat Einsteinian space, this might be the cockeyed optimist in me, but I can't help but think that somewhere there's a hello a few parsecs away, waiting to reach our ears. So, anyway, that's just my yeah...

Joel

As Stephen kind of concluded - Stephen Webb in his book, there's much more likelihood that life is widespread throughout the galaxy than that civilized life is widespread throughout the galaxy. I'm going to go so far as to say I think that it's extremely unlikely that there are Romulans and Klingons out there. If they are, they're a very long way away, and we're not going to run into them for a lot more than the 24th century. So, anyway, I'm going to get back to the next question. This one's going to be for you, Tobias, I think, and I want to get back into this computer intelligence stuff.

So you talk about some of the possible downsides in the interactions between flesh and blood, human beings and artificial intelligence. What were some of your inspirations and where did you learn so much about complexity theory?

Tobias

Well, this is actually a really lovely anecdote about the potential cross fertilization of radical geekiness and one's questing about for a career path. I learned about chaos theory my first year of graduate well, I'm going to be a psychologist. What kind of psychologist? I don't know. I read Jurassic Park by Michael Crichton, and Crichton is one of the few novelists who puts footnotes in his books, and I loved that about him. And I dove deep into chaos theory and I read James Gleick's book Chaos and unbeknownst to me, I was at the precipice of a life changing encounter with a domain of thought.

Once I understood chaos theory to the extent that one can and added complexity theory in there, nothing ever looked the same again. It was one of those Copernican moments where you can look at a picture of a rock against the sky and honestly not know if it's something that could sit on your desk or something you'd need pitons to climb. And that is what impressed the fractal organization of the universe into my head. Things

are self similar. If you ever look up fractals, the fractional dimensions I know you know this, I'm just very good. But it's the dimensions between zero and one essentially and it's a degree of irregularity and nature tends to observe that algorithm.

So things are self similar at different scales of observations. The trunk looks like the bow looks like the branch looks like the twig looks like the leaf bronchial passages. So this self similarity is woven into the structure of any aspect of the universe which is subject to non equilibrium conditions. I mean equilibrium - everything's very predictable in Euclidean, but once you start throwing a flux of energy through the mix, then ho - things get interesting. And that's where the irregularities in matter and energy and information give rise to things like self organization, where the product of the chemical reaction is part of the process of the chemical reaction and nature itself iterates.

And once I understood that, then after my skull reconstituted from the top of my head being blown off, it became endemic to everything. And as I started to learn about one aspect of complexity theory, which is neural networks, which is information processing, not by linear sort of pings to a central processing unit, but by networks of really dumb nodes interacting with each other in incredibly complex ways. And what emerges from that is incredibly sophisticated behaviors and information processing akin to evolution, which is another whole thing I can get into at some point.
But then you'd never shut me up. I don't know. Does that answer your question?

Joel

Sure. That goes a long way towards answering the question. And that's great. Very interesting. So I'm going to talk again for both of you. You both are great writers and you know, right have written amazing stuff that's that I found incredibly entertaining. But there's a problem here. You're independent Sci-Fi writers and you don't have big budget publishers behind you. So what kind of challenges do you face getting readers to buy and read your books? Or is that not a problem? Are you just happy with a couple of readers? Is that good enough? Good enough that I've read it. So I just kind of curious how you face that challenge and what you've learned from it.

Tobias

Well, before anything else is said, I bloody love that you read it, so I'm never going to sell that short. Let me just answer this real quick, and I really want to hear what your impressions are for me. Basically, it has been unending hustling on social media. I will post constantly about, hey, you've never heard of me, but I have this book and posting like vignettes and character studies and occasionally chapters from the audiobook I've mostly recorded. And what's beautiful about that is it creates opportunities where I've connected with people, including you, Joel. And that's been my method, and it has not been as successful as my wildest dreams would have projected, but, I mean, it has yielded dividends beyond mere book sales.

Joel

Well, I know it works because you got me hooked from how many different ways that you drummed it into my head that you had this book out there, and I finally felt like I had to take a look at it and had no regrets, Erasmo? Any thoughts on that? How'd you get people to read K3+?

Erasmo

I focus on writing the story. I didn't even think about the marketing or the returns. I just got it into my head that I had to get the story out. And if you are self published, it's like you cannot get above the noise, and that is a huge handicap to start the game with. For me, what has worked the best is writing articles on Medium, scientific articles on Medium, based on the scientific topics that are brushed in K3+, and that has gotten a good number of people to read the novel. Like my Fermi Paradox article got a lot of readers, and it did sell a number of copies.

Joel

Okay, well, I'm hoping that this is another way - podcasting that we can get a few people thinking about it and maybe some following through. And at the end of this, I want to get some links from you guys to post in the show notes so people know exactly where to go to get more information and hopefully to pull out their wallets and credit cards, download something.

Tobias

That would be lovely.

Joel

Let me know what other stories or upcoming projects you guys want to talk about or is there anything else coming out for you, Tobias, after New Eyes, I believe you said you have another book. Well, before you answer that, I just want to tell you that I fell in love with your characters in the story so much. I really wanted to see more of them. And I like, is there a sequel coming out? What happens to Jenna and Naomi and all that? Well, I know what happened to Naomi, but it was the new... ah, spoiler, and Erasmo a billion years is fine, but surely you've got something in the works for what happens as humanity approaches the heat death of the universe? In another trillion years or so do we escape into another fresh young universe? Why keep the timescale so short here? Let's expand things a little bit.

Erasmo

Well, the timescale just fell into my lap because in order to reach the Virgo Cluster at a sublight speed and you have to stop every certain number of light years to colonize other stars and so on, it would be about a billion years before you make it to the Virgo Cluster. But regarding future projects, this story the way that mankind can go to space and spread, because we already have a lot of the technologies that are necessary, some of them need to be scaled up, tested and so on to be effective in space. Some of them need to be developed, but we already have a lot of the technology necessary to go to space, get a foothold, and colonize the solar system. So what's coming up for me is I want to continue spreading the word out.

I want to continue fighting those with deeply ingrained planetary bias. And basically, I want to get the word out that there is another option besides trying to live on Mars or in the clouds of Venus or in the moon.

Tobias

Okay, can I just jump in here? I have a quick thought on this whole deeply ingrained planetary bias business, because I too, suffer from that particular malady. I bounce in my chair at the prospect. So there's very little suffering actually involved for my subjective reality. One of the things that defines me is that, as Joel mentioned, I am also a mythology junkie. And I don't know, I'm in communion with the shade of old Joseph Campbell about the profound psychological and metapsychological significance of a thing. You know, you said the planets are the womb and that we moved into caves.

And what's interesting is that we emerged from one womb and moved into another womb. If you look at the imagery of caves - sorry, I got a little Freudian there, but I think that there is a certain painting with the grain in terms of our, for want of a better term, archetypal consciousness that planets would satisfy despite their disadvantages. I think that having the ground underfoot is grounding - ha-ha - orienting in a way which is not easily dismissed. For me, I think space is going to be so strange and is going to be such a collective trauma once people find themselves in a space where they look in the sky and there's this teeny tiny blue dot and there's everything else, I think that's going to mess with us.

And that's one of the reasons I see planets as a good transitional space. That being said, I think in terms of the available real estate, giant spaceborne habitats can't be beat. And as our numbers increase, along with our ambitions, let alone our travel aspirations, I mean, that is going to be necessary. I just think that there's a basis for a psychological consideration of the value of a planet which is not easily dismissed. In my office, I have a picture of a sunset over Gustav Crater on Mars. And it's the most haunting image I've ever seen. And many of my clients will say, hey, did you take that?

And I'm like I wish but they look at it and they see a place. They see a place where people live, where they look over the mountains and the sun sets. And I think that it is so, at least for however long evolution takes, it's going to be ingrained in our consciousness at such a primordial level that it gives me pause to consider abandoning that level of experience prematurely. That was a lot of words. Does that make sense?

Erasmo

Yes. And we are humans and we love land. And definitely I understand it because until six years ago, I thought we would live on a planet. But also consider that perhaps in the next two centuries we will be able to build them the size of a continent. And these things are so big, you can feed 5 billion people (with a "B"). You look up in the sky and you see the clouds, you don't see the other. You see continents on the sky, but you don't even get to see the series because they are 1200 km away in the sky.

So you can only detect the cities at night because they are so huge. And again, we don't know exactly how these things will play out. But as you said, Tobias, the planet real estate is limited.

Joel

Yes. Yeah, I want to just throw in my little objection, which is a little different. I mean, I see Tobias's point. The Joseph Campbell thing really resonates. And I'm also thinking, like, for a while I flirted with Taoism and everything is about the grain and the lea and that really strikes me as pretty compelling. But more than just the idea of having ground underfoot, I'm thinking in terms of one of the things that I love is diversity. And maybe it's a little bit the ADHD in me, but I can only see I think what really struck me in my reading more than anything was the first book that Kim Stanley Robinson wrote.

And it was actually about the fourth one he published, but it was the very first one he wrote was called The Memory of Whiteness. And it's an amazing book. It's set in like 3800 or something. And humanity has spread throughout the entire solar system. And it's told from the very distant, from Pluto inward. There's this tour of music that features heavily in it. There's this musical tour that goes from the farthest reaches of the solar system into Mercury and hits all the different worlds along the way. And humanity has settled in so many different ways and in so many places with so many different levels of gravity and different kinds of constraints.

And it's created these incredibly vibrant and varying cultures on each world based on all the things that have impacted them. And that to me is something that I just absolutely loved and thought - like, I want to see that! I want to get to that reality where there's that much difference around. And what I would want to do is make the whole tour. I'd want to explore them all and see what all these different cultures and all these different worlds are like. And maybe it's a fantasy, but Kim Stanley Robinson wrote hard science fiction so he had it pretty well explained how it worked.

And one thing I was going to say about science fiction in general and I think is as a non author, I have to say but a lot of times we're very aware of how science fiction predictions are so wrong so much of the time, right? And these are brilliant guys that are writing these stories and they know a lot about human nature and they know a lot about science and technology and everything, but still they get everything wrong. And I think one of the main reasons why these brilliant people get things wrong is because they're writing from a perspective that's rooted in the present at the time. They're writing in a mindset that's of the present and as humanity develops and surprises emerge and different...

You know, nobody knew about the Internet fifty years ago and how it would completely dominate our culture. And so we don't know what's going to completely dominate our culture in another fifty years and when

the people fifty years from now will have a mindset that's very different from that of the authors who are writing science fiction about that time now, right? So to me that's why it's inevitable that you're going to get everything wrong or a lot of things wrong. And so I just look forward to that. I like surprises. I don't want to know how things are going to happen. I want to see things be different in various ways.

Tobias

Well, it's funny, the original question before I took us down this tributary, allegedly, Shelley Winters was going to write an autobiography entitled All Tributaries and No Stream, which I really wish she had done because that's the best title ever. Speaking of ADHD, but you mentioned other things that I've written that I've been involved in future projects. And one of the things that actually just dropped under two weeks ago was an anthology of cyberpunk stories in which I have one story. There are like 14 amazing authors and me, Joseph, the guy from the hospital. And I started writing cyberpunk because that's more his style.

But I'm lousy at cyberpunk because I don't do dystopia well. I'm not a utopian. I think that there's always going to be warts and blemishes and perhaps even the occasional tumor. But ultimately I think that the life of civilization is one that evolves. So cyberpunk, it's called Neocyberpunk Vol Two and there's some amazing stories in there and mine is sort of a cyberpunk vampire crossover, but I wanted to throw it in there that I don't do dystopia well has probably come out in the course of this conversation. New Eyes is a hopeful vision of the future.

I mean, Earth is in a bad way and heading towards some unpleasant stuff, but Mars is the tabula rasa. It's where people have settled and have elected to leave their baggage behind and create a new branch of civilization, a chance to rewrite the code. And not everybody succeeds, obviously. But,

I mean, just the notion that that is an idea in the noosphere is one that is incredibly positive for me.

Erasmo

If I may. I think in the next 50 years, we're going to see wars over water, wars because of climate, and we're going to see a lot more war and a lot more conflict, especially over resources. That's the only prediction that I'm sure about.

Joel

Yeah, I hope you're wrong. I hope you're wrong. And I think there's some possibility that you are, because as we've gotten more connected and that seems to be something that we will only continue to get more connected, the cost of war becomes so obvious that it's more compelling to avoid it than ever. And I think the greater connection also has an effect on diminishing nationalism and tribalism. And that's another reason I love diversity. I love to connect with people like you, Erasmo, from very far away. My wife is from Russia.

Going to Asia was one of the greatest vacations I ever took, just to see the different perspective there. I have hopes that it will definitely have our disasters, our skirmishes. I'm hoping we can continue to avoid nukes, but who knows? That could happen tomorrow. But I'm really somewhat confident that things will improve in the long haul. In that regard, I think that there are other things that really concern me about the future, and that's more about stasis and getting too comfortable and people becoming too rooted in their comfort. And Robert Zubrin of the Mars Society has a phrase that's always stuck with me since I first read The Case for Mars, which is "feathering our nests," the fear that we will use our technological improvements to continually feather our nests, to keep getting more and more comfortable, and we'll get into the metaverse.

He didn't use that term then, but the metaverse is all about just having everything in your mind and being able to just relax and be comfortable, have three square meals a day and go anywhere you want and do anything you want. And that might be enough for 99% of the population. And I'm not sure that that's a positive thing to happen to humanity, especially after reading The End of Eternity. The main message I got out of that was, this is the wrong path to take to settle into a uniformity of humanity and to get away from risk.

And we need to push ourselves to confront more challenges, to continue to spark our evolution and to drive ourselves into more innovation and more change is good. And if we start getting into a fear of change then we will plateau and just kind of settle out.

Tobias

Yeah, I worry about that too. The sort of invaluted solipsistic view of civilization that becomes more and more planet bound. Whatever's going on with the Kardashians is more important than photographing a black hole. There is a certain sclerotic property to that which I think is very problematic. In addition to having all our eggs in one basket in the event of a calamitous asteroid impact, et cetera. I think that's one of the greatest dangers of remaining unaplanetary is that we just will collapse into our own navels, essentially. And something like the metaverse. That's one of the features of cyberpunk is that people whose life circumstances are so bloody dreadful live in this cyberspace all their time, and they come out and they look like the characters from Wall-E on the ship, sort of just sort of sitting in a chair.

Joel

Um the interesting thing I've never been really big into cyberpunk and the dystopias and everything that much, but it strikes me that they seem to be mostly about, you know, really difficult life and horrible conditions and all that. And what I'm talking about is something like - is almost 180 from that. It's the idea of life becoming too good and too perfect to the point where we're not driven to change. And I kind of feel like that danger and risk and unheard of challenges like weird gravity levels and weird atmospheres are something that would be really a good antidote to that. At some point you're going to have to get out of the comfort zone.

Tobias

Well, speaking of Robert Zubrin quotes, I mean one of my favorite quotes is that the chief export of a Mars colony will be ideas. Adapting to these wildly different circumstances and trying to transcend adversities that are unprecedented in our evolutionary history will in effect push us to evolve in terms of resource wars and such. One of the things that I really have my eye on is next generation fission. I mean fusion of course, but that's what's the old joke 30 years away and always will be. But next generation fission which is like passively cooled and essentially meltdown proof and incredibly energy dense and reprocesses waste, so it becomes renewable and the curing of the concrete of a plant will produce more CO2 than the operation of the plant itself.

So there you have things like desalination, you have things like running grow lights in northern hemispheres, things that disaster relief from small modular reactors which be barged in and renewables of course, but I mean other renewables that is of course. But I think an energy dense future is a thriving future and a future in which the possibility of innovation remains robust. I think that if we continue down our current course, god's forbid, then the energy to power innovation is going to be in dwindling supply. And that's where we start getting into the warlord scenario.

Joel

Erasmo?

Erasmo

I'll just say that. I'll just close with the sun produces in 1 second, nearly 500,000 times the total global energy consumption of the human race. Just try to wrap your mind about those numbers. Rather than using resources to produce energy here on Earth, for those who wants to stay on Earth, we can capture that energy in space and be met down to the ground as low energy radio waves. And that allows you to have energy 24 x 7 and with zero emissions.

Tobias

Word.

Erasmo

And in space, solar panels capture possibly tens of times more energy than on the surface of Earth.

Joel

And I want to make sure that you understand, Erasmo that I am not anti space settlements. I love the idea of space settlements. And when you go back to - I grew up in the - remember seeing those first visualizations of the O'Neill space cylinders? That just blew my mind. We had a coffee table book of those that I would spend hours looking at. And there's another way of looking at it too. What you describe in these gigantic worlds spinning is that is something so different to our normal conception that that's going to drive things too. It's going to drive humanity to a different place than we are mentally, emotionally.

That's not something to forget about. That's going to be a big thing. I just want it all. Yeah, that's all. I want to have enormous numbers of incredible

space settlements. I don't want them to all be the same. I want them to be different so I can go from one to the other and see how things are different. But I also want to after a while I get bored with that and I want to go check out some planets.

Tobias

Sounds good to me.

Joel

That's assuming I live for another billion years like your protagonist. If he could, why couldn't I? I think you said he was born in 66, right?

Erasmo

Fedrix was born in 66, yes.

Joel

I was born about nine years too early.

Tobias

He's my age.

Joel

Well, this has been an amazing discussion and really happy to have had you guys on. I really hope that our listeners found this interesting and I really hope that they check out your books because I think it would do them all wonderful service if they did that. So thanks so much for both of you coming on the podcast. I wish you well. Hope you continue to be so audacious and creative and looking forward to more great stuff from both of you, so keep it up.

Tobias

Thanks so much, Joel.

Joel

So that'll do it for this episode and I'm so grateful to our guests for coming on and talking about their books. I'd love to hear from any listeners who are intrigued enough to read for themselves and share your takes on the novels. I'd also love it if you would help spread the word, as it's hard for indies to find notice in the crowded field of science fiction coming from big budget publishers. Links to Tobias and Erasm's books and other info will be in the show notes on our next episode, we'll be concluding the story of "The Search by the Mule" in "Second Foundation."

When we left the story, the various threads were converging. Thanks to that mysterious hypertracer, the Mule seems to be hot on the trail of Pritcher and Channis, and the speakers of the Second Foundation seem almost ready to confront him. Pritcher seems suspiciously happy for some reason. And what's Channis really thinking? I promise to reveal all, and in only a couple of weeks. So I shall come back for the stirring, twist-filled conclusion of Search by the Mule in our next episode here on Seldon Crisis!

[Closing theme music]